UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2022

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _________ to _________.

Commission File No. 000-51399

FEDERAL HOME LOAN BANK OF CINCINNATI

(Exact name of registrant as specified in its charter)

Federally chartered corporation of the United States	**31-6000228**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
600 Atrium Two, P.O. Box 598, Cincinnati, Ohio	**45201-0598**
(Address of principal executive offices)	*(Zip Code)*

Registrant's telephone number, including area code
(513) 852-7500
Securities registered pursuant to Section 12(b) of the Act: None
Securities registered pursuant to Section 12(g) of the Act:
Class B Stock, par value $100 per share
(Title of class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
☐ Yes ☒ No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.
☐ Yes ☒ No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ☒ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). ☒ Yes ☐ No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

Large accelerated Filer ☐	Accelerated Filer ☐
Non-accelerated Filer ☒	Smaller reporting company ☐
	Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management’s assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive based compensation received by any of the registrant’s executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).
☐ Yes ☒ No

The capital stock of the registrant is not listed on any securities exchange or quoted on any automated quotation system, only may be owned by members and former members and is transferable only at its par value of $100 per share. At June 30, 2022, the aggregate par value of all Class B stock held by members and former members was $4,434,226,900. As of February 28, 2023, the registrant had 48,287,586 shares of capital stock outstanding, which included stock classified as mandatorily redeemable.

Documents Incorporated by Reference: None

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PART I

Special Cautionary Notice Regarding Forward Looking Information

This report contains forward-looking statements that describe the objectives, expectations, estimates, and assessments of the Federal Home Loan Bank of Cincinnati (the FHLB). These statements use words such as “anticipates,” “expects,” “believes,” “could,” “estimates,” “may,” and “should.” By their nature, forward-looking statements relate to matters involving risks or uncertainties, some of which we may not be able to know, control, or completely manage. Actual future results could differ materially from those expressed or implied in forward-looking statements or could affect the extent to which we are able to realize an objective, expectation, estimate, or assessment. Some of the risks and uncertainties that could affect our forward-looking statements include the following:

- the effects of economic, financial, credit, market, and member conditions on our financial condition and results of operations, including changes in economic growth, general liquidity conditions, inflation and deflation, interest rates, interest rate spreads, interest rate volatility, mortgage originations, prepayment activity, housing prices, asset delinquencies, and members' mergers and consolidations, deposit flows, liquidity needs, and loan demand;

- political, national or world events, acts of war, including the current conflict in Ukraine, civil unrest, terrorism, natural disasters, climate change, pandemics, such as the COVID-19 pandemic, or other catastrophic events, and legislative, regulatory, government, judicial or other developments that could affect us, our members, our counterparties, other Federal Home Loan Banks (FHLBanks) and other government-sponsored enterprises (GSEs), and/or investors in the Federal Home Loan Bank System's (FHLBank System or System) unsecured debt securities, which are called Consolidated Obligations (or Obligations);

- competitive forces, including those related to other sources of funding available to members, to purchases of mortgage loans, and to our issuance of Consolidated Obligations;

- the financial results and actions of other FHLBanks that could affect our ability, in relation to the FHLBank System's joint and several liability for Consolidated Obligations, to access the capital markets on acceptable terms or preserve our profitability, or could alter the regulations and legislation to which we are subject;

- changes in ratings assigned to FHLBank System Obligations or the FHLB that could raise our funding cost;

- changes in investor demand for Consolidated Obligations;

- the volatility of market prices, interest rates, credit quality, and other indices that could affect the value of investments and collateral we hold as security for member obligations and/or for counterparty obligations;

- uncertainties related to the phasing out of London InterBank Offered Rate (LIBOR) that could impact our mortgage-backed security (MBS) investments, Advances, derivatives, and collateral;

- the ability to attract and retain skilled management and other key employees;

- the ability to develop, secure and support technology and information systems that effectively manage the risks we face (including cybersecurity risks);

- the risk of loss arising from failures or interruptions in our ongoing business operations, internal controls, information systems or other operating technologies;

- the ability to successfully manage new products and services; and

- the risk of loss arising from litigation filed against us or one or more other FHLBanks.

We do not undertake any obligation to update any forward-looking statements made in this report.

Item 1. Business.

COMPANY INFORMATION

Company Background

The FHLB is a regional wholesale bank that serves the public interest by providing financial products and services to our members to fulfill a public-policy mission of supporting housing finance and community investment. We are part of the FHLBank System. Each of the 11 FHLBanks operates as a separate entity with its own stockholders, employees, Board of Directors, and business model. Our region, known as the Fifth District, comprises Kentucky, Ohio and Tennessee.

The U.S. Congress chartered the FHLBank System in the Federal Home Loan Bank Act of 1932 (the FHLBank Act) as a GSE to help provide liquidity and credit to the U.S. housing market and support home ownership. Promoting home ownership is a long-standing central theme of U.S. government policy. The System has a critical public-policy role as important national liquidity providers to the financial system through our member stockholders, particularly during stressful conditions when private-sector liquidity often proves unreliable.

The FHLBanks are not government agencies and the U.S. government does not guarantee, directly or indirectly, the debt securities or other obligations of the FHLBank System. Rather, the FHLBanks are GSEs, which combine private sector ownership with public sector sponsorship. In addition, the FHLBanks are cooperative institutions, privately and wholly owned by stockholders who are also the primary customers.

The FHLBank System also includes the Federal Housing Finance Agency (Finance Agency) and the Office of Finance. The Finance Agency is an independent agency in the executive branch of the U.S. government that regulates the FHLBanks, the Federal National Mortgage Association (Fannie Mae), the Federal Home Loan Mortgage Corporation (Freddie Mac), and the Office of Finance. The Office of Finance is a joint office of the FHLBanks that facilitates the issuance and servicing of the FHLBank System's Consolidated Obligations.

Thrift institutions, commercial banks, credit unions, certain insurance companies, and certified community development financial institutions chartered in the Fifth District may voluntarily apply for membership in our FHLB. Applicants must satisfy membership requirements in accordance with statutes and Finance Agency regulations. These requirements deal primarily with home financing activities, satisfactory financial condition such that Advances may be made safely, and matters related to the regulatory, supervisory and management oversight of the applicant. By law, an institution is permitted to apply for membership in only one FHLBank, although a holding company may have memberships in more than one FHLBank through its subsidiaries. At December 31, 2022, we had 616 members.

We are exempt from all federal, state, and local taxation other than real property taxes. Any cash dividends we issue are taxable to members and do not benefit from the corporate dividends received exclusion. Notes 1 and 10 of the Notes to Financial Statements provide additional details regarding the assessment for the Affordable Housing Program.

Our internet address is www.fhlbcin.com. Information on our website is not incorporated by reference into this report.

Mission and Corporate Objectives

Our mission is to provide member-stockholders with reliable funding to support housing finance, affordable housing and community investment, and assist with their balance sheet management.

How We Achieve the Mission

We achieve our mission through a cooperative business model. We raise private-sector capital from member stockholders and issue low-cost high-quality debt in the global capital markets jointly with other FHLBanks. The capital and proceeds from debt issuance enable us to provide members services—primarily, access to liquidity via reliable, readily available, and low-cost sources of funding to support their business activities including affordable housing and community investment. Another important member service is that we offer a program to purchase certain mortgage loans, which provides members liquidity and helps them reduce market risk. Additionally, we provide a competitive return on members' capital investment in our company.

Our ability to best perform our mission depends on having a membership base that is an essential component of the nation’s housing and mortgage finance systems. We focus closely on fulfilling our mission for members who are community financial institutions. At the same time, we value having large members who are active borrowers because they provide the System the ability to consistently issue large amounts of debt, which helps ensure the debt has a relatively low cost, benefiting all members.

The primary products we offer are readily available low-cost loans called Advances, purchases of certain whole mortgage loans sold by qualifying members through the Mortgage Purchase Program (MPP), and Letters of Credit. We also offer affordable housing programs and related activities to support members in their efforts to assist very low-, low- and moderate-income households and their local communities. To a more limited extent, we also have several correspondent services that assist members in operational administration.

The primary way we obtain funding is through participation in the issuance of the FHLBank System's Consolidated Obligations in the global capital markets. Secondary sources of funding are capital and deposits we accept from our members. A critical component of the success of the FHLBank System is its ability to maintain a comparative advantage in funding given its GSE status, low risk operations, and joint and several liability across the 11 FHLBanks. We regularly issue Obligations with a wide range of maturities, structures, and amounts, and at relatively favorable spreads to benchmark market interest rates (such as U.S. Treasury securities, Federal funds effective, and the Secured Overnight Financing Rate (SOFR)) compared with many other financial institutions.

Because we are a cooperative organization with some members using our products more heavily than others and members having different amounts of capital stock, we must achieve a balance in generating membership value from product prices and characteristics and paying a competitive dividend rate. We attempt to achieve this balance by pricing our products at relatively narrow spreads over funding costs, compared with other financial institutions, while still achieving acceptable profitability. Our cooperative ownership structure and extensive access to debt markets allow our business to be scalable and self-capitalizing without taking undue risks, diminishing capital adequacy, or jeopardizing profitability.

Our franchise value is derived from the synergies brought by the various components of our business model, including the public-policy mandate, GSE status, cooperative ownership structure, consistent ability to issue large amounts of debt at acceptable funding costs, and mechanisms of providing housing finance liquidity through products and services to financial institutions rather than directly to homeowners.

Corporate Objectives

Our corporate objectives, listed below, are intended to promote housing finance among members and ensure our operations and governance are effective and efficient.

- ***Mission Assets and Activities (as defined below):*** Implement strategies and tactics and effectively manage operations to promote members' usage of Primary Mission Assets and Supplemental Mission Activities and stand ready at all times to provide liquidity to members.
- ***Housing and Community Investment Programs:*** Maintain effective housing and community investment programs and offer targeted voluntary assistance programs.
- ***Safe and Sound Operations:*** Optimize our counterparty and deposit ratings, achieve an acceptable rating on annual examinations, and have an adequate amount and composition of capital.
- ***Risk Management:*** Employ effective risk optimization management practices and maintain risk exposures at low to moderate levels.
- ***Stock Return:*** Earn adequate profitability so that members receive a competitive long-term dividend on their capital stock investment.
- ***Governance:*** Operate in accordance with effective corporate governance processes that emphasize compliance and consider the interest of all stakeholders (members, stockholders, employees, creditors, housing partners, and regulators).

Business Activities

Mission Assets and Activities
The following are our principal business activities with members:

- We lend readily-available, competitively-priced, and fully-collateralized Advances.
- We issue fully-collateralized Letters of Credit.
- We purchase qualifying residential mortgage loans through the MPP and hold them on our balance sheet.

We also may execute standby bond purchase agreements with state housing authorities, which is a minor source of business activity. Together, these product offerings constitute "Mission Assets and Activities." We refer to Advances and Letters of Credit as Credit Services.

Affordable Housing and Community Investment
In addition, through various Housing and Community Investment programs, we assist members in serving very low-, low-, and moderate-income households and community economic development. These programs include Advances at below-market rates of interest, as well as direct grants.

Investments
To help us achieve our mission and corporate objectives, we invest in highly-rated debt instruments of financial institutions and the U.S. government and in mortgage-related securities. In practice, these investments normally include liquidity instruments and longer-term MBS, as permitted by Finance Agency regulation. Investments provide liquidity, help us manage market risk exposure, enhance earnings, and through the purchase of mortgage-related securities, support the housing market.

Sources of Earnings

Our major source of revenue is interest income earned on Advances, MPP loans, and investments.

Major items of expense are:

- interest paid on Consolidated Obligations and deposits to fund assets;
- costs of providing below-market-cost Advances and direct grants and subsidies under the Affordable Housing Program; and
- non-interest expenses.

The largest component of earnings is net interest income, which equals interest income minus interest expense. We derive net interest income from the interest rate spread earned on assets versus funding costs and the use of financial leverage. Each of these can vary over time with changes in market conditions, including most importantly interest rates, business conditions and our risk management activities.

We believe members' capital investment is comparable to investing in adjustable-rate preferred equity instruments. Therefore, we structure our balance sheet risk exposures so that earnings tend to move in the same direction as changes in short-term market rates, which can help provide a degree of predictability for dividend returns.

Capital

Due to our cooperative structure, we obtain capital from members. Each member must own capital stock as a condition of membership and normally must acquire additional stock above the membership stock amount in order to gain access to Mission Assets and Activities. Acquiring capital in connection with growth in Mission Assets and Activities ensures that these assets are self-capitalizing. We issue, redeem, and repurchase capital stock only at its stated par value of $100 per share. By law, our stock is not publicly traded.

We also maintain an amount of capital to ensure we meet all of our regulatory and business requirements relating to capital adequacy and protection of creditors against losses. We hold retained earnings to protect members' stock investment against impairment risk and to help stabilize dividend payments when earnings may be volatile.

Governance

Board of Directors

Our Board of Directors is responsible for the overall oversight and management of the FHLBank pursuant to the Federal Home Loan Bank Act. The combination of public sponsorship and private ownership that drives our business model is reflected in the composition of our 17-member Board of Directors, all of whom members elect. Ten directors are officers and/or directors of our member institutions, while the remaining directors are Independent directors who represent the public interest. When nominating Independent director candidates, our Board values diversity across a number of categories, including diversity of gender, race, and ethnicity, as well as professional backgrounds. The professional backgrounds of our Independent directors cover a wide range of industries and expertise in areas such as financial markets and economics, affordable housing organizations, and technology, including cybersecurity.

Culture of Ethical Behavior

We are committed to the highest possible standards of honesty, integrity and conduct. These standards are essential to our business and foster confidence in our FHLBank and the FHLB System. To promote these standards with our employees and our vendors, we maintain a Whistleblower Policy, Standards of Conduct that apply to all employees, and a Code of Ethics for Senior Financial Officers. The Standards of Conduct outline employees' responsibilities to "promptly raise compliance and ethics questions and concerns" and provide a description of the types of questions and concerns that should be raised. Each employee receives training on and certifies understanding and acceptance of the Standards of Conduct at the inception of their employment and, thereafter, must certify their compliance with the Standards of Conduct at least once each year.

Regulatory Oversight

Our business is subject to extensive regulation and supervision. The laws and regulations to which we are subject cover all key aspects of our business, and directly and indirectly affect our product and service offerings, pricing, competitive position and strategic plan, relationship with members and third parties, capital structure, cash needs and uses, and information security. As discussed throughout this report, such laws and regulations can have a significant effect on key drivers of our results of operations, including, for example, our capital and liquidity, product and service offerings, risk management, and costs of compliance.

The Finance Agency has regulatory authority over the FHLBanks and is charged with ensuring that each FHLBank carries out its housing and community development finance mission, remains adequately capitalized, operates in a safe and sound manner, and complies with Finance Agency regulations. The Finance Agency is headed by a Director who has authority to promulgate regulations and to make other decisions.

To carry out these responsibilities, the Finance Agency conducts examinations of each FHLBank at least annually, as well as periodic reviews, and receives monthly information on each FHLBank's financial condition and operating results. While an individual FHLBank has substantial discretion in governance and operational structure, the Finance Agency maintains broad supervisory and regulatory authority. In addition, the Comptroller General has authority to audit or examine the Finance Agency and the FHLBanks, to decide the extent to which the FHLBanks fairly and effectively fulfill the purposes of the FHLBank Act, and to review any audit, or conduct its own audit, of the financial statements of an FHLBank.

Ratings of Nationally Recognized Statistical Rating Organizations

The FHLBank System's comparative advantage in funding is acknowledged in its excellent credit ratings from nationally recognized statistical rating organizations (NRSROs). Moody's Investors Service (Moody's) currently assigns, and historically has assigned, the System's Consolidated Obligations the highest ratings available: long-term debt is rated Aaa and short-term debt is rated P-1. It also assigns a Prime-1 short-term bond rating on each FHLBank. It affirmed these ratings in 2022 and maintained a stable outlook. In 2022, Standard & Poor's affirmed its issuer credit ratings on each FHLBank and its AA+ ratings on the System's senior debt and also maintained a stable outlook. The ratings closely follow the U.S. sovereign ratings from both agencies.

The agencies' rationales for their ratings of the System and our FHLB include the System's status as a GSE; the joint and several liability for Obligations; excellent overall asset quality; extremely strong capacity to meet commitments to pay timely principal and interest on debt; strong liquidity; conservative use of derivatives; adequate capitalization relative to our risk profile; a stable capital structure; and the fact that no FHLBank has ever defaulted on repayment of, or delayed return of principal or interest on, any Obligation.

A credit rating is not a recommendation to buy, sell or hold securities. A rating organization may revise or withdraw its ratings at any time, and each rating should be evaluated independently of any other rating. We cannot predict what future actions, if any, a rating organization may take regarding the System's or our ratings.

BUSINESS SEGMENTS

We manage the development, resource allocation, product delivery, pricing, credit risk management, and operational administration of our Mission Assets and Activities in two business segments: Traditional Member Finance and the MPP. Traditional Member Finance includes Credit Services, housing and community investment, investments, some correspondent and deposit services, and other financial products of the FHLB. See the "Segment Information" section of "Results of Operations" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 14 of the Notes to Financial Statements for more information on our business segments, including their results of operations.

Traditional Member Finance

Credit Services

Advances. Advances are competitively priced sources of funds available for members to help manage their asset/liability and liquidity needs. Advances can both complement and be alternatives to retail deposits, other wholesale funding sources, and corporate debt issuance. We strive to facilitate efficient, fast, and continuous member access to funds. In most cases, members can access funds on a same-day basis.

We price a variety of standard Advance programs every business day and several other standard programs on demand. We also offer customized, non-standard Advances. Having diverse programs gives members the flexibility to choose and customize their borrowings according to size, maturity, interest rate, interest rate index (for adjustable-rate coupons), interest rate options, and other features.

Repurchase based (REPO) Advances are short-term, fixed-rate instruments structured similarly to repurchase agreements from investment banks, with one principal difference. Members collateralize their REPO Advances through our normal collateralization process, instead of being required to pledge specific securities as would be required in a typical repurchase agreement.

Adjustable-rate Advances have interest rates typically priced off benchmark rate indices such as SOFR. Adjustable-rate Advances may be structured at the member's option as either prepayable with a fee or prepayable without a fee if the prepayment is made on a repricing date.

Regular Fixed-Rate Advances have terms of 3 months to 30 years, with interest normally paid monthly and principal repayment normally at maturity. Members may choose to purchase call options on these Advances, although in the last several years, balances with call options have been at or close to zero.

Putable Advances are fixed-rate Advances that provide us an option to terminate the Advance, usually after an initial "lockout" period. Most have long-term original maturities. Selling us these options enables members to secure lower rates on Putable Advances compared to Regular Fixed-Rate Advances with the same final maturity.

Mortgage-Related Advances are fixed-rate, amortizing Advances with final maturities of 5 to 30 years. Some of these Advances, at the choice of the member, provide members with prepayment options without fees.

We also offer various other Advance programs that have smaller outstanding balances.

Letters of Credit. Letters of Credit are collateralized contractual commitments we issue on a member's behalf to guarantee its performance to third parties. A Letter of Credit may obligate us to make direct payments to a third party, in which case it is treated as an Advance to the member. The most popular use of Letters of Credit is as collateral supporting public unit deposits, which are deposits held by governmental units at financial institutions. We normally earn fees on Letters of Credit based on the actual average amount of the letters utilized, which generally is less than the notional amount issued.

How We Manage Risks of Credit Services. We manage market risk from Advances by funding them with Consolidated Obligations and interest rate swaps that have similar interest rate risk characteristics as the Advances. In addition, for many, but not all Advance programs, Finance Agency regulations require us to charge members prepayment fees for early termination of principal when the early termination results in an economic loss to us. We determine prepayment fees using standard present-value calculations that make us economically indifferent to the prepayment. The prepayment fee equals the present value of the estimated profit that we would have earned over the remaining life of the prepaid Advance. If a member prepays principal on an Advance that we have hedged with an interest rate swap, we may also assess the member a fee to compensate us for the cost we incur in terminating the swap before its stated final maturity. Some Advance programs are structured as non-prepayable and may have additional restrictions in order to terminate. The net effect is that in practice we mitigate market risk exposure associated with Advances sufficiently and within our risk tolerance.

The objective of our credit risk management activities for Credit Services is to equalize risk exposure across members and counterparties to a zero level of expected losses. We require each member to supply us with a security interest in eligible collateral that in the aggregate has estimated value in excess of the total Advances and Letters of Credit. Collateral is comprised mostly of single- and multi-family residential loans, commercial real estate loans, home equity loans, government guaranteed loans and bond securities. The combination of conservative collateral policies and risk-based credit underwriting activities sufficiently mitigates potential credit risk associated with Advances and Letters of Credit. As a result, at December 31, 2022, we did not expect any credit losses on Advances and, therefore, no allowance for credit losses on Advances was recorded. "Quantitative and Qualitative Disclosures About Risk Management” in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 5 of the Notes to Financial Statements provide more detail on our credit risk management of member borrowings.

Investments

Types of Investments. A primary reason we hold investments is to carry sufficient asset liquidity. Permissible liquidity investments include Federal funds, certificates of deposit, bank notes, bankers' acceptances, commercial paper, securities purchased under agreements to resell, and debt securities issued by the U.S. government, its agencies, or other GSE's. Certain certificates of deposit and debt securities issued by the U.S. government, its agencies, or other GSE's are classified as either trading or available-for-sale securities on the Statements of Condition. We also may place deposits with the Federal Reserve Bank. We are prohibited by Finance Agency regulations from investing (secured or unsecured) in financial investments issued by non-U.S. entities other than those issued by U.S. branches and agency offices of foreign commercial banks. Many liquidity investments have short-term maturities.

We are also permitted by regulation to purchase the following other investments, which have longer original maturities than liquidity investments:

- MBS and collateralized mortgage obligations (together, referred to as MBS) issued by GSEs, other U.S. government agencies or private issuers;

- asset-backed securities collateralized by manufactured housing loans or home equity loans issued by GSEs or private issuers; and

- marketable direct obligations of certain government units and agencies (such as state housing finance agencies) that supply needed funding for housing or community lending and that do not exceed 20 percent of our regulatory capital.

We have never purchased asset-backed securities and do not own any privately-issued MBS.

Per Finance Agency regulations, the total investment in MBS and asset-backed securities may not exceed 300 percent of previous month-end regulatory capital on the day we purchase the securities. See the “Capital Resources” section below for the definition of regulatory capital.

Purposes of Having Investments. The investments portfolio helps achieve corporate objectives in the following ways:

- *Liquidity management*. Liquidity investments support the ability to fund assets on a timely basis, especially Advances, and when it may be more difficult to issue new debt. These investments supply liquidity because we normally fund them with longer-term debt than asset maturities. Liquidity investments are either short-term (primarily overnight), or longer-term investments (such as U.S. Treasuries) that may be sold and converted to cash.

- *Earnings enhancement*. The investments portfolio, especially MBS, assists with earning a competitive return on capital, and increasing funding for Housing and Community Investment programs. In addition, liquidity investments help stabilize earnings because they typically earn a relatively stable spread to the cost of debt issued to fund them.

- *Management of debt issuance*. Maintaining a short-term liquidity investment portfolio can help us participate in attractively priced debt issuances, on an opportunistic basis. We can temporarily invest proceeds from debt issuances in short-term liquid assets and quickly access them to fund demand for Mission Assets and Activities, rather than having debt issuances dictated solely by the timing of member demand.

- *Support of housing market*. Investment in MBS and state housing finance agency bonds directly supports the residential mortgage market by providing capital and financing for mortgages.

How We Manage Risks of Investments. We strive to ensure our investment holdings have a moderate degree of market risk and limited credit risk, which tends to lower the returns we can expect to earn on these securities. We believe that a philosophy of purchasing investments with a high amount of market or credit risk would be inconsistent with our GSE status and corporate objectives.

Market risk associated with short-term investments tends to be minimal because of their short maturities and because we typically fund them with short-term Consolidated Obligations. We mitigate much of the market risk of MBS, which exists primarily from changes in mortgage prepayment speeds, by limiting their balances to 300 percent of regulatory capital and by funding them with a portfolio of long-term fixed-rate callable and non-callable Obligations. Additionally, we mitigate much of the market risk of longer-term non-MBS securities, and a portion of our MBS, by using interest rate swaps to effectively convert the fixed rate investments to adjustable-rate investments. We also manage the market risk exposure of the entire balance sheet within prudent policy limits.

Finance Agency regulations and internal policies also provide controls on market risk exposure by restricting the types of mortgage loans, MBS and other investments we can hold. These restrictions prohibit, among others, the purchase of interest only or principal only stripped MBS and MBS whose average life varies more than six years under a 300 basis points interest rate shock.

Our internal policies specify guidelines for, and relatively tight constraints on, the types and amounts of short-term investments we are permitted to hold and the maximum amount of credit risk exposure we are permitted to have with eligible counterparties. We are only permitted to invest in unsecured investments with counterparties that have high credit ratings. We believe all of our investments have high credit quality because of our conservative investment policies and practices. We have never had a credit loss or credit-related write down of any investment security.

Deposits

We provide a variety of deposit programs, including demand, overnight, term and Federal funds, which enable depositors to invest funds in short-term liquid assets. We accept deposits from members, other FHLBanks, any institution to which we offer correspondent services, and other government instrumentalities. The rates of interest we pay on deposits are subject to change daily based on comparable money market interest rates. The balances in deposit programs tend to vary positively with the amount of idle funds members have available to invest, as well as the level of short-term interest rates. Deposits have typically represented one to three percent of our funding sources in recent years.

Mortgage Purchase Program (MPP or Mortgage Loans Held for Portfolio)

Description of the MPP

Types of Loans and Benefits. Finance Agency regulations permit FHLBanks to purchase and hold specified whole mortgage loans from their members, which offers members a competitive alternative to the traditional secondary mortgage market and directly supports housing finance. We account for MPP loans as mortgage loans held for portfolio. By selling mortgage loans to us, members can increase their balance sheet liquidity and lower interest rate and mortgage prepayment risks. The MPP particularly enables small- and medium-sized community-based financial institutions to use their existing relationship with us to participate more effectively in the secondary mortgage market.

We purchase two types of mortgage loans: qualifying conforming fixed-rate conventional 1-4 family residential mortgages and residential mortgages fully insured by the Federal Housing Administration (FHA). Members approved to sell us these loans are referred to as Participating Financial Institutions (PFIs).

A "conventional" mortgage refers to a non-government-guaranteed mortgage. A "conforming" mortgage refers to a loan that meets the dollar limit permissible to be lent as a regular prime (i.e., non-jumbo, non-subprime) mortgage and other funding criteria of Fannie Mae and Freddie Mac. For 2023, the Finance Agency established the conforming limit for mortgages that finance single-family one-unit properties at $726,200. Additionally, the Finance Agency allows higher conforming limits on loans originated in a limited number of high-cost areas. We have elected to only purchase mortgages up to the $726,200 conforming limit.

Loan Purchase Process. We purchase loans from PFIs pursuant to a Mandatory Delivery Contract, which is a legal commitment we make to purchase, and a PFI makes to deliver, a specified dollar amount of mortgage loans, with a forward settlement date, at a specified range of note rates and prices. Shortly before delivering the loans that will fill the Mandatory Delivery Contract, the PFI must submit loan level detail including underwriting information. We apply procedures through an automated system designed to screen loans that do not comply with our policies. Our underwriting guidelines generally mirror those of Fannie Mae and Freddie Mac for conforming conventional loans, although our guidelines and pool composition requirements are more conservative in a number of ways in order to further limit credit risk exposure. PFIs are required to make certain representations and warranties against our underwriting guidelines on the loans they sell to us. If a PFI sells us a loan in breach of those representations and warranties, we have the contractual right to require the PFI to repurchase the loan.

How We Manage Risks of the MPP

Market Risk. We mitigate the MPP's market risk similarly to how we mitigate market risk from MBS.

Credit Risk - Conventional Mortgage Loans. A unique feature of the MPP is that it separates the various activities and risks associated with residential mortgage lending for conventional loans and allows these risks and activities to be taken on by different entities. We manage the market risk (including interest rate risk and prepayment risk) and liquidity risk. PFIs manage marketing, originating and, in most cases, servicing the loans. PFIs may either retain servicing or sell it to a qualified and approved third-party servicer (also referred to as a PFI). Because PFIs manage and bear most of the credit risk, they do not pay us a guarantee fee to transfer credit risk.

We manage credit risk exposure for conventional loans primarily through underwriting and pool composition requirements and by applying layered credit enhancements. These enhancements, which apply after a homeowner's equity is exhausted, currently include available primary mortgage insurance and the Lender Risk Account (discussed below). These credit enhancements are designed to protect us against credit losses in scenarios of severe downward movements in housing prices and unfavorable changes in other factors that can affect loan delinquencies and defaults.

The Lender Risk Account is a key component of how we manage residual credit risk. It is a holdback of a portion of the initial purchase price. Starting after five years from the loan purchase date, we may return the holdback to PFIs if they manage credit risk to predefined acceptable levels of exposure on the loan pools they sell to us. Actual loan losses are deducted from the amount of the purchase-price holdback we return to the PFI. The Lender Risk Account provides PFIs with a strong incentive to sell us high quality performing mortgage loans.

Credit Risk - FHA Mortgage Loans. Because the FHA makes an explicit guarantee on FHA loans, we do not require any credit enhancements on these loans beyond primary mortgage insurance.

"Quantitative and Qualitative Disclosures About Risk Management" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations provides more detail on how we manage market and credit risks for the MPP.

Earnings from the MPP

The MPP enhances long-term profitability on a risk-adjusted basis and augments the return on member stockholders' capital investment. We generate earnings in the MPP from monthly interest payments minus the cost of funding and the cost of hedging the MPP's interest rate risk. Interest income on each loan is generally computed as the mortgage note rate multiplied by the loan's principal balance:

- minus servicing costs (0.25 percent for conventional loans and 0.44 percent for FHA loans); and
- adjusted for the amortization of purchase premiums or the accretion of purchase discounts and for the amortization or accretion of fair value adjustments on loans initially classified as mortgage loan commitments.

For new loan purchases, we consider the cost of the Lender Risk Account when we set conventional loan prices and evaluate the MPP's potential return on investment. We do not receive fees or income for retaining the risk of losses in excess of any credit enhancements.

FUNDING - CONSOLIDATED OBLIGATIONS

Our primary source of funding and hedging market risk exposure is through participation in the sale of Consolidated Obligation debt securities to global investors. Obligations are the joint and several obligations of all the FHLBanks, backed only by the financial resources of the FHLBanks. Consolidated Obligations are the principal funding source used to make Advances and to purchase mortgage loans and investments. There are two types of Consolidated Obligations: Consolidated Bonds (Bonds) and Consolidated Discount Notes (Discount Notes).

Bonds may have fixed or adjustable rates of interest. Fixed-rate Bonds are either non-callable or callable. A callable Bond is one that we are able to redeem in whole or in part at our discretion on one or more predetermined call dates according to the Bond's offering notice. The maturity of Bonds are typically up to 20 years. Adjustable-rate Bonds use a benchmark market interest rate, typically SOFR, for interest rate resets. We do not participate in the issuance of range Bonds, zero coupon Bonds, or indexed principal redemption Bonds.

Discount Notes are issued primarily to raise short-term funds and have original maturities from one day to one year. Discount Notes generally sell at less than their face amount and are redeemed at par value when they mature.

The mix of Obligations fluctuates in response to relative changes in short-term versus long-term assets, relative changes in fixed-rate versus adjustable-rate assets, decisions on market risk management (particularly the amount of funding of longer-term assets with short-term Obligations), and differences in relative costs of various Obligations.

Interest rates on Obligations are affected by a multitude of factors such as: overall economic and credit conditions; credit ratings of the FHLBank System; investor demand and preferences for our debt securities; the level and shape of market interest rates (e.g., U.S. Treasury rates); and the supply, volume, timing, and characteristics of debt issuances by the FHLBanks, other GSEs, and other highly-rated issuers.

Finance Agency regulations govern the issuance of Obligations. An FHLBank may not issue individual debt securities without Finance Agency approval, and we have never done so. The Office of Finance services Obligations, prepares the FHLBank System's quarterly and annual combined financial statements, and serves as a source of information for the FHLBanks on capital market developments.

We have the primary liability for our portion of Obligations, i.e., those issued on our behalf for which we received the proceeds. However, we also are jointly and severally liable with the other FHLBanks for the payment of principal and interest on all Obligations. If we do not pay the principal or interest in full when due on any Obligation issued on our FHLB's behalf, we are prohibited from paying dividends or redeeming or repurchasing shares of capital stock. If another FHLBank were unable to repay its participation in an Obligation for which it is the primary obligor, the Finance Agency could call on each of the other FHLBanks to repay all or part of the Obligation. The Finance Agency has never invoked this authority.

LIQUIDITY

Our business requires a substantial and continual amount of liquidity to satisfy financial obligations (primarily maturing Consolidated Obligations) in a timely and cost-efficient manner and to provide members access to timely Advance funding and mortgage loan sales in all financial environments. We obtain liquidity by issuing debt, holding short-term assets that mature before their associated funding, and having the ability to sell certain investments without significant accounting consequences. Sources of asset liquidity include cash, maturing Advances, maturing investments, principal paydowns of mortgage assets, the ability to sell certain investments, and interest payments received. Uses of liquidity primarily include repayments of Obligations, issuances of new Advances, purchases of loans under the MPP, purchases of investments, and payments of interest.

Liquidity requirements are significant because Advance balances can be volatile, many have short-term maturities, and we strive to allow members to borrow Advances on the same day they request them. We regularly monitor liquidity risks and the investment and cash resources available to meet liquidity needs, as well as statutory and regulatory liquidity requirements.

Because Obligations have favorable credit ratings and because the FHLBank System is one of the largest sellers of debt in the worldwide capital markets, the System historically has been able to satisfy its liquidity needs through debt issuance across a wide range of structures at relatively favorable spreads to benchmark market interest rates, such as U.S. Treasury rates.

CAPITAL RESOURCES

Capital Requirements

Statutory and Regulatory Requirements

Under Finance Agency regulations, regulatory capital is composed of all capital stock (including stock classified as mandatorily redeemable), retained earnings, general loss allowances, and other amounts from sources the Finance Agency determines are available to absorb losses. Under the Gramm-Leach-Bliley Act of 1999 (GLB Act), permanent capital equals Class B stock plus retained earnings.

Finance Agency regulations stipulate that we must comply with three limits on capital leverage and risk-based capital. These ensure a low amount of capital risk while providing for competitive profitability. We have always complied with these regulatory capital requirements.

- We must maintain at least a four percent minimum regulatory capital-to-assets ratio.
- We must maintain at least a five percent minimum leverage ratio of capital divided by total assets, which includes a 1.5 weighting factor applicable to permanent capital. Because all of our Class B stock is permanent capital, this requirement is met automatically if we satisfy the four percent unweighted capital requirement.
- We are subject to a risk-based capital rule in which we must hold an amount of "permanent" capital that exceeds the amount of exposure to market risk, credit risk, and operational risk. How we determine the amount of these risk exposures is stipulated by Finance Agency regulation. Permanent capital includes retained earnings and the regulatory amount of Class B capital stock.

In addition to the minimum capital requirements, the GLB Act and our Capital Plan promote the adequacy of our capital to absorb financial losses in three ways. These combine to give member stockholders a clear incentive to require us to minimize our risk profile:

- the five-year redemption period for Class B stock;
- the option we have to call on members to purchase additional capital if required to preserve safety and soundness; and
- the limitations, described below, on our ability to honor requested redemptions of capital if we are at risk of not maintaining safe and sound operations.

In accordance with the GLB Act, our stock is also putable by members. There are statutory and regulatory restrictions on our obligation or right to redeem or repurchase outstanding stock, including, but not limited to, the following:

- We may not redeem any capital stock if, following the redemption, we would fail to satisfy any regulatory capital requirements. By law, we may not redeem any stock if we become undercapitalized.

- We may not redeem any capital stock without approval of the Finance Agency if either our Board of Directors or the Finance Agency determines that we have incurred or are likely to incur losses resulting or expected to result in a charge against capital.

If we were to be liquidated, stockholders would be entitled to receive the par value of their capital stock after payment in full to our creditors. In addition, each stockholder would be entitled to any retained earnings in an amount proportional to the stockholder's share of the total shares of capital stock. In the event of a merger or consolidation of the FHLB, the Board of Directors would determine the rights and preferences of the FHLB's stockholders, subject to any terms and conditions imposed by the Finance Agency.

Capital Plan

Our Capital Plan ties the amount of each member's required capital stock to the amount of the member's assets and the amount and type of its activity with us. The Capital Plan has the following basic characteristics:

- We offer only one class of capital stock, Class B, which is generally redeemable upon a member's five-year advance written notice. We strive to manage capital risks to be able to safely and soundly satisfy redemption requests sooner than five years, although we may elect to wait up to five years (or longer under certain conditions).

- We issue shares of capital stock as required for an institution to become a member or maintain membership (membership stock), as required for members to capitalize certain Mission Assets and Activities (activity stock), and if we pay dividends in the form of additional shares of stock.

- We may, subject to the restrictions described above, repurchase certain capital stock (i.e., "excess" capital stock).

We believe the Capital Plan enables us to efficiently increase and decrease capital stock needed to capitalize assets in response to changes in the membership base and demand for Mission Assets and Activities. This enables us to maintain a prudent amount of financial leverage and consistently generate a competitive dividend return.

At December 31, 2022, the amount of membership stock required for each member ranged from a minimum of $1,000 to a maximum of $20 million, with the amount within that range determined as a percentage of member assets. Separate from its membership stock, each member is required to purchase and hold activity stock to capitalize Mission Assets and Activities. Activity stock is required to capitalize the principal balance of Advances, guaranteed funds and rate Advance commitments, the principal balance of loans and commitments in the MPP, and the notional balance of Letters of Credit.

The FHLB must capitalize its total assets at a rate of at least four percent. The Capital Plan supports the membership's stock component towards this overall requirement. As specified within the Capital Plan, each member is required to maintain a percentage of activity stock depending on the type of transaction. Currently, the activity percentages are as follows:

Transaction Type	Activity Percentage
Advances	4.50%
Advance Commitments	4.50
MPP	3.00
Letters of Credit	0.10

If a member owns more stock than is needed to satisfy both its membership and activity stock requirements, we designate the remaining stock as the member's excess capital stock. The member utilizes its excess stock to capitalize additional Mission Assets and Activities, before purchasing activity stock.

Retained Earnings

Purposes and Amount of Retained Earnings

Retained earnings are important to protect members' capital stock investment against the risk of impairment and to enhance our ability to pay stable and competitive dividends when earnings may be volatile. Impairment risk is the risk that members would have to write down the par value of their capital stock investment in our FHLB as a result of their analysis of ultimate recoverability. An extreme situation of earnings instability, in which substantial credit losses were experienced and expected for a period of time, could result in members determining that the value of their capital stock investment was impaired.

We have a policy that sets forth a minimum amount of retained earnings we believe is needed to mitigate impairment risk and facilitate dividend stability in light of the risks we face. At December 31, 2022, the minimum retained earnings requirement was approximately $745 million, based on mitigating quantifiable risks under very stressed business and market scenarios to a 99 percent confidence level. At the end of 2022, our retained earnings totaled $1.4 billion. We believe the current amount of retained earnings is fully sufficient to protect our capital stock against impairment risk and to provide for dividend stability.

Joint Capital Agreement to Augment Retained Earnings

The FHLBanks entered into a Joint Capital Enhancement Agreement (the “Capital Agreement”) in February 2011. The Capital Agreement provides that each FHLBank will, on a quarterly basis, allocate at least 20 percent of its net income to a restricted retained earnings account (the “Account”) until the balance of the Account, calculated as of the last day of each calendar quarter, equals at least one percent of that FHLBank's average balance of outstanding Consolidated Obligations for the calendar quarter. The Account is not available to be distributed as dividends except under certain limited circumstances. The Capital Agreement does not limit our ability to use retained earnings held outside of the Account to pay dividends. Although we have always maintained compliance with our capital requirements, we believe the Capital Agreement enhances risk mitigation by building a larger capital buffer over time to absorb unexpected losses, if any, that we may experience.

USE OF DERIVATIVES

Finance Agency regulations and our policies establish guidelines for the execution and use of derivative transactions. We are prohibited from trading in, or the speculative use of, derivatives and have limits on the amount of credit risk to which we may be exposed. Most of our derivatives activity involves interest rate swaps, some of which may include options. We account for all derivatives at fair value.

Similar to our participation in debt issuances, use of derivatives is integral to hedging market risk created by Advances, certain longer-term fixed-rate investments and mortgage assets, including commitments. Derivatives related to Advances most commonly hedge either:

- below-market rates and/or the market risk exposure on Putable Advances, and certain other Advances, for which members have sold us options embedded within the Advances; or

- Regular Fixed-Rate Advances when it may not be as advantageous to issue Obligations or when it may improve our market risk management.

The derivatives we transact related to investments hedge market risk exposure by effectively converting the fixed-rate investment to an adjustable-rate investment. The derivatives we transact related to mortgage assets primarily hedge interest rate risk and prepayment risk. Such derivatives include options on interest rates swaps (swaptions) and sales of to-be-announced MBS for forward settlement.

Derivatives transactions related to Bonds help us intermediate between the preference of capital market investors for intermediate- and long-term fixed-rate debt securities and the preference of our members for shorter-term or adjustable-rate Advances. We can satisfy the preferences of both groups by issuing long-term fixed-rate Bonds and entering into an interest rate swap that synthetically converts the Bonds to an adjustable-rate funding basis that matches up with the short-term and adjustable-rate Advances, thereby preserving a favorable interest rate spread.

We may also transact derivatives to reduce the repricing risk of Discount Notes that fund certain overnight and shorter-term assets.

Use of derivatives can result in a substantial amount of volatility of accounting and economic earnings. We strive to maintain a low amount of earnings volatility from realized gains and losses on derivatives. We accept a higher amount of earnings volatility from unrealized gains and losses on recording derivatives at fair values, to the extent our use of derivatives effectively hedge market risk exposure.

COMPETITION

Advances

Members' demand for our Advances is affected by, among other things, the cost of other sources of funding available, including our members' customer deposits. We compete with other suppliers of wholesale funding, both secured and unsecured, including the federal government, commercial banks, investment banking divisions of commercial banks, brokered deposits and other FHLBanks when our members' affiliated institutions are members of other FHLBanks. In addition, competition is often more significant when originating Advances to larger members, which have greater access to the national and global capital markets.

Our ability to compete successfully with other suppliers of wholesale funding, including other FHLBanks, depends primarily on the total cost of Advances to members, which include the rates we charge, earnings and dividend performance, collateral policies, capital stock requirements, product features and members' perceptions of our relative safety and soundness. See Item 1A. Risk Factors below for further discussion.

Mortgage Purchase Program

The primary competitors for mortgage loans we purchase in the MPP are Fannie Mae and Freddie Mac, government agencies such as the Government National Mortgage Association (Ginnie Mae), and other secondary mortgage market conduits. Fannie Mae and Freddie Mac, in particular, have long-established and efficient programs and are the dominant purchasers of fixed-rate conventional mortgages. In addition, a number of private financial institutions have well-established securitization programs, although they may not currently be as active as they were historically. The MPP also competes with the Federal Reserve to the extent it purchases MBS and affects market prices and the availability of supply.

Debt Issuance

The FHLBank System primarily competes with the U.S. government and other GSEs for funds raised through the issuance of unsecured debt in the national and global debt markets. Increases in the supply of competing debt products may, in the absence of increases in demand, result in higher debt costs.

SOCIAL RESPONSIBILITY

Housing and Community Investment Programs

We support affordable housing, necessary housing repairs, disaster reconstruction and home ownership for very low- to moderate-income individuals through multiple programs across Kentucky, Ohio and Tennessee. By using our programs individually or in combination, our members and their community partners can create economically competitive solutions that contribute to the quality of life in the communities they serve.

Our Housing and Community Investment Programs include the Affordable Housing Program and various housing and community economic development-related Advance and grant programs. We fund the Affordable Housing Program with an accrual equal to 10 percent of our previous year's net earnings, mandated by the Financial Institutions Reform, Recovery and Enforcement Act of 1989. In addition to the mandated 10 percent accrual, the Board of Directors may elect to make voluntary contributions to the Affordable Housing Program. See Note 10 of the Notes to Financial Statements for a complete description of the Affordable Housing Program calculation.

The Affordable Housing Program provides funding for the development of affordable housing, from large rental complexes that provide homes to seniors to individual homes for first time buyers. The Program consists of a Competitive Program and a homeownership program called Welcome Home, which assists homebuyers with down payments and closing costs. Under the Competitive Program, we may distribute funds in the form of grants or below-market rate Advances to members that apply and successfully compete in an annual offering. Under Welcome Home, we make funds available beginning in March until they have been fully committed. For both programs, the income of qualifying individuals or households must be 80 percent or less of the area median income. We set aside up to 35 percent of the Affordable Housing Program accrual for Welcome Home and allocate the remainder to the Competitive Program.

Two other housing programs that fall outside of the Affordable Housing Program are the Community Investment Program and the Economic Development Program. Advances under the former program have rates equal to our cost of funds, while Advances under the latter program have rates equal to our cost of funds plus reasonable administrative costs. Members use the Community Investment Program to serve housing needs of low- and moderate-income households and, under certain conditions, community economic development projects. The Economic Development Program is a discounted Advance program used to promote economic development and job creation and retention.

Our Board of Directors also allocates funds to voluntary housing programs. Currently, we offer two voluntary housing programs, the Carol M. Peterson Housing Fund and the Disaster Reconstruction Program. The Board authorized $1.0 million to the Carol M. Peterson Housing Fund for use during 2022. In January 2023, the Board re-authorized another $1.5 million for the Carol M. Peterson Housing Fund for use in 2023. These funds are primarily used as grants to pay for accessibility rehabilitation and emergency repairs for special needs and elderly homeowners. The Disaster Reconstruction Program helps very low- to moderate-income families whose homes were impacted by fires, tornadoes, flooding, landslides or other state or federally declared natural disasters in the Fifth District. The program offers up to $20,000 to help repair and rebuild homes affected by disasters and $5,000 for displaced renters to purchase homes. Since the program's inception, we have disbursed over $6.8 million to assist 535 households. The Zero Interest Fund provides loans with a zero percent interest rate to support upfront infrastructure costs on residential and economic development projects. The fund is a $2 million revolving loan fund.

Serving the Community
Our employees participate in various programs, such as fundraising campaigns or volunteer opportunities, which support and give back to our local communities. Examples of these programs included the United Way Campaign, the Cincinnati Wish Tree Program, the Annual Heart Mini-Marathon and Walk, the Habitat for Humanity Rock the Block, and various volunteer opportunities supporting local schools and families. Through participation in Rock the Block and other employee volunteer events, our employees' efforts helped advocate for safe, decent and affordable housing and play an active role in serving the needs of our local community.

Diversity, Equity and Inclusion Program
Diversity, equity and inclusion is a strategic business priority. Our diversity, equity and inclusion officer reports to the President and Chief Executive Officer, serves as a liaison to the Board of Directors, and is a member of our senior management enterprise strategy committee. We recognize that diversity increases capacity for innovation and creativity and that inclusion allows us to leverage the unique perspectives of all employees and strengthen retention efforts. We operationalize our commitment through the development and execution of a three-year diversity, equity and inclusion strategic plan that includes quantifiable metrics to measure its success. Our diversity, equity and inclusion officer and team reports regularly on performance against the strategic plan to management and the Board of Directors. Additionally, employee job descriptions contain inclusive behavior expectations that increase with increasing responsibilities in the organization, and also are included as part of our annual performance management process.

We offer a range of opportunities for our employees to connect, and grow personally and professionally through employee resource groups and community outreach. We consider learning an important component of our diversity, equity and inclusion strategic plan and regularly offer educational opportunities to our employees. Examples of these opportunities include consultant-led diversity, equity and inclusion training about employee experiences as they relate to race, ethnicity and gender, listening to panel discussions about issues affecting race in the United States, as well as a series of lunch and learns to help raise awareness and engage employees in conversations about diversity, equity and inclusion. Our commitment to diversity, equity and inclusion has led us to join local and national movements, such as The Hamilton County (Ohio) Gender Parity Initiative and Shine A Light on Antisemitism, that support gender equity and shine a light on hate. In addition, we have made a commitment to be part of the national dialogue and solution to end systemic racism through our sponsorship of the YWCA Racial and Justice Inclusion Initiative.

HUMAN CAPITAL RESOURCES

Our human capital is a significant contributor to the success of our strategic business objectives. In managing human capital, we focus on our workforce profile and the various programs and philosophies described below.

Workforce Profile
Our workforce is primarily comprised of corporate employees, with one location of principal operations. As of December 31, 2022, we had 240 employees. As of December 31, 2022, approximately 39 percent of our workforce was female, 61 percent male, 81 percent non-minority and 19 percent minority. Our workforce is leanly staffed, and historically has included a number

of longer-tenured employees. As of December 31, 2022, the average tenure of our employees was nine years. We strive to both develop talent from within the organization and supplement with external hires. We believe that developing talent internally results in institutional strength and continuity and promotes loyalty and commitment in our employee base, which furthers our success. However, adding new employees contributes to new ideas, continuous improvement, and our goals of a diverse, equitable and inclusive workforce. We encourage feedback from employees in our efforts to be an inclusive organization through third party surveys, internal surveys and a dedicated email address to send in questions or comments for review by the Chief Executive Officer. Our employees are not represented by a collective bargaining unit.

Total Rewards

We seek to attract, develop and retain talented employees. We strive to achieve this objective through a combination of development programs, benefits and employee wellness programs, and recognizing and rewarding performance. Specifically, our programs include:

- Cash compensation – provides competitive salary, transportation and other cash subsidies, and performance based incentives.
- Benefits – offers health insurance with a health savings account contribution, dental and vision insurance, life and AD&D insurance, supplemental life insurance, short-term disability, long-term disability insurance, employee assistance program, 401(k) retirement savings plan with employer match, and defined benefit pension benefits.
- Recognition programs – sponsors peer-to-peer recognition program, department recognition program and company-wide recognition.
- Time off programs - provides paid time off for any reason (vacation, illness, personal) and other paid leave programs for bereavement, jury duty, and for times when caring for a sick family member, bonding with a newborn or recovering from childbirth.
- Work / life balance – provides flexible work arrangements and scheduling including allowing a hybrid work arrangement where employees may work up to three days per week from home and two days in the office. Additional flexibility is provided through our "Work from Anywhere" weeks, which allow employees to work fully remote for a limited number of weeks in the year.
- Culture – promotes employee resource groups and various cultural and inclusion initiatives.
- Development programs and training – offers tuition assistance programs, internal educational and development opportunities, and fee reimbursement for external educational and development programs.
- Management succession planning – assesses talent annually with our leadership and Board of Directors with, at a minimum, a defined plan for positions at Vice President and above.

Item 1A. Risk Factors.

The following discussion summarizes risks and uncertainties we currently face. The realization of one or more of the risks could negatively affect our results of operations, financial condition, safety and soundness, and, at the extreme, the viability of our business franchise. The effects could include reductions in Mission Assets and Activities, lower earnings and dividends, and, at the extreme, impair our capital or hinder our ability to participate in issuances of Consolidated Obligations. The risks identified below are not the only risks we face. Other risks not presently known or which we deem to be currently immaterial may also impact our business. Additionally, the risks identified may adversely affect our business in ways we do not expect or anticipate.

BUSINESS AND REGULATORY RISK

A prolonged downturn in the economy, including the U.S. housing market, and related U.S. government monetary policy responses, could lower Mission Assets and Activities and profitability.

Member demand for Mission Assets and Activities depends in large part on the general health of the economy and overall business conditions. Numerous external factors can affect our Mission Assets and Activities and earnings including:

- the general state and trends of the economy and financial institutions, especially in the Fifth District;
- conditions in the financial, credit, mortgage, and housing markets;
- interest rates;
- Federal Reserve actions to influence the Fed funds rate or use its balance sheet to influence financial markets and economic conditions;
- competitive alternatives to our products, such as retail deposits and other sources of wholesale funding;
- inflation;
- regulations affecting our members' liquidity requirements;
- the willingness and ability of financial institutions to expand lending; and
- natural disasters, pandemics or other widespread health emergencies (such as the COVID-19 pandemic), terrorist attacks, civil unrest, geopolitical instability or conflicts (including the prolonged hostilities between Russia and Ukraine), trade disruptions, economic or other sanctions, or other unanticipated or catastrophic events could create economic and financial disruptions and uncertainties.

These external factors are likely to have a more severe impact if a prolonged economic downturn is accompanied by significant changes in interest rates, stresses in the housing market, elevated competitive forces, or actual or potential changes in the legislative and regulatory environment. Any of these factors, or a combination of factors, could adversely affect our business activities and results of operations and may ultimately cause stockholders to request redemption of a portion of their capital or request withdrawal from membership (both referred to in this report as “request withdrawal of capital”).

Historically, overall Advance demand has been unfavorably affected when a substantial amount of deposit-based liquidity is provided to financial institutions through the monetary and fiscal policies of the U.S. government and its agencies, including the Federal Reserve. The Federal Reserve’s policies directly and indirectly influence interest rates on our assets and liabilities and could adversely affect the demand for Advances and Consolidated Obligations as well as our financial condition and results of operations. Recent efforts of the Federal Reserve to ease inflation, such as continued increases in interest rates and reductions in their balance sheet, have contributed to significant volatility in the financial markets and uncertainties about the economic outlook, including concerns about a possible recession. See "Executive Overview" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations for additional information on recent market activity.

The competitive environment for our products could adversely affect business activities, including decreasing the level and utilization rates of Mission Assets and Activities, earnings, and capitalization.

Our primary business is providing liquidity to our members by making Advances to, and purchasing mortgage loans from, our members. Members have access to alternative funding sources, including their customers' deposits, wholesale funding and other liquidity programs of the Federal Reserve, such as the limited time Bank Term Funding Program implemented on March 13, 2023 and effective through March 11, 2024. Members' alternative funding sources may offer more favorable terms than we offer, such as lower rates or more flexible credit or collateral standards. Some of our competitors are not subject to the same body of regulations applicable to us, which enables those competitors to offer products and terms that we are not able to offer. In addition, state and federal regulators' perception of the stability and reliability of our Advances can also directly impact the amount of Advances used by members.

In connection with purchasing mortgage loans from our members, we face competition in the areas of customer service, purchase prices for the MPP loans and ancillary services such as automated underwriting and loan servicing options. Our primary competitors are Fannie Mae, Freddie Mac, government agencies such as Ginnie Mae, and other secondary mortgage market conduits. In addition, our members continue to face increased competition in mortgage origination from non-bank financial institutions that are not eligible for FHLBank membership, which could reduce the amount of mortgage loans that members can make available to us to purchase.

Increased competition could decrease the amount of Advances and mortgage loans and narrow profitability, both of which could cause stockholders to request withdrawals of capital and ultimately result in a failure to meet our capital adequacy requirements.

In addition, the FHLBank System's offerings of debt compete with the U.S. Treasury, Fannie Mae, Freddie Mac, other GSEs, and corporate, state, and sovereign entities, among others. Increases in the supply and types of competing debt products or other regulatory factors could adversely affect the System's ability to access funding or increase the cost of our debt issuance. Either of these effects could in turn adversely affect our financial condition and results of operations and the value of FHLB membership.

Sharp reductions in Mission Assets and Activities resulting from lower usage by large members, consolidation of large members, or continued shift in mortgage lending activities towards entities not eligible for FHLB membership could adversely impact our net income and dividends.

The amount of Mission Assets and Activities and capital is concentrated among a small number of our large members. Additionally, the financial industry continues to consolidate and in recent years there has been a systemic trend of financial institutions that are currently ineligible for FHLB membership gaining an increasing market share, especially related to mortgage finance. However, the legislative and regulatory environment faced by the FHLBanks has not changed in response to this trend. Our members could decrease their Mission Assets and Activities and the amount of their capital stock as a result of merger and acquisition activity or continued loss of market share to ineligible entities. At December 31, 2022, one member, U.S. Bank, N.A., held over 28 percent of our Advances and one member PFI, Union Savings Bank, accounted for 24 percent of the outstanding MPP principal balance. Our business model is structured to be able to absorb sharp changes in Mission Assets and Activities because we can undertake commensurate reductions in liability balances and capital and because of our relatively modest operating expenses. However, an extremely large and sustained reduction in Mission Assets and Activities could affect our profitability and ability to pay competitive dividends, as well as, at the FHLBank System level, raise policy questions about the relevance of the FHLBank System in its traditional mission of supporting housing finance. Ultimately, our ongoing viability and that of the FHLBank System is subject to the ability to provide sufficient membership value through the combination of products, services and return on investment of capital stock.

Changes in the regulatory and legislative environment could unfavorably affect our business model, financial condition, and results of operations.

In addition to potential GSE reform, the legislative and regulatory environment in which the System operates continues to undergo change. Recently-promulgated and future legislative and regulatory actions could result in, among other things: an increase in our cost of funding and regulatory compliance; a change in membership or permissible business activities; additional capital and liquidity requirements; additional contributions under our Affordable Housing Program; reduced demand for Advances or limitation on Advances made to members; or a change in the size, scope, or nature of our lending, investment, or mortgage financing activities. Furthermore, since we are reliant upon a voluntary membership base, a member's willingness to maintain the required level of capital stock investment may be influenced by changes in the legislative and regulatory environment.

For example, in 2022, the Finance Agency initiated a comprehensive review of the FHLBank System. This review is expected to culminate with a written report from the Finance Agency. Such report may include recommendations for statutory revisions, proposals for new or modified regulations, regulatory guidance under existing regulations, and/or other regulatory or supervisory actions consistent with the Finance Agency's statutory authority. See "Executive Overview" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations for recent developments.

We cannot predict what regulations will be issued or revised or legislation will be enacted or repealed, and we cannot predict the effect of any such regulations or legislation on our business operations and/or financial condition. Legislative, regulatory, or other changes could result in, for example, an increase in the FHLBanks' cost of funding, a change in permissible business activities, including limitations to lend to members, change in our membership, limitations on Advances made to our members, an increase in our mandatory contribution to affordable housing or community development programs, or a decrease in the size, scope, or nature of the FHLBanks' lending, investment, or mortgage-financing activities, any of which could adversely impact our financial condition and results of operations.

Potential GSE reform could unfavorably affect our business model, financial condition, and results of operations.

Due to our GSE status, the ultimate resolution to the conservatorship of Fannie Mae and Freddie Mac could affect the FHLBanks. While there appears to be consensus that a permanent financial and political solution to the current conservatorship status should be implemented, which could include maintaining the current structure, no consensus has evolved to date around any of the various legislative proposals. Some policy proposals directed towards Fannie Mae and Freddie Mac have included provisions applicable to the FHLBank System, such as limitations on Advances and portfolio investments. Other proposals have included broader changes in GSE mortgage finance, such as the FHLBank System being a greater participant in the secondary mortgage market, which could affect the FHLBank System's long-standing business model.

There are significant differences between the FHLBank System and Fannie Mae and Freddie Mac, including the System's focus on lending as opposed to guaranteeing mortgages and its distinctive cooperative business model. GSE legislation could inadequately account for these differences. This could jeopardize the ability of the FHLBank System to continue operating effectively within its current business model, including by adversely changing the perceptions of the capital markets about the risk associated with the debt of housing GSEs. We cannot predict the effects on the System if GSE reform were to be enacted.

Replacement of the LIBOR benchmark interest rate could adversely affect our business, financial condition, and results of operations.

Under the July 2017 and March 2021 announcements by the United Kingdom's Financial Conduct Authority (FCA), which regulates LIBOR, the one-week and two-month U.S. dollar LIBOR settings and all non-U.S. dollar LIBOR settings ceased to be provided by any administrator and were no longer representative as of January 1, 2022. The remaining U.S. dollar LIBOR settings will either cease to be provided by any administrator or no longer be representative immediately after June 30, 2023. Although the FCA does not expect these remaining LIBOR settings to become unrepresentative before the cessation date, there is no assurance that any of them will continue to be published or be representative through any particular date.

Accordingly, we have developed and implemented a LIBOR transition plan. We have added or adjusted fallback language for our Advances and Consolidated Obligations, have worked with our counterparties to address over-the-counter derivative agreements referencing U.S. dollar LIBOR, and will convert our LIBOR-linked MBS as a part of our LIBOR transition efforts. We continue to monitor the market-wide efforts to address fallback language related to derivatives and investment securities, as well as fallback language for new activities and issuances of financial instruments. Despite relief under recent legislation and proposed Congressional action addressing LIBOR cessation, the contractual consequences of LIBOR cessation for some existing LIBOR-indexed instruments may not be clear. As LIBOR has been a principal floating-rate benchmark in the financial markets, its cessation has affected, and will continue to affect, the financial markets and may also affect our business, financial condition, and results of operations.

In response to the cessation of LIBOR, the Federal Reserve Bank of New York's Alternative Reference Rates Committee (ARRC) established SOFR as its recommended alternative to U.S. dollar LIBOR, and the Federal Reserve Bank of New York publishes SOFR rates. SOFR is based on a broad segment of the overnight Treasury repurchase market and is intended to be a measure of the cost of borrowing cash overnight collateralized by Treasury securities. As the market activity in SOFR-linked financial instruments has continued to develop, we have offered SOFR-linked Consolidated Obligations and SOFR-linked Advances on an ongoing basis. In addition, we have been using SOFR-based derivatives to manage interest-rate risk, purchasing SOFR-linked MBS, and converted LIBOR-based derivatives with maturities after June 30, 2023 to SOFR.

The market transition away from LIBOR and towards SOFR or another alternate reference rate has been and is expected to continue to be complicated and may include the development of term and credit adjustments to accommodate differences between LIBOR and SOFR or any other alternate reference rate. During the market transition away from the remaining LIBOR settings, LIBOR may experience increased volatility, and the overnight Treasury repurchase market underlying SOFR may also experience disruptions from time to time, which may result in unexpected fluctuations in SOFR. Any disruption in the market transition away from LIBOR towards SOFR or another alternate reference rate could result in increased financial, operational, legal, reputational or compliance risks. We are not currently able to predict the ultimate impact the market transition away from LIBOR towards SOFR may have on our business, financial condition, and results of operations. See "Executive Overview" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations for additional information about the replacement of LIBOR.

Failure to meet minimum capital adequacy requirements mandated by Finance Agency regulations and supervisory guidance could affect our ability to pay dividends or repurchase or redeem members' capital stock, which may cause a decrease in demand for Advances or difficulties in retaining existing members and attracting new members.

To ensure safe and sound operations, we must hold a minimum amount of capital relative to our asset levels. Additionally, we must also hold a sufficient amount of retained earnings to help protect members' capital stock investment against impairment risk. If we are unable to satisfy our minimum capital requirements, we would be subject to capital restoration requirements. Until the minimum capital levels have been restored, we would also be prohibited from paying dividends and redeeming or repurchasing capital stock without prior approval from the Finance Agency, which could adversely affect the value of membership in our company. For example, the competitiveness of our Advances depends on the total cost to members, which includes the rates we charge, dividends paid, and members' perceptions of our relative safety and soundness, among other things. Therefore, outcomes of failing to meet capital adequacy requirements may include reduced demand for Advances, decreased profitability, or difficulty in retaining members or attracting new members.

MARKET AND LIQUIDITY RISK

Changes in interest rates and mortgage prepayment speeds (together referred to as market risk exposure or interest rate risk exposure) could significantly affect our financial condition and results of operations.

Exposure of earnings to unhedged changes in interest rates and mortgage prepayment speeds is one of our largest ongoing residual risks. We derive most of our income from the interest earned on assets less the interest paid on Consolidated Obligations and deposits used to fund the assets. Spreads on our assets tend to be narrow compared to those of many other financial institutions due to our cooperative business model. Market conditions, yield curve shape, competitive forces, and market risk exposure could cause these already narrow asset spreads to decline, which could substantially reduce our profitability. A key spread relationship is that we tend to utilize Consolidated Discount Notes to fund a significant amount of assets that have adjustable-rates tied to a benchmark interest rate, such as SOFR, or historically LIBOR. Because rates on Discount Notes do not perfectly correlate with other adjustable benchmark interest rates, a narrowing of this spread, for example from investors changing perceptions about the quality of our debt, could lower income and reduce balances of Mission Assets and Activities.

We hedge mortgage assets with a combination of Consolidated Obligations and derivatives transactions. Interest rate movements can lower profitability in two primary ways: 1) directly due to their impact on earnings from cash flow mismatches between assets and liabilities; and 2) indirectly via their impact on prepayment speeds on our MBS investments and mortgages purchased under our MPP, which can unfavorably affect the cash flow mismatches. The effects on income can also include acceleration in the amortization of purchased premiums on mortgage assets.

Although we mitigate a large portion of our market risk exposure, a residual amount of market risk normally remains after incorporating risk management activities. Sharp increases or decreases in interest rates could adversely affect us and our stockholders by making dividend rates less competitive relative to the returns available to members on alternative investments.

In some extremely stressful scenarios, changes in interest rates and prepayment speeds could result in dividends being below stockholders' expectations for an extended period of time and/or market capitalization ratios falling below par, which could indicate potential impairment of member stock. In such a situation, members could engage in less Mission Assets and Activities and could request a withdrawal of capital. See "Quantitative and Qualitative Disclosures About Risk Management" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations for additional information about market risk exposure.

Impaired access to the capital markets for debt issuance could decrease the amount of Mission Assets and Activities, lower earnings by raising debt costs and, at the extreme, prevent the System from meeting its financial obligations.

Our principal long-term source of funding, liquidity, and market risk management is through access on acceptable terms to the capital markets for participation in the issuances of debt securities and execution of derivative transactions at prices and yields that are adequate to support our business model. Our ability to obtain funds through the sale of Consolidated Obligations depends in part on prevailing conditions in the capital markets, particularly the short-term capital markets, because we and the System normally have a large reliance on short-term funding. The System's strong debt ratings, the implicit U.S. government backing of our debt, strong investor demand for FHLBank System debt, and effective funding management are instrumental in ensuring satisfactory access to the capital markets.

We are exposed to liquidity risk if significant disruptions in the capital markets occur. Although the System has been able to maintain access to the capital markets for debt issuances on acceptable terms in its history, there is no assurance this will continue to be the case. Future ability to effectively access the capital markets on acceptable terms could be adversely affected by external events (such as general economic and financial instabilities, political instability, wars, natural disasters, pandemics or other widespread health emergencies, civil unrest or other unanticipated or catastrophic events), deterioration in the perception of financial market participants about the financial strength of Consolidated Obligations, or downgrades to the System's credit ratings or the U.S. sovereign credit rating or outlook. For example, the failure by the U.S. Congress to adequately address its statutory debt limit in a timely manner, or uncertainty relating to the debt limit, could result in downgrades to the U.S. sovereign credit rating or outlook and cause significant disruptions in the capital markets. The System could also be affected by the continued changes in the capital markets in response to financial regulations and by the joint and several liability for Consolidated Obligations, which exposes the System as a whole to events at individual FHLBanks. If access to capital markets were to be impaired for an extended period, the effect on our financial condition and results of operations could be material. At the extreme, the System's ability to achieve its mission and satisfy its financial obligations could be threatened.

CREDIT RISK

We are exposed to credit risk that, if realized, could materially affect our financial condition and results of operations.

We believe we have a de minimis overall amount of residual credit risk exposure. However, we can make no assurances that credit losses could not materially affect our financial condition or results of operations in all scenarios.

The FHLB is primarily an asset-based lender for Advances and Letters of Credit. Advances and Letters of Credit are over-collateralized and we have a perfected security interest on all pledged collateral. However, we do not have full information on the characteristics of, nor do we estimate current market values on, a large portion of non-securities collateral subject to a blanket pledge. This results in a degree of uncertainty as to the precise amount of over-collateralization.

Our MPP consists of mortgage loans considered to have high credit quality and conservative underwriting and loan characteristics with additional credit enhancements in place designed to protect us against credit losses. The result has been a minimal amount of credit losses historically.

Although Advances and Letters of Credit are over-collateralized and mortgage loans in the MPP are of high credit quality with various credit enhancements, credit risk could increase under a number adverse scenarios, such as damage or destruction of collateral that members pledge to secure Credit Services or mortgages that we hold in the MPP as a result of natural disasters, which may be caused by the effects of climate change or other catastrophic events. Significant declines in the value of collateral pledged to secure Credit Services could lead to greater exposure to credit losses in the event of a member default. Additionally, significant and sustained reductions in home prices and sustained elevated levels of unemployment and other factors that influence delinquencies and defaults could increase the risk of credit losses in the MPP.

Some of our liquidity investments are unsecured, as are uncollateralized portions of certain derivatives. We make unsecured liquidity investments in and transact derivatives with highly rated, investment-grade institutions, have conservative limits on dollar and maturity exposure to each institution, and have strong credit underwriting practices. Failure of an investment or derivative counterparty with which we have a large unsecured position could have a material adverse effect on our financial conditions and results of operations. To the extent we engage in derivative transactions required to be cleared under provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), we may be exposed to nonperformance from central clearinghouses and Futures Commission Merchants.

Financial institutions are increasingly inter-related as a result of trading, clearing, counterparty, and other relationships. As a result, actual or potential defaults of one or more financial institutions could lead to market-wide disruptions that could impact our financial condition or results of operations and make it difficult for us to find qualified counterparties for transactions.

Financial difficulties at other FHLBanks could require us to provide financial assistance to another FHLBank, which could adversely affect our results of operations or our financial condition.

Each FHLBank has a joint and several liability for principal and interest payments on Consolidated Obligations, which are backed only by the financial resources of the FHLBanks. Although no FHLBank has ever defaulted on its principal or interest share of an Obligation, there can be no assurance that this will continue to be the case. Financial performance issues could require our FHLB to provide financial assistance to one or more other FHLBanks, for example, by making a payment on an Obligation on behalf of another FHLBank. Such assistance could adversely affect our financial condition, earnings, ability to pay dividends, or ability to redeem or repurchase capital stock.

OPERATIONAL RISK

Failures or interruptions of the Office of Finance's services could disrupt the ability to conduct and manage our business.

The Office of Finance is a joint office of the FHLBanks established to facilitate the issuance and servicing of Consolidated Obligations, among other things. Pursuant to Finance Agency regulations, the Office of Finance, often in conjunction with the FHLBanks, has adopted policies and procedures for the purposes of facilitating and approving the issuance of Consolidation Obligations. A failure or interruption of the Office of Finance's services as a result of breaches, cyberattacks, or technological risks could negatively affect the business operations of each FHLBank, including disruptions to the FHLBanks' access to funding through the sale of Consolidated Obligations. Although the Office of Finance has business continuity and security incident response plans in place, our business operations could be constrained, disrupted or otherwise negatively affected if the Office of Finance was not able to perform its functions for a period of time.

Failures or interruptions in our information systems and other technologies, financial and business models, and third-party vendors could harm our financial condition, results of operations, reputation, and relations with members.

As a financial institution, we rely heavily on internal and third-party information systems and other technology to manage our business, including the secure processing, storage and transmission of confidential borrower and financial information in computer systems and networks. For instance, due to our reliance on the book-entry system of the Federal Reserve Banks for debt issuance and servicing operations, we depend on them and their fiscal agent, the Federal Reserve Bank of New York, and one or more settlement agents to issue and make payments of principal and interest on Consolidated Obligations. Failures in information systems and other technologies could occur from human error, fraud, cyberattacks, errors or misuse of models and services we employ, lapses in operating processes, or natural or man-made disasters.

Computer systems, software and networks are increasingly more vulnerable to failures and interruptions from cyberattacks, which may include breaches, unauthorized access, misuse, computer viruses or other malicious or destructive code (such as ransomware) and other events against information owned by our company and customers. These failures and interruptions could jeopardize the confidentiality or integrity of information, or otherwise cause interruptions or malfunctions in operations. Additionally, threats of cyber terrorism, external extremist parties, including state-sponsored actors, result in heightened risk exposure. These threats may increase as a result of geopolitical conflicts. The techniques used in cyberattacks change frequently and have grown increasingly sophisticated, and these attacks or ensuing security breaches could persist for an extended period of time before being detected. It could take considerable time for us to determine the scope, extent, amount, and type of information compromised. We can make no assurance that we will be able to prevent, timely and adequately address, or mitigate failures, interruptions, or cyberattacks in information systems and other technology. If we experience a failure, interruption, or cyberattack in any of these systems, we may be unable to effectively conduct or manage business activities, operating processes, and risk management, which could significantly harm customer relations, our reputation, and operating costs, potentially resulting in material adverse effects on our financial condition and results of operations. We may not be able to foresee, prevent, mitigate, reverse or repair the negative effects of such failures, interruptions, cyberattacks, or cyber terrorism.

Natural disasters, including those resulting from significant climate change, could adversely affect our business and our members' businesses.

Natural disasters, such as hurricanes, tornadoes, floods, wild fire, and drought may impact our operations or our members' businesses. Climate change is increasing the frequency, intensity and duration of these weather events. These natural disasters, including those resulting from significant climate change, could destroy or damage facilities or other properties (such as collateral that members have pledged to secure Advances or mortgages), disrupt business, increase the probability of power or other outages, or otherwise cause significant economic dislocation in the affected regions. Any of these situations may adversely affect our financial condition and results of operations.

Our financial condition and results of operations could suffer if we are unable to hire and retain skilled key personnel.

We rely on key personnel for many of our functions and have a relatively small workforce, given the size and complexity of our business. The success of our mission depends, in large part, on the ability to attract and retain key personnel. We must continue to recruit, retain and motivate a qualified and diverse pool of employees, both to maintain our current business, and to execute strategic initiatives. Beginning in 2021, we have experienced higher employee turnover and increased competition in hiring and retaining skilled key personnel as the COVID-19 pandemic brought about significant disruptions and changes to the U.S. labor market. Increased remote-working opportunities have also increased competition in hiring and retaining skilled key personnel. Failure to attract and retain skilled key personnel or ineffective succession planning related to key personnel could adversely affect our financial condition and results of operations.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Our primary offices are located in approximately 79,000 square feet of leased space in downtown Cincinnati, Ohio. We also maintain a leased, fully functioning, back-up facility in suburban Cincinnati. We believe that our facilities are in good condition, well maintained, and adequate for our current needs.

Item 3. Legal Proceedings.

From time to time, we are subject to various legal proceedings arising in the normal course of business. Management does not anticipate that the ultimate liability, if any, arising out of these matters will have a material adverse effect on our financial condition or results of operations.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

By law our stock is not publicly traded, and only our members (and former members with a withdrawal notice pending) may own our stock. The par value of our capital stock is $100 per share. As of February 28, 2023, we had 628 member and former member stockholders and approximately 48 million shares of capital stock outstanding, all of which were Class B Stock.

Generally, the Board of Directors has discretion to declare or not declare dividends and to determine the rate of any dividend declared. Our policy states that dividends for a quarter are declared and paid from retained earnings after the close of a calendar quarter and are based on average stock balances for the then closed quarter. The Board of Directors' decision to declare dividends is influenced by the financial condition, overall financial performance and retained earnings of the FHLB, and actual and anticipated developments in the overall economic and financial environment including interest rates and the mortgage and credit markets. The dividend rate is generally referenced as a spread to average short-term interest rates experienced during the quarter to help assess a competitive level for our stockholders. In 2022, 2021, and 2020 we declared quarterly cash dividends.

We may not declare a dividend if, at the time, we are not in compliance with all of our capital requirements. We also may not declare or pay a dividend if, after distributing the dividend, we would fail to meet any of our capital requirements or if we determine that the dividend would create a safety and soundness issue for the FHLB. See Note 11 of the Notes to the Financial Statements for additional information regarding our capital stock.

RECENT SALES OF UNREGISTERED SECURITIES

We provide Letters of Credit in the ordinary course of business to support members' obligations issued in support of unaffiliated, third-party offerings of notes, bonds or other securities. We provided $11 million, $2 million and $1 million of such credit support during 2022, 2021 and 2020. To the extent that these Letters of Credit are securities for purposes of the Securities Act of 1933, their issuance is exempt from registration pursuant to Section 3(a)(2) thereof.

Item 6. [Reserved].

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

This discussion and analysis of the FHLB's financial condition and results of operations should be read in conjunction with the Financial Statements and related Notes to Financial Statements contained in this Form 10-K.

EXECUTIVE OVERVIEW

Recent Developments

Business Environment

During 2022, concerns about inflation and interest rate hikes by the Federal Reserve, continued economic pressures related to the COVID-19 pandemic and the prolonged hostilities between Russia and Ukraine were dominant themes causing market volatility. Additionally, in March 2023 the failure of two banks outside of the Fifth District created stress for the banking industry and the financial markets, which led to further uncertainty about future interest rate expectations and the Federal Reserve's introduction of the Bank Term Funding Program to help stabilize the markets. Despite these challenges, we have continued to fulfill our mission of providing robust access to a key source of readily available and competitively priced wholesale funding to member financial institutions and supporting our commitment to affordable housing and community investment. For example, in connection with the March 2023 bank failures outside of the Fifth District, we continued to provide uninterrupted access to additional Advances to deliver liquidity to our members in the days following these bank failures. In addition to the required Affordable Housing Program (AHP) assessment and our voluntary sponsorship of two other housing programs, we demonstrated our commitment to affordable housing with a $3 million voluntary contribution to our AHP in the third quarter.

Our capital and liquidity positions continue to remain strong, as has our overall ability to fund operations through the issuance of Consolidated Obligations at acceptable interest costs, including most recently during the market volatility in March 2023. Additionally, overall residual credit risk exposure from our Credit Services, mortgage loan portfolio, investments, and derivative transactions has remained de minimis. Our market risk measures continue to be within our risk appetite. We continue to monitor the changing economic landscape and effects of inflation, recent bank failures, the COVID-19 pandemic and the ensuing market volatility and are committed to assisting members in meeting their funding needs as these events continue to unfold.

Finance Agency's Review and Analysis of the FHLBank System

On July 20, 2022, Finance Agency Director Sandra Thompson testified to the U.S. House Committee on Financial Services that the Finance Agency would conduct a review and analysis of the FHLBank System. As part of its review and analysis, the Finance Agency has held a series of public listening sessions and regional roundtable discussions, and has requested written comments from stakeholders. The review has been examining matters covering such areas as the FHLBanks' adequate fulfillment of their mission and purpose in a changing marketplace; their organization, operational efficiency, and effectiveness; their role in promoting affordable, sustainable, equitable, and resilient housing and community investment; their role in addressing the unique needs of rural and financially vulnerable communities; member products, services, and collateral requirements; and membership eligibility and requirements. We anticipate that the Finance Agency's review and analysis will culminate in a written report. The report may involve recommendations for changes related to a number of areas such as the FHLBanks' fulfillment of their mission, membership requirements, contributions to affordable housing and support to community investment and may lead to recommendations for statutory revisions, proposals for new or modified regulations, regulatory guidance under existing regulations, and/or other regulatory or supervisory actions consistent with the Finance Agency's statutory authority.

Financial Condition

Mission Assets and Activities

Primary Mission Assets (i.e., principal balances of Advances and mortgage loans held for portfolio) and Supplemental Mission Activities (i.e., Letters of Credit, Mandatory Delivery Contracts and standby bond purchase agreements) are the primary means by which we fulfill our mission with direct connections to members and what we refer to as Mission Assets and Activities. We regularly monitor our concentration of Mission Assets and Activities. One measure we use to assess mission achievement is our Primary Mission Asset ratio, which measures the sum of average Advances and mortgage loans as a percentage of average Consolidated Obligations (adjusted for certain high-quality liquid assets, as permitted by regulation). In 2022, the Primary Mission Asset ratio averaged 73 percent, above the Finance Agency's preferred ratio of 70 percent. In assessing overall mission achievement, we also consider supplemental sources of Mission Assets and Activities, the most significant of which is Letters of Credit issued for the benefit of members.

The following table summarizes our Mission Assets and Activities.

	Year Ended December 31,			
	Ending Balances		Average Balances	
(In millions)	2022	2021	2022	2021
Primary Mission Assets [1]:				
Advances	$ 67,428	$ 22,954	$ 52,367	$ 23,721
Mortgage loans held for portfolio	7,006	7,402	7,263	7,931
Total Primary Mission Assets	$ 74,434	$ 30,356	$ 59,630	$ 31,652
Supplemental Mission Activities [2]:				
Letters of Credit (notional)	$ 41,345	$ 34,637	$ 36,887	$ 33,922
Mandatory Delivery Contracts (notional)	14	250	45	249
Standby bond purchase agreements (notional)	11	27	15	31
Total Supplemental Mission Activities	$ 41,370	$ 34,914	$ 36,947	$ 34,202

(1) Amounts represent principal balances.
(2) Amounts represent off-balance sheet commitments.

Advance principal balances increased $44.5 billion (194 percent) from year-end 2021. Additionally, average principal Advance balances for 2022 increased $28.6 billion (121 percent) compared to 2021. The increase in Advances resulted primarily from depository members' greater demand for liquidity, especially short-term Advances. A decline in some members' deposit balances and loan growth contributed in part to the higher liquidity demand.

Advance balances are often volatile given our members' ability to quickly, normally on the same day, increase or decrease their amount of Advances. We believe that a key benefit of membership comes from our business model as a wholesale lender GSE, which provides members flexibility in their Advance funding levels and helps support their asset-liability management needs. We act as a readily available source of funding for our members. Our business model is designed to support significant changes in asset levels without having to undergo material changes in staffing, operations, risk practices, or general resource needs. A key reason for this scalability is that our Capital Plan provides for additional capital when Advances grow and the opportunity for us to retire capital when Advances decline, thereby acting, along with our efficient level of operating expenses, to preserve competitive profitability.

The MPP principal balance declined $0.4 billion (five percent) from the year-end 2021 balance. During 2022, we purchased $0.7 billion of mortgage loans, while principal reductions were $1.1 billion. Principal reductions in 2022 trended much lower than the reductions in 2021 reflecting the rise in mortgage rates.

Letters of Credit rose $6.7 billion (19 percent) from year-end 2021. Letters of Credit balances began increasing in the second half of 2020 and have remained strong primarily because of members using them to secure elevated levels of public unit deposits. We normally earn fees on Letters of Credit based on the actual average amount of the Letters utilized, which generally is less than the notional amount issued.

Investments
The balance of investments at December 31, 2022 was $33.6 billion, an increase of $4.2 billion (14 percent) from year-end 2021. At December 31, 2022, investments included $16.6 billion of MBS and $17.0 billion of other investments, which consisted primarily of highly-rated short-term instruments and longer-term U.S. Treasury and GSE obligations held for liquidity. All of our MBS held at December 31, 2022 were issued and guaranteed by Fannie Mae, Freddie Mac or Ginnie Mae.

Investments averaged $38.7 billion in 2022, an increase of $10.6 billion (38 percent) compared to the average in 2021, which was driven by higher liquidity investments and MBS. The ending and average balances of MBS rose given our increased authority to purchase MBS, which was a result of the higher regulatory capital balance in support of Advance borrowings. The majority of the $7.7 billion of MBS purchased were variable-rate products indexed to the Secured Overnight Financing Rate (SOFR). The increase in average liquidity investments was driven by holding more liquidity throughout 2022 in light of the increased Advance demand, which has been concentrated in short-term Advances and somewhat volatile. Liquidity investments can vary significantly on a daily basis during times of volatility in Advance balances. We maintained a robust amount of asset liquidity throughout 2022 across a variety of liquidity measures, as discussed in the "Liquidity Risk" section of "Quantitative and Qualitative Disclosures About Risk Management."

Capital

Capital adequacy surpassed all minimum regulatory capital requirements in 2022. The GAAP and regulatory capital-to-assets ratios at December 31, 2022 were 5.99 percent and 6.05 percent, respectively. Both ratios exceeded the regulatory required minimum of four percent. Regulatory capital includes mandatorily redeemable capital stock accounted for as a liability under GAAP. GAAP and regulatory capital increased $2.7 billion and $2.8 billion, respectively, from year-end 2021. The increase in capital was driven by purchases of capital stock to support Advance activity in 2022. Retained earnings totaled $1.4 billion at December 31, 2022, an increase of eight percent from year-end 2021. We believe the amount of retained earnings is sufficient to protect against members' impairment risk of their capital stock investment in the FHLB and to provide the opportunity to stabilize or increase future dividends.

Results of Operations

Overall Results

Our earnings over time reflect the combination of a stable business model and conservative management of risk. Key market driven factors that can cause significant periodic volatility in our profitability are changes in the level of interest rates, changes in spreads between benchmark interest rates and our short-term funding costs, recognition of net amortization from accelerated prepayments of mortgage assets, and fair value adjustments related to the use of derivatives and the associated hedged items. Our profitability may also be affected by our members' overall Advance demand, which is largely influenced by the monetary policies of the U.S. government and its agencies, including the Federal Reserve, and general economic conditions. The table below summarizes our results of operations.

	Year Ended December 31,		
(Dollars in millions)	2022	2021	2020
Net income	$ 252	$ 42	$ 276
Affordable Housing Program assessments	29	5	31
Return on average equity (ROE)	4.78 %	1.08 %	5.78 %
Return on average assets	0.25	0.07	0.31
Weighted average dividend rate	4.31	2.00	2.23
Dividend payout ratio (1)	57.1	126.8	30.3
Average overnight interest rates (2)	1.67	0.06	0.37
ROE spread to average overnight interest rates	3.11	1.02	5.41
Dividend rate spread to average overnight interest rates	2.64	1.94	1.86

(1) Dividend payout ratio is dividends declared in the period as a percentage of net income.
(2) Average overnight interest rates consist of SOFR and the Federal funds effective rate.

Net income increased $210 million in 2022. The increase in net income in 2022 compared to 2021 was primarily a result of the rising interest rate environment and significantly higher average Advance and investment balances. For example, higher average short-term interest rates increased the earnings generated from investing the FHLB's capital and improved the spreads earned on mortgage loans. Additionally, higher mortgage rates resulted in a lower volume of mortgage refinance activity, which reduced premium amortization. However, the increase in profitability was partially offset by unrealized losses on certain derivatives and other financial instruments carried at fair value.

In 2022, we accrued $29 million for the AHP pool of funds, which will be available to members in 2023. In September 2022, our Board of Directors affirmed its commitment to affordable housing by electing to make a voluntary AHP contribution of $3 million in addition to the $29 million annual AHP assessment. This contribution was included with our 2022 AHP awards in order to increase access to affordable housing throughout the Fifth District. In addition to the required AHP assessment and the voluntary AHP contribution, we provided voluntary sponsorship of two other housing programs. These programs provided funds to cover accessibility and emergency repairs for special needs and elderly homeowners and funds for the replacement or repair of homes damaged or destroyed by natural disasters within the Fifth District.

In December 2022, we paid stockholders a quarterly dividend at a 6.00 percent annualized rate on their capital investment in our company, which is 2.36 percentage points above fourth quarter average overnight interest rates.

Effect of Interest Rate Environment
Trends in market interest rates and the resulting shapes of the market yield curves strongly influence our results of operations and profitability because of how they affect members' demand for Mission Assets and Activities, spreads on assets, funding costs and decisions in managing the tradeoffs in our market risk/return profile. The following table presents key market interest rates (obtained from Bloomberg L.P.).

	Year 2022		Year 2021		Year 2020	
	Ending	Average	Ending	Average	Ending	Average
Federal funds effective	4.33 %	1.69 %	0.07 %	0.08 %	0.09 %	0.37 %
SOFR	4.30	1.65	0.05	0.04	0.09	0.37
3-month LIBOR	4.77	2.39	0.21	0.16	0.24	0.65
2-year LIBOR	4.71	3.27	0.94	0.38	0.20	0.49
10-year LIBOR	3.84	3.00	1.58	1.45	0.93	0.88
2-year U.S. Treasury	4.43	2.98	0.73	0.26	0.12	0.39
10-year U.S. Treasury	3.88	2.95	1.51	1.43	0.92	0.89
15-year mortgage current coupon (1)	4.71	3.60	1.41	1.21	0.71	1.21
30-year mortgage current coupon (1)	5.39	4.25	2.07	1.84	1.34	1.69

	Year 2022 by Quarter - Average			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Federal funds effective	0.12 %	0.77 %	2.18 %	3.65 %
SOFR	0.09	0.71	2.13	3.62
3-month LIBOR	0.51	1.51	2.99	4.51
2-year LIBOR	1.63	3.03	3.67	4.73
10-year LIBOR	2.01	2.99	3.15	3.82
2-year U.S. Treasury	1.43	2.71	3.36	4.39
10-year U.S. Treasury	1.93	2.92	3.08	3.82
15-year mortgage current coupon (1)	2.17	3.49	3.91	4.81
30-year mortgage current coupon (1)	2.83	4.16	4.53	5.45

(1) Current coupon rate of Fannie Mae par MBS indications.

During 2022, the Federal Reserve responded to inflationary concerns by increasing the target overnight Federal funds rate and indicating further expected rate hikes. At December 31, 2022 the target overnight Federal funds rate was in the range of 4.25 to 4.50 percent, a significant increase from the range of zero to 0.25 percent at December 31, 2021. In February 2023, the Federal Reserve increased the target overnight Federal funds rate by 0.25 percent to a range of 4.50 to 4.75 percent.

Average overnight rates were approximately 160 basis points higher in 2022 compared to 2021, while average mortgage rates increased approximately 240 basis points. The increase in short-term rates improved our earnings from capital by $95 million in 2022. Additionally, the substantial increase in mortgage rates in 2022 benefited net income as it resulted in fewer homeowners refinancing, which decreased the amount of principal prepayments and lowered the associated premium amortization.

During 2022, as in 2021, the market risk exposure to changing interest rates was moderate overall and well within policy limits. We believe that longer-term profitability will be competitive, unless interest rates were to further increase significantly for a sustained period of time. In the short-term, profitability could begin to decrease if long-term interest rates decline more than 200 basis points, leading to modestly faster prepayments of mortgage assets.

Regulatory and Legislative Developments

General
The FHLBank System is subject to legislative and regulatory oversight. Legislative and regulatory actions applicable, directly or indirectly, to the FHLBank System in the last decade have increased uncertainty regarding the business model and membership base under which the FHLBanks may operate in the future. This is due primarily to the uncertainty around potential actions related to the Finance Agency's review of the FHLBank System, future GSE reform, and the evolution of mortgage financing moving towards financial institutions currently not eligible for FHLBank membership. We cannot predict

the ultimate outcome of the FHLBank System review, GSE reform and whether our membership base will be legislatively and regulatorily permitted to evolve in concert with the housing finance market. See Item 1A. Risk Factors for more discussion.

LIBOR Transition Update

We are planning for the replacement of LIBOR and the establishment of SOFR as the recommended alternative to LIBOR. Under the July 2017 and March 2021 announcements by the United Kingdom's Financial Conduct Authority (FCA), the one-week and two-month U.S. dollar LIBOR settings ceased to be provided by any administrator and were no longer representative as of January 1, 2022. The remaining U.S. dollar LIBOR settings will either cease to be provided by any administrator or no longer be representative immediately after June 30, 2023. Although the FCA does not expect these remaining LIBOR settings to become unrepresentative before the cessation date, there is no assurance that any of them will continue to be published or be representative through any particular date.

In March 2022, the Adjustable Interest Rate (LIBOR) Act (LIBOR Act) was signed into law. The LIBOR Act provides a national, uniform approach to legacy contracts with inadequate or unworkable fallback provisions commencing from the LIBOR replacement date. For relevant contracts, the LIBOR Act will automatically impose a rate selected by the Federal Reserve Board based upon SOFR including any applicable tenor spread adjustment. The legislation also includes a safe harbor against liability for parties with contractual discretion who choose the Federal Reserve Board's SOFR-based rate to replace LIBOR. In December 2022, the Federal Reserve Board adopted a final rule that implements the LIBOR Act. For example, the rule identifies separate Federal Reserve Board-selected replacement rates for derivatives transactions, covered GSE contracts, and all other covered contracts.

In preparation for the replacement of LIBOR, we have developed and implemented a LIBOR transition plan to remediate our LIBOR-linked financial instruments and contracts. We have added or adjusted fallback language for our Advances, have worked with our counterparties to address over-the-counter derivative agreements referencing U.S. dollar LIBOR, and will convert LIBOR-linked MBS as part of our LIBOR transition efforts. We have offered SOFR-linked Consolidated Obligations and SOFR-linked Advances on an ongoing basis. In addition, we have been using SOFR-based derivatives to manage interest-rate risk, purchasing SOFR-linked MBS, and converted LIBOR-based interest rate swaps with maturities after June 30, 2023 to SOFR. Collectively, we believe these efforts have reduced our LIBOR exposure and have kept us on track for the full replacement of LIBOR.

The following table presents our remaining LIBOR-indexed Advances, investment securities and derivatives at December 31, 2022. At December 31, 2022, all of our variable rate Consolidated Obligations were linked to SOFR.

(In millions)	Maturing on or before June 30, 2023	Maturing after June 30, 2023
LIBOR-Indexed Variable Rate Financial Instruments		
Advances by redemption term	$ 5	$ 3,007
MBS by contractual maturity [1]	—	3,472
Total principal amount	$ 5	$ 6,479
Derivatives, notional amount by termination date	$ 265	$ 155

(1) MBS are presented by contractual maturity; however, their expected maturities will likely differ from contractual maturities as borrowers may have the right to call or prepay obligations with or without call or prepayment fees.

The market transition away from LIBOR towards SOFR is complicated, including the possible development of term structures and credit adjustments to accommodate differences between LIBOR and SOFR and the potential introduction of other alternative reference rates. However, we believe our LIBOR transition plan has effectively positioned us for the full replacement of LIBOR and has reduced the risk of adverse effects the transition may have on our business.

ANALYSIS OF FINANCIAL CONDITION

Credit Services

Credit Activity and Advance Composition

The tables below show trends in Advance balances by major programs and in the notional amount of Letters of Credit.

(Dollars in millions)	December 31, 2022		December 31, 2021	
	Balance	Percent[(1)]	Balance	Percent[(1)]
Adjustable/Variable Rate-Indexed:				
LIBOR	$ 3,012	4 %	$ 3,295	14 %
SOFR	10,170	15	123	1
Other	2,785	4	163	1
Total	15,967	23	3,581	16
Fixed-Rate:				
Repurchase based (REPO)	26,436	39	3,980	17
Regular Fixed-Rate	19,505	29	9,773	42
Putable [(2)]	1,020	2	2,467	11
Amortizing/Mortgage Matched	1,358	2	1,533	7
Other	3,142	5	1,620	7
Total	51,461	77	19,373	84
Total Advances Principal	$ 67,428	100 %	$ 22,954	100 %
Letters of Credit (notional) [(3)]	$ 41,345		$ 34,637	

(Dollars in millions)	December 31, 2022		September 30, 2022		June 30, 2022		March 31, 2022	
	Balance	Percent[(1)]	Balance	Percent[(1)]	Balance	Percent[(1)]	Balance	Percent[(1)]
Adjustable/Variable-Rate Indexed:								
LIBOR	$ 3,012	4 %	$ 3,110	5 %	$ 3,292	6 %	$ 3,292	10 %
SOFR	10,170	15	11,864	20	7,169	13	426	1
Other	2,785	4	3,733	6	2,855	5	174	1
Total	15,967	23	18,707	31	13,316	24	3,892	12
Fixed-Rate:								
Repurchase based (REPO)	26,436	39	20,018	33	24,852	44	14,496	43
Regular Fixed-Rate	19,505	29	15,941	27	13,061	23	9,656	29
Putable [(2)]	1,020	2	1,450	2	1,240	2	2,342	7
Amortizing/Mortgage Matched	1,358	2	1,399	2	1,433	3	1,464	4
Other	3,142	5	2,666	5	2,100	4	1,800	5
Total	51,461	77	41,474	69	42,686	76	29,758	88
Total Advances Principal	$67,428	100 %	$60,181	100 %	$56,002	100 %	$33,650	100 %
Letters of Credit (notional) [(3)]	$41,345		$39,002		$37,009		$33,813	

(1) As a percentage of total Advances principal.
(2) Excludes Putable Advances where the related put options have expired or where the Advance is indexed to a variable-rate. These Advances are classified based on their current terms.
(3) Represents the amount of an off-balance sheet obligation.

Advance principal balances at December 31, 2022 increased 194 percent compared to year-end 2021. The increase in Advances resulted primarily from depository members' greater demand for liquidity, which was due in part to a decline in some members' deposit balances and loan growth. The decline in deposit balances was primarily driven by inflationary pressures and higher interest rates, which resulted in a more competitive deposit market and ultimately deposit outflows at some members. In March 2023, member demand for Advances accelerated in response to the stress placed on the banking industry and financial markets. Although Advance balances have increased, much of the demand has been for short-term Advances, which are often volatile as members' funding needs may change quickly. The future levels of Advance balances is difficult to predict and depends on many factors, including but not limited to, changes in the level of liquidity in the financial markets, changes in our members' deposit levels compared to loan growth and whether an economic downturn occurs.

Letters of Credit are issued on behalf of members to support certain obligations of members (or members' customers) to third-party beneficiaries. Letters of Credit were elevated throughout 2021 and increased an additional $6.7 billion (19 percent) in 2022 as members continue to primarily use them to secure higher levels of public unit deposits. Letters of Credit usually expire without being drawn upon.

Advance Usage

In addition to analyzing Advance balances by dollar trends, we monitor the degree to which members use Advances to fund their balance sheets. The following table shows the unweighted, average ratio of each member's Advance balance to its most-recently available figures for total assets.

	December 31, 2022	December 31, 2021
Average Advances-to-assets for members		
Assets less than $1.0 billion (487 members)	2.43 %	1.46 %
Assets over $1.0 billion (129 members)	3.38	1.50
All members	2.63	1.47

The following table shows Advance usage of members by charter type.

(Dollars in millions)	December 31, 2022		December 31, 2021	
	Principal Amount of Advances	Percent of Total Principal Amount of Advances	Principal Amount of Advances	Percent of Total Principal Amount of Advances
Commercial Banks	$ 44,334	66 %	$ 7,258	32 %
Savings Institutions	7,637	11	4,262	18
Credit Unions	3,933	6	1,323	6
Insurance Companies	11,501	17	10,073	44
Total member Advances	67,405	100	22,916	100
Former member borrowings	23	—	38	—
Total principal amount of Advances	$ 67,428	100 %	$ 22,954	100 %

The following tables present principal balances for the five members with the largest Advance borrowings.

(Dollars in millions)

December 31, 2022			December 31, 2021		
Name	Principal Amount of Advances	Percent of Total Principal Amount of Advances	Name	Principal Amount of Advances	Percent of Total Principal Amount of Advances
U.S. Bank, N.A.	$ 19,000	28 %	U.S. Bank, N.A.	$ 3,272	14 %
Keybank, N.A.	11,344	17	Third Federal Savings and Loan Association	3,179	14
Third Federal Savings and Loan Association	4,826	7	Protective Life Insurance Company	2,800	12
Fifth Third Bank	4,301	6	Nationwide Life Insurance Company	2,702	12
Nationwide Life Insurance Company	3,136	5	Western-Southern Life Assurance Co.	1,487	6
Total of Top 5	$ 42,607	63 %	Total of Top 5	$ 13,440	58 %

We believe that having large financial institutions that actively use our products augments the value of membership to all members. For example, such activity improves our operating efficiency, increases our earnings and thereby contributions to housing and community investment programs. This activity may enable us to obtain more favorable funding costs, and helps us maintain competitively priced products.

Mortgage Loans Held for Portfolio (Mortgage Purchase Program, or MPP)

MPP balances are influenced by conditions in the housing and mortgage markets, the competitiveness of prices we offer to purchase loans as well as program features, and activity from our largest sellers. Our ongoing strategy for the MPP has two components: 1) increase the number of regular sellers and participants in the program; and 2) manage purchases and balances at a prudent level relative to capital and total assets to effectively manage market and credit risks consistent with our risk appetite.

The table below shows principal purchases and reductions of loans in the MPP for each of the last two years. All loans acquired in 2022 and 2021 were conventional loans.

(In millions)	2022	2021
Balance, beginning of year	$ 7,402	$ 9,316
Principal purchases	714	1,671
Principal reductions	(1,110)	(3,585)
Balance, end of year	$ 7,006	$ 7,402

We closely track the refinancing incentives of our mortgage assets (including loans in the MPP and MBS) because the option for homeowners to change their principal payments normally represents the largest portion of our market risk exposure and can affect MPP balances. MPP principal paydowns decreased in 2022 to an 11 percent annual constant prepayment rate, compared to the 34 percent rate during 2021, driven by the sharp increase in mortgage rates. Likewise, the increase in mortgage rates substantially slowed the purchases of new MPP loans in 2022.

Overall, MPP yields on new purchases and existing portfolio balances, relative to their market and credit risks, are expected to continue to generate a profitable long-term return.

The following tables show the percentage of principal balances from Participating Financial Institutions (PFIs) supplying five percent or more of total principal and the percentage of principal balances from all other PFIs. As shown below, MPP activity is concentrated amongst a few members.

(Dollars in millions)	December 31, 2022			December 31, 2021	
	Principal	% of Total		Principal	% of Total
Union Savings Bank	$ 1,651	24 %	Union Savings Bank	$ 1,841	25 %
FirstBank	730	10	FirstBank	565	8
Guardian Savings Bank FSB	438	6	Guardian Savings Bank FSB	524	7
All others	4,187	60	All others	4,472	60
Total	$ 7,006	100 %	Total	$ 7,402	100 %

Housing and Community Investment

In 2022, we accrued $29 million of earnings for the AHP, which will be awarded to members in 2023. In addition to the annual AHP assessment, our Board made a voluntary AHP contribution of $3 million, which was included in the 2022 AHP awards. The AHP consists of a Competitive Program and a homeownership program called Welcome Home, which assists homebuyers with down payments and closing costs.

Including funds available in 2022 from previous years, we had $12.5 million available for the Competitive Program in 2022, which we awarded to 48 projects through a single competitive offering. In addition, we disbursed over $2.6 million to 145 members on behalf of 559 homebuyers through the Welcome Home Program, which assists homebuyers with down payments and closing costs.

Additionally, in 2022, our Board committed $1.0 million to the Carol M. Peterson Housing Fund, which helped 137 homeowners, and continued its commitment to the Disaster Reconstruction Program. Both are voluntary programs beyond the 10 percent of earnings that we are required by law to set aside for the AHP.

Our activities to support affordable housing and economic development also include offering Advances and loans through the AHP, Community Investment Program, Economic Development Program and Zero Interest Rate Fund with below-market interest rates and, in some cases, rates as low as zero percent. At the end of 2022, Advance balances under these programs totaled $194 million.

In 2022, approximately 29 percent of members applied for funding under our Housing and Community Investment programs.

Investments

The table below presents the ending and average balances of our investment portfolio.

(In millions)	2022		2021	
	Ending Balance	Average Balance	Ending Balance	Average Balance
Liquidity investments	$ 17,028	$ 24,608	$ 18,589	$ 18,576
MBS	16,577	13,678	10,803	9,186
Other investments [1]	—	444	—	340
Total investments	$ 33,605	$ 38,730	$ 29,392	$ 28,102

(1) The average balance includes the rights or obligations to cash collateral, which are included in the fair value of derivative assets or derivative liabilities on the Statements of Condition at period end.

Liquidity investments are either short-term (primarily overnight), or longer-term investments that may be sold and converted to cash. Under our regulatory requirements, liquidity includes certain high-quality liquid assets, which are defined as uncommitted U.S. Treasury obligations with remaining maturities of 10 years or less held as trading securities or available-for-sale securities. It is normal for liquidity investments to vary by up to several billion dollars on a daily basis. Liquidity investment levels can vary significantly based on changes in the amount of actual Advances, anticipated demand for Advances, regulatory liquidity requirements, the availability of acceptable net spreads, and the number of eligible counterparties that meet our unsecured credit risk criteria. The average balance of liquidity investments in 2022 increased $6.0 billion (32 percent) compared to the average balance in 2021 because of additional liquidity investments being held in light of the increased level and volatility of Advance demand as previously described.

Our overarching strategy for balances of MBS is to keep holdings as close as possible to the regulatory maximum. Finance Agency regulations prohibit us from purchasing MBS if our investment in these securities exceeds three times regulatory capital on the day we intend to purchase the securities. The ratio of MBS to regulatory capital was 2.56 at December 31, 2022. Although we purchased $7.7 billion of MBS in 2022, the MBS ratio was still below our preference to hold it near the three times regulatory maximum primarily because of the rapid increase in regulatory capital, which was driven by purchases of capital stock to support Advance activity.

The balance of MBS at December 31, 2022 consisted of $15.4 billion of securities issued by Fannie Mae or Freddie Mac (of which $12.5 billion were floating-rate securities), and $1.2 billion of securities issued by Ginnie Mae (which are primarily fixed rate).

The table below shows principal purchases and paydowns of our MBS for each of the last two years. The majority of the purchases were variable-rate MBS linked to SOFR.

(In millions)	MBS Principal	
	2022	2021
Balance, beginning of year	$ 10,795	$ 9,745
Principal purchases	7,726	3,837
Principal paydowns	(1,723)	(2,787)
Balance, end of year	$ 16,798	$ 10,795

As mortgage rates rose in 2022, MBS principal paydowns decreased to a 12 percent annual constant prepayment rate from the 26 percent rate experienced in all of 2021.

Consolidated Obligations

We fund variable-rate assets with Discount Notes (a portion of which may be swapped), adjustable-rate Bonds, and swapped fixed-rate Bonds because they give us the ability to effectively match the underlying rate reset periods embedded in these assets. The balances and composition of our Consolidated Obligations tend to fluctuate with changes in the balances and composition of our assets. In addition, changes in the amount and composition of our funding may be necessary from time to time to meet the days of positive liquidity and asset/liability maturity funding gap requirements discussed in the "Liquidity Risk" section of "Quantitative and Qualitative Disclosures About Risk Management."

The table below presents the ending and average balances of our participations in Consolidated Obligations.

(In millions)	2022		2021	
	Ending Balance	Average Balance	Ending Balance	Average Balance
Discount Notes:				
Unswapped	$ 19,825	$ 24,931	$ 19,418	$ 22,933
Swapped	21,183	21,692	10,426	3,156
Total par Discount Notes	41,008	46,623	29,844	26,089
Other items [1]	(317)	(173)	(6)	(1)
Total Discount Notes	40,691	46,450	29,838	26,088
Bonds:				
Unswapped fixed-rate	13,280	14,078	16,112	18,840
Unswapped adjustable-rate [2]	39,621	22,834	850	6,710
Swapped fixed-rate	6,842	7,062	7,627	2,737
Total par Bonds	59,743	43,974	24,589	28,287
Other items [1]	(75)	(34)	13	24
Total Bonds	59,668	43,940	24,602	28,311
Total Consolidated Obligations [3]	$ 100,359	$ 90,390	$ 54,440	$ 54,399

(1) Includes unamortized premiums/discounts, fair value option valuation adjustments, hedging and other basis adjustments.
(2) At December 31, 2022 and 2021, all unswapped adjustable-rate Bonds were indexed to SOFR.
(3) The 11 FHLBanks have joint and several liability for the par amount of all of the Consolidated Obligations issued on their behalves. The par amount of the outstanding Consolidated Obligations for all of the FHLBanks was (in millions) $1,181,743 and $652,862 at December 31, 2022 and 2021, respectively.

The balances of Discount Notes and unswapped adjustable-rate Bonds in 2022 were higher compared to the balances at year-end 2021 primarily due to growth in short-term and variable-rate Advances during 2022. The growth in Advances resulted primarily from depository members' greater demand for liquidity, which was due in part to a decline in some members' deposit balances and loan growth.

The ending and average balances of swapped Discount Notes at December 31, 2022 were higher than year-end 2021 because the market environment in 2022 generally favored swapped debt. We swap term Discount Notes and fixed-rate bonds to adjustable-rates in order to match the underlying rate reset periods to the assets the Discount Notes and Bonds are funding, as well as to reduce the repricing risk of Discount Notes.

Deposits

Total deposits with us are normally a relatively minor source of low-cost funding. All deposits with us are uninsured. Total interest-bearing deposits at December 31, 2022 were $1.0 billion, a decrease of $0.4 billion compared to the balance at year-end 2021.

Derivatives Hedging Activity and Liquidity

Our use of derivatives is discussed in the "Effect of the Use of Derivatives on Net Interest Income" and "Non-Interest Income (Loss)" sections in "Results of Operations." Liquidity is discussed in the "Liquidity Risk" section in “Quantitative and Qualitative Disclosures About Risk Management.”

Capital Resources

The following tables present capital amounts and capital-to-assets ratios, on both a GAAP and regulatory basis. We consider the regulatory ratio to be a better representation of financial leverage than the GAAP ratio because, although the GAAP ratio treats mandatorily redeemable capital stock as a liability, it protects investors in our debt in the same manner as GAAP capital stock and retained earnings.

	Year Ended December 31,			
(In millions)	2022		2021	
	Period End	Average	Period End	Average
GAAP and Regulatory Capital				
GAAP Capital Stock	$ 5,151	$ 3,961	$ 2,490	$ 2,585
Mandatorily Redeemable Capital Stock	17	115	21	19
Regulatory Capital Stock	5,168	4,076	2,511	2,604
Retained Earnings	1,401	1,339	1,293	1,304
Regulatory Capital	$ 6,569	$ 5,415	$ 3,804	$ 3,908

	2022		2021	
	Period End	Average	Period End	Average
GAAP and Regulatory Capital-to-Assets Ratio				
GAAP	5.99 %	5.33 %	6.26 %	6.40 %
Regulatory [(1)]	6.05	5.47	6.28	6.44

(1) At all times, the FHLB must maintain at least a four percent minimum regulatory capital-to-assets ratio.

The following table presents the sources of change in regulatory capital stock balances in 2022 and 2021.

(In millions)	2022	2021
Regulatory stock balance at beginning of year	$ 2,511	$ 2,660
Stock purchases:		
Membership stock	1	20
Activity stock	5,533	1,089
Stock repurchases/redemptions:		
Redemption of member excess	(2,650)	(60)
Repurchase of member excess	(208)	(1,186)
Withdrawals	(19)	(12)
Regulatory stock balance at the end of the year	$ 5,168	$ 2,511

Our business model is structured to be able to absorb sharp changes in assets because we can execute commensurate changes in liability and capital stock balances. For example, in 2022, we issued $5.5 billion of capital stock to members in support of Advance borrowings, some of which were repaid prior to December 31, 2022. As such, certain members requested the redemption of $2.7 billion of capital stock that was no longer required to support Advance borrowings. These redemption requests were reclassified as mandatorily redeemable capital stock, most of which were subsequently redeemed in 2022.

Excess capital stock is the amount of stock held by a member (or former member) in excess of that institution's minimum stock ownership requirement. Excess capital stock provides a base of capital to manage financial leverage at prudent levels, augments loss protections for bondholders, and may be used by a member to capitalize additional Mission Assets and Activities, before purchasing activity stock. At December 31, 2022, the amount of excess stock, as defined by our Capital Plan, was $1.2 billion, an increase of $0.8 billion compared to the balance at year-end 2021. The balance of excess stock increased in 2022 given the volatility in short-term Advance borrowings. In January 2023, we repurchased $1.1 billion of excess capital stock.

See the "Capital Adequacy" section in “Quantitative and Qualitative Disclosures About Risk Management” for discussion of our retained earnings.

Membership and Stockholders

In 2022, we added six new member stockholders and lost eight member stockholders, ending the year at 616 member stockholders. Of the eight members lost, six merged with other Fifth District members and the other two merged out of district.

In 2022, there were no material changes in the allocation of membership by state, charter type, or asset size. At the end of 2022, the composition of membership by state was Ohio with 301, Kentucky with 159, and Tennessee with 156.

The following table provides the number of member stockholders by charter type.

	December 31,	
	2022	2021
Commercial Banks	335	338
Savings Institutions	75	76
Credit Unions	144	142
Insurance Companies	55	55
Community Development Financial Institutions	7	7
Total	616	618

The following table provides the ownership of capital stock by charter type.

(In millions)	December 31,	
	2022	2021
Commercial Banks	$ 3,542	$ 1,109
Savings Institutions	518	432
Credit Unions	305	184
Insurance Companies	785	764
Community Development Financial Institutions	1	1
Total GAAP Capital Stock	5,151	2,490
Mandatorily Redeemable Capital Stock	17	21
Total Regulatory Capital Stock	$ 5,168	$ 2,511

Credit union members hold relatively less stock than their membership proportion because they tend to be smaller than the average member and borrow less. Insurance company members hold relatively more stock than their membership proportion because they tend to be larger than the average member and borrow more.

The following table provides a summary of member stockholders by asset size.

	December 31,	
Member Asset Size [(1)]	2022	2021
Up to $100 million	111	128
> $100 up to $500 million	301	296
> $500 million up to $1 billion	75	68
> $1 billion	129	126
Total Member Stockholders	616	618

(1) The December 31 membership composition reflects members' assets as of the most-recently available figures for total assets.

Most members are smaller community financial institutions, with 67 percent having assets up to $500 million. As noted elsewhere, having larger members is important to help achieve our mission objectives, including providing valuable products and services to all members.

RESULTS OF OPERATIONS

The following tables and discussion provide information for the years ended December 31, 2022, 2021 and 2020 and a comparison of the results between 2022 and 2021. For a comparison of the results between 2021 and 2020, see Part II, Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" of our 2021 Annual Report on Form 10-K.

Components of Earnings and Return on Equity

The following table is a summary income statement for the last three years. Each ROE percentage is computed by dividing income or expense for the category by the average amount of stockholders' equity for the period.

(Dollars in millions)	2022		2021		2020	
	Amount	ROE (1)	Amount	ROE (1)	Amount	ROE (1)
Net interest income	$ 487	9.25 %	$ 277	7.12 %	$ 406	8.51 %
Non-interest income (loss):						
Net gains (losses) on investment securities	(337)	(6.39)	(257)	(6.63)	257	5.39
Net gains (losses) on derivatives	131	2.48	82	2.12	(273)	(5.72)
Net gains (losses) on financial instruments held under fair value option	75	1.42	10	0.26	(7)	(0.15)
Other non-interest income, net	28	0.53	27	0.69	16	0.33
Total non-interest income (loss)	(103)	(1.96)	(138)	(3.56)	(7)	(0.15)
Total income	384	7.29	139	3.56	399	8.36
Non-interest expense	103	1.97	92	2.36	92	1.93
Affordable Housing Program assessments	29	0.54	5	0.12	31	0.65
Net income	$ 252	4.78 %	$ 42	1.08 %	$ 276	5.78 %

(1) The ROE amounts have been computed using dollars in thousands. Accordingly, recalculations based upon the disclosed amounts in millions may produce nominally different results.

Details on the individual factors contributing to the level and changes in profitability are explained in the sections below.

Net Interest Income

The largest component of net income is net interest income. Our principal goal in managing net interest income is to balance the trade-offs between maintaining a moderate market risk profile and ensuring profitability remains competitive. Effective risk/return management requires us to focus principally on the relationships among assets and liabilities that affect net interest income, rather than individual balance sheet and income statement accounts in isolation.

Our ROE normally is lower than that of many other financial institutions because of the cooperative wholesale business model that results in narrow spreads earned on our assets, the moderate overall risk profile, and the strategic objective to have a positive correlation of earnings to short-term interest rates.

Components of Net Interest Income

We generate net interest income from the following two components:

- **Net interest rate spread.** This component equals the balance of total earning assets multiplied by the difference between the book yield on interest-earning assets and the book cost of interest-bearing liabilities. It is composed of net (amortization)/accretion, prepayment fees on Advances, and all other earnings from interest-earning assets net of funding costs. The latter is the largest component and represents the coupon yields of interest-earning assets net of the coupon costs of interest-bearing liabilities.
- **Earnings from funding assets with capital ("earnings from capital").** Because of our relatively low net interest rate spread compared to other financial institutions, we have historically derived a substantial portion of net interest income from deploying interest-free capital in interest-earning assets. We deploy much of the capital in short-term and adjustable-rate assets in order to help ensure that ROE moves in the same direction as short-term interest rates and to help control market risk exposure.

The following table shows selected components of net interest income. Reasons for the variance in net interest income between the 2022 and 2021 periods are discussed below.

(Dollars in millions)	2022		2021		2020	
	Amount	% of Earning Assets	Amount	% of Earning Assets	Amount	% of Earning Assets
Components of net interest rate spread:						
Net (amortization)/accretion (1) (2)	$ (31)	(0.03)%	$ (87)	(0.15)%	$ (115)	(0.13)%
Prepayment fees on Advances, net (2)	3	—	13	0.02	34	0.04
Other components of net interest rate spread	393	0.40	324	0.54	441	0.50
Total net interest rate spread	365	0.37	250	0.41	360	0.41
Earnings from funding assets with interest-free capital	122	0.13	27	0.05	46	0.05
Total net interest income/net interest margin (3)	$ 487	0.50 %	$ 277	0.46 %	$ 406	0.46 %

(1) Includes monthly recognition of premiums and discounts paid on purchases of mortgage assets, premiums, discounts and concessions paid on Consolidated Obligations and other hedging basis adjustments.
(2) This component of net interest rate spread has been segregated to display its relative impact.
(3) Net interest margin is net interest income as a percentage of average total interest-earning assets.

Net Amortization/Accretion (generally referred to as "amortization"): Net amortization can become substantial and volatile with changes in interest rates. When mortgage rates decrease, premium amortization of mortgage assets generally increases, which reduces net interest income. In 2022, mortgage rates increased rapidly and reduced mortgage refinance activity, which decreased net amortization. Net amortization was higher in 2021 given the historically low mortgage rates that existed at the end of 2020 and continued into the first half of 2021.

Prepayment Fees on Advances: Fees for members' early repayment of certain Advances, which are included in net interest income, are designed to make us economically indifferent to whether members hold Advances to maturity or repay them before maturity. Advance prepayment fees were minimal in 2022.

Other Components of Net Interest Rate Spread: The total other components of net interest rate spread increased $69 million in 2022 compared to 2021. The net increase was primarily due to the factors below.

2022 Versus 2021

- **Higher average Advance balances-*Favorable*:** The $28.2 billion increase in the average balance of Advances improved net interest income by an estimated $107 million.
- **Higher spreads earned on mortgage loans held for portfolio-*Favorable*:** Higher spreads on mortgage loans held for portfolio increased net interest income by an estimated $56 million. Spreads improved primarily because of the rise in interest rates.
- **Higher average balances of investments-*Favorable*:** Increases of $4.5 billion in average MBS and $6.0 billion in average liquidity investment balances improved net interest income by an estimated $32 million.
- **Higher net unrealized gains on designated fair value hedges-*Favorable*:** Net unrealized gains on hedged items and derivatives in qualifying fair value hedge relationships were higher by $14 million.
- **Lower spreads on shorter-term and floating-rate assets-*Unfavorable*:** Lower spreads on shorter-term and floating-rate assets (including those that have been swapped to a floating rate) decreased net interest income by an estimated $129 million. However, the decrease in net interest income was partially offset by lower non-interest losses primarily because of a $74 million decline in the net interest settlements being paid on related derivatives not receiving hedge accounting.
- **Higher interest paid on mandatorily redeemable capital stock-*Unfavorable*:** Interest paid on mandatorily redeemable capital stock was higher by $6 million. The interest expense increased due to higher average dividend rates paid and a higher average balance of mandatorily redeemable capital stock, which was driven by members requesting the redemption of capital stock no longer supporting Advance borrowings.
- **Lower average balances of mortgage loans held for portfolio-*Unfavorable*:** The $0.7 billion decrease in the average balance of mortgage loans held for portfolio lowered net interest income by an estimated $5 million. Mortgage balances declined because of the acceleration of principal cash flows driven by historically low mortgage interest rates in 2021.

Earnings from Capital: Earnings from capital increased $95 million in 2022 compared to 2021 because of the significantly higher average short-term interest rates and higher average capital balances.

Average Balance Sheet and Rates

The following table provides average balances and rates for major balance sheet accounts, which determine the changes in net interest rate spreads. Interest amounts and average rates are affected by our use of derivatives and the related accounting elections we make. Interest amounts reported for Advances, MBS, Other investments and Swapped Bonds include gains (losses) on hedged items and derivatives in qualifying fair value hedge relationships.

In addition, the net interest settlements of interest receivables or payables associated with derivatives in a fair value hedge relationship are included in net interest income and interest rate spread. However, if the derivatives do not qualify for fair value hedge accounting, the related net interest settlements of interest receivables or payables are recorded in "Non-interest income (loss)" as "Net gains (losses) on derivatives" and therefore are excluded from the calculation of net interest rate spread. Amortization associated with some hedging-related basis adjustments is also reflected in net interest income, which affects interest rate spread.

(Dollars in millions)	2022			2021			2020		
	Average Balance	Interest	Average Rate (1)	Average Balance	Interest	Average Rate (1)	Average Balance	Interest	Average Rate (1)
Assets:									
Advances (2)	$ 52,167	$ 1,211	2.32 %	$ 23,943	$ 147	0.62 %	$ 43,323	$ 469	1.08 %
Mortgage loans held for portfolio (3)	7,431	204	2.75	8,130	169	2.07	11,264	276	2.45
Securities purchased under agreements to resell	2,354	49	2.09	545	1	0.07	1,633	11	0.68
Federal funds sold	11,183	204	1.82	6,891	5	0.08	6,151	32	0.52
Interest-bearing deposits in banks (4)	1,298	25	1.94	736	1	0.09	1,390	8	0.55
MBS (5)	13,702	288	2.11	9,182	107	1.17	11,864	186	1.57
Other investments (5)	10,209	238	2.33	10,733	205	1.91	11,832	265	2.24
Loans to other FHLBanks	25	1	2.77	—	—	—	5	—	1.22
Total interest-earning assets	98,369	2,220	2.26	60,160	635	1.05	87,462	1,247	1.43
Less: allowance for credit losses on mortgage loans	—			—			—		
Other assets	578			526			1,248		
Total assets	$ 98,947			$ 60,686			$ 88,710		
Liabilities and Capital:									
Term deposits	$ 77	1	1.03	$ 79	—	0.23	$ 78	—	0.67
Other interest-bearing deposits (4)	1,329	16	1.21	1,434	—	0.02	1,208	3	0.25
Discount Notes	46,450	775	1.67	26,088	14	0.05	43,284	295	0.68
Unswapped fixed-rate Bonds	14,087	282	2.00	18,857	327	1.74	21,319	432	2.03
Unswapped adjustable-rate Bonds	22,833	539	2.36	6,710	5	0.07	13,394	53	0.40
Swapped Bonds	7,020	114	1.62	2,744	12	0.42	3,584	57	1.58
Mandatorily redeemable capital stock	115	6	4.77	19	—	2.01	55	1	1.93
Other borrowings	—	—	2.27	—	—	—	1	—	—
Total interest-bearing liabilities	91,911	1,733	1.89	55,931	358	0.64	82,923	841	1.02
Non-interest bearing deposits	—			—			2		
Other liabilities	1,765			869			1,006		
Total capital	5,271			3,886			4,779		
Total liabilities and capital	$ 98,947			$ 60,686			$ 88,710		
Net interest rate spread			0.37 %			0.41 %			0.41 %
Net interest income and net interest margin (6)		$ 487	0.50 %		$ 277	0.46 %		$ 406	0.46 %
Average interest-earning assets to interest-bearing liabilities			107.03 %			107.56 %			105.48 %

(1) Amounts used to calculate average rates are based on dollars in thousands. Accordingly, recalculations based upon the disclosed amounts in millions may not produce the same results.
(2) Interest on Advances includes prepayment fees of (in millions) $3, $13, and $34 for the years ended December 31, 2022, 2021, and 2020, respectively.
(3) Non-accrual loans are included in average balances used to determine average rate.
(4) The average balance amounts include the rights or obligations to cash collateral, which are included in the fair value of derivative assets or derivative liabilities on the Statements of Condition at period end.
(5) Includes available-for-sale securities based on their amortized costs. The yield information does not give effect to changes in fair value that are reflected as a component of stockholders' equity for available-for-sale securities.
(6) Net interest margin is net interest income as a percentage of average total interest-earning assets.

Rates and corresponding levels of interest income and expense on all of our interest-bearing assets and liabilities increased in 2022 compared to 2021, as these assets and liabilities have repriced to the higher interest rates.

Volume/Rate Analysis

Changes in both average balances (volume) and interest rates influence changes in net interest income, as shown in the following table.

(In millions)	2022 over 2021			2021 over 2020		
	Volume [1][3]	Rate [2][3]	Total	Volume [1][3]	Rate [2][3]	Total
Increase (decrease) in interest income						
Advances	$ 317	$ 747	$ 1,064	$ (164)	$ (158)	$ (322)
Mortgage loans held for portfolio	(16)	51	35	(69)	(38)	(107)
Securities purchased under agreements to resell	5	43	48	(4)	(6)	(10)
Federal funds sold	5	194	199	3	(30)	(27)
Interest-bearing deposits in banks	1	23	24	(2)	(5)	(7)
MBS	69	112	181	(37)	(42)	(79)
Other investments	(10)	43	33	(23)	(37)	(60)
Loans to other FHLBanks	1	—	1	—	—	—
Total	372	1,213	1,585	(296)	(316)	(612)
Increase (decrease) in interest expense						
Term deposits	—	1	1	—	—	—
Other interest-bearing deposits	—	16	16	—	(3)	(3)
Discount Notes	18	743	761	(84)	(197)	(281)
Unswapped fixed-rate Bonds	(90)	45	(45)	(46)	(59)	(105)
Unswapped adjustable-rate Bonds	37	497	534	(18)	(30)	(48)
Swapped Bonds	36	66	102	(11)	(34)	(45)
Mandatorily redeemable capital stock	4	2	6	(1)	—	(1)
Other borrowings	—	—	—	—	—	—
Total	5	1,370	1,375	(160)	(323)	(483)
Increase (decrease) in net interest income	$ 367	$ (157)	$ 210	$ (136)	$ 7	$ (129)

(1) Volume changes are calculated as the change in volume multiplied by the prior year rate.
(2) Rate changes are calculated as the change in rate multiplied by the prior year average balance.
(3) Changes that are not identifiable as either volume-related or rate-related, but rather are equally attributable to both volume and rate changes, have been allocated to the volume and rate categories based upon the proportion of the absolute value of the volume and rate changes.

Effect of the Use of Derivatives on Net Interest Income

The following table shows the impact on net interest income from the effect of derivatives and hedging activities. As noted above, gains (losses) on hedged items and derivatives in qualifying fair value hedge relationships are recorded in interest income or expense. In addition, for derivatives designated as a fair value hedge, the net interest settlements of interest receivables or payables related to such derivatives are recognized as adjustments to the interest income or expense of the designated hedged item. As such, all the effects on earnings of derivatives qualifying for fair value hedge accounting are reflected in net interest income. The effect on earnings from derivatives not receiving fair value hedge accounting is provided in the "Non-Interest Income (Loss)" section below.

(In millions)	2022	2021	2020
Advances:			
Amortization of hedging activities in net interest income	$ —	$ (1)	$ (1)
Gains (losses) on designated fair value hedges	11	1	(16)
Net interest settlements included in net interest income	12	(110)	(91)
Investment securities:			
Amortization of hedging activities in net interest income	(1)	—	—
Gains (losses) on designated fair value hedges	(15)	—	—
Net interest settlements included in net interest income	39	(20)	(2)
Mortgage loans:			
Amortization of derivative fair value adjustments in net interest income	(2)	(12)	(12)
Consolidated Obligation Bonds:			
Net interest settlements included in net interest income	(4)	1	2
Increase (decrease) to net interest income	$ 40	$ (141)	$ (120)

Most of our use of derivatives is to synthetically convert the fixed interest rates on certain Advances, investments and Consolidated Obligations to adjustable rates tied to an eligible benchmark rate (e.g., the Federal funds effective rate or SOFR). The sharp increases in short-term interest rates primarily benefited net interest income in 2022 as the conversion of certain Advances' and investments' fixed interest rates to adjustable-coupon rates resulted in net interest settlements being received rather than paid in the second half of 2022. The fluctuation in earnings from the use of derivatives was acceptable because it enabled us to lower market risk exposure by matching actual cash flows between assets and liabilities more closely and efficiently than would otherwise occur.

Non-Interest Income (Loss)

Non-interest income (loss) consists of certain gains (losses) on investment securities, derivatives activities, financial instruments held under the fair value option, and other non-interest earning activities. The following tables present the net effect of derivatives and hedging activities on non-interest income (loss). The effects of derivatives and hedging activities on non-interest income (loss) relate only to derivatives not qualifying for fair value hedge accounting.

(In millions)	2022							
	Advances	Investment Securities	Mortgage Loans	Bonds	Discount Notes	Balance Sheet [1]	Other	Total
Net effect of derivatives and hedging activities								
Gains (losses) on derivatives not receiving hedge accounting	$ (1)	$ 291	$ (9)	$ (57)	$ (12)	$ 10	$ —	$ 222
Net interest settlements on derivatives not receiving hedge accounting	—	(42)	—	(14)	(34)	—	—	(90)
Price alignment amount [2]	—	—	—	—	—	—	(1)	(1)
Net gains (losses) on derivatives	(1)	249	(9)	(71)	(46)	10	(1)	131
Gains (losses) on trading securities [3]	—	(337)	—	—	—	—	—	(337)
Gains (losses) on financial instruments held under fair value option [4]	1	—	—	69	5	—	—	75
Total net effect on non-interest income	$ —	$ (88)	$ (9)	$ (2)	$ (41)	$ 10	$ (1)	$ (131)

(In millions)	2021							
	Advances	Investment Securities	Mortgage Loans	Bonds	Discount Notes	Balance Sheet [1]	Other	Total
Net effect of derivatives and hedging activities								
Gains (losses) on derivatives not receiving hedge accounting	$ 1	$ 252	$ 3	$ (9)	$ (1)	$ —	$ —	$ 246
Net interest settlements on derivatives not receiving hedge accounting	—	(172)	—	8	—	—	—	(164)
Price alignment amount [2]	—	—	—	—	—	—	—	—
Net gains (losses) on derivatives	1	80	3	(1)	(1)	—	—	82
Gains (losses) on trading securities [3]	—	(257)	—	—	—	—	—	(257)
Gains (losses) on financial instruments held under fair value option [4]	(1)	—	—	10	1	—	—	10
Total net effect on non-interest income	$ —	$ (177)	$ 3	$ 9	$ —	$ —	$ —	$ (165)

(In millions)	2020 Advances	2020 Investment Securities	2020 Mortgage Loans	2020 Bonds	2020 Discount Notes	2020 Balance Sheet [1]	2020 Other	2020 Total
Net effect of derivatives and hedging activities								
Gains (losses) on derivatives not receiving hedge accounting	$ —	$ (242)	$ (10)	$ 14	$ —	$ 91	$ —	$ (147)
Net interest settlements on derivatives not receiving hedge accounting	—	(172)	—	23	22	—	—	(127)
Price alignment amount [2]	—	—	—	—	—	—	1	1
Net gains (losses) on derivatives	—	(414)	(10)	37	22	91	1	(273)
Gains (losses) on trading securities [3]	—	257	—	—	—	—	—	257
Gains (losses) on financial instruments held under fair value option [4]	1	—	—	(9)	1	—	—	(7)
Total net effect on non-interest income	$ 1	$ (157)	$ (10)	$ 28	$ 23	$ 91	$ 1	$ (23)

(1) Balance sheet includes synthetic basis swaps and swaptions, which are not designated as hedging a specific financial instrument.
(2) This amount is for derivatives for which variation margin is characterized as a daily settled contract.
(3) Includes only those gains (losses) on trading securities that have an assigned economic derivative; therefore, this line item may not agree to the Statement of Income.
(4) Includes only those gains or losses on financial instruments held at fair value that have an economic derivative "assigned."

The effect of derivatives and hedging activities on earnings in 2022 improved primarily because of the increase in short-term rates, which significantly lowered the net interest settlements being paid on derivatives related to investments where the fixed interest rates were converted to adjustable-coupon rates. Some of this benefit was partially offset as the increase in short-term rates also resulted in net interest settlements being paid rather than received on derivatives related to Bonds and Discount Notes. Additionally, the overall improvement related to net interest settlements in 2022 compared to 2021 was partially offset by higher net unrealized losses on investments and their related derivatives that we expect to hold to maturity. As noted above, the fluctuation in earnings from the use of derivatives was acceptable because it enabled us to lower market risk exposure.

In the table above, "Gains (losses) on trading securities" consist of fixed-rate U.S. Treasury and GSE obligations that have been swapped to a variable rate. Trading securities are recorded at fair value, with changes in fair value reported in non-interest income (loss). There are a number of factors that affect the fair value of these securities, including changes in interest rates, the passage of time, and volatility. By hedging these trading securities, the gains or losses on these trading securities will generally be offset by the gains or losses on the associated interest rate swaps.

Non-Interest Expense

The following table presents non-interest expense for each of the last three years.

(In millions)	2022	2021	2020
Non-interest expense			
Compensation and benefits	$ 51	$ 48	$ 50
Other operating expense	25	23	21
Finance Agency	8	7	7
Office of Finance	6	5	5
Other	13	9	9
Total non-interest expense	$ 103	$ 92	$ 92

Our business is designed to support significant changes in asset levels without having to undergo material changes in staffing, operations, risk practices, or general resource needs. Accordingly, the components of non-interest expense generally remained stable over the past several years. In 2022, "Other" non-interest expense includes a voluntary AHP contribution of $3 million. Our Board of Directors elected to make a voluntary AHP contribution in order to increase access to affordable housing throughout the Fifth District.

Analysis of Quarterly ROE

The following table summarizes the components of 2022's quarterly ROE and provides quarterly ROE for 2021 and 2020.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Components of 2022 ROE:					
Net interest income:					
Other net interest income	8.19 %	6.59 %	10.49 %	12.67 %	9.78 %
Net amortization	(0.99)	(0.70)	(0.47)	(0.35)	(0.59)
Prepayment fees	0.25	0.03	0.01	—	0.06
Total net interest income	7.45	5.92	10.03	12.32	9.25
Net gains (losses) on derivatives	8.95	1.69	1.89	(0.83)	2.48
Other non-interest income (loss)	(12.38)	(1.68)	(2.89)	(2.48)	(4.44)
Total non-interest income (loss)	(3.43)	0.01	(1.00)	(3.31)	(1.96)
Total income	4.02	5.93	9.03	9.01	7.29
Total non-interest expense	2.36	2.17	1.87	1.62	1.97
Affordable Housing Program assessments	0.18	0.38	0.73	0.75	0.54
2022 ROE	1.48 %	3.38 %	6.43 %	6.64 %	4.78 %
2021 ROE	1.96 %	0.03 %	0.60 %	1.81 %	1.08 %
2020 ROE	6.94 %	7.12 %	4.70 %	3.93 %	5.78 %

The increase in profitability in 2022 compared to 2021 was in part due to rising interest rates and higher average Advance balances. Additionally, higher mortgage rates resulted in a lower volume of mortgage refinance activity, which reduced premium amortization.

Segment Information

Note 14 of the Notes to Financial Statements presents information on our two operating business segments. We manage financial operations and market risk exposure primarily at the macro level, and within the context of the entire balance sheet, rather than exclusively at the level of individual segments. Under this approach, the market risk/return profile of each segment may not match, or possibly even have the same trends as, what would occur if we managed each segment on a stand-alone basis. The tables below summarize each segment's operating results for the periods shown.

(Dollars in millions)	Traditional Member Finance	MPP	Total
2022			
Net interest income (loss)	$ 421	$ 66	$ 487
Net income (loss)	$ 202	$ 50	$ 252
Average assets	$ 89,202	$ 9,745	$ 98,947
Assumed average capital allocation	$ 4,747	$ 524	$ 5,271
Return on average assets [(1)]	0.23 %	0.51 %	0.25 %
Return on average equity [(1)]	4.26 %	9.46 %	4.78 %
2021			
Net interest income (loss)	$ 318	$ (41)	$ 277
Net income (loss)	$ 85	$ (43)	$ 42
Average assets	$ 49,258	$ 11,428	$ 60,686
Assumed average capital allocation	$ 3,154	$ 732	$ 3,886
Return on average assets [(1)]	0.17 %	(0.38)%	0.07 %
Return on average equity [(1)]	2.70 %	(5.92)%	1.08 %
2020			
Net interest income (loss)	$ 385	$ 21	$ 406
Net income (loss)	$ 221	$ 55	$ 276
Average assets	$ 77,090	$ 11,620	$ 88,710
Assumed average capital allocation	$ 4,149	$ 630	$ 4,779
Return on average assets [(1)]	0.29 %	0.48 %	0.31 %
Return on average equity [(1)]	5.33 %	8.76 %	5.78 %

(1) Amounts used to calculate returns are based on numbers in thousands. Accordingly, recalculations based upon the disclosed amounts in millions may not produce the same results.

Traditional Member Finance Segment

Net income improved in 2022 compared to 2021 primarily because of higher average balances of Advances and investments. Additionally, the rising interest rate environment benefited this segment as it resulted in higher earnings from capital. However, the increase in profitability was partially offset by unrealized losses on certain derivatives and other financial instruments carried at fair value.

MPP Segment

Earnings from the MPP segment improved significantly in 2022 compared to 2021 because of higher net interest income, which resulted primarily from the rising interest rate environment. Higher mortgage rates resulted in a lower volume of mortgage refinance activity, which reduced premium amortization. Additionally, the MPP segment benefited from higher average short-term interest rates, which increased the earnings generated from capital and improved the spreads earned.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT RISK MANAGEMENT

Overview

We face various risks that could affect the ability to achieve our mission and corporate objectives. We generally categorize risks as: 1) business/strategic risk, 2) compliance, 3) market risk (also referred to as interest rate or prepayment risk), 4) credit risk, 5) funding/liquidity risk, and 6) operational risk (which includes cyber risks). Our Board of Directors establishes objectives regarding risk philosophy, risk appetite, risk tolerances, and financial performance expectations. Market, capital adequacy, credit, liquidity, concentration, and operational risks are discussed below. Other risks are discussed throughout this report.

We strive to maintain a risk profile that ensures we operate safely and soundly, promotes prudent growth in Mission Assets and Activities, consistently generates competitive earnings, and protects the par value of members' capital stock investment. We believe our business is financially sound and adequately capitalized on a risk-adjusted basis.

We practice this conservative risk philosophy in many ways:

- We operate with moderate market risk and limited residual credit risk, liquidity risk, operational risk, and capital impairment risk.
- We have a business objective to ensure competitive and relatively stable profitability.
- We make conservative investment choices in terms of the types of investments we purchase and counterparties with which we engage.
- We use derivatives to hedge assets and liabilities and to help reduce market risk exposure.
- We maintain a prudent amount of financial leverage.
- We are judicious in instituting regular, district-wide repurchases of excess stock.
- We hold an amount of retained earnings that we believe will protect the par value of capital stock and provide for dividend stabilization.
- We create a working and operating environment that emphasizes a stable employee base.

We have numerous Board-adopted policies and processes that address risk management including risk appetite, tolerances, limits, guidelines, and regulatory compliance. Our cooperative business model, corporate objectives, capital structure, and regulatory oversight provide us clear incentives to minimize risk exposures. Our policies and operating practices are designed to limit risk exposures from ongoing operations in the following broad ways:

- by anticipating potential business risks and developing appropriate responses;
- by defining permissible lines of business;
- by limiting the kinds of assets we are permitted to hold in terms of their credit risk exposure and the kinds of hedging and financing arrangements we are permitted to use;
- by limiting the amount of market risk to which we are permitted to be exposed;
- by specifying very conservative tolerances for credit risk posed by Advances;
- by specifying capital adequacy minimums; and
- by requiring strict adherence to internal controls and operating procedures, adequate insurance coverage, and comprehensive Human Resources policies, procedures, and strategies.

Market Risk

Overview
Market risk exposure is the risk that profitability and the value of stockholders' capital investment may decrease and that profitability may become uncompetitive for an extended period as a result of changes and volatility in the market environment and economy. Along with business/strategic risk, market risk is normally our largest residual risk.

Our risk appetite is to maintain market risk exposure in a low to moderate range while earning a competitive return on members' capital stock investment. There is normally a tradeoff between long-term market risk exposure and shorter-term exposure. Effective management of each component is important in order to attract and retain members and capital and to support Mission Assets and Activities.

The primary challenges in managing market risk exposure arise from 1) the tradeoff between earning a competitive return and correlating profitability with short-term interest rates and 2) the market risk exposure of owning mortgage assets. Mortgage assets grant homeowners prepayment options that could adversely affect our financial performance when interest rates increase or decrease. We mitigate the market risk of mortgage assets primarily by funding them principally with a portfolio of long-term fixed-rate callable and non-callable Bonds. Secondarily, we use swaption derivative transactions to a limited extent to mitigate the market risk of mortgage assets. The Bonds and swaptions can provide expected cash flows that are similar to the cash flows expected from mortgage assets under a wide range of interest rate and prepayment environments. Because it is normally cost-prohibitive to completely mitigate mortgage prepayment risk, a residual amount of market risk remains after funding and hedging activities.

We analyze market risk using numerous analytical measures under a variety of interest rate and business scenarios, including stressed scenarios, and perform sensitivity analyses on the many variables that can affect market risk, using several market risk models from third-party software companies. These models employ rigorous valuation techniques for the optionality that exists in mortgage prepayments, call and put options, and caps/floors. We regularly assess the effects of different assumptions, techniques and methodologies on the measurements of market risk exposure, including comparisons to alternative models and information from brokers/dealers.

Policy Limits on Market Risk Exposure
We have six sets of policy limits regarding market risk exposure, which primarily measure long-term market risk exposure. We determine compliance with our policy limits at every month end or more frequently if market or business conditions change significantly or are volatile.

- **Market Value of Equity Sensitivity.** The market value of equity for the entire balance sheet in two hypothetical interest rate scenarios (up 200 basis points and down 100 to 200 basis points from the applicable interest rate environment) must be between positive and negative 10 percent of the current balance sheet's market value of equity. The interest rate movements are “shocks,” defined as instantaneous, permanent, and parallel changes in interest rates in which every point on the yield curve is changed by the same amount. The size of the down shock varies with the level of long-term interest rates observed when measuring the risk.

- **Duration of Equity.** The duration of equity for the entire balance sheet in the current (“base case”) interest rate environment must be between positive and negative five years and in the two interest rate shock scenarios (up 200 basis points and down 100 to 200 basis points from the applicable interest rate environment) must be between positive and negative six years.

- **Mortgage Assets Portfolio.** The change in net market value of the mortgage assets portfolio as a percentage of the book value of portfolio assets must be between positive and negative three percent in each of the two interest rate shock scenarios. Net market value is defined as the market value of assets minus the market value of liabilities, with no assumed capital allocation.

- **Market Capitalization.** The market capitalization ratio (defined as the ratio of the market value of equity to the par value of regulatory stock) must be above 100 percent in the current rate environment and must be above 95 percent in each of the two interest rate shock scenarios.

- **Fixed Rate Mortgage Assets as a Multiple of Regulatory Capital.** The amount of fixed mortgage assets must be less than five times the amount of regulatory capital.

- **MPP Assets as a Multiple of Regulatory Capital.** The amount of MPP assets must be less than four times the amount of regulatory capital.

In addition, Finance Agency regulations and an internal policy provide controls on market risk exposure by restricting the types of mortgage loans, mortgage-backed securities and other investments we can hold. We also manage market risk exposure by charging members prepayment fees on many Advance programs where an early termination of an Advance would result in an economic loss to us.

In practice we carry a substantially smaller amount of market risk exposure by establishing a strategic management range that is well within policy limits.

Market Value of Equity and Duration of Equity - Entire Balance Sheet

Two key measures of long-term market risk exposure are the sensitivities of the market value of equity and the duration of equity to changes in interest rates and other variables, as presented in the following tables for various instantaneous and permanent interest rate shocks (in basis points). The mortgage assets portfolio normally accounts for almost all market risk exposure because of prepayment volatility that we cannot completely hedge while maintaining sufficient net spreads. We compiled average results using data for each month end. Given the level of rates at certain time periods, some down rate shocks are nonparallel scenarios, with short-term rates decreasing less than long-term rates such that no rate falls below zero.

Market Value of Equity

(Dollars in millions)	Down 300	Down 200	Down 100	Flat Rates	Up 100	Up 200	Up 300
Average Results							
2022 Full Year							
Market Value of Equity	$ 5,643	$ 5,498	$ 5,408	$ 5,317	$ 5,207	$ 5,101	$ 5,012
% Change from Flat Case	6.1 %	3.4 %	1.7 %	—	(2.1)%	(4.1)%	(5.7)%
2021 Full Year							
Market Value of Equity	$ 3,916	$ 3,920	$ 3,921	$ 3,942	$ 3,878	$ 3,771	$ 3,705
% Change from Flat Case	(0.6)%	(0.6)%	(0.5)%	—	(1.6)%	(4.3)%	(6.0)%
Month-End Results							
December 31, 2022							
Market Value of Equity	$ 6,517	$ 6,402	$ 6,283	$ 6,160	$ 6,042	$ 5,937	$ 5,844
% Change from Flat Case	5.8 %	3.9 %	2.0 %	—	(1.9)%	(3.6)%	(5.1)%
December 31, 2021							
Market Value of Equity	$ 3,977	$ 3,977	$ 3,865	$ 3,858	$ 3,767	$ 3,628	$ 3,525
% Change from Flat Case	3.1 %	3.1 %	0.2 %	—	(2.4)%	(6.0)%	(8.6)%

Duration of Equity

(In years)	Down 300	Down 200	Down 100	Flat Rates	Up 100	Up 200	Up 300
Average Results							
2022 Full Year	2.6	1.9	1.5	2.0	2.2	2.0	1.7
2021 Full Year	(0.1)	(0.2)	(0.6)	1.0	2.6	2.5	1.0
Month-End Results							
December 31, 2022	1.8	2.0	2.1	2.1	2.0	1.8	1.6
December 31, 2021	—	0.7	2.0	1.4	3.4	3.6	2.1

The overall market risk exposure to changing interest rates was well within policy limits during the periods presented. At December 31, 2022, market risk exposure to falling rate shocks benefited from the rapid increase in mortgage interest rates in 2022 while exposure to rising rates remained stable. The duration of equity, which provides an estimate of the change in market value of equity to further changes in interest rates, remained well within policy limits.

Based on the totality of our risk analysis, we expect that overall profitability, defined as the level of ROE compared with short-term market rates, will be competitive over the long term unless interest rates increase further by large amounts in a short period of time. Substantial declines in long-term interest rates could decrease income temporarily before reverting to average levels. This temporary reduction in income would be driven by additional recognition of mortgage asset premiums as the incentive for borrowers to refinance results in faster than anticipated repayments of those mortgage assets. However, we believe the mortgage assets portfolio will continue to provide an acceptable risk-adjusted return consistent with our risk appetite philosophy.

Use of Derivatives in Market Risk Management

A key component of hedging market risk exposure is the use of derivative transactions. The following table presents the notional amounts of the derivatives classified by how we designate the hedging relationship. The notional amount of derivatives at December 31, 2022 increased by $11.5 billion from the end of 2021, primarily due to our heightened use of swapped Discount Notes in the current market environment driven by increased Advance demand.

(In millions)		December 31, 2022		December 31, 2021	
Hedged Item/Hedging Instrument	Hedging Objective	Fair Value Hedge	Economic Hedge	Fair Value Hedge	Economic Hedge
Advances:					
Pay-fixed, receive-float interest rate swap (without options)	Converts the Advance's fixed rate to a variable-rate index.	$ 9,560	$ 10	$ 5,503	$ 10
Pay-fixed, receive-float interest rate swap (with options)	Converts the Advance's fixed rate to a variable-rate index and offsets option risk in the Advance.	1,020	—	2,452	21
Total Advances		10,580	10	7,955	31
Investment securities:					
Pay-fixed, receive-float interest rate swap (without options)	Converts the investment security's fixed rate to a variable-rate index.	9,668	1,952	5,313	6,427
Consolidated Obligations Bonds:					
Receive-fixed, pay-float interest rate swap (without options)	Converts the Bond's fixed rate to a variable-rate index.	569	1,140	452	7,175
Receive-fixed, pay-float interest rate swap (with options)	Converts the Bond's fixed rate to a variable-rate index and offsets option risk in the Bond.	760	4,374	—	—
Total Consolidated Obligations Bonds		1,329	5,514	452	7,175
Consolidated Discount Notes:					
Receive-fixed, pay-float interest rate swap (without options)	Converts the Discount Note's fixed rate to a variable-rate index.	—	21,365	—	10,426
Balance Sheet:					
Interest rate swaptions	Provides the option to enter into an interest rate swap to offset interest-rate or prepayment risk.	—	355	—	1,219
Stand-Alone Derivatives:					
Mandatory Delivery Contracts	Exposure to fair-value risk associated with fixed rate mortgage purchase commitments.	—	14	—	250
Total		$ 21,577	$ 29,210	$ 13,720	$ 25,528

See Note 7 of the Notes to Financial Statements for additional information on how we use derivatives and the types of assets and liabilities hedged with derivatives.

Capital Adequacy

Retained Earnings

We must hold sufficient capital to protect against exposure to various risks, including market, credit, and operational risks. We regularly conduct a variety of measurements and assessments for capital adequacy. At December 31, 2022, our capital management policy set forth approximately $745 million as the minimum amount of retained earnings we believe is necessary to mitigate impairment risk.

The following table presents retained earnings.

(In millions)	December 31, 2022	December 31, 2021
Unrestricted retained earnings	$ 841	$ 783
Restricted retained earnings [1]	560	510
Total retained earnings	$ 1,401	$ 1,293

(1) Pursuant to the FHLBank System's Joint Capital Enhancement Agreement we are not permitted to distribute as dividends.

As indicated in the table above, our current balance of retained earnings exceeds the policy minimum, which we expect will continue to be the case as we bolster capital adequacy over time by allocating a portion of earnings to the restricted retained earnings account.

Risk-Based Capital

The following table shows the amount of risk-based capital required based on Finance Agency prescribed measurements. By regulation, we are required to hold permanent capital at least equal to the amount of risk-based capital.

(Dollars in millions)	December 31, 2022	December 31, 2021
Market risk-based capital	$ 470	$ 435
Credit risk-based capital	238	224
Operational risk-based capital	212	197
Total risk-based capital requirement	920	856
Total permanent capital	6,569	3,804
Excess permanent capital	$ 5,649	$ 2,948
Risk-based capital as a percent of permanent capital	14 %	23 %

The risk-based capital requirement has historically not been a constraint on operations, and we do not use it to actively manage any of our risks. It has normally ranged from 10 to 25 percent of permanent capital.

Market Capitalization Ratios

We measure two sets of market capitalization ratios. One measures the market value of equity (i.e., total capital) relative to the par value of regulatory capital stock (which is GAAP capital stock and mandatorily redeemable capital stock). The other measures the market value of total capital relative to the book value of total capital, which includes all components of capital, and mandatorily redeemable capital stock. The measures provide a point-in-time indication of the FHLB's liquidation or franchise value and can also serve as a measure of realized or potential market risk exposure.

The following table presents the market value of equity to regulatory capital stock (excluding retained earnings) for several interest rate environments.

	December 31, 2022	December 31, 2021
Market Value of Equity to Par Value of Regulatory Capital Stock - Base Case (Flat Rates) Scenario	119 %	154 %
Market Value of Equity to Par Value of Regulatory Capital Stock - Down Shock [1]	124	154
Market Value of Equity to Par Value of Regulatory Capital Stock - Up Shock [2]	115	145

(1) Represents down shocks of 200 basis points and 100 basis points for December 31, 2022 and 2021, respectively.
(2) Represents an up shock of 200 basis points.

A base case value below 100 percent could indicate that, in the remote event of an immediate liquidation scenario involving redemption of all capital stock, capital stock may be returned to stockholders at a value below par. This could be due to experiencing risks that lower the market value of capital and/or to having an insufficient amount of retained earnings. In 2022, the market capitalization ratios in the scenarios presented continued to be above our policy requirements. The decline in these ratios during 2022 was driven by the rapid capital growth to support Advance borrowings with secondary factors being the significant increase in interest rates and associated market pricing volatility. The base case ratio at December 31, 2022 was still well above 100 percent because retained earnings were 27 percent of regulatory capital stock and we maintained stable market risk exposure.

The following table presents the market value of equity to the book value of total capital and mandatorily redeemable capital stock.

	December 31, 2022	December 31, 2021
Market Value of Equity to Book Value of Capital - Base Case (Flat Rates) Scenario [1]	94 %	101 %
Market Value of Equity to Book Value of Capital - Down Shock [1][2]	98	101
Market Value of Equity to Book Value of Capital - Up Shock [1][3]	91	95

(1) Capital includes total capital and mandatorily redeemable capital stock.
(2) Represents down shocks of 200 basis points and 100 basis points for December 31, 2022 and 2021, respectively.
(3) Represents an up shock of 200 basis points.

A base-case value below 100 percent indicates that we have realized or could realize risks (especially market risk), such that the market value of total capital owned by stockholders is below the book value of total capital. The base-case ratio of 94 percent at December 31, 2022 indicates that the market value of total capital is $359 million below the book value of total capital. In a scenario in which interest rates increase 200 basis points, the market value of total capital would be $582 million below the book value of total capital. This indicates that in a liquidation scenario, stockholders would not receive the full sum of their total equity ownership in the FHLB. We believe the likelihood of a liquidation scenario is extremely remote; and therefore, we accept the risk of diluting equity ownership in such a scenario. The decline in these ratios was driven primarily by volatility in the market pricing of mortgage assets and the sharp increase in interest rates.

Credit Risk

Overview
We believe our risk management practices, discussed below, minimize residual credit risk levels. We have no loan loss reserves or impairment recorded for Credit Services, investments, or derivatives. We have a minimal amount of credit risk exposure in the MPP.

Credit Services
Overview: We have policies and practices to manage credit risk exposure from our secured lending activities, which include Advances and Letters of Credit. The objective of our credit risk management activities is to equalize risk exposure across members and counterparties to a zero level of expected losses. This approach is consistent with our conservative risk management principles and desire to have no residual credit risk related to Advances and Letters of Credit.

Collateral: We require each member to provide a security interest in eligible collateral before it can undertake any secured borrowing. Eligible loan collateral types include the following: single- and multi-family residential, home equity, commercial real estate, government guaranteed and farm real estate. Eligible security types include those that are government or agency backed, along with highly-rated private-label residential and commercial mortgage-backed securities. We have conservative eligibility criteria within each of the above asset types. The estimated value of pledged collateral is discounted in order to offset market, credit, and liquidity risks that may affect the collateral's realizable value in the event it must be liquidated. At December 31, 2022, total eligible pledged collateral of $478.4 billion resulted in total borrowing capacity of $390.6 billion of which $108.8 billion was used to support outstanding Advances and Letters of Credit. Borrowers often pledge collateral in excess of their collateral requirement to demonstrate access to liquidity and to have the ability to borrow additional amounts in the future. Over-collateralization by one member is not applied to another member. The collateral composition remained relatively stable compared to the end of 2021.

The table below shows total collateral pledged by type.

(Dollars in billions)	December 31, 2022		December 31, 2021	
	Eligible Collateral	Percent of Total Pledged Collateral	Eligible Collateral	Percent of Total Pledged Collateral
Single-family loans	$ 298.7	62 %	$ 258.8	61 %
Multi-family loans	65.6	14	59.5	14
Commercial real estate loans	55.1	12	50.6	12
Bond Securities	35.7	7	30.0	7
Home equity loans/lines of credit	22.3	5	22.3	5
Farm real estate loans	0.8	—	0.7	—
Government guaranteed loans	0.2	—	3.3	1
Total	$ 478.4	100 %	$ 425.2	100 %

At December 31, 2022, 67 percent of collateral was related to residential mortgage lending in single-family loans and home equity loans/lines of credit.

Our management of credit risk related to Advances and Letters of Credit includes risk-based variations in collateral requirements, including discounts or haircuts, eligibility criteria, form of valuation, custody arrangements, the level of detail in periodic reporting, and in blanket versus specific pledges, as discussed below.

- **Haircuts.** We discount collateral values for purposes of determining borrowing capacity. These haircuts result in lendable values that are less than the amount of pledged collateral. In general, higher discounts are applied to more risky forms of collateral and to collateral pledged by higher risk members.
- **Eligibility.** The balances of loans and securities we lend against are subject to conservative eligibility criteria such that Advances and Letters of Credit are supported by high quality assets within each collateral type.
- **Custody.** All pledged securities and loans pledged by higher risk members must be delivered into our custody or that of a third-party custodian that we have engaged.
- **Blanket versus Specific Pledge.** Except under limited circumstances, we require a member pledging loans under a blanket agreement to pledge all of their loans for a given collateral type.
- **Valuation.** All members' securities collateral and individually listed loans are subject to a market valuation process to establish the borrowing base. For loan collateral, this involves submission of extensive loan level information (on "Listings") to facilitate the valuation process. Any member allowed to make a specific instead of a blanket pledge (non-depositories and certain highly-rated commercial banks) is required to submit this level of reporting.

We use third-party services and internally run models to regularly estimate market values of individually listed loan collateral. Third-party services use various proprietary models to estimate market values. Assumptions may be made on factors that affect collateral value, such as market liquidity, discount rates, prepayments, liquidation and servicing costs in the event of a default and economic and market conditions. We have policies and procedures for evaluating the reasonableness of collateral valuations.

Borrowing Capacity/Lendable Value: Lendable Value Rates (LVRs) represent the percent of collateral value net of the haircut. LVRs are determined by statistical analysis and management assumptions relating to historical price volatility, inherent credit risks, liquidation costs, and the current credit and economic environment. We apply LVR results to the estimated values of pledged assets. LVRs vary among pledged assets and members based on the member institution type, the financial strength of the member institution, the form of valuation, lien position, the issuer of bond collateral or the quality of securitized assets, the quality of the loan collateral as reflected in the manner in which it was underwritten, and the marketability of the pledged assets.

The table below indicates the range of LVRs for each major collateral type pledged at December 31, 2022.

	Lendable Value Rates Applied to Collateral
Blanket Status:	
Prime 1-4 family loans	71-79%
Multi-family loans	61-81%
Prime home equity loans/lines of credit	54-77%
Commercial real estate loans	62-83%
Farm real estate loans	67-82%
Listing Status/Physical Delivery:	
Cash/U.S. Government/U.S. Treasury/U.S. agency securities	88-100%
U.S. agency residential MBS/collateralized mortgage obligations	88-96%
U.S. agency commercial MBS/collateralized mortgage obligations	80-91%
Private-label residential MBS	61-89%
Private-label commercial MBS	49-85%
Municipal securities	75-94%
SBA certificates	88-93%
Prime 1-4 family loans	71-86%
Multi-family loans	62-85%
Prime home equity loans/lines of credit	56-84%
Commercial real estate loans	69-89%
Farm real estate loans	67-86%
SBA Paycheck Protection Program loans	10-90%

The ranges of lendable values exclude subprime residential loan collateral. Loans pledged by lower risk members for which we require only high level, summary reporting of eligible balances are generally discounted more heavily than loans on which we have detailed loan structure and underwriting information. For any form of loan collateral, additional credit risk based adjustments may be made to an individual member’s collateral that results in a lower lendable value than that indicated in the above table.

Subprime Loan Collateral: We have policies and processes to identify subprime residential mortgage loans pledged by members. We perform collateral reviews to estimate the volume of subprime loans pledged by members in blanket status. Depending on the quality of underwriting and administration, we may subject these loans to lower LVRs.

Internal Credit Ratings: We perform credit underwriting of our members and nonmember institutions and assign them an internal credit rating on a scale of one to seven, with a higher number representing a less favorable assessment of the institution's financial condition. These credit ratings are based on internal and third-party ratings models, credit analyses and consideration of credit ratings from independent credit rating organizations. Credit ratings are used in conjunction with other measures of credit risk in managing secured credit risk exposure.

A less favorable credit rating can cause us to 1) decrease the institution's borrowing capacity via lower LVRs, 2) require the institution to provide an increased level of detail on pledged collateral, 3) require it to deliver collateral into our custody, 4) prompt us to more closely and/or frequently monitor the institution, and/or 5) limit the institution's exposure through borrowing restrictions (e.g., maturity restrictions on new Advances or restrictions on borrowing capacity from higher risk collateral sources).

The following tables show the distribution of internal credit ratings we assigned to member and nonmember institutions, which we use to help manage credit risk exposure.

(Dollars in billions)

	December 31, 2022			December 31, 2021	
Credit Rating	Number of Institutions	Collateral-Based Borrowing Capacity	Credit Rating	Number of Institutions	Collateral-Based Borrowing Capacity
1-3	505	$ 371.7	1-3	470	$ 322.6
4	76	18.1	4	109	23.1
5	26	0.7	5	29	0.9
6	9	0.1	6	12	0.2
7	4	—	7	3	—
Total	620	$ 390.6	Total	623	$ 346.8

We consider institutions with credit ratings of "1" through "4" to be financially sound. At December 31, 2022, only 39 institutions (six percent of the total) had credit ratings of "5" through "7," a decrease of five institutions compared to the end of 2021. These institutions had $0.8 billion of borrowing capacity at December 31, 2022. We believe the credit rating distribution continues to show a financially sound membership base.

Member Failures, Closures, and Receiverships: There were no member failures in 2022.

MPP

Overview: The residual amount of credit risk exposure to loans in the MPP is minimal, based on the following factors:

- various credit enhancements for conventional loans, which are designed to protect us against credit losses;
- conservative underwriting and loan characteristics consistent with favorable expected credit performance;
- a small overall amount of delinquencies and defaults when compared to national averages;
- no credit losses in 2022 and only credit losses totaling less than $0.1 million in 2021; and
- in addition to the low credit losses, based on financial analysis, we believe that future credit losses will not harm capital adequacy and will not significantly affect profitability except under the most extreme and unlikely credit conditions.

Portfolio Loan Characteristics: The following table shows FICO® credit scores of homeowners at origination dates for the conventional loan portfolio.

FICO® Score (1)	December 31, 2022	December 31, 2021
< 620	— %	— %
620 to < 660	—	—
660 to < 700	8	7
700 to < 740	18	18
>= 740	74	75
Weighted Average	763	763

(1) Represents the FICO® score at origination.

The distribution of FICO® scores at origination as of December 31, 2022 were similar to those at year-end 2021. The distribution of FICO® scores at origination is one indication of the portfolio's overall favorable credit quality. At December 31, 2022, 74 percent of the portfolio had scores at an excellent level of 740 or above and 92 percent had scores above 700, which is a threshold generally considered indicative of homeowners with good credit quality.

The following tables show loan-to-value ratios for conventional loans based on values estimated at the origination dates and current values estimated at the noted periods. The estimated current ratios are based on original loan values, principal paydowns that have occurred since origination, and a third-party estimate of changes in historical home prices for the zip code in which each loan resides. Both measures are weighted by current unpaid principal.

	Based on Estimated Origination Value			Based On Estimated Current Value	
Loan-to-Value	December 31, 2022	December 31, 2021	Loan-to-Value	December 31, 2022	December 31, 2021
<= 60%	16 %	17 %	<= 60%	76 %	77 %
> 60% to 70%	18	18	> 60% to 70%	12	14
> 70% to 80%	54	53	> 70% to 80%	8	7
> 80% to 90%	8	8	> 80% to 90%	3	1
> 90%	4	4	> 90% to 100%	1	1
			> 100%	—	—
Weighted Average	73 %	73 %	Weighted Average	49 %	49 %

The levels of loan-to-value ratios are consistent with the portfolio's excellent credit quality. The percent of loans with current loan-to-value ratios of 60 percent and below decreased slightly at December 31, 2022 compared to year-end 2021, which reflected the recent small declines in average housing prices nationwide.

Based on the available data, we believe we have minimal exposure to loans in the MPP considered to have characteristics of “subprime” or “alternative/nontraditional” loans. Further, we do not knowingly purchase any loan that violates the terms of our Anti-Predatory Lending Policy.

The following table presents the geographical allocation based on the unpaid principal balance of conventional loans in the MPP.

	December 31, 2022		December 31, 2021
Ohio	62 %	Ohio	63 %
Kentucky	12	Kentucky	12
Indiana	8	Indiana	9
Tennessee	5	Tennessee	4
Alabama	2	Alabama	1
All others	11	All others	11
Total	100 %	Total	100 %

Credit Enhancements: Conventional mortgage loans are primarily supported against credit losses by some combination of credit enhancements (primary mortgage insurance (PMI) and the Lender Risk Account (LRA)). The LRA is a hold back of a portion of the initial purchase price to cover expected credit losses for a specific pool of loans. Starting after five years from the loan purchase date, we may return the hold back to PFIs if they manage credit risk to predefined acceptable levels of exposure on the pools of loans they sell to us. As a result, some pools of loans may have sufficient credit enhancements to recapture all losses while other pools of loans may not. The LRA had balances of $244 million and $252 million at December 31, 2022 and 2021, respectively. For more information, see Note 6 of the Notes to Financial Statements.

Credit Performance: The table below provides an analysis of conventional loans delinquent or in the process of foreclosure, along with the national average serious delinquency rate.

	Conventional Loan Delinquencies	
(Dollars in millions)	December 31, 2022	December 31, 2021
Early stage delinquencies - unpaid principal balance (1)	$ 31	$ 33
Serious delinquencies - unpaid principal balance (2)	$ 12	$ 24
Early stage delinquency rate (3)	0.5 %	0.5 %
Serious delinquency rate (4)	0.2 %	0.3 %
National average serious delinquency rate (5)	1.4 %	2.3 %

(1) Includes conventional loans 30 to 89 days delinquent and not in foreclosure.
(2) Includes conventional loans that are 90 days or more past due or where the decision of foreclosure or a similar alternative such as pursuit of deed-in-lieu has been reported.
(3) Early stage delinquencies expressed as a percentage of the total conventional loan portfolio.
(4) Serious delinquencies expressed as a percentage of the total conventional loan portfolio.
(5) National average number of fixed-rate prime and subprime conventional loans that are 90 days or more past due or in the process of foreclosure is based on the most recent national delinquency data available. The December 31, 2022 rate is based on September 30, 2022 data.

Overall, the MPP has experienced a minimal amount of delinquencies, with delinquency rates continuing to be well below national averages.

We consider a high risk loan as having a current loan-to-value ratio above 100 percent. At December 31, 2022, we had less than $1 million of loans with a current loan-to-value ratio above 100 percent. Historically, high risk loans have experienced a minimal amount of serious delinquencies. We believe these data further support our view that the overall portfolio is comprised of high-quality, well-performing loans.

Credit Losses: Residual credit risk exposure depends on the actual and potential credit performance of the loans in each pool compared to the pool's equity (on individual loans) and credit enhancements. Our available credit enhancements at December 31, 2022 were ample and able to cover nearly all of the estimated gross credit losses. As a result, estimated credit losses at December 31, 2022 were less than $1 million. Estimated credit losses, after credit enhancements, are accounted for in the allowance for credit losses or as a charge off (i.e., a reduction to the principal of mortgage loans held for portfolio).

Separate from our allowance for credit losses analysis, we regularly analyze potential adverse scenarios of lifetime credit risk exposure for the loans in the MPP. Even under severely adverse macroeconomic scenarios, we expect credit losses to remain low.

Investments

Liquidity Investments: We purchase liquidity investments from counterparties that have a strong ability to repay principal and interest. These investments can be converted to cash and may be unsecured, guaranteed or supported by the U.S. government, or secured (i.e., collateralized). For unsecured liquidity investments, we invest in the debt securities of highly rated, investment-grade institutions, have appropriate and conservative limits on dollar and maturity exposure to each institution, and have strong credit underwriting practices, including active monitoring of credit quality of our counterparties and of the environment in which they operate.

Our unsecured liquidity investments to a counterparty or group of affiliated counterparties are limited by Finance Agency regulations to maturities of no more than nine months and limited to a dollar amount based on a percentage of eligible regulatory capital (defined as the lessor of our regulatory capital or the eligible amount of a counterparty's Tier 1 capital). The permissible percentage ranges from 1 percent to 15 percent. The permissible range is solely based on consideration of the internal credit risk ratings of unsecured counterparties as required by Finance Agency regulations.

The lowest long-term credit rating for a counterparty to which we are permitted to extend credit on an unsecured basis is double-B. However, we have generally only invested funds on an unsecured basis with eligible institutions that have long-term credit ratings of at least single-A. In addition, we restrict maturities, reduce dollar exposure, and avoid new investments with counterparties we deem to represent elevated credit risk. Furthermore, a portion of our total liquidity investments are with counterparties for which the investments are secured with collateral (secured resale agreements). We believe these investments present no credit risk exposure to us.

The following table presents the carrying value of liquidity investments outstanding in relation to the counterparties' lowest long-term credit ratings provided by Standard & Poor's, Moody's, and/or Fitch Advisory Services. Our internal ratings of these investments may differ from those obtained from Standard & Poor's, Moody's, and/or Fitch Advisory Services. The historical or current ratings displayed in this table should not be taken as an indication of future ratings.

(In millions)	December 31, 2022			
	Long-Term Rating			
	AA	A	Unrated	Total
Unsecured Liquidity Investments				
Interest-bearing deposits	$ —	$ 1,770	$ —	$ 1,770
Federal funds sold	1,804	3,595	—	5,399
Total unsecured liquidity investments	1,804	5,365	—	7,169
Guaranteed/Secured Liquidity Investments				
Securities purchased under agreements to resell	35	—	485	520
U.S. Treasury obligations	7,733	—	—	7,733
GSE obligations	1,606	—	—	1,606
Total guaranteed/secured liquidity investments	9,374	—	485	9,859
Total liquidity investments	$ 11,178	$ 5,365	$ 485	$ 17,028

Some counterparties used to transact our securities purchased under agreements to resell are not rated by an NRSRO because they are not issuers of debt or are otherwise not required to be rated by an NRSRO. However, each of the counterparties are considered to have the equivalent of at least an investment grade rating based on our internal ratings resulting from a fundamental credit analysis. Securities purchased under agreements to resell are secured by the following types of collateral: U.S. Treasury obligations, U.S. agency/GSE obligations, or U.S. agency/GSE MBS. At December 31, 2022, the collateral received had long-term credit ratings of AA, based on the lowest long-term credit ratings of the issuer as provided by Standard & Poor’s, Moody’s, and/or Fitch Advisory Services. The terms of our securities purchased under agreements to resell are structured such that if the fair value of the underlying securities decreases below the fair value required as collateral, the counterparty must place an equivalent amount of additional securities as collateral or remit an equivalent amount of cash. Additionally, these investments primarily mature overnight. All overnight investments in securities purchased under agreements to resell outstanding at December 31, 2022 were repaid according to the contractual terms.

Liquidity investments were not materially different from the balances held at December 31, 2021. Liquidity investments generally fluctuate because of changes in the amount of actual Advances, anticipated demand for Advances, regulatory liquidity requirements, the availability of acceptable net spreads, and the number of eligible counterparties that meet our unsecured credit risk criteria.

The following table presents the lowest long-term credit ratings provided by Standard & Poor's, Moody's, and/or Fitch Advisory Services of our unsecured investment credit exposure by the domicile of the counterparty or the domicile of the counterparty's immediate parent for U.S. branches and agency offices of foreign commercial banks. Our internal ratings of these investments may differ from those obtained from Standard & Poor's, Moody's, and/or Fitch Advisory Services. The historical or current ratings displayed in this table should not be taken as an indication of future ratings.

(In millions)	December 31, 2022		
	Counterparty Rating		
Domicile of Counterparty	AA	A	Total
Domestic	$ —	$ 1,770	$ 1,770
U.S. branches and agency offices of foreign commercial banks:			
Australia	—	1,850	1,850
Canada	1,100	400	1,500
Netherlands	—	800	800
Finland	704	—	704
United Kingdom	—	395	395
Germany	—	150	150
Total U.S. branches and agency offices of foreign commercial banks	1,804	3,595	5,399
Total unsecured investment credit exposure	$ 1,804	$ 5,365	$ 7,169

We restrict a significant portion of unsecured lending to overnight maturities, which further limits risk exposure to these counterparties. By Finance Agency regulation, all counterparties exposed to non-U.S. countries are required to be domestic U.S. branches of foreign counterparties.

MBS:

GSE MBS

At December 31, 2022, $15.4 billion of MBS held were GSE securities issued by Fannie Mae and Freddie Mac, which provide credit safeguards by guaranteeing either timely or ultimate payments of principal and interest. We believe that the conservatorships of Fannie Mae and Freddie Mac lower the chance that they would not be able to fulfill their credit guarantees. In addition, based on the data available to us and our purchase practices, we believe that most of the mortgage loans backing our GSE MBS are of high quality with acceptable credit performance.

MBS Issued by Other Government Agencies

We also invest in MBS issued and guaranteed by Ginnie Mae. These investments totaled $1.2 billion at December 31, 2022. We believe that the strength of Ginnie Mae's guarantee and backing by the full faith and credit of the U.S. government is sufficient to protect us against credit losses on these securities.

Derivatives

Credit Risk Exposure: We mitigate most of the credit risk exposure resulting from derivative transactions through collateralization or use of daily settled contracts. The table below presents derivative positions to which we had credit risk exposure at December 31, 2022.

(In millions)

	Total Notional	Net Derivatives Fair Value Before Collateral	Cash Collateral Pledged to (from) Counterparties	Net Credit Exposure to Counterparties
Nonmember counterparties:				
Asset positions with credit exposure:				
Uncleared derivatives:				
A-rated	$ 210	$ 3	$ (3)	$ —
Total uncleared derivatives	210	3	(3)	—
Cleared derivatives [1]	43,067	28	455	483
Liability positions with credit exposure:				
Uncleared derivatives:				
A-rated	3,592	(30)	35	5
BBB-rated	1,285	(22)	24	2
Total uncleared derivatives	4,877	(52)	59	7
Cleared derivatives [1]	307	—	1	1
Member institutions [2]	2	—	—	—
Total	$ 48,463	$ (21)	$ 512	$ 491

(1) Represents derivative transactions cleared with LCH Ltd. and CME Clearing, the FHLB's clearinghouses. LCH Ltd. is rated AA- by Standard & Poor's, and CME Clearing is not rated, but its parent company, CME Group Inc., is rated Aa3 by Moody's and AA- by Standard & Poor's.

(2) Represents Mandatory Delivery Contracts.

Our exposure to cleared derivatives is primarily associated with the requirement to post initial margin through the clearing agent to the Derivatives Clearing Organizations. We pledge cash as collateral to satisfy this initial margin requirement. However, the use of cleared derivatives mitigates credit risk exposure because a central counterparty is substituted for individual counterparties.

At December 31, 2022, the net exposure of uncleared derivatives with residual credit risk exposure was less than $7 million. If interest rates rise or the composition of our derivatives change resulting in an increase to our gross exposure to uncleared derivatives, the contractual collateral provisions in these derivatives would limit our net exposure to acceptable levels.

Although we cannot predict if we will realize credit risk losses from any of our derivatives counterparties, we believe that all of the counterparties will be able to continue making timely interest payments and, more generally, to continue to satisfy the terms and conditions of their derivative contracts with us. As of December 31, 2022, we had $0.3 billion of notional amount of interest rate swaps with a subsidiary of our member, JPMorgan Chase Bank, N.A., which also had outstanding credit services with us. Due to the amount of market value collateralization, we had a de minimis amount of credit exposure to this counterparty related to interest rate swaps outstanding.

Liquidity Risk

Liquidity Overview

We strive to be in a liquidity position at all times to meet the borrowing needs of our members and to meet all current and future financial commitments. This objective is achieved by managing liquidity positions to maintain stable, reliable, and cost-effective sources of funds while taking into account market conditions, member demand, and the maturity profile of assets and liabilities. Our liquidity position complies with the FHLBank Act, Finance Agency regulations, and internal policies.

The FHLBank System's primary source of funds is the sale of Consolidated Obligations in the capital markets. Our ability to obtain funds through the sale of Consolidated Obligations at acceptable interest costs depends on the financial market's perception of the riskiness of the Obligations and on prevailing conditions in the capital markets, particularly the short-term capital markets. The System's favorable debt ratings, which takes into account our status as a GSE, and our effective risk management practices are instrumental in ensuring stable and satisfactory access to the capital markets.

We believe our liquidity position, as well as that of the System, continued to be strong during 2022. Our overall ability to effectively fund our operations through debt issuances remained sufficient. Investor demand for System debt was robust in 2022, as investors continued to prefer short-term, high-quality money market instruments. We believe there is a low probability of a liquidity or funding crisis in the System that would impair our ability to participate, on a cost-effective basis, in issuances of debt, service outstanding debt, maintain adequate capitalization, or pay competitive dividends. However, in light of the uncertainty regarding the U.S. government's debt ceiling, we are closely monitoring our liquidity position in preparation for the possibility of a disorderly market caused by potential government debt defaults.

The System works collectively to manage and monitor the System-wide liquidity and funding risks. Liquidity risk includes the risk that the System could have difficulty rolling over short-term Obligations when market conditions change, also called refinancing risk. The System has a large reliance on short-term funding; therefore, it has a sharp focus on managing liquidity risk to very low levels. As shown on the Statements of Cash Flows, in 2022, our portion of the System's debt issuances totaled $259.2 billion for Discount Notes and $85.8 billion for Bonds. Access to short-term debt markets has been reliable because investors, driven by liquidity preferences and risk aversion, have sought the System’s short-term debt, which has resulted in strong demand for debt maturing in one year or less.

See the Notes to Financial Statements for more detailed information regarding maturities of certain financial assets and liabilities which are instrumental in determining the amount of liquidity risk. In addition to contractual maturities, other assumptions regarding cash flows such as estimated prepayments, embedded call optionality, and scheduled amortization are considered when managing liquidity risks.

Liquidity Management and Regulatory Requirements

We manage liquidity risk by ensuring compliance with our regulatory liquidity requirements and regularly monitoring other metrics.

The Finance Agency establishes the expectations with respect to the maintenance of sufficient liquidity without access to the capital markets for a specified number of days, which was set as a period of between 10 to 30 calendar days in the base case. Under these expectations, all Advance maturities are assumed to renew, unless the Advances relate to former members who are ineligible to borrow new Advances. The maintenance of sufficient liquidity is intended to provide additional assurance that we can continue to provide Advances and Letters of Credit to members over an extended period without access to the capital markets. As of December 31, 2022, the number of days our regulatory liquidity balances were positive was within these expectations.

The Finance Agency also provides guidance related to asset/liability maturity funding gap limits. Funding gap metrics measure the difference between assets and liabilities that are scheduled to mature during a specified period of time and are expressed as a percentage of total assets. Although subject to change depending on conditions in the financial markets, the current regulatory requirement for funding gaps is between -10 percent to -20 percent for the three-month maturity horizon and is between -25 percent to -35 percent for the one-year maturity horizon. As of December 31, 2022, we were operating within those limits.

To support our member deposits, we also must meet a statutory deposit reserve requirement. The sum of our investments in obligations of the United States, deposits in eligible banks or trust companies, and Advances with a final maturity not exceeding five years must equal or exceed the current amount of member deposits. The following table presents the components of this liquidity requirement.

(In millions)	December 31, 2022	December 31, 2021
Deposit Reserve Requirement		
Total Eligible Deposit Reserves	$ 80,428	$ 35,230
Total Member Deposits	(1,043)	(1,416)
Excess Deposit Reserves	$ 79,385	$ 33,814

Member Concentration Risk

We regularly assess concentration risks from business activity. We believe the effect on credit risk exposure from borrower concentration is minimal because of our application of credit risk mitigations, the most important of which is over-collateralization of borrowings. Advance concentration has a minimal effect on market risk exposure because Advances are largely funded by Consolidated Obligations and interest rate swaps that have similar interest rate characteristics. Furthermore, additional increases in Advance concentration would not materially affect capital adequacy because Advance growth is supported by new purchases of capital stock as required by the Capital Plan.

Operational Risks

Operational risk is defined as the risk of an unexpected loss resulting from human error, fraud, inability to enforce legal contracts, or deficiencies in internal controls or information systems. We mitigate operational risks through adherence to internal policies, conformance with entity level controls, and through an emphasis on the importance of risk management, as further discussed below. In addition, the Internal Audit Department, which reports directly to the Audit Committee of the Board of Directors, regularly monitors and tests compliance with our policies, procedures and applicable regulatory requirements.

Internal Department Procedures and Controls

Each of our departments maintains and regularly reviews and enhances, as needed, a system of internal procedures and controls, including those that address proper segregation of duties. Each system is designed to prevent any one individual from processing the entirety of a transaction that affects member accounts, correspondent FHLB accounts or third-party servicers providing support to us. We review daily and periodic transaction activity reports in a timely manner to detect erroneous or fraudulent activity. Procedures and controls also are assessed on an enterprise-wide basis, independently from the business unit departments. We also are in compliance with Sarbanes-Oxley Sections 302 and 404, which focus on the control environment over financial reporting.

Information Systems

We rely heavily upon internal and third-party information systems and other technology to conduct and manage our business. Our operations rely on the secure processing, storage and transmission of confidential and other information in our computer systems and networks. Our computer systems, software and networks may be subjected to cyberattacks (e.g., breaches, unauthorized access, misuse, computer viruses or other malicious code and other events) that could jeopardize the confidentiality or integrity of such information, or otherwise cause interruptions or malfunctions in our operations.

We mitigate the risk associated with cyberattacks through the implementation of multiple layers of security controls. Administrative, physical, and logical controls are in place for establishing, administering and actively monitoring system access, sensitive data, and system change. Additionally, separate groups within our organization and/or third parties test the strength of our security controls and responses, and recommend changes as needed to bolster resilience to security risks.

Disaster Recovery Provisions

We have a Business Resiliency Management Plan that provides us with the ability to maintain operations in various scenarios of business disruption. We review and update this plan periodically to ensure that it serves our changing operational needs and those of our members. In case of business disruptions, we have an off-site facility in a suburb of Cincinnati, Ohio, which is kept ready for use and tested at least annually, and employees are set up to work from home. We also have a back-up agreement in place with another FHLBank in the event that both of our Cincinnati-based facilities are inoperable.

Insurance Coverage
We have insurance coverage for cyber risks, employee fraud, forgery and wrongdoing, and Directors' and Officers' liability. This coverage primarily provides protection for claims alleging breach of duty, misappropriation of funds, neglect, acts of omission, employment practices, and fiduciary liability. We also have property, casualty, computer equipment, automobile, and various other types of coverage.

Human Resources Policies and Procedures
The risks associated with our Human Resources function are categorized as either Employment Practices Risk or Human Capital Risk. Employment Practices Risk is the potential failure to properly administer our policies regarding employment practices and compensation and benefit programs for eligible staff and retirees, and the potential failure to observe and properly comply with federal, state and municipal laws and regulations. Comprehensive policies and procedures are in place to limit Employment Practices Risk. These are supported by an established internal control system that is routinely monitored and audited.

Human Capital Risk is the potential inability to attract and retain appropriate levels of qualified human resources to maintain efficient operations. With respect to Human Capital Risk, we strive to maintain a competitive salary and benefit structure, which is regularly reviewed and updated as appropriate to attract and retain qualified staff. In addition, we have a management succession plan that is reviewed and approved by our Board of Directors. See "Human Capital Resources" in Item 1. Business for further discussion.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Introduction

The preparation of financial statements in accordance with GAAP requires management to make a number of significant judgments, estimates, and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities (if applicable), and the reported amounts of income and expenses during the reported periods. Although management believes its judgments, estimates, and assumptions are reasonable, actual results may differ and other parties could arrive at different conclusions.

We have identified the following critical accounting policies that require management to make subjective or complex judgments about inherently uncertain matters. Our financial condition and results of operations could be materially affected under different conditions or different assumptions related to these accounting policies.

Accounting for Derivatives and Hedging Activity

In accordance with Finance Agency regulations, we execute all derivatives to manage market risk exposure, not for speculation or solely for earnings enhancement. We record derivative instruments at their fair values on the Statements of Condition, and we record changes in these fair values in current period earnings. We strive to ensure that our use of derivatives maximizes the probability that they are highly effective in offsetting changes in the market values of the designated balance sheet instruments.

Fair Value Hedges
As indicated in the "Use of Derivatives in Market Risk Management" section of "Quantitative and Qualitative Disclosures About Risk Management," we designate a portion of our derivatives as fair value hedges. Fair value hedge accounting permits the changes in fair values of the hedged risk in the hedged instruments to be recorded in the current period, thus offsetting the change in fair value of the derivatives. For derivatives accounted for as fair value hedges, generally the hedged risk is designated to be changes in the eligible benchmark interest rate. The result is that there has been a relatively small amount of unrealized earnings volatility from hedging market risk with derivatives.

In order to determine if a derivative qualifies for fair value hedge accounting, we must assess how effective the derivative has been, and is expected to be, in hedging changes in the fair values of the risk being hedged. Each month we perform effectiveness testing using a consistently applied standard statistical methodology, regression analysis, which measures the degree of correlation and relationship between the changes in fair values of the derivative and hedged instrument. The results of the statistical measures must pass predefined threshold values to enable us to conclude that the changes in fair values of the derivative transaction have a close correlation with the changes in fair values of the hedged instrument. If any measure is outside of its respective tolerance, the hedge would no longer qualify for fair value hedge accounting. This means we must then record the fair value change of the derivative in current earnings without any offset in the fair value change of the related hedged instrument. Due to the intentional matching of terms between the derivative and the hedged instrument, we expect that failing an effectiveness test will be infrequent, which has been the case historically.

If a derivative/hedged instrument transaction fails effectiveness testing, it does not mean that the hedge relationship is no longer successful in achieving its intended economic purpose. For example, a Consolidated Obligation hedged with an interest rate swap creates adjustable-rate funding, which is used to match fund adjustable-rate and other short-term Advances. The hedge achieves the desired result (matching the net funding with the asset) because, economically, the Advance is part of the overall hedging strategy and the reason for engaging in the derivative transaction.

Each month, we compute fair values on all derivatives and related hedged instruments across a range of interest rate scenarios. For derivatives receiving long-haul fair value hedge accounting, the additional amount of earnings volatility under an assumption of stressed interest rate environments as of year-end 2022 was in a range of negative $2 million to positive $16 million. This range is minimal compared to the notional principal amount.

Fair Value Option—Economic Hedge

We account for a portion of Advance and Consolidated Obligation-related derivatives using an accounting election called "fair value option," which is included in the economic hedge category. An economic hedge under the fair value option does not require passing effectiveness testing to permit the derivative's fair market value to be offset with the market value of the hedged instrument, as is required under a fair value hedge. However, it records the fair market value of the hedged instrument at its full fair value instead of only the value related to the benchmark interest rate. The effect of electing full fair value is that the hedged instrument's market value includes the impact of changes in spreads between the designated benchmark interest rate and the interest rate index related to the hedged instrument, as well as other risk components, such as liquidity. Therefore, full fair value results in a different kind of unrealized earnings volatility, which could be higher or lower, compared to accounting under fair value hedge treatment.

Fair Values

We carry certain assets and liabilities on the Statement of Conditions at estimated fair value, including all derivatives, investments classified as available-for-sale and trading, and any financial instruments where we elected the fair value option. Fair value is defined as the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date. Because our financial instruments generally do not have available quoted market prices, we determine fair values based on 1) our valuation models or 2) dealer indications, which may be based on the dealers' own valuation models and/or prices of similar instruments.

Valuation models and their underlying assumptions are based on the best estimates of management with respect to discount rates, prepayments, market volatility, and other factors. These assumptions may have a significant effect on the reported fair values of assets and liabilities, and the income and expense related thereto. The use of different assumptions or changes in the models and assumptions, as well as changes in market conditions, could result in materially different net income and retained earnings.

We have control processes designed to ensure that fair value measurements are appropriate and reliable, that they are based on observable inputs wherever possible and that our valuation approaches and assumptions are reasonable and consistently applied. Where applicable, valuations are also compared to alternative external market data (e.g., quoted market prices, broker or dealer indications, pricing services and comparative analyses to similar instruments). For further discussion regarding how we measure financial assets and financial liabilities at fair value, see Note 15 of the Notes to Financial Statements.

We categorize each of our financial instruments carried at fair value into one of three levels in accordance with the fair value hierarchy. The hierarchy is based upon the transparency (observable or unobservable) of inputs to the valuation of an asset or liability as of the measurement date. Observable inputs reflect market data obtained from independent sources (Levels 1 and 2), while unobservable inputs reflect our assumptions of market variables (Level 3). Management utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. Because items classified as Level 3 are valued using significant unobservable inputs, the process for determining the fair value of these items is generally more subjective and involves a high degree of management judgment and use of assumptions. As of December 31, 2022 and 2021, all of our assets and liabilities measured at fair value on a recurring basis were classified as Level 2 within the fair value hierarchy.

RECENTLY ISSUED ACCOUNTING STANDARDS AND INTERPRETATIONS

See Note 2 of the Notes to Financial Statements for a discussion of recently issued accounting standards and interpretations.

OTHER FINANCIAL INFORMATION

Investments

Data on investments for the years ended December 31, 2022, 2021 and 2020 are provided in the tables below.

(In millions)	Carrying Value at December 31,		
	2022	2021	2020
Interest-bearing deposits	$ 1,770	$ 340	$ 555
Securities purchased under agreements to resell	520	1,282	1,818
Federal funds sold	5,399	5,505	4,240
Trading securities:			
U.S. Treasury obligations	492	5,031	8,362
GSE obligations	1,488	1,750	2,126
Total trading securities	1,980	6,781	10,488
Available-for-sale securities:			
U.S. Treasury obligations	7,194	4,499	—
GSE obligations	118	135	142
MBS:			
GSE multi-family	1,320	633	150
Total available-for-sale securities	8,632	5,267	292
Held-to-maturity securities:			
U.S. Treasury obligations	47	47	42
MBS:			
U.S. obligation single-family	1,232	1,057	986
GSE single-family	1,632	1,860	3,013
GSE multi-family	12,393	7,253	5,607
Total held-to-maturity securities	15,304	10,217	9,648
Total securities	25,916	22,265	20,428
Total investments	$ 33,605	$ 29,392	$ 27,041

As of December 31, 2022, available-for-sale and held-to-maturity securities had the following maturity and yield characteristics.

(Dollars in millions)	Due in one year or less	Due after one year through five years	Due after five through 10 years	Due after 10 years	Carrying Value
Available-for-sale securities:					
U.S. Treasury obligations	$ —	$ 2,503	$ 4,691	$ —	$ 7,194
GSE obligations	—	74	34	10	118
MBS (1):					
GSE multi-family	—	—	1,320	—	1,320
Total available-for-sale securities	$ —	$ 2,577	$ 6,045	$ 10	$ 8,632
Yield on available-for sale securities (2)	— %	2.13 %	1.88 %	3.07 %	
Held-to-maturity securities:					
U.S. Treasury obligations	$ 47	$ —	$ —	$ —	$ 47
MBS (1):					
U.S. obligation single-family	—	—	—	1,232	1,232
GSE single-family	—	4	17	1,611	1,632
GSE multi-family	—	1,534	10,691	168	12,393
Total held-to-maturity securities	$ 47	$ 1,538	$ 10,708	$ 3,011	$ 15,304
Yield on held-to-maturity securities (2)	2.93 %	4.57 %	4.25 %	2.97 %	

(1) MBS allocated based on contractual principal maturities assuming no prepayments.
(2) The yields on available-for-sale and held-to-maturity securities represent weighted averages of the coupon rates adjusted by the impact of amortization and accretion of premiums and discounts for the total debt securities in the applicable portfolio.

Advances

The following table presents Advances by product type and redemption term, including index-amortizing Advances, which are presented according to their predetermined amortization schedules.

(In millions)	December 31,	
Types of Advances by Redemption Term	2022	2021
Fixed-rate:		
Due in 1 year or less	$ 42,188	$ 10,845
Due after 1 year through 3 years	3,034	2,765
Due after 3 years through 5 years	2,957	1,176
Due after 5 years through 15 years	858	520
Thereafter	4	3
Total par value	49,041	15,309
Fixed-rate, callable or prepayable (1):		
Due in 1 year or less	—	—
Due after 1 year through 3 years	—	19
Due after 3 years through 5 years	—	—
Due after 5 years through 15 years	—	21
Thereafter	—	—
Total par value	—	40
Fixed-rate, putable:		
Due in 1 year or less	—	—
Due after 1 year through 3 years	5	34
Due after 3 years through 5 years	80	23
Due after 5 years through 15 years	935	2,410
Thereafter	—	—
Total par value	1,020	2,467
Variable-rate:		
Due in 1 year or less	6,254	86
Due after 1 year through 3 years	3,912	3
Due after 3 years through 5 years	50	116
Due after 5 years through 15 years	—	—
Thereafter	—	—
Total par value	10,216	205
Variable-rate, callable or prepayable (1):		
Due in 1 year or less	2,745	361
Due after 1 year through 3 years	1,506	11
Due after 3 years through 5 years	1,500	3,004
Due after 5 years through 15 years	—	—
Thereafter	—	—
Total par value	5,751	3,376
Other (2):		
Due in 1 year or less	304	317
Due after 1 year through 3 years	416	452
Due after 3 years through 5 years	294	336
Due after 5 years through 15 years	374	437
Thereafter	12	15
Total par value	1,400	1,557
Total par value Advances	$ 67,428	$ 22,954

(1) Prepayable Advances are those Advances that may be contractually prepaid by the borrower on specified dates without incurring prepayment or termination fees.

(2) Includes fixed-rate amortizing/mortgage matched and other fixed-rate Advances.

Mortgage Loans

The following table presents mortgage loan redemptions according to their predetermined amortization schedules. All of our mortgage loans have fixed rates.

(In millions)	December 31,	
Redemption Term	2022	2021
Due in 1 year or less	$ 255	$ 265
Due after 1 year through 5 years	1,052	1,107
Due after 5 years through 15 years	2,630	2,752
Thereafter	3,069	3,278
Total unpaid principal balance	$ 7,006	$ 7,402

The following table presents certain credit risk related balances and ratios for mortgage loans.

(Dollars in millions)	December 31, 2022	December 31, 2021
Unpaid Principal Balance		
Mortgage loans held for portfolio	$ 7,006	$ 7,402
Average loans outstanding during the period	7,263	7,931
Non-accrual loans	1	2
Allowance for credit losses on mortgage loans held for portfolio	—	—
Net charge-offs	—	—
Ratios (1)		
Net charge-offs to average loans outstanding during the period	— %	— %
Allowance for credit losses to mortgage loans held for portfolio	—	—
Non-accrual loans to mortgage loans held for portfolio	0.02	0.02
Allowance for credit losses to non-accrual loans	21.44	14.57

(1) The ratios have been computed using dollars in thousands. Accordingly, recalculations based upon the disclosed amounts in millions may produce nominally different results.

Uninsured Term Deposits

The table below presents the maturities for uninsured term deposits:

(In millions) By remaining maturity at December 31, 2022	3 months or less	Over 3 months but within 6 months	Over 6 months but within 12 months	Over 12 months but within 24 months	Total
Uninsured term deposits	$ 12	$ 22	$ 9	$ 13	$ 56

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Information required under this Item is set forth in the “Quantitative and Qualitative Disclosures About Risk Management” caption at Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, of this report.

Item 8. Financial Statements and Supplementary Data.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of the Federal Home Loan Bank of Cincinnati

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying statements of condition of the Federal Home Loan Bank of Cincinnati (the "FHLB") as of December 31, 2022 and 2021, and the related statements of income, of comprehensive income, of capital and of cash flows for each of the three years in the period ended December 31, 2022, including the related notes (collectively referred to as the "financial statements"). We also have audited the FHLB's internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the FHLB as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the FHLB maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The FHLB's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the FHLB's financial statements and on the FHLB's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the FHLB in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Valuation of Interest-Rate Derivatives and Hedged Items

As described in Notes 7 and 15 to the financial statements, the FHLB uses derivatives to manage interest-rate risk and reduce funding costs, among other risk management objectives. The total notional amount of derivatives as of December 31, 2022 was $50.8 billion, of which 42% were designated as hedging instruments, and the fair value of derivative assets and liabilities as of December 31, 2022 was $490.6 million and $0.5 million, respectively. The fair values of interest-rate derivatives and hedged items are determined using the standard valuation technique of discounted cash flow analysis, which uses market-observable inputs, such as discount rate, forward interest rate, and volatility assumptions.

The principal considerations for our determination that performing procedures relating to the valuation of interest-rate derivatives and hedged items is a critical audit matter are the significant audit effort in evaluating the discount rate, forward interest rate, and volatility assumptions used to fair value these derivatives and hedged items, and the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the financial statements. These procedures included testing the effectiveness of controls relating to the valuation of interest-rate derivatives and hedged items, including controls over the method, data and assumptions. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in developing an independent range of prices for a sample of interest rate derivatives and hedged items and comparison of management's estimate to the independently developed ranges. Developing the independent range of prices involved testing the completeness and accuracy of data provided by management and independently developing the discount rate, forward interest rate, and volatility assumptions.

/s/ PricewaterhouseCoopers LLP
Cincinnati, Ohio
March 16, 2023

We have served as the FHLB's auditor since 1990.

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF CONDITION

(In thousands, except par value)	December 31, 2022	December 31, 2021
ASSETS		
Cash and due from banks (Note 3)	$ 19,604	$ 167,822
Interest-bearing deposits	1,770,194	340,147
Securities purchased under agreements to resell	519,540	1,282,440
Federal funds sold	5,399,000	5,505,000
Investment securities: (Note 4)		
Trading securities	1,979,816	6,780,817
Available-for-sale securities (amortized cost of $8,680,491 and $5,240,998 at December 31, 2022 and 2021, respectively)	8,631,765	5,267,123
Held-to-maturity securities (fair value of $14,983,043 and $10,269,821 at December 31, 2022 and 2021, respectively)	15,304,359	10,216,756
Total investment securities	25,915,940	22,264,696
Advances (includes $4,954 and $25,805 at fair value under fair value option at December 31, 2022 and 2021, respectively) (Note 5)	67,019,555	23,054,748
Mortgage loans held for portfolio, net of allowance for credit losses of $301 and $233 at December 31, 2022 and 2021, respectively (Note 6)	7,162,509	7,588,184
Accrued interest receivable	283,132	88,672
Derivative assets (Note 7)	490,560	297,736
Other assets, net	29,470	28,140
TOTAL ASSETS	$ 108,609,504	$ 60,617,585
LIABILITIES		
Deposits (Note 8)	$ 1,039,427	$ 1,415,651
Consolidated Obligations: (Note 9)		
Discount Notes (includes $21,010,746 and $10,420,974 at fair value under fair value option at December 31, 2022 and 2021, respectively)	40,691,180	29,837,696
Bonds (includes $5,469,583 and $7,175,060 at fair value under fair value option at December 31, 2022 and 2021, respectively)	59,667,745	24,601,838
Total Consolidated Obligations	100,358,925	54,439,534
Mandatorily redeemable capital stock (Note 11)	17,453	21,211
Accrued interest payable	290,194	60,682
Affordable Housing Program payable (Note 10)	87,923	84,504
Derivative liabilities	460	3,291
Other liabilities	312,891	796,811
Total liabilities	102,107,273	56,821,684
Commitments and contingencies (Note 16)		
CAPITAL (Note 11)		
Capital stock Class B putable ($100 par value); issued and outstanding shares: 51,507 shares at December 31, 2022 and 24,900 shares at December 31, 2021	5,150,679	2,490,016
Retained earnings:		
Unrestricted	840,774	783,072
Restricted	560,118	509,719
Total retained earnings	1,400,892	1,292,791
Accumulated other comprehensive income (loss) (Note 12)	(49,340)	13,094
Total capital	6,502,231	3,795,901
TOTAL LIABILITIES AND CAPITAL	$ 108,609,504	$ 60,617,585

The accompanying notes are an integral part of these financial statements.

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF INCOME

(In thousands)	For the Years Ended December 31,		
	2022	2021	2020
INTEREST INCOME:			
Advances	$ 1,208,130	$ 134,600	$ 434,815
Prepayment fees on Advances, net	3,114	12,654	34,583
Interest-bearing deposits	25,192	663	4,467
Securities purchased under agreements to resell	49,132	400	11,124
Federal funds sold	203,630	5,265	32,051
Investment securities:			
Trading securities	105,247	198,547	263,847
Available-for-sale securities	162,394	7,228	4,782
Held-to-maturity securities	258,682	106,498	186,363
Total investment securities	526,323	312,273	454,992
Mortgage loans held for portfolio	204,011	168,482	275,600
Loans to other FHLBanks	687	—	60
Total interest income	2,220,219	634,337	1,247,692
INTEREST EXPENSE:			
Consolidated Obligations:			
Discount Notes	775,421	13,460	294,573
Bonds	935,003	343,495	541,996
Total Consolidated Obligations	1,710,424	356,955	836,569
Deposits	16,838	439	3,525
Loans from other FHLBanks	1	—	—
Mandatorily redeemable capital stock	5,522	383	1,068
Total interest expense	1,732,785	357,777	841,162
NET INTEREST INCOME	487,434	276,560	406,530
NON-INTEREST INCOME (LOSS):			
Net gains (losses) on investment securities	(336,889)	(257,497)	257,566
Net gains (losses) on financial instruments held under fair value option	74,712	10,135	(7,293)
Net gains (losses) on derivatives	130,991	82,264	(273,253)
Letters of Credit fees	25,675	25,118	13,936
Other, net	2,244	1,708	1,976
Total non-interest income (loss)	(103,267)	(138,272)	(7,068)
NON-INTEREST EXPENSE:			
Compensation and benefits	51,122	47,794	50,242
Other operating expenses	25,107	22,616	20,901
Finance Agency	7,842	7,434	6,765
Office of Finance	6,373	5,157	5,119
Other	13,114	8,588	9,246
Total non-interest expense	103,558	91,589	92,273
INCOME BEFORE ASSESSMENTS	280,609	46,699	307,189
Affordable Housing Program assessments	28,613	4,708	30,826
NET INCOME	$ 251,996	$ 41,991	$ 276,363

The accompanying notes are an integral part of these financial statements.

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF COMPREHENSIVE INCOME

(In thousands)	For the Years Ended December 31,		
	2022	2021	2020
Net income	$ 251,996	$ 41,991	$ 276,363
Other comprehensive income (loss) adjustments:			
Net unrealized gains (losses) on available-for-sale securities	(74,851)	21,407	4,348
Pension and postretirement benefits	12,417	6,672	(2,939)
Total other comprehensive income (loss) adjustments	(62,434)	28,079	1,409
Comprehensive income	$ 189,562	$ 70,070	$ 277,772

The accompanying notes are an integral part of these financial statements.

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF CAPITAL

(In thousands)	Capital Stock Class B - Putable		Retained Earnings			Accumulated Other Comprehensive Income (Loss)	Total Capital
	Shares	Par Value	Unrestricted	Restricted	Total		
BALANCE, DECEMBER 31, 2019	33,664	$ 3,366,428	$ 648,374	$ 446,048	$ 1,094,422	$ (16,394)	$ 4,444,456
Adjustment for cumulative effect of accounting change			366		366		366
Comprehensive income (loss)			221,090	55,273	276,363	1,409	277,772
Proceeds from sale of capital stock	21,351	2,135,091					2,135,091
Repurchase of capital stock	(23,000)	(2,300,000)					(2,300,000)
Net shares reclassified to mandatorily redeemable capital stock	(5,606)	(560,656)					(560,656)
Partial recovery of prior capital distribution to Financing Corporation			16,533		16,533		16,533
Cash dividends on capital stock			(83,648)		(83,648)		(83,648)
BALANCE, DECEMBER 31, 2020	26,409	2,640,863	802,715	501,321	1,304,036	(14,985)	3,929,914
Comprehensive income (loss)			33,593	8,398	41,991	28,079	70,070
Proceeds from sale of capital stock	11,090	1,109,046					1,109,046
Repurchase of capital stock	(11,864)	(1,186,402)					(1,186,402)
Net shares reclassified to mandatorily redeemable capital stock	(735)	(73,491)					(73,491)
Cash dividends on capital stock			(53,236)		(53,236)		(53,236)
BALANCE, DECEMBER 31, 2021	24,900	2,490,016	783,072	509,719	1,292,791	13,094	3,795,901
Comprehensive income (loss)			201,597	50,399	251,996	(62,434)	189,562
Proceeds from sale of capital stock	55,337	5,533,659					5,533,659
Repurchase of capital stock	(2,082)	(208,150)					(208,150)
Net shares reclassified to mandatorily redeemable capital stock	(26,648)	(2,664,846)					(2,664,846)
Cash dividends on capital stock			(143,895)		(143,895)		(143,895)
BALANCE, DECEMBER 31, 2022	51,507	$ 5,150,679	$ 840,774	$ 560,118	$ 1,400,892	$ (49,340)	$ 6,502,231

The accompanying notes are an integral part of these financial statements.

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF CASH FLOWS

(In thousands)	For the Years Ended December 31,		
	2022	2021	2020
OPERATING ACTIVITIES:			
Net income	$ 251,996	$ 41,991	$ 276,363
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Depreciation and amortization/(accretion)	304,480	81,444	64,208
Net change in derivative and hedging activities	1,356,601	228,896	(123,345)
Net change in fair value adjustments on trading securities	336,889	257,497	(257,566)
Net change in fair value adjustments on financial instruments held under fair value option	(74,712)	(10,135)	7,293
Other adjustments, net	754	884	1,014
Net change in:			
Accrued interest receivable	(196,020)	25,036	68,750
Other assets	(2,695)	804	(4,476)
Accrued interest payable	254,707	(27,971)	(54,159)
Other liabilities	(2,106)	(20,069)	16,062
Total adjustments	1,977,898	536,386	(282,219)
Net cash provided by (used in) operating activities	2,229,894	578,377	(5,856)
INVESTING ACTIVITIES:			
Net change in:			
Interest-bearing deposits	(1,590,953)	219,561	(87,411)
Securities purchased under agreements to resell	762,900	535,828	530,316
Federal funds sold	106,000	(1,265,000)	593,000
Premises, software, and equipment	(1,512)	(1,411)	(1,861)
Trading securities:			
Proceeds from maturities and paydowns	2,975,089	1,275,119	5,885,074
Proceeds from sales	1,489,023	2,174,690	—
Purchases	—	—	(4,499,938)
Available-for-sale securities:			
Proceeds from maturities and paydowns	—	—	1,810,000
Purchases	(4,505,274)	(4,872,885)	(550,267)
Held-to-maturity securities:			
Proceeds from maturities and paydowns	1,815,470	2,868,790	3,919,706
Purchases	(7,218,330)	(3,121,145)	(75,604)
Advances:			
Repaid	1,950,113,605	409,411,398	512,521,226
Originated	(1,994,587,205)	(407,357,984)	(490,263,028)
Mortgage loans held for portfolio:			
Principal collected	1,110,219	3,585,322	4,291,048
Purchases	(724,885)	(1,715,689)	(2,691,664)
Net cash provided by (used in) investing activities	(50,255,853)	1,736,594	31,380,597

The accompanying notes are an integral part of these financial statements.

(continued from previous page)

FEDERAL HOME LOAN BANK OF CINCINNATI
STATEMENTS OF CASH FLOWS

(In thousands)	For the Years Ended December 31,		
	2022	2021	2020
FINANCING ACTIVITIES:			
Net change in deposits and pass-through reserves	$ (370,784)	$ 88,599	$ 371,585
Net proceeds (payments) on derivative contracts with financing elements	—	—	(10,764)
Net proceeds from issuance of Consolidated Obligations:			
Discount Notes	259,185,837	193,534,651	275,314,658
Bonds	85,793,046	33,771,274	37,753,386
Payments for maturing and retiring Consolidated Obligations:			
Discount Notes	(248,606,483)	(191,190,825)	(296,851,576)
Bonds	(50,636,885)	(41,132,595)	(44,193,670)
Proceeds from issuance of capital stock	5,533,659	1,109,046	2,135,091
Payments for repurchase of capital stock	(208,150)	(1,186,402)	(2,300,000)
Payments for repurchase/redemption of mandatorily redeemable capital stock	(2,668,604)	(71,734)	(562,871)
Cash dividends paid	(143,895)	(53,236)	(83,648)
Partial recovery of prior capital distribution to Financing Corporation	—	—	16,533
Net cash provided by (used in) financing activities	47,877,741	(5,131,222)	(28,411,276)
Net increase (decrease) in cash and due from banks	(148,218)	(2,816,251)	2,963,465
Cash and due from banks at beginning of the period	167,822	2,984,073	20,608
Cash and due from banks at end of the period	$ 19,604	$ 167,822	$ 2,984,073
Supplemental Disclosures:			
Interest paid	$ 1,214,471	$ 391,108	$ 955,423
Affordable Housing Program payments, net	$ 28,194	$ 30,976	$ 35,349

The accompanying notes are an integral part of these financial statements.

FEDERAL HOME LOAN BANK OF CINCINNATI

NOTES TO FINANCIAL STATEMENTS

Background Information

The Federal Home Loan Bank of Cincinnati (the FHLB), a federally chartered corporation, is one of 11 District Federal Home Loan Banks (FHLBanks). The FHLBanks are government-sponsored enterprises (GSEs) that serve the public by enhancing the availability of credit for residential mortgages and targeted community development. The FHLB provides a readily available, competitively-priced source of funds to its member institutions. The FHLB is a cooperative whose member institutions own nearly all of the capital stock of the FHLB and may receive dividends on their investment to the extent declared by the FHLB's Board of Directors. Former members own the remaining capital stock to support business transactions still carried on the FHLB's Statements of Condition. Regulated financial depositories and insurance companies engaged in residential housing finance may apply for membership. Housing associates, including state and local housing authorities, may also borrow from the FHLB; while eligible to borrow, housing authorities are not members of the FHLB and, therefore, are not allowed to hold capital stock. A housing authority is eligible to utilize the Advance programs of the FHLB if it meets applicable statutory requirements. It must be a U.S. Department of Housing and Urban Development approved mortgagee and must also meet applicable mortgage lending, financial condition, as well as charter, inspection and supervision requirements.

All members must purchase stock in the FHLB. Members must own capital stock in the FHLB based on the amount of their total assets. Each member also may be required to purchase activity-based capital stock as it engages in certain business activities with the FHLB. As a result of these requirements, the FHLB conducts business with stockholders in the normal course of business. For financial statement purposes, the FHLB defines related parties as those members with more than 10 percent of the voting interests of the FHLB's outstanding capital stock. See Note 18 for more information relating to transactions with stockholders.

The Federal Housing Finance Agency (Finance Agency), an independent agency in the executive branch of the U.S. government, supervises and regulates the FHLBanks, Federal Home Loan Mortgage Corporation (Freddie Mac) and Federal National Mortgage Association (Fannie Mae). The Finance Agency's stated mission, with respect to the FHLBanks, is to ensure the FHLBanks fulfill their mission by operating in a safe and sound manner to serve as a reliable source of liquidity and funding for the housing finance market throughout the economic cycle.

Each FHLBank operates as a separate entity with its own management, employees, and board of directors. The FHLB does not sponsor any special purpose entities or any other type of off-balance sheet conduits.

The Office of Finance is a joint office of the FHLBanks established to facilitate the issuance and servicing of the debt instruments of the FHLBanks, known as Consolidated Obligations, and to prepare combined quarterly and annual financial reports of all FHLBanks. As provided by the Federal Home Loan Bank Act of 1932, as amended (the FHLBank Act), or by Finance Agency regulation, the FHLBanks' Consolidated Obligations are backed only by the financial resources of the FHLBanks and are the primary source of funds for the FHLBanks. Deposits, other borrowings, and capital stock issued to members provide other funds. The FHLB primarily uses its funds to provide Advances to members and to purchase loans from members through its Mortgage Purchase Program (MPP). The FHLB also provides member institutions with correspondent services, such as wire transfer, security safekeeping, and settlement services.

Note 1 - Summary of Significant Accounting Policies

Basis of Presentation

The FHLB's accounting and financial reporting policies conform to accounting principles generally accepted in the United States of America (GAAP).

Significant Accounting Policies

Cash Flows. In the Statements of Cash Flows, the FHLB considers non-interest bearing cash and due from banks as cash and cash equivalents. Federal funds sold are not treated as cash equivalents for purposes of the Statements of Cash Flows, but are instead treated as short-term investments and are reflected in the investing activities section of the Statements of Cash Flows.

Subsequent Events. The FHLB has evaluated subsequent events for potential recognition or disclosure through the issuance of these financial statements and believes there have been no material subsequent events requiring additional disclosure or recognition in these financial statements.

Use of Estimates. The preparation of financial statements in accordance with GAAP requires management to make subjective assumptions and estimates. These assumptions and estimates affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities, and the reported amounts of income and expenses. Actual results could differ from these estimates.

Fair Values. Some of the FHLB's financial instruments lack an available trading market with prices characterized as those that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date. Therefore, the FHLB uses pricing services and/or internal models employing significant estimates and present value calculations when disclosing fair values. See Note 15 for more information.

Interest-Bearing Deposits, Securities Purchased Under Agreements to Resell, and Federal Funds Sold. These investments provide short-term liquidity and are carried at amortized cost; however, accrued interest receivable is recorded separately on the Statement of Condition. Interest-bearing deposits include certificates of deposits not meeting the definition of an investment security. The FHLB treats securities purchased under agreements to resell as short-term collateralized loans. Federal funds sold are unsecured loans that are generally transacted on an overnight term.

Interest-bearing deposits and federal funds sold are evaluated quarterly for expected credit losses if they are not expected to be repaid according to the relevant contractual terms. If applicable, an allowance for credit losses is recorded with a corresponding adjustment to the provision (reversal) for credit losses.

Securities purchased under agreements to resell are evaluated quarterly for expected credit losses. The FHLB applies the collateral maintenance provision practical expedient, which allows expected credit losses to be measured based on the difference between the fair value of the collateral and the investment's amortized cost, for securities purchased under agreements to resell. The credit loss would be limited to the difference between the fair value of the collateral and the investment’s amortized cost.

Debt Securities. The FHLB classifies investment securities as trading, available-for-sale and held-to-maturity at the date of acquisition. Purchases and sales of securities are recorded on a trade date basis.

Trading. Securities classified as trading are acquired for liquidity purposes and asset/liability management and are carried at fair value. The FHLB records changes in the fair value of these securities through non-interest income (loss) as a net gain or loss on trading securities. Finance Agency regulations and the FHLB's risk management policies prohibit the speculative trading of these instruments and limit credit risk arising from them.

Available-for-Sale. Securities that are not classified as held-to-maturity or trading are classified as available-for-sale and are carried at fair value. The change in fair value of available-for-sale securities is recorded in other comprehensive income as net unrealized gains (losses) on available-for-sale securities. For available-for-sale securities in hedging relationships that qualify as fair value hedges, the FHLB records the portion of the change in the fair value of the investment related to the risk being hedged in interest income on available-for-sale securities together with the related change in the fair value of the derivative, and records the remainder of the change in the fair value of the investment in other comprehensive income as net unrealized gains (losses) on available-for-sale securities.

For securities classified as available-for-sale, the FHLB evaluates an individual security for impairment on a quarterly basis by comparing the security’s fair value to its amortized cost. Accrued interest receivable is recorded separately on the Statements of Condition. Impairment exists when the fair value of the investment is less than its amortized cost (i.e., in an unrealized loss position). In assessing whether a credit loss exists on an impaired security, the FHLB considers whether there would be a shortfall in receiving all cash flows contractually due. When a shortfall is considered possible, the FHLB compares the present value of cash flows to be collected from the security with the amortized cost basis of the security. If the present value of cash flows is less than amortized cost, an allowance for credit losses is recorded with a corresponding adjustment to the provision (reversal) for credit losses. The allowance is limited by the amount of the unrealized loss. The allowance for credit losses excludes uncollectible accrued interest receivable, which is measured separately.

If management intends to sell an impaired security classified as available-for-sale, or more likely than not will be required to sell the security before expected recovery of its amortized cost basis, any allowance for credit losses is written off and the amortized cost basis is written down to the security’s fair value at the reporting date with any incremental impairment reported in earnings as net gains (losses) on investment securities. If management does not intend to sell an impaired security classified as available-for-sale and it is not more likely than not that management will be required to sell the debt security, then the credit portion of the difference is recognized as an allowance for credit losses and any remaining difference between the security’s fair value and amortized cost is recorded to net unrealized gains (losses) on available-for-sale securities within other comprehensive income (loss).

Held-to-Maturity. Securities that the FHLB has both the ability and intent to hold to maturity are classified as held-to-maturity and are carried at amortized cost, which is original cost net of periodic principal repayments and amortization of premiums and accretion of discounts. Accrued interest receivable is recorded separately on the Statements of Condition.

Certain changes in circumstances may cause the FHLB to change its intent to hold a security to maturity without calling into question its intent to hold other debt securities to maturity in the future. Thus, the sale or transfer of a held-to-maturity security due to certain changes in circumstances, such as evidence of significant deterioration in the issuer's creditworthiness or changes in regulatory requirements, is not considered to be inconsistent with its original classification. Other events that are isolated, nonrecurring, and unusual for the FHLB that could not have been reasonably anticipated may cause the FHLB to sell or transfer a held-to-maturity security without necessarily calling into question its intent to hold other debt securities to maturity.

In addition, sales of held-to-maturity debt securities that meet either of the following two conditions may be considered as maturities for purposes of the classification of securities: (1) the sale occurs near enough to the security's maturity date (for example, within three months of maturity), or call date if exercise of the call is probable, that interest rate risk is substantially eliminated as a pricing factor and changes in market interest rates would not have a significant effect on the security's fair value, or (2) the sale of the security occurs after the FHLB has already collected a substantial portion (at least 85 percent) of the principal outstanding at acquisition due either to prepayments on the security or to scheduled payments on the security payable in equal installments (both principal and interest) over its term.

Held-to-maturity securities are evaluated quarterly for expected credit losses on a pool basis unless an individual assessment is deemed necessary because the securities do not possess similar risk characteristics. If applicable, an allowance for credit losses is recorded with a corresponding adjustment to the provision (reversal) for credit losses. The allowance for credit losses excludes uncollectible accrued interest receivable, which is measured separately.

Premiums and Discounts. For mortgage-backed securities (MBS) with multiple underlying loans classified as available-for-sale or held-to-maturity, the FHLB amortizes the related purchased premiums and accretes the related purchased discounts using the retrospective interest method (retrospective method). The retrospective method requires that the FHLB estimate prepayments over the estimated life of the securities and make a retrospective adjustment of the effective yield each time that the FHLB changes the estimated life as if the new estimate had been known since the original acquisition date of the securities. The FHLB uses nationally recognized third-party prepayment models to project estimated cash flows. For MBS with single or few underlying loans classified as available-for-sale or held-to-maturity, the FHLB amortizes the related purchased premiums and accretes the related purchased discounts using the contractual interest method (contractual method). Due to their short term nature, the FHLB amortizes premiums and accretes discounts on other investment categories with a term of one year or less using a straight-line methodology based on the contractual maturity of the securities. Analyses of the straight-line compared to the interest, or level-yield, methodology have been performed by the FHLB, and it has determined that the impact of the difference on the financial statements for each period reported, taken individually and as a whole, is not material.

Gains and Losses on Sales. The FHLB computes gains and losses on sales of investment securities using the specific identification method and includes these gains and losses in non-interest income (loss).

Advances. The FHLB records Advances (loans to members, former members or housing associates) either at amortized cost or at fair value when the fair value option has been elected. Advances recorded at amortized cost are carried at original cost net of periodic principal repayments and amortization of premiums and accretion of discounts (including discounts related to the Affordable Housing Program), unearned commitment fees, and fair value hedge adjustments. The FHLB amortizes or accretes premiums and discounts, and recognizes unearned commitment fees and fair value hedging adjustments on Advances to interest income using a level-yield methodology. For Advances recorded at amortized cost, accrued interest receivable is recorded separately on the Statements of Condition.

The Advances carried at amortized cost are evaluated quarterly for expected credit losses. If deemed necessary, an allowance for credit losses is recorded with a corresponding adjustment to the provision (reversal) for credit losses.

Advance Modifications. In cases in which the FHLB funds a new Advance concurrent with or within a short period of time before or after the prepayment of an existing Advance by the same borrower, the FHLB evaluates whether the new Advance meets the accounting criteria to qualify as a modification of an existing Advance or whether it constitutes a new Advance. The FHLB compares the present value of cash flows on the new Advance to the present value of cash flows remaining on the existing Advance. If there is at least a 10 percent difference in the cash flows, or if the FHLB concludes the differences between the Advances are more than minor based on qualitative factors, the Advance is accounted for as a new Advance. In all other instances, the new Advance is accounted for as a modification.

Prepayment Fees. The FHLB charges a borrower a prepayment fee when the borrower prepays certain Advances before the original maturity. The recognition of prepayment fees is dependent on whether a new Advance was funded. If there were no new Advances funded, the FHLB records prepayment fees, net of basis adjustments related to hedging activities included in the carrying value of the Advances, as “Prepayment fees on Advances, net” in the interest income section of the Statements of Income.

If a new Advance was funded, but does not qualify as a modification of a prepaid Advance, the prepaid Advance is treated as an Advance termination with subsequent funding of a new Advance and the fees on the prepaid Advance, net of related fair value hedging adjustments, are recorded in interest income as “Prepayment fees on Advances, net.”

If a new Advance is funded and qualifies as a modification of the original Advance, the net prepayment fee is deferred, recorded in the basis of the modified Advance, and amortized/accreted using a level-yield methodology over the life of the modified Advance to Advance interest income. If the modified Advance is hedged and meets the hedge accounting requirements, the associated fair value gains or losses of the Advance and the prepayment fees are included in the basis of the modified Advance. Such gains or losses and prepayment fees are then amortized in interest income over the life of the modified Advance using a level-yield methodology.

Mortgage Loans Held for Portfolio. Mortgage loans held for portfolio are recorded at amortized cost, which is original cost, net of periodic principal repayments and amortization of premiums and accretion of discounts, hedging basis adjustments on loans initially classified as mortgage loan commitments, and direct write-downs. The FHLB has the intent and ability to hold these mortgage loans to maturity. Accrued interest receivable is recorded separately on the Statements of Condition. If deemed necessary, an allowance for credit losses is recorded with a corresponding adjustment to the provision (reversal) for credit losses. The FHLB does not purchase mortgage loans with credit deterioration present at the time of purchase.

The FHLB performs a quarterly assessment of its mortgage loans held for portfolio to estimate expected credit losses. The FHLB measures expected credit losses on mortgage loans on a collective basis, pooling loans with similar risk characteristics. If a mortgage loan no longer shares risk characteristics with other loans, it is removed from the pool and evaluated for expected credit losses on an individual basis.

When developing the allowance for credit losses, the FHLB measures the expected loss over the estimated remaining life of a mortgage loan, which also considers how the FHLB’s credit enhancements mitigate credit losses. If a loan is purchased at a discount, the discount does not offset the allowance for credit losses. The FHLB includes estimates of expected recoveries within the allowance for credit losses.

The allowance excludes uncollectible accrued interest receivable, as the FHLB writes off accrued interest receivable by reversing interest income if a mortgage loan is placed on non-accrual status.

Premiums and Discounts. The FHLB defers and amortizes premiums and accretes discounts paid to and received by the FHLB's participating members (Participating Financial Institutions, or PFIs) and hedging basis adjustments, as interest income using the contractual interest method (contractual method).

Other Fees. The FHLB may receive non-origination fees, called pair-off fees. Pair-off fees represent a make-whole provision and are assessed when a member fails to deliver the quantity of loans committed to in a Mandatory Delivery Contract. Pair-off fees are recorded in non-interest income (loss). A Mandatory Delivery Contract is a legal commitment the FHLB makes to purchase, and a PFI makes to deliver, a specified dollar amount of mortgage loans, with a forward settlement date, at a specified range of mortgage note rates and prices.

Collateral-dependent Loans. An impaired loan is considered collateral-dependent when the borrower is experiencing financial difficulty and repayment is expected to be substantially through the sale of the underlying collateral. A loan that is considered collateral-dependent is measured for impairment based on the fair value of the underlying property less estimated selling costs, with any shortfall recognized as an allowance for loan loss or charged-off. Interest income on impaired loans is recognized in the same manner as non-accrual loans noted below.

Non-accrual Loans. The FHLB places a conventional mortgage loan on non-accrual status if it is determined that either (1) the collection of interest or principal is doubtful (e.g., when a related charge-off is recorded on a loan), or (2) interest or principal is past due for 90 days or more, except when the loan is well-secured and in the process of collection (e.g., through credit enhancements and with monthly remittances on a schedule/scheduled basis). Past due loans are those where the borrower has failed to make a full payment of principal and interest within one month of its due date. Loans with remittances on a schedule/scheduled basis means the FHLB receives monthly principal and interest payments from the servicer regardless of whether the mortgagee is making payments to the servicer. Loans with monthly remittances on an actual/actual basis are considered well-secured; however, servicers of actual/actual remittance types contractually do not advance principal and interest regardless of borrower creditworthiness. As a result, these loans are placed on non-accrual status once they become 90 days delinquent.

For those mortgage loans placed on non-accrual status, accrued but uncollected interest is reversed against interest income. The FHLB records cash payments received on non-accrual loans first as interest income and then as a reduction of principal as specified in the contractual agreement, unless the collection of the remaining principal amount due is considered doubtful. If the collection of the remaining principal amount due is considered doubtful, cash payments received are applied first solely to principal until the remaining principal amount due is expected to be collected and then as a recovery of any charge-off, if applicable, followed by recording interest income. A loan on non-accrual status may be restored to accrual status when (1) none of its contractual principal and interest is due and unpaid, and the FHLB expects repayment of the remaining contractual interest and principal, or (2) it otherwise becomes well secured and in the process of collection.

Charge-off Policy. A charge-off is recorded if it is estimated that the amortized cost and any applicable accrued interest in a loan will not be recovered. The FHLB evaluates whether to record a charge-off on a conventional mortgage loan upon the occurrence of a confirming event, such as notification of a claim against any of the credit enhancements. The FHLB also charges off the portion of outstanding conventional mortgage loan balances in excess of fair value of the underlying property, less cost to sell and adjusted for any available credit enhancements, for loans that are 180 days or more delinquent and/or certain loans where the borrower has filed for bankruptcy.

Premises, Software and Equipment, Net. Premises, software and equipment are included in other assets on the Statements of Condition. The FHLB records premises, software and equipment at cost less accumulated depreciation and amortization. The FHLB computes depreciation on a straight-line methodology over the estimated useful lives of assets ranging from three to ten years. Leasehold improvements are amortized on a straight-line basis over the shorter of the estimated useful life of the improvement or the remaining term of the lease. The FHLB capitalizes improvements and major renewals but expenses ordinary maintenance and repairs when incurred. The FHLB capitalizes and amortizes the cost of computer software developed or obtained for internal use over future periods. In addition, the FHLB includes gains and losses on the disposal of premises, software and equipment in other non-interest income (loss) in the Statements of Income.

Premises, software and equipment were $6,212,000 and $6,936,000, which was net of accumulated depreciation and amortization of $37,971,000 and $35,748,000 as of December 31, 2022 and 2021, respectively. For the years ended December 31, 2022, 2021, and 2020, the depreciation and amortization expense for premises, software and equipment was $2,256,000, $2,396,000, and $2,367,000, respectively.

Leases. The FHLB leases office space and office equipment to run its business operations. At December 31, 2022 and 2021, the FHLB included in the Statement of Condition $3,439,000 and $4,079,000 of operating lease right-of-use assets in other assets, net, and $3,739,000 and $4,500,000 of operating lease liabilities in other liabilities. The FHLB recognized operating lease costs in the other operating expenses line of the Statement of Income of $1,840,000, $1,848,000 and $1,832,000 for the years ended December 31, 2022, 2021 and 2020.

Derivatives and Hedging Activities. All derivatives are recognized on the Statements of Condition at their fair values and are reported as either derivative assets or derivative liabilities, net of cash collateral, and accrued interest from counterparties. The fair values of derivatives are netted by counterparty when the netting requirements have been met. If these netted amounts are positive, they are classified as an asset and, if negative, they are classified as a liability. Cash flows associated with a derivative are reflected as cash flows from operating activities in the Statement of Cash Flows unless the derivative meets the criteria to be a financing derivative.

The FHLB utilizes two Derivative Clearing Organizations (Clearinghouses), for all cleared derivative transactions, LCH Ltd. and CME Clearing. At both Clearinghouses, variation margin is characterized as daily settlement payments and initial margin is considered cash collateral.

Derivative Designations. Each derivative is designated as one of the following:

a. a qualifying hedge of the fair value of a recognized asset or liability or an unrecognized firm commitment (a "fair value" hedge); or

b. a non-qualifying hedge ("economic hedge") for asset/liability management purposes.

Accounting for Fair Value Hedges. 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 are eligible for fair value hedge accounting and the offsetting changes in fair value of the hedged items attributable to the hedged risk may be recorded in earnings. The application of fair value hedge accounting generally requires the FHLB to evaluate the effectiveness of the hedging relationships at inception and on an ongoing basis and to calculate the changes in fair value of the derivatives and related hedged items independently. This is known as the "long-haul" method of accounting. Transactions that meet more stringent criteria qualify for the "shortcut" method of hedge accounting in which an assumption can be made that the change in fair value of a hedged item exactly offsets the change in value of the related derivative.

Derivatives are typically executed at the same time as the hedged item, and the FHLB designates the hedged item in a qualifying hedging relationship as of the trade date. In many hedging relationships, the FHLB may designate the hedging relationship upon its commitment to disburse an Advance, trade a Consolidated Obligation or purchase an investment security in which settlement occurs within the shortest period of time possible for the type of instrument based on market settlement conventions. The FHLB records the changes in fair value of the derivative and the hedged item beginning on the trade date.

Changes in the fair value of a derivative that is designated and qualifies as a fair value hedge, along with changes in the fair value of the hedged asset or liability that are attributable to the hedged risk, are recorded in net interest income in the same line as the earnings effect of the hedged item.

Accounting for Economic Hedges. An economic hedge is defined as a derivative hedging specific or non-specific underlying assets, liabilities, or firm commitments that does not qualify, or was not designated, for hedge accounting, but is an acceptable hedging strategy under the FHLB's risk management program. These economic hedging strategies also comply with Finance Agency regulatory requirements prohibiting speculative hedge transactions. An economic hedge introduces the potential for earnings variability caused by the changes in fair value of the derivatives that are recorded in the FHLB's income but that are not offset by corresponding changes in the value of the economically hedged assets, liabilities, or firm commitments. The FHLB recognizes the net interest and the change in fair value of these derivatives in non-interest income (loss) as "Net gains (losses) on derivatives."

Accrued Interest Receivables and Payables. The difference between accruals of interest receivables and payables on derivatives that are designated as fair value hedging relationships is recognized as adjustments to the interest income or expense of the designated hedged item. The difference between accruals of interest receivables and payables on economic hedges are recognized in non-interest income (loss) as "Net gains (losses) on derivatives."

Discontinuance of Hedge Accounting. The FHLB discontinues hedge accounting prospectively when: (1) it determines that the derivative is no longer highly effective in offsetting changes in the fair value of a hedged item attributable to the hedged risk; (2) the derivative and/or the hedged item expires or is sold, terminated, or exercised; or (3) management determines that designating the derivative as a hedging instrument is no longer appropriate.

When hedge accounting is discontinued because the FHLB determines that the derivative no longer qualifies as an effective fair value hedge of an existing hedged item, the FHLB continues to carry the derivative on the Statements of Condition at its fair value, ceases to adjust the hedged asset or liability for changes in fair value, and amortizes the cumulative basis adjustment on the hedged item into earnings over the remaining life of the hedged item using a level-yield methodology.

Embedded Derivatives. The FHLB may issue debt, make Advances, or purchase financial instruments in which a derivative instrument is "embedded." The FHLB assesses whether the economic characteristics of the embedded derivative are clearly and closely related to the economic characteristics of the remaining component of the debt, Advance, or purchased financial instrument (the host contract) and whether a separate, non-embedded instrument with the same terms as the embedded instrument would meet the definition of a derivative instrument. When the FHLB determines that (1) the embedded derivative has economic characteristics that are not clearly and closely related to the economic characteristics of the host contract and (2) a separate, stand-alone instrument with the same terms would qualify as a derivative instrument, the embedded derivative is separated from the host contract, carried at fair value, and designated as a stand-alone derivative instrument pursuant to an economic hedge. However, the entire contract is carried at fair value and no portion of the contract is designated as a hedging instrument if the entire contract (the host contract and the embedded derivative) is to be measured at fair value, with changes in fair value reported in current-period earnings (such as an investment security classified as "trading" as well as hybrid financial instruments for which the fair value option is elected), or if the FHLB cannot reliably identify and measure the embedded derivative for purposes of separating that derivative from its host contract.

Consolidated Obligations. Consolidated Obligations are recorded at amortized cost unless the FHLB has elected the fair value option, in which case the Consolidated Obligations are carried at fair value.

Concessions. Dealers receive concessions in connection with the issuance of certain Consolidated Obligations. The Office of Finance prorates the amount of the concession to the FHLB based upon the percentage of the debt issued that is assumed by the FHLB. Concessions paid on Consolidated Obligations designated under the fair value option are expensed as incurred in other non-interest expense. The FHLB records concessions paid on Consolidated Obligation Bonds not designated under the fair value option as a direct deduction from their carrying amounts, consistent with the presentation of discounts on Consolidated Obligations. The concessions are amortized, using a level-yield methodology, over the terms to maturity or the expected lives of the Consolidated Obligation Bonds. The amortization of those concessions is included in Consolidated Obligation Bond interest expense.

The FHLB charges to expense as incurred the concessions applicable to Consolidated Obligation Discount Notes because of the short maturities of these Notes. Analyses of expensing concessions as incurred compared to a level-yield methodology have been performed by the FHLB, and it has determined that the impact of the difference on the financial statements for each period reported, taken individually and as a whole, is not material.

Discounts and Premiums. The FHLB accretes the discounts and amortizes the premiums on Consolidated Obligation Bonds to interest expense using a level-yield methodology over the terms to maturity or estimated lives of the corresponding Consolidated Obligation Bonds. Due to their short-term nature, the FHLB expenses the discounts on Consolidated Obligation Discount Notes using a straight-line methodology over the term of the Discount Notes. Analyses of a straight-line compared to a level-yield methodology have been performed by the FHLB, and the FHLB has determined that the impact of the difference on the financial statements for each period reported, taken individually and as a whole, is not material.

Off-Balance Sheet Credit Exposures. The FHLB evaluates its off-balance sheet credit exposures on a quarterly basis for expected credit losses. If deemed necessary, an allowance for expected credit losses on these off-balance sheet exposures is recorded in other liabilities with a corresponding adjustment to the provision (reversal) for credit losses.

Mandatorily Redeemable Capital Stock. The FHLB reclassifies stock subject to redemption from capital stock to a liability upon expiration of the “grace period” after a member provides written notice of redemption, gives notice of intent to withdraw from membership, or attains nonmember status by merger or acquisition, charter termination, or involuntary termination from membership, because the member's shares then meet the definition of a mandatorily redeemable financial instrument. Shares meeting this definition are reclassified to a liability at fair value. Dividends declared on shares classified as a liability are accrued at the expected dividend rate and reflected as interest expense in the Statements of Income. The repurchase or redemption of mandatorily redeemable capital stock is reflected as a cash outflow in the financing activities section of the Statements of Cash Flows.

If a member cancels its written notice of redemption or notice of withdrawal, the FHLB reclassifies the mandatorily redeemable capital stock from a liability to capital. After the reclassification, dividends on the capital stock are no longer classified as interest expense.

Restricted Retained Earnings. The Joint Capital Enhancement Agreement, as amended (Capital Agreement), provides that the FHLB will, on a quarterly basis, allocate 20 percent of its quarterly net income to a separate restricted retained earnings account until the balance of that account, calculated as of the last day of each calendar quarter, equals at least one percent of the FHLB's average balance of outstanding Consolidated Obligations for the calendar quarter. Additionally, the Capital Agreement provides that amounts in restricted retained earnings in excess of 150 percent of the FHLB's restricted retained earnings minimum (i.e., one percent of the FHLB's average balance of outstanding Consolidated Obligations calculated as of the last day of each calendar quarter) may be released from restricted retained earnings. Restricted retained earnings are not available to pay dividends and are presented separately on the Statements of Condition.

Letters of Credit. The FHLB records commitment fees for Letters of Credit as deferred income when it receives the fees and accretes them using a straight-line methodology over the term of the Letter of Credit. Based upon past experience, the FHLB's management believes that the likelihood of Letters of Credit being drawn upon is remote.

Finance Agency Expenses. The FHLB funds its proportionate share of the costs of operating the Finance Agency. The portion of the Finance Agency's expenses and working capital fund paid by each FHLBank has been allocated based on each

FHLBank's *pro rata* share of total annual assessments (which are based on the ratio between each FHLBank's minimum required regulatory capital and the aggregate minimum required regulatory capital of every FHLBank).

Office of Finance Expenses. The FHLB is assessed for its proportionate share of the costs of operating the Office of Finance. Each FHLBank's proportionate share of Office of Finance operating and capital expenditures is calculated using a formula that is based upon the following components: (1) two-thirds based upon each FHLBank's share of total Consolidated Obligations outstanding and (2) one-third based upon an equal pro rata allocation.

Voluntary Housing Programs. The FHLB classifies amounts awarded under its voluntary housing programs as other non-interest expenses.

Affordable Housing Program (AHP) Assessments. The FHLBank Act requires each FHLBank to establish and fund an AHP. The FHLB charges the required funding for AHP to earnings and establishes a liability. The AHP funds provide subsidies to members to assist in the purchase, construction, or rehabilitation of housing for very low-, low-, and moderate-income households. Currently, the FHLB makes subsidies available to members in the form of grants. However, in previous years, the FHLB also provided subsidies in the form of AHP Advances, which were issued at interest rates below the customary interest rate for non-subsidized Advances. For an AHP Advance, the present value of the variation in the cash flow caused by the difference in the interest rate between the AHP Advance rate and the FHLB's related cost of funds for comparable maturity funding is charged against the AHP liability and recorded as a discount on the AHP Advance. The discount on AHP Advances is accreted to interest income on Advances using a level-yield methodology over the life of the Advance.

Note 2 - Recently Issued and Adopted Accounting Guidance

Troubled Debt Restructurings and Vintage Disclosures. In March 2022, the Financial Accounting Standards Board (FASB) issued guidance that eliminates the accounting guidance for troubled debt restructurings by creditors that have adopted the current expected credit losses methodology while enhancing disclosure requirements for certain loan refinancings and restructurings by creditors made to borrowers experiencing financial difficulty. Additionally, this guidance requires disclosure of current-period gross write-offs by year of origination for financing receivables and net investment in leases. The guidance became effective for the FHLB for the interim and annual periods beginning on January 1, 2023. The FHLB adopted this guidance as of January 1, 2023 and it did not have any effect on the FHLB's financial condition, results of operations, or cash flows. The adoption of this guidance will affect the FHLB's disclosures.

Fair Value Hedging - Portfolio Layer Method. In March 2022, the FASB issued guidance that expands fair value hedging under the current last-of-layer method by allowing multiple hedged layers of a single closed portfolio under the method. To reflect that expansion, the last-of-layer method is renamed the portfolio layer method. Additionally, among other things, this guidance (1) expands the scope of the portfolio layer method to include nonprepayable assets, (2) specifies eligible hedging instruments in a single-layer hedge, (3) provides additional guidance on the accounting for and disclosure of hedge basis adjustments under the portfolio layer method, and (4) specifies how hedge basis adjustments should be considered when determining credit losses for the assets included in the closed portfolio. The guidance became effective for the FHLB for the interim and annual periods beginning on January 1, 2023. The FHLB adopted this guidance as of January 1, 2023 and it did not have any effect on the FHLB's financial condition, results of operations, and cash flows. The FHLB may elect the fair value hedging portfolio layer method in the future.

Facilitation of the Effects of Reference Rate Reform on Financial Reporting, as amended. In March 2020, the FASB issued temporary, optional guidance to ease the potential burden in accounting for reference rate reform. The new guidance provides optional expedients and exceptions for applying GAAP to transactions affected by reference rate reform if certain criteria are met. The transactions primarily include (1) contract modifications, (2) hedging relationships, and (3) sale and/or transfer of debt securities classified as held-to-maturity. This guidance became effective for the FHLB beginning March 12, 2020 and may be applied through December 31, 2024. The FHLB elected optional practical expedients specific to fair value hedging relationships, which did not have a material effect, and may elect additional optional expedients in the future.

Note 3 - Cash and Due from Banks

Cash and due from banks on the Statement of Condition includes cash on hand, cash items in the process of collection, compensating balances, and amounts due from correspondent banks and the Federal Reserve Bank.

Compensating Balances. The FHLB maintains collected cash balances with commercial banks in return for certain services. These agreements contain no legal restrictions on the withdrawal of funds. The average collected cash balances for the years ended December 31, 2022 and 2021 were approximately $408,000 and $380,000, respectively.

Note 4 - Investments

The FHLB makes short-term investments in interest-bearing deposits, securities purchased under agreements to resell, and Federal funds sold and may make other investments in debt securities, which are classified as either trading, available-for-sale, or held-to-maturity.

Interest-Bearing Deposits, Securities Purchased under Agreements to Resell, and Federal Funds Sold

The FHLB invests in interest-bearing deposits, securities purchased under agreements to resell, and Federal funds sold to provide short-term liquidity.

Interest-bearing deposits and Federal funds sold are generally transacted with counterparties that have received a credit rating of single-A or greater by a nationally recognized statistical rating organization (NRSRO). The FHLB's internal ratings of these counterparties may differ from those issued by an NRSRO. Finance Agency regulations include a limit on the amount of unsecured credit the FHLB may extend to a counterparty. At December 31, 2022 and 2021, all investments in interest-bearing deposits and Federal funds sold were repaid or expected to be repaid according to the contractual terms. No allowance for credit losses was recorded for these assets at December 31, 2022 and 2021. Carrying values of interest-bearing deposits and Federal funds sold exclude accrued interest receivable of (in thousands) $5,524 and $1,299 as of December 31, 2022, and $1 and $10 as of December 31, 2021.

Securities purchased under agreements to resell are short-term and are structured such that they are evaluated regularly to determine if the market value of the underlying securities decreases below the market value required as collateral (i.e., subject to collateral maintenance provisions). If so, the counterparty must place an equivalent amount of additional securities as collateral or remit an equivalent amount of cash, generally by the next business day. Based upon the collateral held as security and collateral maintenance provisions with counterparties, the FHLB determined that no allowance for credit losses was needed for its securities purchased under agreements to resell at December 31, 2022 and 2021. The carrying value of securities purchased under agreements to resell excludes accrued interest receivable of (in thousands) $232 and $10 as of December 31, 2022 and 2021, respectively.

Debt Securities

The FHLB invests in debt securities, which are classified as either trading, available-for-sale, or held-to-maturity. The FHLB is prohibited by Finance Agency regulations from purchasing certain higher-risk securities, such as equity securities and debt instruments that are not investment quality, other than certain investments targeted at low-income persons or communities and instruments that experienced credit deterioration after their purchase by the FHLB.

Trading Securities

Table 4.1 - Trading Securities by Major Security Types (in thousands)

Fair Value	December 31, 2022	December 31, 2021
Non-mortgage-backed securities (non-MBS):		
U.S. Treasury obligations	$ 491,464	$ 5,030,946
GSE obligations	1,488,235	1,749,661
Total non-MBS	1,979,699	6,780,607
Mortgage-backed securities (MBS):		
U.S. obligation single-family	117	210
Total MBS	117	210
Total	$ 1,979,816	$ 6,780,817

Table 4.2 - Net Gains (Losses) on Trading Securities (in thousands)

	For the Years Ended December 31,		
	2022	2021	2020
Net unrealized gains (losses) on trading securities held at period end	$ (284,575)	$ (211,450)	$ 268,392
Net gains (losses) on trading securities sold/matured during the period	(52,314)	(46,047)	(10,826)
Net gains (losses) on trading securities	$ (336,889)	$ (257,497)	$ 257,566

Available-for-Sale Securities

Table 4.3 - Available-for-Sale Securities by Major Security Types (in thousands)

	December 31, 2022			
	Amortized Cost [(1)]	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 7,202,715	$ 3,584	$ (12,028)	$ 7,194,271
GSE obligations	117,555	726	(199)	118,082
Total non-MBS	7,320,270	4,310	(12,227)	7,312,353
MBS:				
GSE multi-family	1,360,221	—	(40,809)	1,319,412
Total MBS	1,360,221	—	(40,809)	1,319,412
Total	$ 8,680,491	$ 4,310	$ (53,036)	$ 8,631,765

	December 31, 2021			
	Amortized Cost [(1)]	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 4,475,664	$ 23,206	$ —	$ 4,498,870
GSE obligations	133,058	2,250	—	135,308
Total non-MBS	4,608,722	25,456	—	4,634,178
MBS:				
GSE multi-family	632,276	2,961	(2,292)	632,945
Total MBS	632,276	2,961	(2,292)	632,945
Total	$ 5,240,998	$ 28,417	$ (2,292)	$ 5,267,123

(1) Amortized cost of available-for-sale securities includes adjustments made to the cost basis of an investment for accretion, amortization, and/or fair value hedge accounting adjustments, and excludes accrued interest receivable of (in thousands) $40,246 and $13,014 at December 31, 2022 and 2021.

Table 4.4 summarizes the available-for-sale securities with gross unrealized losses, which are aggregated by major security type and length of time that individual securities have been in a continuous gross unrealized loss position.

Table 4.4 - Available-for-Sale Securities in a Continuous Gross Unrealized Loss Position (in thousands)

	December 31, 2022					
	Less than 12 Months		12 Months or more		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Non-MBS:						
U.S. Treasury obligations	$4,624,895	$ (12,028)	$ —	$ —	$4,624,895	$ (12,028)
GSE obligations	9,887	(199)	—	—	9,887	(199)
Total non-MBS	4,634,782	(12,227)	—	—	4,634,782	(12,227)
MBS:						
GSE multi-family MBS	959,421	(22,519)	359,991	(18,290)	1,319,412	(40,809)
Total MBS	959,421	(22,519)	359,991	(18,290)	1,319,412	(40,809)
Total	$5,594,203	$ (34,746)	$ 359,991	$ (18,290)	$5,954,194	$ (53,036)

	December 31, 2021					
	Less than 12 Months		12 Months or more		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
GSE multi-family MBS	$ 489,983	$ (2,292)	$ —	$ —	$ 489,983	$ (2,292)
Total	$ 489,983	$ (2,292)	$ —	$ —	$ 489,983	$ (2,292)

Table 4.5 - Available-for-Sale Securities by Contractual Maturity (in thousands)

	December 31, 2022		December 31, 2021	
Year of Maturity	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Non-MBS:				
Due in 1 year or less	$ —	$ —	$ —	$ —
Due after 1 year through 5 years	2,576,167	2,577,121	81,194	82,185
Due after 5 years through 10 years	4,734,017	4,725,345	4,515,054	4,538,945
Due after 10 years	10,086	9,887	12,474	13,048
Total non-MBS	7,320,270	7,312,353	4,608,722	4,634,178
MBS [(1)]	1,360,221	1,319,412	632,276	632,945
Total	$ 8,680,491	$ 8,631,765	$ 5,240,998	$ 5,267,123

(1) MBS are not presented by contractual maturity because their expected maturities will likely differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment fees.

Table 4.6 - Interest Rate Payment Terms of Available-for-Sale Securities (in thousands)

	December 31, 2022	December 31, 2021
Amortized cost of non-MBS:		
Fixed-rate	$ 7,320,270	$ 4,608,722
Total amortized cost of non-MBS	7,320,270	4,608,722
Amortized cost of MBS:		
Fixed-rate	1,360,221	632,276
Total amortized cost of MBS	1,360,221	632,276
Total	$ 8,680,491	$ 5,240,998

The FHLB had no sales of securities out of its available-for-sale portfolio for the years ended December 31, 2022, 2021 or 2020.

Held-to-Maturity Securities

Table 4.7 - Held-to-Maturity Securities by Major Security Types (in thousands)

	December 31, 2022			
	Amortized Cost [(1)]	Gross Unrecognized Holding Gains	Gross Unrecognized Holding Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 47,405	$ —	$ (51)	$ 47,354
Total non-MBS	47,405	—	(51)	47,354
MBS:				
U.S. obligation single-family	1,232,001	—	(147,423)	1,084,578
GSE single-family	1,632,099	4,074	(101,140)	1,535,033
GSE multi-family	12,392,854	598	(77,374)	12,316,078
Total MBS	15,256,954	4,672	(325,937)	14,935,689
Total	$ 15,304,359	$ 4,672	$ (325,988)	$ 14,983,043

	December 31, 2021			
	Amortized Cost [(1)]	Gross Unrecognized Holding Gains	Gross Unrecognized Holding Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 46,879	$ —	$ —	$ 46,879
Total non-MBS	46,879	—	—	46,879
MBS:				
U.S. obligation single-family	1,056,729	11,553	(8,337)	1,059,945
GSE single-family	1,860,197	49,026	—	1,909,223
GSE multi-family	7,252,951	4,841	(4,018)	7,253,774
Total MBS	10,169,877	65,420	(12,355)	10,222,942
Total	$ 10,216,756	$ 65,420	$ (12,355)	$ 10,269,821

(1) Carrying value equals amortized cost. Amortized cost of held-to-maturity securities includes adjustments made to the cost basis of an investment for accretion and amortization and excludes accrued interest receivable of (in thousands) $48,937 and $7,461 as of December 31, 2022 and 2021.

Table 4.8 - Held-to-Maturity Securities by Contractual Maturity (in thousands)

Year of Maturity	December 31, 2022 Amortized Cost (1)	December 31, 2022 Fair Value	December 31, 2021 Amortized Cost (1)	December 31, 2021 Fair Value
Non-MBS:				
Due in 1 year or less	$ 47,405	$ 47,354	$ 46,879	$ 46,879
Due after 1 year through 5 years	—	—	—	—
Due after 5 years through 10 years	—	—	—	—
Due after 10 years	—	—	—	—
Total non-MBS	47,405	47,354	46,879	46,879
MBS (2)	15,256,954	14,935,689	10,169,877	10,222,942
Total	$ 15,304,359	$ 14,983,043	$ 10,216,756	$ 10,269,821

(1) Carrying value equals amortized cost.
(2) MBS are not presented by contractual maturity because their expected maturities will likely differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment fees.

Table 4.9 - Interest Rate Payment Terms of Held-to-Maturity Securities (in thousands)

	December 31, 2022	December 31, 2021
Amortized cost of non-MBS:		
Fixed-rate	$ 47,405	$ 46,879
Total amortized cost of non-MBS	47,405	46,879
Amortized cost of MBS:		
Fixed-rate	2,709,494	2,718,127
Variable-rate	12,547,460	7,451,750
Total amortized cost of MBS	15,256,954	10,169,877
Total	$ 15,304,359	$ 10,216,756

From time to time the FHLB may sell securities out of its held-to-maturity portfolio. These securities, generally, have less than 15 percent of the acquired principal outstanding at the time of the sale. These sales are considered maturities for the purposes of security classification. For the years ended December 31, 2022, 2021 and 2020, the FHLB did not sell any held-to-maturity securities.

Allowance for Credit Losses on Available-for-Sale and Held-to-Maturity Securities

The FHLB evaluates available-for-sale and held-to-maturity investment securities for credit losses on a quarterly basis. The FHLB's available-for-sale and held-to-maturity securities are U.S. Treasury obligations, GSE obligations, and MBS issued by Fannie Mae, Freddie Mac and Ginnie Mae that are backed by single-family or multi-family mortgage loans. The FHLB only purchases securities considered investment quality. At December 31, 2022 and 2021, all available-for-sale and held-to-maturity securities were rated single-A, or above, by an NRSRO, based on the lowest long-term credit rating for each security used by the FHLB. The FHLB's internal ratings of these securities may differ from those obtained from an NRSRO.

The FHLB evaluates individual available-for-sale securities for impairment by comparing the security's fair value to its amortized cost. Impairment may exist when the fair value of the investment is less than its amortized cost (i.e., in an unrealized loss position). At December 31, 2022 and 2021, certain available-for-sale securities were in an unrealized loss position. These losses are considered temporary as the FHLB expects to recover the entire amortized cost basis on these available-for-sale investment securities and does not intend to sell these securities nor considers it more likely than not that it will be required to sell these securities before the anticipated recovery of each security's remaining amortized cost basis. Further, the FHLB has not experienced any payment defaults on the instruments and all of these securities are highly-rated. In the case of U.S. obligations, they carry an explicit government guarantee. In the case of GSE securities, they are purchased under the assumption that the issuers' obligation to pay principal and interest on those securities will be honored, taking into account their status as GSEs. As a result, no allowance for credit losses was recorded on these available-for-sale securities at December 31, 2022 and 2021.

The FHLB evaluates its held-to-maturity securities for impairment on a collective, or pooled basis, unless an individual assessment is deemed necessary because the securities do not possess similar risk characteristics. As of December 31, 2022 and 2021, the FHLB had not established an allowance for credit loss on any held-to-maturity securities because the securities: (1)

were all highly-rated and/or had short remaining terms to maturity, (2) had not experienced, nor did the FHLB expect, any payment default on the instruments, (3) in the case of U.S. obligations, the securities carry an explicit government guarantee such that the FHLB considered the risk of nonpayment to be zero, and (4) in the case of GSE securities, they are purchased under an assumption that the issuers' obligation to pay principal and interest on those securities will be honored, taking into account their status as GSEs.

Note 5 - Advances

The FHLB offers a wide range of fixed- and variable-rate Advance products with different maturities, interest rates, payment characteristics and optionality. Fixed-rate Advances generally have maturities ranging from one day to 30 years. Variable-rate Advances generally have maturities ranging from less than 30 days to 10 years, where the interest rates reset periodically at a fixed spread to a specified index. The following table presents Advance redemptions by contractual maturity, including index-amortizing Advances, which are presented according to their predetermined amortization schedules.

Table 5.1 - Advances by Redemption Term (dollars in thousands)

	December 31, 2022		December 31, 2021	
Redemption Term	Amount	Weighted Average Interest Rate	Amount	Weighted Average Interest Rate
Due in 1 year or less	$ 51,491,191	4.36 %	$ 11,608,264	0.49 %
Due after 1 year through 2 years	5,904,109	3.69	1,451,741	2.06
Due after 2 years through 3 years	2,969,160	4.01	1,832,622	1.89
Due after 3 years through 4 years	2,418,222	4.14	2,486,809	0.97
Due after 4 years through 5 years	2,462,903	3.28	2,168,145	0.98
Thereafter	2,182,434	2.29	3,406,837	1.49
Total principal amount	67,428,019	4.17	22,954,418	0.95
Commitment fees	(90)		(156)	
Discounts	(2,073)		(3,220)	
Fair value hedging adjustments	(406,255)		104,401	
Fair value option valuation adjustments and accrued interest	(46)		(695)	
Total [(1)]	$ 67,019,555		$ 23,054,748	

(1) Carrying values exclude accrued interest receivable of (in thousands) $149,255 and $18,823 as of December 31, 2022 and 2021.

The FHLB offers certain fixed- and variable-rate Advances to members that may be prepaid on specified dates (call dates) without incurring prepayment or termination fees (callable Advances). If the call option is exercised, replacement funding may be available to members. Other Advances may only be prepaid subject to a prepayment fee paid to the FHLB that makes the FHLB financially indifferent to the prepayment of the Advance.

Table 5.2 - Advances by Redemption Term or Next Call Date (in thousands)

Redemption Term or Next Call Date	December 31, 2022	December 31, 2021
Due in 1 year or less	$ 54,497,542	$ 14,642,697
Due after 1 year through 2 years	5,901,058	1,444,659
Due after 2 years through 3 years	1,465,860	1,809,871
Due after 3 years through 4 years	918,222	1,003,709
Due after 4 years through 5 years	2,462,903	668,145
Thereafter	2,182,434	3,385,337
Total principal amount	$ 67,428,019	$ 22,954,418

The FHLB also offers putable Advances. With a putable Advance, the FHLB effectively purchases put options from the member that allows the FHLB to terminate the Advance at predetermined dates. The FHLB normally would exercise its put option when interest rates increase relative to contractual rates.

Table 5.3 - Advances by Redemption Term or Next Put Date for Putable Advances (in thousands)

Redemption Term or Next Put Date	December 31, 2022	December 31, 2021
Due in 1 year or less	$ 52,461,191	$ 13,995,514
Due after 1 year through 2 years	5,929,109	1,511,741
Due after 2 years through 3 years	2,989,160	1,818,372
Due after 3 years through 4 years	2,418,222	2,471,809
Due after 4 years through 5 years	2,382,903	2,160,145
Thereafter	1,247,434	996,837
Total principal amount	$ 67,428,019	$ 22,954,418

Table 5.4 - Advances by Interest Rate Payment Terms (in thousands)

	December 31, 2022	December 31, 2021
Fixed-rate (1)		
Due in one year or less	$ 42,492,817	$ 11,161,638
Due after one year	8,968,517	8,211,221
Total fixed-rate (1)	51,461,334	19,372,859
Variable-rate (1)		
Due in one year or less	8,998,374	446,626
Due after one year	6,968,311	3,134,933
Total variable-rate (1)	15,966,685	3,581,559
Total principal amount	$ 67,428,019	$ 22,954,418

(1) Payment terms based on current interest rate terms, which reflect any option exercises or rate conversions that have occurred subsequent to the related Advance issuance.

Credit Risk Exposure and Security Terms

The FHLB's Advances are made to member financial institutions. The FHLB manages its credit exposure to Advances through an integrated approach that includes establishing a credit limit for each borrower and ongoing review of each borrower's financial condition, coupled with collateral and lending policies to limit risk of loss while balancing borrowers' needs for a reliable source of funding.

In addition, the FHLB lends to eligible borrowers in accordance with federal law and Finance Agency regulations, which require the FHLB to obtain sufficient collateral to fully secure credit products. Under regulation, collateral eligible to secure new or renewed Advances includes:

- one-to-four family loans (delinquent for no more than 60 days) and multi-family mortgage loans (delinquent for no more than 30 days) and securities representing such mortgages;
- loans and securities issued and insured, or guaranteed by the U.S. government or any U.S. government agency (for example, mortgage-backed securities issued or guaranteed by Fannie Mae, Freddie Mac, or Ginnie Mae);
- cash or deposits in the FHLB;
- certain other collateral that is real estate-related, provided that the collateral has a readily ascertainable value, can be reliably discounted to account for liquidation and other risks, can be liquidated in due course and the FHLB can perfect a security interest in it; and
- certain qualifying securities representing undivided equity interests in eligible Advance collateral.

Residential mortgage loans are the principal form of collateral for Advances. The estimated value of the collateral required to secure each member's credit products is calculated by applying collateral discounts, or haircuts, to the value of the collateral. In addition, community financial institutions are eligible to utilize expanded statutory collateral provisions for small business and agribusiness loans. The FHLB's capital stock owned by its member borrowers is also pledged as collateral. Collateral arrangements and a member’s borrowing capacity vary based on the financial condition and performance of the institution, the types of collateral pledged and the overall quality of those assets. The FHLB can also require additional or substitute collateral to protect its security interest. The FHLB also has policies and procedures for validating the reasonableness of its collateral valuations and makes changes to its collateral guidelines, as necessary, based on current market conditions. In addition, collateral verifications and reviews are performed by the FHLB based on the risk profile of the borrower. Management of the FHLB believes that these policies effectively manage the FHLB's credit risk from Advances.

Members experiencing financial difficulties are subject to FHLB-performed “stress tests” to evaluate the impact of poorly performing assets on the member’s capital and loss reserve positions. Depending on the results of these tests and the level of over-collateralization, a member may be allowed to maintain pledged loan assets in its custody, may be required to deliver those loans into the custody of the FHLB or its agent, or may be required to provide details on those loans to facilitate an estimate of their fair value. The FHLB perfects its security interest in all pledged collateral. The FHLBank Act affords any security interest granted to the FHLB by a member priority over the claims or rights of any other party except for claims or rights of a third party that would otherwise be entitled to priority under applicable law and that are held by a bona fide purchaser for value or by a secured party holding a prior perfected security interest.

Using a risk-based approach, the FHLB considers the payment status, collateralization levels, and borrower's financial condition to be indicators of credit quality for its credit products. At December 31, 2022 and 2021, the FHLB did not have any Advances that were past due, in non-accrual status or considered impaired. In addition, there were no troubled debt restructurings related to Advances of the FHLB during 2022 or 2021. At December 31, 2022 and 2021, the FHLB had rights to collateral on a member-by-member basis with an estimated value in excess of its outstanding extensions of credit.

Based upon the collateral held as security, its credit extension and collateral policies and the repayment history on Advances, the FHLB did not expect any credit losses on Advances as of December 31, 2022 and, therefore, no allowance for credit losses on Advances was recorded. For the same reasons, the FHLB did not record any allowance for credit losses on Advances at December 31, 2021.

Advance Concentrations

The FHLB's Advances are concentrated in commercial banks, savings institutions, and insurance companies. Advance borrower concentrations can change significantly because of members' ability to quickly increase or decrease their amount of Advances based on their current funding needs.

Table 5.5 - Borrowers Holding Five Percent or more of Total Advances, Including Any Known Affiliates that are Members of the FHLB (dollars in millions)

December 31, 2022			December 31, 2021		
	Principal	**% of Total Principal Amount of Advances**		**Principal**	**% of Total Principal Amount of Advances**
U.S. Bank, N.A.	$ 19,000	28 %	U.S. Bank, N.A.	$ 3,272	14 %
Keybank, N.A.	11,344	17	Third Federal Savings and Loan Association	3,179	14
Third Federal Savings and Loan Association	4,826	7	Protective Life Insurance Company	2,800	12
Fifth Third Bank	4,301	6	Nationwide Life Insurance Company	2,702	12
Nationwide Life Insurance Company	3,136	5	Western-Southern Life Assurance Co.	1,487	6
Total	$ 42,607	63 %	Total	$ 13,440	58 %

Note 6 - Mortgage Loans

Total mortgage loans held for portfolio represent residential mortgage loans under the Mortgage Purchase Program (MPP) that the FHLB's members originate, credit enhance, and then sell to the FHLB. The FHLB does not service any of these loans. The FHLB plans to retain its existing portfolio of mortgage loans.

Table 6.1 - Mortgage Loans Held for Portfolio (in thousands)

	December 31, 2022	December 31, 2021
Fixed rate medium-term single-family mortgage loans (1)	$ 530,956	$ 649,052
Fixed rate long-term single-family mortgage loans	6,475,525	6,752,858
Total unpaid principal balance	7,006,481	7,401,910
Premiums	151,756	168,993
Discounts	(2,246)	(1,088)
Hedging basis adjustments (2)	6,819	18,602
Total mortgage loans held for portfolio (3)	7,162,810	7,588,417
Allowance for credit losses on mortgage loans	(301)	(233)
Mortgage loans held for portfolio, net	$ 7,162,509	$ 7,588,184

(1) Medium-term is defined as a term of 15 years or less.
(2) Represents the unamortized balance of the mortgage purchase commitments' market values at the time of settlement. The market value of the commitment is included in the basis of the mortgage loan and amortized accordingly.
(3) Excludes accrued interest receivable of (in thousands) $21,846 and $22,847 at December 31, 2022 and 2021.

Table 6.2 - Mortgage Loans Held for Portfolio by Collateral/Guarantee Type (in thousands)

	December 31, 2022	December 31, 2021
Conventional mortgage loans	$ 6,893,552	$ 7,262,740
Federal Housing Administration (FHA) mortgage loans	112,929	139,170
Total unpaid principal balance	$ 7,006,481	$ 7,401,910

Table 6.3 - Members, Including Any Known Affiliates that are Members of the FHLB, and Former Members Selling Five Percent or more of Total Unpaid Principal (dollars in millions)

	December 31, 2022			December 31, 2021	
	Principal	% of Total		Principal	% of Total
Union Savings Bank	$ 1,651	24 %	Union Savings Bank	$ 1,841	25 %
FirstBank	730	10	FirstBank	565	8
Guardian Savings Bank FSB	438	6	Guardian Savings Bank FSB	524	7

Credit Risk Exposure

The FHLB manages credit risk exposure for conventional mortgage loans primarily though conservative underwriting and purchasing loans with characteristics consistent with favorable expected credit performance and by applying various credit enhancements.

Credit Enhancements. The conventional mortgage loans under the MPP are primarily supported by some combination of credit enhancements (primary mortgage insurance (PMI) and the Lender Risk Account (LRA), including pooled LRA for those members participating in an aggregated MPP pool). These credit enhancements apply after a homeowner's equity is exhausted. The LRA is funded by the FHLB upfront as a portion of the purchase proceeds. The LRA is recorded in other liabilities in the Statement of Condition. Excess funds from the LRA are released to the member in accordance with the terms of the Master Commitment Contract, which is typically after five years, subject to performance of the related loan pool. The LRA established for a pool of loans is limited to only covering losses of that specific pool of loans. Because the FHA makes an explicit guarantee on FHA mortgage loans, the FHLB does not require any credit enhancements on these loans beyond primary mortgage insurance.

Table 6.4 - Changes in the LRA (in thousands)

	For the Years Ended December 31,		
	2022	2021	2020
LRA at beginning of year	$ 252,310	$ 246,435	$ 233,476
Additions	7,476	20,181	28,795
Claims	(25)	(3)	(101)
Scheduled distributions	(15,507)	(14,303)	(15,735)
LRA at end of period	$ 244,254	$ 252,310	$ 246,435

Payment Status of Mortgage Loans. The key credit quality indicator for conventional mortgage loans is payment status, which allows the FHLB to monitor borrower performance. Past due loans are those where the borrower has failed to make a full payment of principal and interest within one month of its due date. Table 6.5 presents the payment status of conventional mortgage loans.

Table 6.5 - Credit Quality Indicator of Conventional Mortgage Loans (in thousands)

	December 31, 2022		
	Origination Year		
Payment status, at amortized cost:	Prior to 2018	2018 to 2022	Total
Past due 30-59 days	$ 12,643	$ 14,440	$ 27,083
Past due 60-89 days	3,303	1,751	5,054
Past due 90 days or more	8,251	3,682	11,933
Total past due mortgage loans	24,197	19,873	44,070
Current mortgage loans	2,404,090	4,600,889	7,004,979
Total conventional mortgage loans	$ 2,428,287	$ 4,620,762	$ 7,049,049

	December 31, 2021		
	Origination Year		
Payment status, at amortized cost:	Prior to 2017	2017 to 2021	Total
Past due 30-59 days	$ 16,105	$ 11,557	$ 27,662
Past due 60-89 days	3,703	2,533	6,236
Past due 90 days or more	12,185	11,623	23,808
Total past due mortgage loans	31,993	25,713	57,706
Current mortgage loans	2,542,107	4,848,339	7,390,446
Total conventional mortgage loans	$ 2,574,100	$ 4,874,052	$ 7,448,152

Other delinquency statistics include loans in process of foreclosure, serious delinquency rates, loans past due 90 days or more and still accruing interest, and non-accrual loans. Table 6.6 presents other delinquency statistics of mortgage loans.

Table 6.6 - Other Delinquency Statistics (dollars in thousands)

	December 31, 2022		
Amortized Cost:	Conventional MPP Loans	FHA Loans	Total
In process of foreclosure (1)	$ 7,206	$ 361	$ 7,567
Serious delinquency rate (2)	0.18 %	1.32 %	0.19 %
Past due 90 days or more still accruing interest (3)	$ 11,369	$ 1,500	$ 12,869
Loans on non-accrual status (4)	$ 1,423	$ —	$ 1,423

	December 31, 2021		
Amortized Cost:	Conventional MPP Loans	FHA Loans	Total
In process of foreclosure (1)	$ 4,424	$ 501	$ 4,925
Serious delinquency rate (2)	0.32 %	2.00 %	0.35 %
Past due 90 days or more still accruing interest (3)	$ 23,169	$ 2,812	$ 25,981
Loans on non-accrual status (4)	$ 1,617	$ —	$ 1,617

(1) Includes loans where the decision of foreclosure or a similar alternative such as pursuit of deed-in-lieu has been reported.

(2) Loans that are 90 days or more past due or in the process of foreclosure (including past due or current loans in the process of foreclosure) expressed as a percentage of the total loan portfolio class.

(3) Each conventional loan past due 90 days or more still accruing interest is on a schedule/scheduled monthly settlement basis and contains one or more credit enhancements. Loans that are well secured and in the process of collection as a result of remaining credit enhancements and schedule/scheduled settlement are not placed on non-accrual status.

(4) At December 31, 2022 and 2021, (in thousands) $971 and $1,617, respectively, of conventional MPP loans on non-accrual status do not have a related allowance because these loans were either previously charged off to their expected recoverable value and/or the fair value of the underlying collateral, including any credit enhancements, is greater than the amortized cost of the loans.

The FHLB did not have any real estate owned at December 31, 2022 or 2021.

Troubled Debt Restructurings. A troubled debt restructuring is considered to have occurred when a concession is granted to a borrower for economic or legal reasons related to the borrower's financial difficulties and that concession would not have been considered otherwise. The FHLB's troubled debt restructurings primarily involve loans where an agreement permits the recapitalization of past due amounts up to the original loan amount and certain loans discharged in Chapter 7 bankruptcy. The FHLB's amortized cost in modified loans considered troubled debt restructurings was (in thousands) $19,460 and $19,970 at December 31, 2022 and 2021, respectively. The amount of troubled debt restructurings is not considered material to the FHLB's financial condition, results of operations, or cash flows.

Evaluation of Current Expected Credit Losses

Mortgage Loans - FHA. The FHLB invests in fixed-rate mortgage loans secured by one to four family residential properties insured by the FHA. The FHLB expects to recover any losses from such loans from the FHA. Any losses from these loans that are not recovered from the FHA would be caused by a claim rejection by the FHA and, as such, would be recoverable from the selling participating financial institutions. Therefore, the FHLB only has credit risk for these loans if the seller or servicer fails to pay for losses not covered by the FHA insurance, but in such instance, the FHLB would have recourse against the servicer for such failure. As a result, the FHLB did not record an allowance for credit losses on its FHA insured mortgage loans. Furthermore, due to the insurance, none of these mortgage loans have been placed on non-accrual status.

Mortgage Loans - Conventional MPP. Conventional loans are evaluated collectively when similar risk characteristics exist; loans that do not share risk characteristics with other pools are removed from the collective evaluation and evaluated for expected credit losses on an individual basis. For loans with similar risk characteristics, the FHLB determines the allowance for credit losses through analyses that include considering various loan portfolio and collateral-related characteristics, such as past performance, current conditions, and reasonable and supportable forecasts of expected economic conditions. The FHLB uses a model that employs a variety of methods, such as projected cash flows to estimate expected credit losses over the life of the loans. This model relies on a number of inputs, such as both current and forecasted property values and interest rates as well as historical borrower behavior experience. The FHLB’s calculation of expected credit losses includes a forecast of home prices over the entire contractual terms of its conventional loans rather than a reversion to historical home price trends after an initial forecast period. The FHLB also incorporates associated credit enhancements to determine estimated expected credit losses.

Certain conventional loans may be evaluated for credit losses by using the practical expedient for collateral dependent assets. A mortgage loan is considered collateral dependent when the borrower is experiencing financial difficulty and repayment is expected to be substantially through the sale of the underlying collateral. The FHLB may estimate the fair value of this collateral by either applying an appropriate loss severity rate, using third-party estimates, or using a property valuation model. The expected credit loss of a collateral dependent mortgage loan is equal to the difference between the amortized cost of the loan and the estimated fair value of the collateral, less estimated selling costs. The FHLB will either reserve for these estimated losses or record a direct charge-off of the loan balance, if certain triggering criteria are met. Expected recoveries of prior charge-offs, if any, are included in the allowance for credit losses.

The FHLB also assesses other qualitative factors in its estimation of loan losses for the collectively evaluated population. This amount represents a subjective management judgment, based on facts and circumstances that exist as of the reporting date, which is intended to cover other expected losses that may not otherwise be captured in the methodology described above.

Allowance for Credit Losses on Conventional Mortgage Loans. At December 31, 2022 and 2021 the FHLB's allowance for credit losses on its conventional mortgage loans held for portfolio was (in thousands) $301 and $233, respectively.

Note 7 - Derivatives and Hedging Activities

Nature of Business Activity

The FHLB is exposed to interest rate risk primarily from the effect of changes in interest rates. The goal of the FHLB'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, the FHLB has established policies and procedures, which include guidelines on the amount of exposure to interest rate changes it is willing to accept. In addition, the FHLB monitors the risk to its interest income, net interest margin and average maturity of interest-earning assets and interest-bearing liabilities. The FHLB uses derivatives when they are considered to be the most cost-effective alternative to achieve the FHLB's financial and risk management objectives.

The FHLB transacts its derivatives with counterparties that are 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 executed either with a counterparty, referred to as uncleared derivatives, or cleared through a Futures Commission Merchant (i.e., clearing agent) with a Derivative Clearing Organization, referred to as cleared derivatives. The FHLB is not a derivative dealer and does not trade derivatives for short-term profit.

Consistent with Finance Agency regulations, the FHLB enters into derivatives to manage the interest rate risk exposures inherent in otherwise unhedged assets and funding positions, to achieve the FHLB's risk management objectives and to act as an intermediary between its members and counterparties. The use of derivatives is an integral part of the FHLB's financial management strategy. However, Finance Agency regulations and the FHLB's financial management policy prohibit trading in, or the speculative use of, derivative instruments and limit credit risk arising from them.

The most common ways in which the FHLB 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);
- manage embedded options in assets and liabilities;

- reduce funding costs by combining a derivative with a Consolidated Obligation, as 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.

Types of Derivatives

The FHLB primarily uses the following derivative instruments:

Interest rate swaps - An interest rate swap is an agreement between two entities to exchange cash flows in the future. The agreement sets the dates on which the cash flows will be exchanged and the manner in which the cash flows will be calculated. One of the simplest forms of an interest rate swap involves the promise by one party to pay cash flows equivalent to the interest on a notional principal amount at a predetermined fixed rate for a given period of time. In return for this promise, this party receives cash flows equivalent to the interest on the same notional principal amount at a variable-rate index for the same period of time. As of December 31, 2022, the variable-rates received or paid by the FHLB in its derivative transactions were based on the Federal Funds Overnight Index Swap (OIS), Secured Overnight Financing Rate (SOFR), and London InterBank Offering Rate (LIBOR).

Swaptions - A swaption is an option on a swap that gives the buyer the right to enter into a specified interest rate swap at a certain time in the future. The FHLB may enter into both payer swaptions and receiver swaptions. A payer swaption is the option to make fixed interest payments at a later date and a receiver swaption is the option to receive fixed interest payments at a later date.

Forwards Contracts - Forwards contracts gives the buyer the right to buy or sell a specific type of asset at a specific time at a given price. For example, certain mortgage delivery commitments entered into by the FHLB are considered derivatives. The FHLB may hedge these commitments by selling to-be-announced (TBA) mortgage-backed securities for forward settlement. A TBA represents a forward contract for the sale of mortgage-backed securities at a future agreed upon date for an established price.

Application of Derivatives

The FHLB documents at inception all relationships between derivatives designated as hedging instruments and the hedged items, its risk management objectives and strategies for undertaking various hedge transactions, and its method of assessing hedge effectiveness. This process includes linking all derivatives that are designated as fair value hedges to assets and liabilities on the Statements of Condition.

The FHLB may use certain derivatives as fair value hedges of associated financial instruments. However, because the FHLB uses derivatives when they are considered to be the most cost-effective alternative to achieve the FHLB's financial and risk management objectives, it may enter into derivatives that do not necessarily qualify for hedge accounting (economic hedges). The FHLB re-evaluates its hedging strategies from time to time and may change the hedging techniques it uses or adopt new strategies.

Types of Hedged Items

The types of assets and liabilities currently hedged with derivatives are:

Investments - The interest rate and prepayment risks associated with the FHLB's investment securities are managed through a combination of debt issuance and derivatives. The FHLB may manage the prepayment and interest rate risk by funding investment securities with Consolidated Obligations that have call features or by hedging these risks with interest rate swaps, caps or floors, or swaptions. The FHLB may also manage the risk arising from changing market prices and volatility of investment securities by entering into economic derivatives that generally offset the changes in fair value of the securities. Derivatives held by the FHLB that are associated with trading and held-to-maturity securities are designated as economic hedges, and derivatives specifically linked to individual available-for-sale securities may qualify as fair value hedges or be designated as economic hedges.

Advances - The FHLB offers a wide range of fixed- and variable-rate Advance products with different maturities, interest rates, payment characteristics, and optionality. The FHLB may use derivatives to manage the repricing and/or option characteristics of Advances in order to more closely match the characteristics of the FHLB's funding liabilities. In general, whenever a member executes a fixed-rate Advance or a variable-rate Advance with embedded options, the FHLB may simultaneously execute a derivative with terms that offset the terms and embedded options in the Advance. For example, the FHLB may hedge a fixed-rate Advance with an interest rate swap where the FHLB pays a fixed-rate and receives a variable-rate, effectively converting the fixed-rate Advance to a variable-rate Advance. These types of hedges are typically treated as fair value hedges.

When issuing a putable Advance, the FHLB effectively purchases a put option from the member that allows the FHLB to put or extinguish the fixed-rate Advance, which the FHLB normally would exercise when interest rates increase. The FHLB may hedge these Advances by entering into a cancelable derivative.

Mortgage Loans - The FHLB invests in fixed-rate mortgage loans. The prepayment options embedded in mortgage loans can result in extensions or contractions in the expected repayment of these investments, depending on changes in actual and estimated prepayment speeds. The FHLB may manage the interest rate and prepayment risks associated with mortgage loans through a combination of debt issuance and derivatives. The FHLB issues both callable and non-callable debt and prepayment linked Consolidated Obligations to achieve cash flow patterns and liability durations similar to those expected on the mortgage loans. The FHLB may purchase swaptions to minimize the prepayment risk embedded in mortgage loans. Although these derivatives are valid economic hedges against the prepayment risk of the loans, they are not specifically linked to individual loans and therefore do not receive fair value hedge accounting. These derivatives are marked-to-market through earnings.

Consolidated Obligations - The FHLB may enter into derivatives to hedge the interest rate risk associated with its debt issuances. The FHLB manages the risk arising from changing market prices and volatility of a Consolidated Obligation by matching the cash inflow on a derivative with the cash outflow on the Consolidated Obligation.

For example, fixed-rate Consolidated Obligations are issued and the FHLB may simultaneously enter into a matching interest rate swap in which the counterparty pays fixed cash flows to the FHLB designed to mirror in timing and amount the cash outflows the FHLB pays on the Consolidated Obligation. The FHLB pays a variable cash flow that closely matches the interest payments it receives on short-term or variable-rate Advances. These transactions are treated as fair value hedges.

This strategy of issuing Consolidated Obligations while simultaneously entering into derivatives enables the FHLB to offer a wider range of attractively priced Advances to its members and may allow the FHLB to reduce its funding costs. The continued attractiveness of such debt depends on yield relationships between the FHLB's Consolidated Obligations and the derivative markets. If conditions in these markets change, the FHLB may alter the types or terms of the Consolidated Obligations.

Firm Commitments - Certain mortgage loan purchase commitments, such as mortgage delivery commitments, are considered derivatives. The FHLB may hedge these commitments by selling TBA mortgage-backed securities for forward settlement. The mortgage loan purchase commitment and the TBA used in the firm commitment hedging strategy are treated as an economic hedge and are marked-to-market through earnings. When the mortgage loan purchase commitment derivative settles, the current market value of the commitment is included in the basis of the mortgage loan and amortized accordingly.

Financial Statement Effect and Additional Financial Information

The notional amount of derivatives serves as a factor in determining periodic interest payments or cash flows received and paid. The notional amount reflects the FHLB's involvement in the various classes of financial instruments and represents neither the actual amounts exchanged nor the overall exposure of the FHLB to credit and market risk; the overall risk is much smaller. The risks of derivatives only can be measured meaningfully on a portfolio basis that takes into account the counterparties, the types of derivatives, the items being hedged and any offsets between the derivatives and the items being hedged.

Table 7.1 summarizes the notional amount and fair value of derivative instruments and total derivative assets and liabilities. Total derivative assets and liabilities include the effect of netting adjustments and cash collateral. For purposes of this disclosure, the derivative values include the fair value of derivatives and the related accrued interest.

Table 7.1 - Fair Value of Derivative Instruments (in thousands)

	December 31, 2022		
	Notional Amount of Derivatives	**Derivative Assets**	**Derivative Liabilities**
Derivatives designated as fair value hedging instruments:			
Interest rate swaps	$ 21,577,007	$ 37,175	$ 32,630
Derivatives not designated as hedging instruments:			
Interest rate swaps	28,840,270	5,839	55,327
Interest rate swaptions	355,000	7,766	—
Mortgage delivery commitments	14,291	12	88
Total derivatives not designated as hedging instruments	29,209,561	13,617	55,415
Total derivatives before adjustments	$ 50,786,568	50,792	88,045
Netting adjustments and cash collateral [1]		439,768	(87,585)
Total derivative assets and total derivative liabilities		$ 490,560	$ 460

	December 31, 2021		
	Notional Amount of Derivatives	**Derivative Assets**	**Derivative Liabilities**
Derivatives designated as fair value hedging instruments:			
Interest rate swaps	$ 13,720,290	$ 710	$ 77,992
Derivatives not designated as hedging instruments:			
Interest rate swaps	24,059,664	1,919	291
Interest rate swaptions	1,219,000	532	—
Mortgage delivery commitments	249,581	77	829
Total derivatives not designated as hedging instruments	25,528,245	2,528	1,120
Total derivatives before adjustments	$ 39,248,535	3,238	79,112
Netting adjustments and cash collateral [1]		294,498	(75,821)
Total derivative assets and total derivative liabilities		$ 297,736	$ 3,291

(1) Amounts represent the application of the netting requirements that allow the FHLB to settle positive and negative positions, and also cash collateral, including accrued interest, held or placed by the FHLB with the same clearing agent and/or counterparty. Cash collateral posted, including accrued interest, was (in thousands) $533,270 and $370,779 at December 31, 2022 and 2021. Cash collateral received, including accrued interest, was (in thousands) $5,917 and $460 at December 31, 2022 and 2021.

Table 7.2 presents the impact of qualifying fair value hedging relationships on net interest income as well as the total interest income (expense) by product.

Table 7.2 - Impact of Fair Value Hedging Relationships on Net Interest Income (in thousands)

	For the Year Ended December 31, 2022		
	Advances	Available-for-Sale Securities	Consolidated Bonds
Total interest income (expense) recorded in the Statements of Income	$ 1,208,130	$ 162,394	$ (935,003)
Impact of Fair Value Hedging Relationships			
Interest rate swaps:			
Net interest settlements	$ 11,923	$ 39,382	$ (4,263)
Gain (loss) on derivatives	521,180	913,021	(40,279)
Gain (loss) on hedged items	(510,628)	(928,860)	40,640
Effect on net interest income	$ 22,475	$ 23,543	$ (3,902)

	For the Year Ended December 31, 2021		
	Advances	Available-for-Sale Securities	Consolidated Bonds
Total interest income (expense) recorded in the Statements of Income	$ 134,600	$ 7,228	$ (343,495)
Impact of Fair Value Hedging Relationships			
Interest rate swaps:			
Net interest settlements	$ (109,824)	$ (20,521)	$ 1,137
Gain (loss) on derivatives	254,151	71,732	(3,217)
Gain (loss) on hedged items	(254,112)	(71,331)	3,190
Effect on net interest income	$ (109,785)	$ (20,120)	$ 1,110

	For the Year Ended December 31, 2020		
	Advances	Available-for-Sale Securities	Consolidated Bonds
Total interest income (expense) recorded in the Statements of Income	$ 434,815	$ 4,782	$ (541,996)
Impact of Fair Value Hedging Relationships			
Interest rate swaps:			
Net interest settlements	$ (90,959)	$ (2,484)	$ 1,652
Gain (loss) on derivatives	(263,046)	(5,209)	1,477
Gain (loss) on hedged items	247,059	4,826	(1,377)
Effect on net interest income	$ (106,946)	$ (2,867)	$ 1,752

Table 7.3 presents the cumulative basis adjustments on hedged items designated as fair value hedges and the related amortized cost of the hedged items.

Table 7.3 - Cumulative Basis Adjustments for Fair Value Hedges (in thousands)

	December 31, 2022		
	Advances	Available-for-Sale Securities	Consolidated Bonds
Amortized cost of hedged asset or liability [(1)]	$ 10,199,624	$ 8,668,634	$ 1,286,881
Fair value hedging adjustments			
Basis adjustments for active hedging relationships included in amortized cost	$ (407,137)	$ (989,810)	$ (41,745)
Basis adjustments for discontinued hedging relationships included in amortized cost	882	13,932	—
Total amount of fair value hedging basis adjustments	$ (406,255)	$ (975,878)	$ (41,745)

	December 31, 2021		
	Advances	Available-for-Sale Securities	Consolidated Bonds
Amortized cost of hedged asset or liability [(1)]	$ 8,089,716	$ 5,238,549	$ 450,369
Fair value hedging adjustments			
Basis adjustments for active hedging relationships included in amortized cost	$ 103,468	$ (61,734)	$ (1,104)
Basis adjustments for discontinued hedging relationships included in amortized cost	933	2,627	—
Total amount of fair value hedging basis adjustments	$ 104,401	$ (59,107)	$ (1,104)

(1) Includes only the portion of amortized cost representing the hedged items in fair value hedging relationships.

Table 7.4 presents net gains (losses) recorded in non-interest income (loss) on derivatives not designated as hedging instruments.

Table 7.4 - Net Gains (Losses) Recorded in Non-interest Income (Loss) on Derivatives Not Designated as Hedging Instruments (in thousands)

	For the Years Ended December 31,		
	2022	2021	2020
Derivatives not designated as hedging instruments:			
Economic hedges:			
Interest rate swaps	$ 220,342	$ 242,731	$ (227,781)
Interest rate swaptions	9,617	(181)	90,594
Forward rate agreements	—	—	(31,935)
Net interest settlements	(89,583)	(163,533)	(127,098)
Mortgage delivery commitments	(8,507)	3,119	21,549
Total net gains (losses) related to derivatives not designated as hedging instruments	131,869	82,136	(274,671)
Price alignment amount [(1)]	(878)	128	1,418
Net gains (losses) on derivatives	$ 130,991	$ 82,264	$ (273,253)

(1) This amount is for derivatives for which variation margin is characterized as a daily settled contract.

Credit Risk on Derivatives

The FHLB is subject to credit risk given 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 Finance Agency regulations.

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. The FHLB requires collateral agreements on its uncleared derivatives with the collateral delivery threshold set to zero.

For cleared derivatives, the Clearinghouse is the FHLB's counterparty. The Clearinghouse notifies the clearing agent of the required initial and variation margin and the clearing agent in turn notifies the FHLB. The FHLB utilizes two Clearinghouses for all cleared derivative transactions, LCH Ltd. and CME Clearing. At both Clearinghouses, variation margin is characterized as daily settlement payments, while initial margin is considered to be collateral. The requirement that the FHLB post initial and variation margin through the clearing agent, to the Clearinghouse, exposes the FHLB 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 value of cleared derivatives is posted daily through a clearing agent. On the Statements of Cash Flows, the variation margin cash payments, or daily settlement payments, are included in net change in derivative and hedging activities, as an operating activity.

For cleared derivatives, the Clearinghouse determines initial margin requirements and generally credit ratings are not factored into the initial margin. However, clearing agents may require additional initial margin to be posted based on credit considerations, including, but not limited to, credit rating downgrades. At December 31, 2022, the FHLB was not required to post additional initial margin by its clearing agents based on credit considerations.

Offsetting of Derivative Assets and Derivative Liabilities

The FHLB presents derivative instruments, related cash collateral 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.

The FHLB has analyzed the enforceability of offsetting rights incorporated in its cleared derivative transactions, and it expects that the exercise of those offsetting rights by a non-defaulting party under these transactions would be upheld under applicable law upon an event of default including bankruptcy, insolvency, or similar proceeding involving the Clearinghouse or the FHLB's clearing agent, or both. Based on this analysis, the FHLB presents a net derivative receivable or payable for all of its transactions through a particular clearing agent with a particular Clearinghouse.

Table 7.5 presents separately the fair value of derivative instruments meeting or not meeting netting requirements, including the related collateral. At December 31, 2022 and 2021, the FHLB did not receive or pledge any non-cash collateral. Any over-collateralization under an individual clearing agent and/or counterparty level is not included in the determination of the net unsecured amount.

Table 7.5 - Offsetting of Derivative Assets and Derivative Liabilities (in thousands)

	December 31, 2022			
	Derivative Instruments Meeting Netting Requirements			
	Gross Recognized Amount	Gross Amount of Netting Adjustments and Cash Collateral	Derivative Instruments Not Meeting Netting Requirements (1)	Total Derivative Assets and Total Derivative Liabilities
Derivative Assets:				
Uncleared	$ 19,195	$ (12,600)	$ 12	$ 6,607
Cleared	31,585	452,368	—	483,953
Total				$ 490,560
Derivative Liabilities:				
Uncleared	$ 83,896	$ (83,524)	$ 88	$ 460
Cleared	4,061	(4,061)	—	—
Total				$ 460

	December 31, 2021			
	Derivative Instruments Meeting Netting Requirements			
	Gross Recognized Amount	Gross Amount of Netting Adjustments and Cash Collateral	Derivative Instruments Not Meeting Netting Requirements (1)	Total Derivative Assets and Total Derivative Liabilities
Derivative Assets:				
Uncleared	$ 1,892	$ (1,748)	$ 77	$ 221
Cleared	1,269	296,246	—	297,515
Total				$ 297,736
Derivative Liabilities:				
Uncleared	$ 77,126	$ (74,664)	$ 829	$ 3,291
Cleared	1,157	(1,157)	—	—
Total				$ 3,291

(1) Represents mortgage delivery commitments that are not subject to an enforceable netting agreement.

Note 8 - Deposits

The FHLB offers demand and overnight deposits to members and to qualifying nonmembers. In addition, the FHLB offers short-term interest-bearing deposit programs to members, and in certain cases, to qualifying nonmembers. A member that services mortgage loans may deposit funds collected in connection with the mortgage loans at the FHLB, pending disbursement of such funds to the owners of the mortgage loans. The FHLB classifies these funds as other interest-bearing deposits. Deposits classified as demand, overnight, and other pay interest based on a daily interest rate. Term deposits pay interest based on a fixed rate determined at the issuance of the deposit.

Table 8.1 - Deposits (in thousands)

	December 31, 2022	December 31, 2021
Interest-bearing:		
Demand and overnight	$ 977,140	$ 1,353,490
Term	55,925	53,650
Other	6,362	8,511
Total interest-bearing deposits	$ 1,039,427	$ 1,415,651

Note 9 - Consolidated Obligations

Consolidated Obligations consist of Consolidated Bonds and Discount Notes. The FHLBanks issue Consolidated Obligations through the Office of Finance as their agent. In connection with each debt issuance, each FHLBank specifies the amount of debt it wants issued on its behalf. The Office of Finance tracks the amount of debt issued on behalf of each FHLBank. In addition, the FHLBank records as a liability its specific portion of Consolidated Obligations for which it is the primary obligor.

The Finance Agency and the U.S. Secretary of the Treasury oversee the issuance of FHLBank debt through the Office of Finance. Consolidated Bonds may be issued to raise short-, intermediate-, and long-term funds for the FHLBanks and are not subject to any statutory or regulatory limits on maturity. Consolidated Discount Notes are issued primarily to raise short-term funds and have original maturities up to one year. These notes generally sell at less than their face amount and are redeemed at par value when they mature.

Although the FHLB is primarily liable for its portion of Consolidated Obligations, the FHLB is also jointly and severally liable with the other 10 FHLBanks for the payment of principal and interest on all Consolidated Obligations of each of the other FHLBanks. The Finance Agency, at its discretion, may require any FHLBank to make principal or interest payments due on any Consolidated Obligation whether or not the Consolidated Obligation represents a primary liability of such FHLBank. Although an FHLBank has never paid the principal or interest payments due on a Consolidated Obligation on behalf of another FHLBank, if that event should occur, Finance Agency regulations provide that the paying FHLBank is entitled to reimbursement from the FHLBank that is primarily liable for that Consolidated Obligation for any payments and other associated costs, including interest to be determined by the Finance Agency. If, however, that FHLBank is unable to satisfy its repayment obligations, the Finance Agency may allocate the outstanding liabilities of that FHLBank among the remaining FHLBanks on a *pro rata* basis in proportion to each FHLBank's participation in all Consolidated Obligations outstanding or in any other manner it may determine to ensure that the FHLBanks operate in a safe and sound manner.

The par values of the 11 FHLBanks' outstanding Consolidated Obligations were approximately $1,181.7 billion and $652.9 billion at December 31, 2022 and 2021, respectively. Finance Agency regulations require the FHLB to maintain unpledged qualifying assets equal to its participation in the Consolidated Obligations outstanding. Qualifying assets are defined as cash; secured Advances; obligations of or fully guaranteed by the United States; and investments (i.e., obligations, participations or other instruments of or issued by Fannie Mae or Ginnie Mae; mortgage, obligations, or other securities which are or ever have been sold by Freddie Mac; and such securities as fiduciary and trust funds may invest in under the laws of the state in which the FHLB is located). Any assets subject to a lien or pledge for the benefit of holders of any issue of Consolidated Obligations are treated as if they were free from lien or pledge for purposes of compliance with these regulations.

Table 9.1 - Consolidated Discount Notes Outstanding (dollars in thousands)

	Carrying Value	Principal Amount	Weighted Average Interest Rate (1)
December 31, 2022	$ 40,691,180	$ 41,007,526	3.95 %
December 31, 2021	$ 29,837,696	$ 29,843,992	0.05 %

(1) Represents an implied rate without consideration of concessions.

Table 9.2 - Consolidated Bonds Outstanding by Original Contractual Maturity (dollars in thousands)

	December 31, 2022		December 31, 2021	
Year of Original Contractual Maturity	Amount	Weighted Average Interest Rate	Amount	Weighted Average Interest Rate
Due in 1 year or less	$ 48,105,620	4.00 %	$ 12,828,885	0.55 %
Due after 1 year through 2 years	3,056,405	2.97	3,836,120	1.91
Due after 2 years through 3 years	2,815,000	1.70	1,724,405	2.23
Due after 3 years through 4 years	934,000	1.97	2,095,000	1.39
Due after 4 years through 5 years	1,586,000	1.94	870,000	1.86
Thereafter	3,246,140	2.83	3,235,000	2.17
Total principal amount	59,743,165	3.69	24,589,410	1.21
Premiums	28,958		31,181	
Discounts	(18,716)		(17,709)	
Fair value hedging adjustments	(41,745)		(1,104)	
Fair value option valuation adjustment and accrued interest	(43,917)		60	
Total	$ 59,667,745		$ 24,601,838	

Consolidated Bonds outstanding were issued with either fixed-rate coupon payment terms or variable-rate coupon payment terms that are indexed to SOFR. To meet the expected specific needs of certain investors in Consolidated Obligations, both fixed-rate and variable-rate Bonds may contain features that result in complex coupon payment terms and call options. When these Consolidated Bonds are issued, the FHLB may enter into derivatives containing features that offset the terms and embedded options, if any, of the Consolidated Bonds.

Table 9.3 - Consolidated Bonds Outstanding by Call Features (in thousands)

	December 31, 2022	December 31, 2021
Principal Amount of Consolidated Bonds:		
Non-callable	$ 49,628,665	$ 19,689,410
Callable	10,114,500	4,900,000
Total principal amount	$ 59,743,165	$ 24,589,410

Table 9.4 - Consolidated Bonds Outstanding by Original Contractual Maturity or Next Call Date (in thousands)

Year of Original Contractual Maturity or Next Call Date	December 31, 2022	December 31, 2021
Due in 1 year or less	$ 54,465,620	$ 17,518,885
Due after 1 year through 2 years	1,543,405	3,085,120
Due after 2 years through 3 years	803,000	1,262,405
Due after 3 years through 4 years	571,000	728,000
Due after 4 years through 5 years	258,000	547,000
Thereafter	2,102,140	1,448,000
Total principal amount	$ 59,743,165	$ 24,589,410

Table 9.5 - Consolidated Bonds by Interest-rate Payment Type (in thousands)

	December 31, 2022	December 31, 2021
Principal Amount of Consolidated Bonds:		
Fixed-rate	$ 19,797,165	$ 23,739,410
Variable-rate	39,621,000	850,000
Step-up	325,000	—
Total principal amount	$ 59,743,165	$ 24,589,410

Note 10 - Affordable Housing Program (AHP)

The FHLBank Act requires each FHLBank to establish an AHP. Each FHLBank provides subsidies in the form of direct grants or below-market interest rates on Advances to members who provide the funds to assist in the purchase, construction, or rehabilitation of housing for very low-, low-, and moderate-income households. Each FHLBank recognizes AHP assessment expense equal to the greater of 10 percent of its annual income subject to assessment, or the prorated sum required to ensure the aggregate contribution by the FHLBanks is no less than $100 million for each year. For purposes of the AHP calculation, income subject to assessment is defined as net income before AHP assessments, plus interest expense related to mandatorily redeemable capital stock. The FHLB accrues AHP expense monthly based on its income subject to assessment. The FHLB reduces the AHP liability as members use subsidies. In addition to the required AHP assessment, the Board of Directors may elect to make voluntary contributions to the AHP.

If the FHLB experienced a net loss during a quarter, but still had income subject to assessment for the year, the FHLB's obligation to the AHP would be calculated based on the FHLB's year-to-date income subject to assessment. If the FHLB had income subject to assessment in subsequent quarters, it would be required to contribute additional amounts to meet its calculated annual obligation. If the FHLB experienced a net loss for a full year, the FHLB would have no obligation to the AHP for the year, because each FHLBank's required annual AHP contribution is limited to its annual income subject to assessment. If the aggregate 10 percent calculation described above was less than $100 million for the FHLBanks, each FHLBank would be required to contribute a prorated sum to ensure that the aggregate contributions by the FHLBanks equaled $100 million. The proration would be made on the basis of an FHLBank's income in relation to the income of all FHLBanks for the previous year.

There was no shortfall, as described above, in 2022, 2021, or 2020. If an FHLBank finds that its required AHP obligations are contributing to its financial instability, it may apply to the Finance Agency for a temporary suspension of its contributions under the FHLBank Act. The FHLB has never made such an application.

Table 10.1 - Rollforward of the AHP Liability (in thousands)

	2022	2021
Balance at beginning of year	$ 84,504	$ 110,772
Assessments (current year additions)	28,613	4,708
Voluntary contribution	3,000	—
Subsidy uses, net	(28,194)	(30,976)
Balance at end of year	$ 87,923	$ 84,504

Note 11 - Capital

The FHLB is subject to three capital requirements under its Capital Plan and the Finance Agency rules and regulations. Regulatory capital does not include accumulated other comprehensive income, but does include mandatorily redeemable capital stock.

1. *Risk-based capital.* The FHLB must maintain at all times permanent capital, defined as Class B stock and retained earnings, in an amount at least equal to the sum of its credit risk, market risk, and operational risk capital requirements, all of which are calculated in accordance with the rules and regulations of the Finance Agency.

2. *Total regulatory capital.* The FHLB must maintain at all times a total regulatory capital-to-assets ratio of at least four percent. Total regulatory capital is the sum of permanent capital, the amounts paid-in for Class A stock, any general loss allowance, if consistent with GAAP and not established for specific assets, and other amounts from sources determined by the Finance Agency as available to absorb losses.

3. *Leverage capital.* The FHLB must maintain at all times a leverage capital-to-assets ratio of at least five percent. Leverage capital is defined as the sum of permanent capital weighted 1.5 times and all other components of total capital.

The Finance Agency may require the FHLB to maintain greater permanent capital than is required based on Finance Agency rules and regulations.

At December 31, 2022 and 2021, the FHLB was in compliance with each of these capital requirements.

Table 11.1 - Capital Requirements (dollars in thousands)

	December 31, 2022		December 31, 2021	
	Minimum Requirement	Actual	Minimum Requirement	Actual
Risk-based capital	$ 920,030	$ 6,569,024	$ 856,322	$ 3,804,018
Capital-to-assets ratio (regulatory)	4.00 %	6.05 %	4.00 %	6.28 %
Regulatory capital	$ 4,344,380	$ 6,569,024	$ 2,424,703	$ 3,804,018
Leverage capital-to-assets ratio (regulatory)	5.00 %	9.07 %	5.00 %	9.41 %
Leverage capital	$ 5,430,475	$ 9,853,536	$ 3,030,879	$ 5,706,027

The FHLB currently offers only Class B stock, which is issued and redeemed at a par value of $100 per share. Class B stock may be issued to meet membership and activity stock purchase requirements, to pay dividends, and to pay interest on mandatorily redeemable capital stock. Membership stock is required to become a member of and maintain membership in the FHLB. The membership stock requirement is based upon a percentage of the member's total assets. At December 31, 2022, the membership stock requirement was determined within a declining range from 0.08 percent to 0.02 percent of each member's total assets, with a minimum of $1 thousand and a maximum of $20 million for each member.

In addition to membership stock, a member may be required to hold activity stock to capitalize certain transactions with the FHLB, including Advances, certain funds and rate Advance commitments, Letters of Credit, and MPP activity that occurred after implementation of the Capital Plan on December 30, 2002. Members were required to maintain activity stock capitalization percentages as follows for 2022 and 2021: 4.50 percent for Advances and Advance commitments, 0.10 percent for Letters of Credit, and 3.00 percent for MPP. If a member owns more than its required activity stock, the additional stock is classified as excess stock.

A member may request redemption of all or part of its Class B stock or may withdraw from membership by giving five years' advance written notice. When the FHLB repurchases capital stock, it must first repurchase shares for which a redemption or withdrawal notice's five-year redemption period or withdrawal period has expired. Since its Capital Plan was implemented, the FHLB has repurchased, at its discretion, all member shares subject to outstanding redemption notices prior to the expiration of the five-year redemption period.

Any member that has withdrawn from membership, or otherwise has had its membership terminated, may not be readmitted to membership in any FHLBank until five years from the divestiture date for all capital stock that was held as a condition of membership, unless the institution has canceled its notice of withdrawal prior to the divestiture date. This restriction does not apply if the member is transferring its membership from one FHLBank to another on an uninterrupted basis.

Each class of FHLB stock is considered putable by the member and the FHLB may repurchase, in its sole discretion, any member's stock investments that exceed the required minimum amount. However, there are significant statutory and regulatory restrictions on the obligation to redeem, or right to repurchase, the outstanding stock. As a result, whether or not a member may have its capital stock in the FHLB repurchased (at the FHLB's discretion at any time before the end of the redemption period) or redeemed (at a member's request, completed at the end of a redemption period) will depend on whether the FHLB is in compliance with those restrictions.

The FHLB's retained earnings are owned proportionately by the current holders of Class B stock. The holders' interest in the retained earnings is realized at the time the FHLB periodically declares dividends or at such time as the FHLB is liquidated. The FHLB's Board of Directors may declare and pay dividends in either cash or capital stock, assuming the FHLB is in compliance with Finance Agency rules and regulations.

Restricted Retained Earnings. The Capital Agreement is intended to enhance the capital position of each FHLBank. The Capital Agreement provides that each FHLBank will, on a quarterly basis, allocate 20 percent of its net income to a separate restricted retained earnings account until the balance of that account, calculated as of the last day of each calendar quarter, equals at least one percent of that FHLBank's average balance of outstanding Consolidated Obligations for the calendar quarter. These restricted retained earnings are not available to pay dividends but are available to absorb unexpected losses, if any, that an FHLBank may experience. At December 31, 2022 and 2021 the FHLB had (in thousands) $560,118 and $509,719, respectively, in restricted retained earnings. Additionally, the Capital Agreement provides that amounts in restricted retained earnings in excess of 150 percent of the FHLB's restricted retained earnings minimum (i.e., one percent of the FHLB's average balance of outstanding Consolidated Obligations calculated as of the last day of each calendar quarter) may be released from restricted retained earnings.

Mandatorily Redeemable Capital Stock. The FHLB is a cooperative whose members own most of the FHLB's capital stock. Former members (including certain nonmembers that own the FHLB's capital stock as a result of a merger or acquisition, relocation, charter termination, or involuntary termination of an FHLB member) own the remaining capital stock to support business transactions still carried on the FHLB's Statements of Condition. Member shares cannot be purchased or sold except between the FHLB and its members at its $100 per share par value, as mandated by the FHLB's Capital Plan. The FHLB reclassifies stock subject to redemption from equity to liability upon expiration of the “grace period” after a member submits a written redemption request or withdrawal notice, or when the member attains nonmember status by merger or acquisition, relocation, charter termination, or involuntary termination of membership. A member may cancel or revoke its written redemption request or its withdrawal notice prior to the end of the five-year redemption period. Under the FHLB's Capital Plan, there is a five calendar day “grace period” for revocation of a redemption request and a 30 calendar day “grace period” for revocation of a withdrawal notice during which the member may cancel the redemption request or withdrawal notice without a penalty or fee. The cancellation fee after the “grace period” is currently two percent of the requested amount in the first year and increases one percent a year until it reaches a maximum of six percent in the fifth year. The cancellation fee can be waived by the FHLB's Board of Directors for a bona fide business purpose.

Stock subject to a redemption or withdrawal notice that is within the “grace period” continues to be considered equity because there is no penalty or fee to retract these notices. Expiration of the “grace period” triggers the reclassification from equity to a liability (mandatorily redeemable capital stock) at fair value because after the “grace period” the penalty to retract these notices is considered substantive. If a member cancels its written notice of redemption or notice of withdrawal, the FHLB will reclassify mandatorily redeemable capital stock from a liability to equity. Dividends related to capital stock classified as a liability are accrued at the expected dividend rate and reported as interest expense in the Statements of Income. For the years ended December 31, 2022, 2021, and 2020 dividends on mandatorily redeemable capital stock (in thousands) of $5,522, $383 and $1,068, respectively, were recorded as interest expense.

Table 11.2 - Rollforward of Mandatorily Redeemable Capital Stock (in thousands)

	2022	2021	2020
Balance, beginning of year	$ 21,211	$ 19,454	$ 21,669
Capital stock subject to mandatory redemption reclassified from equity	2,664,846	73,491	560,779
Capital stock previously subject to mandatory redemption reclassified to capital	—	—	(123)
Repurchase/redemption of mandatorily redeemable capital stock	(2,668,604)	(71,734)	(562,871)
Balance, end of year	$ 17,453	$ 21,211	$ 19,454

The number of stockholders holding the mandatorily redeemable capital stock was 16, 17 and 24 at December 31, 2022, 2021, and 2020.

As of December 31, 2022 there were no members or former members that had requested redemptions of capital stock whose stock had not been reclassified as mandatorily redeemable capital stock because the "grace periods" had not yet expired on these requests.

Table 11.3 shows the amount of mandatorily redeemable capital stock by contractual year of redemption. The year of redemption in the table is the end of the five-year redemption period. Consistent with the Capital Plan currently in effect, the FHLB is not required to redeem membership stock until five years after either (i) the membership is terminated or (ii) the FHLB receives notice of withdrawal. The FHLB is not required to redeem activity-based stock until the later of the expiration of the notice of redemption or until the activity to which the capital stock relates no longer remains outstanding. If activity-based stock becomes excess stock as a result of an activity no longer remaining outstanding, the FHLB may repurchase such shares, in its sole discretion, subject to the statutory and regulatory restrictions on capital stock redemption.

Table 11.3 - Mandatorily Redeemable Capital Stock by Contractual Year of Redemption (in thousands)

Contractual Year of Redemption	December 31, 2022	December 31, 2021
Year 1	$ 1,148	$ 1,091
Year 2	29	1,427
Year 3	5	270
Year 4	5,853	5
Year 5	3,313	10,791
Past contractual redemption date due to remaining activity (1)	7,105	7,627
Total	$ 17,453	$ 21,211

(1) Represents mandatorily redeemable capital stock that is past the end of the contractual redemption period because there is activity outstanding to which the mandatorily redeemable capital stock relates.

Excess Capital Stock. Excess capital stock is the amount of stock held by a member (or former member) in excess of that institution's minimum stock ownership requirement. Finance Agency rules limit the ability of an FHLBank to create member excess stock under certain circumstances. The FHLB may not pay dividends in the form of capital stock or issue new excess stock to members if its excess stock exceeds one percent of its total assets or if the issuance of excess stock would cause the FHLB's excess stock to exceed one percent of its total assets. At December 31, 2022, the FHLB had excess capital stock outstanding totaling more than one percent of its total assets. At December 31, 2022, the FHLB was in compliance with the Finance Agency's excess stock rules.

Note 12 - Accumulated Other Comprehensive Income (Loss)

The following tables summarize the changes in accumulated other comprehensive income (loss) for the years ended December 31, 2022, 2021 and 2020.

Table 12.1 - Accumulated Other Comprehensive Income (Loss) (in thousands)

	Net unrealized gains (losses) on available-for-sale securities	Pension and postretirement benefits	Total accumulated other comprehensive income (loss)
BALANCE, DECEMBER 31, 2019	$ 370	$ (16,764)	$ (16,394)
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	4,348	—	4,348
Net actuarial gains (losses)	—	(5,227)	(5,227)
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits (1)	—	2,288	2,288
Net current period other comprehensive income (loss)	4,348	(2,939)	1,409
BALANCE, DECEMBER 31, 2020	4,718	(19,703)	(14,985)
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	21,407	—	21,407
Net actuarial gains (losses)	—	2,170	2,170
Prior service benefit	—	1,882	1,882
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits (1)	—	2,620	2,620
Net current period other comprehensive income (loss)	21,407	6,672	28,079
BALANCE, DECEMBER 31, 2021	26,125	(13,031)	13,094
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	(74,851)	—	(74,851)
Net actuarial gains (losses)	—	11,108	11,108
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits (1)	—	1,309	1,309
Net current period other comprehensive income (loss)	(74,851)	12,417	(62,434)
BALANCE, DECEMBER 31, 2022	$ (48,726)	$ (614)	$ (49,340)

(1) Included in Non-Interest Expense - Other in the Statements of Income.

Note 13 - Pension and Postretirement Benefit Plans

Qualified Defined Benefit Multi-employer Plan. The FHLB participates in the Pentegra Defined Benefit Plan for Financial Institutions (Pentegra Defined Benefit Plan), a tax-qualified defined benefit pension plan. The Pentegra Defined Benefit Plan is treated as a multi-employer plan for accounting purposes, but operates as a multiple-employer plan under the Employee Retirement Income Security Act of 1974 (ERISA) and the Internal Revenue Code. As a result, certain multi-employer plan disclosures, including the certified zone status, are not applicable to the Pentegra Defined Benefit Plan. Under the Pentegra Defined Benefit Plan, contributions made by one participating employer may be used to provide benefits to employees of other participating employers because assets contributed by an employer are not segregated in a separate account or restricted to provide benefits only to employees of that employer. Also, in the event a participating employer is unable to meet its contribution requirements, the required contributions for the other participating employers could increase proportionately. The Pentegra Defined Benefit Plan covers all officers and employees of the FHLB who meet certain eligibility requirements.

The Pentegra Defined Benefit Plan operates on a plan year from July 1 through June 30. The Pentegra Defined Benefit Plan files one Form 5500 on behalf of all employers who participate in the plan. The Employer Identification Number is 13-5645888 and the three-digit plan number is 333. There are no collective bargaining agreements in place at the FHLB.

The Pentegra Defined Benefit Plan's annual valuation process includes calculating the plan's funded status and separately calculating the funded status of each participating employer. The funded status is defined as the market value of assets divided by the funding target (100 percent of the present value of all benefit liabilities accrued at that date). As permitted by ERISA, the Pentegra Defined Benefit Plan accepts contributions for the prior plan year up to eight and a half months after the end of the prior plan year. As a result, the market value of assets at the valuation date (July 1) will increase by any subsequent contributions designated for the immediately preceding plan year ended June 30.

The most recent Form 5500 available for the Pentegra Defined Benefit Plan is for the year ended June 30, 2021. The FHLB did not contribute more than five percent of the total contributions to the Pentegra Defined Benefit Plan for the plan years ended June 30, 2021, 2020 and 2019.

Table 13.1 - Pentegra Defined Benefit Plan Net Pension Cost and Funded Status (dollars in thousands)

	2022	2021	2020
Net pension cost charged to compensation and benefit expense for the year ended December 31	$ 5,911	$ 6,473	$ 6,429
Pentegra Defined Benefit Plan funded status as of July 1	118.87 % [a]	130.59 % [b]	108.50 %
FHLB's funded status as of July 1	135.80 %	146.44 %	122.36 %

(a) The Pentegra Defined Benefit Plan's funded status as of July 1, 2022 is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2022 through March 15, 2023. Contributions made on or before March 15, 2023, and designated for the plan year ended June 30, 2022, will be included in the final valuation as of July 1, 2022. The final funded status as of July 1, 2022 will not be available until the Form 5500 for the plan year July 1, 2022 through June 30, 2023 is filed (this Form 5500 is due to be filed no later than April 2024).

(b) The Pentegra Defined Benefit Plan's funded status as of July 1, 2021 is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2021 through March 15, 2022. Contributions made on or before March 15, 2022, and designated for the plan year ended June 30, 2021, will be included in the final valuation as of July 1, 2021. The final funded status as of July 1, 2021 will not be available until the Form 5500 for the plan year July 1, 2021 through June 30, 2022 is filed (this Form 5500 is due to be filed no later than April 2023).

Qualified Defined Contribution Plan. The FHLB maintains a tax-qualified, defined contribution plan for its employees. The FHLB contributes a percentage of the participants' compensation by making a matching contribution equal to a certain percentage of voluntary employee contributions, subject to certain IRS limitations. The FHLB contributed $2,336,000, $1,520,000, and $1,437,000 in the years ended December 31, 2022, 2021, and 2020, respectively. The FHLB's contributions are recorded as compensation and benefits expense in the Statements of Income.

Non-qualified Supplemental Defined Benefit Retirement Plan (Defined Benefit Retirement Plan). The FHLB maintains a non-qualified, unfunded defined benefit plan for its employees. The plan ensures that participants receive the full amount of benefits to which they would have been entitled under the qualified defined benefit plan in the absence of limits on benefit levels imposed by the IRS. There are no funded plan assets. The FHLB has established a grantor trust, which is included in held-to-maturity securities on the Statements of Condition, to meet future benefit obligations and current payments to beneficiaries. Effective July 1, 2021, the Defined Benefit Retirement Plan benefit formula was amended to adjust the accrual rate from 2.50 percent to 1.25 percent.

Postretirement Benefits Plan. The FHLB also sponsors a Postretirement Benefits Plan that includes health care and life insurance benefits for eligible retirees. Future retirees are eligible for the postretirement benefits plan if they were hired prior to August 1, 1990, are age 55 or older, and their age plus years of continuous service at retirement are greater than or equal to 80. Spouses are covered subject to required contributions. There are no funded plan assets that have been designated to provide postretirement benefits.

Table 13.2 presents the obligations and funding status of the Defined Benefit Retirement Plan and Postretirement Benefits Plan. The benefit obligation represents projected benefit obligation for the Defined Benefit Retirement Plan and accumulated postretirement benefit obligation for the Postretirement Benefits Plan.

Table 13.2 - Benefit Obligation, Fair Value of Plan Assets and Funded Status (in thousands)

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
Change in benefit obligation:	**2022**	**2021**	**2022**	**2021**
Benefit obligation at beginning of year	$ 46,527	$ 49,538	$ 4,011	$ 5,046
Service cost	537	899	4	7
Interest cost	1,206	1,171	105	115
Actuarial loss (gain)	(10,811)	(1,224)	(297)	(946)
Plan amendments	—	(1,882)	—	—
Benefits paid	(2,121)	(1,975)	(259)	(211)
Benefit obligation at end of year	35,338	46,527	3,564	4,011
Change in plan assets:				
Fair value of plan assets at beginning of year	—	—	—	—
Employer contribution	2,121	1,975	259	211
Benefits paid	(2,121)	(1,975)	(259)	(211)
Fair value of plan assets at end of year	—	—	—	—
Funded status at end of year	$ (35,338)	$ (46,527)	$ (3,564)	$ (4,011)

Amounts recognized in "Other liabilities" on the Statements of Condition for the Defined Benefit Retirement Plan and Postretirement Benefits Plan as of December 31, 2022 and 2021 were (in thousands) $38,902 and $50,538, respectively.

Table 13.3 - Amounts Recognized in Accumulated Other Comprehensive Income (in thousands)

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
	2022	**2021**	**2022**	**2021**
Net actuarial loss (gain)	$ 2,449	$ 14,930	$ (495)	$ (198)
Prior service benefit	(1,340)	(1,701)	—	—
Total	$ 1,109	$ 13,229	$ (495)	$ (198)

Table 13.4 - Net Periodic Benefit Cost and Other Amounts Recognized in Accumulated Other Comprehensive Income (in thousands)

	For the Years Ended December 31,					
	Defined Benefit Retirement Plan			Postretirement Benefits Plan		
	2022	2021	2020	2022	2021	2020
Net Periodic Benefit Cost						
Service cost	$ 537	$ 899	$ 1,129	$ 4	$ 7	$ 9
Interest cost	1,206	1,171	1,324	105	115	141
Amortization of prior service benefit	(361)	(181)	—	—	—	—
Amortization of net loss	1,670	2,747	2,288	—	54	—
Net periodic benefit cost	$ 3,052	$ 4,636	$ 4,741	$ 109	$ 176	$ 150
Other Changes in Benefit Obligations Recognized in Other Comprehensive Income						
Net loss (gain)	$(10,811)	$ (1,224)	$ 4,749	$ (297)	$ (946)	$ 478
Prior service benefit	—	(1,882)	—	—	—	—
Amortization of net loss	(1,670)	(2,747)	(2,288)	—	(54)	—
Amortization of prior service benefit	361	181	—	—	—	—
Total recognized in other comprehensive income	(12,120)	(5,672)	2,461	(297)	(1,000)	478
Total recognized in net periodic benefit cost and other comprehensive income	$ (9,068)	$ (1,036)	$ 7,202	$ (188)	$ (824)	$ 628

For the Defined Benefit Retirement Plan and the Postretirement Benefits Plan, the related service cost is recorded as part of Non-Interest Expense - Compensation and Benefits on the Statements of Income. The non-service related components of interest cost, amortization of prior service benefit and amortization of net loss are recorded as Non-Interest Expense - Other in the Statements of Income.

Table 13.5 presents the key assumptions used for the actuarial calculations to determine benefit obligations for the Defined Benefit Retirement Plan and Postretirement Benefits Plan.

Table 13.5 - Benefit Obligation Key Assumptions

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
	2022	2021	2022	2021
Discount rate	4.96 %	2.64 %	4.99 %	2.69 %
Salary increases	5.00 %	5.00 %	N/A	N/A

Table 13.6 presents the key assumptions used for the actuarial calculations to determine net periodic benefit cost for the Defined Benefit Retirement Plan and Postretirement Benefit Plan.

Table 13.6 - Net Periodic Benefit Cost Key Assumptions

	Defined Benefit Retirement Plan			Postretirement Benefits Plan		
	2022	2021	2020	2022	2021	2020
Discount rate [1]	2.64 %	2.26/2.61%	3.06 %	2.69 %	2.33 %	3.12 %
Salary increases	5.00 %	5.00 %	5.00 %	N/A	N/A	N/A

(1) For the Defined Benefit Retirement Plan in 2021, a rate of 2.26% was used for the first six months of 2021 while a rate of 2.61% was used for the second six months of 2021 resulting from an interim actuarial valuation at June 30, 2021, due to the Defined Benefit Retirement Plan amendment.

Table 13.7 - Postretirement Benefits Plan Assumed Health Care Cost Trend Rates

	2022	2021
Assumed for next year	6.50 %	6.50 %
Ultimate rate	5.00 %	5.00 %
Year that ultimate rate is reached	2024	2024

The discount rates for the disclosures as of December 31, 2022 were determined by using a discounted cash flow approach, which incorporates the timing of each expected future benefit payment. Estimated future benefit payments are based on each plan's census data, benefit formulas and provisions, and valuation assumptions reflecting the probability of decrement and survival. The present value of the future benefit payments is determined by using weighted average duration based interest rate yields from a variety of highly rated relevant corporate bond indices as of December 31, 2022, and solving for the single discount rate that produces the same present value.

Table 13.8 presents the estimated future benefits payments reflecting expected future services for the years ended after December 31, 2022.

Table 13.8 - Estimated Future Benefit Payments (in thousands)

Years	Defined Benefit Retirement Plan	Postretirement Benefit Plan
2023	$ 1,762	$ 282
2024	1,803	281
2025	1,967	276
2026	2,092	275
2027	2,474	259
2028 - 2032	12,726	1,300

Note 14 - Segment Information

The FHLB has identified two primary operating segments based on its method of internal reporting: Traditional Member Finance and the MPP. These segments reflect the FHLB's two primary Mission Asset Activities and the manner in which they are managed from the perspective of development, resource allocation, product delivery, pricing, credit risk and operational administration. The segments identify the principal ways the FHLB provides services to member stockholders. The FHLB, as an interest rate spread manager, considers a segment's net interest income, net interest rate spread and, ultimately, net income as the key factors in allocating resources. Resource allocation decisions are made by considering these profitability measures in the context of the historical, current and expected risk profile of each segment and the entire balance sheet, as well as current incremental profitability measures relative to the incremental market risk profile.

Overall financial performance and risk management are dynamically managed primarily at the level of, and within the context of, the entire balance sheet rather than at the level of individual business segments or product lines. Also, the FHLB hedges specific asset purchases and specific subportfolios in the context of the entire mortgage asset portfolio and the entire balance sheet. Under this holistic approach, the market risk/return profile of each business segment does not correspond, in general, to the performance that each segment would generate if it were completely managed on a separate basis, and it is not possible to accurately determine what the performance would be if the two business segments were managed on a stand-alone basis. Further, because financial and risk management is a dynamic process, the performance of a segment over a single identified period may not reflect the long-term expected or actual future trends for the segment.

The Traditional Member Finance segment includes products such as Advances and investments and the borrowing costs related to those assets. The FHLB assigns its investments to this segment primarily because they historically have been used to provide liquidity for Advances and to support the level and volatility of earnings from Advances. All interest rate swaps and a portion of swaptions, including their market value adjustments, are allocated to the Traditional Member Finance segment. The FHLB executed all of its interest rate swaps in its management of market risk for the Traditional Member Finance segment. The FHLB enters into swaptions to minimize the prepayment risk in its overall mortgage asset portfolio.

Income from the MPP is derived primarily from the difference, or spread, between the yield on mortgage loans and the borrowing cost of Consolidated Obligations outstanding allocated to this segment at the time debt is issued. MPP income also includes the gains (losses) on derivatives associated with the MPP segment, comprising all mortgage delivery commitments and forward rate agreements and a portion of swaptions.

Both segments also earn income from investment of interest-free capital. Capital is allocated proportionate to each segment's average assets based on the total balance sheet's average capital-to-assets ratio. Expenses are allocated based on cost accounting techniques that include direct usage, time allocations and square footage of space used. AHP assessments are calculated using the current assessment rates based on the income before assessments for each segment.

The following tables set forth the FHLB's financial performance by operating segment for the years ended December 31.

Table 14.1 - Financial Performance by Operating Segment (in thousands)

	For the Years Ended December 31,		
	Traditional Member Finance	MPP	Total
2022			
Net interest income (loss)	$ 421,251	$ 66,183	$ 487,434
Non-interest income (loss)	(102,696)	(571)	(103,267)
Non-interest expense	93,046	10,512	103,558
Income (loss) before assessments	225,509	55,100	280,609
Affordable Housing Program assessments	23,103	5,510	28,613
Net income (loss)	$ 202,406	$ 49,590	$ 251,996
2021			
Net interest income (loss)	$ 317,432	$ (40,872)	$ 276,560
Non-interest income (loss)	(141,250)	2,978	(138,272)
Non-interest expense	81,363	10,226	91,589
Income (loss) before assessments	94,819	(48,120)	46,699
Affordable Housing Program assessments	9,520	(4,812)	4,708
Net income (loss)	$ 85,299	$ (43,308)	$ 41,991
2020			
Net interest income (loss)	$ 385,127	$ 21,403	$ 406,530
Non-interest income (loss)	(58,701)	51,633	(7,068)
Non-interest expense	80,569	11,704	92,273
Income (loss) before assessments	245,857	61,332	307,189
Affordable Housing Program assessments	24,693	6,133	30,826
Net income (loss)	$ 221,164	$ 55,199	$ 276,363

Table 14.2 - Asset Balances by Operating Segment (in thousands)

	Assets		
	Traditional Member Finance	MPP	Total
December 31, 2022	$ 99,649,867	$ 8,959,637	$ 108,609,504
December 31, 2021	50,086,904	10,530,681	60,617,585

Note 15 - Fair Value Disclosures

The fair value amounts recorded on the Statements of Condition and presented in the related note disclosures have been determined by the FHLB using available market information and the FHLB's best judgment of appropriate valuation methods. GAAP defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (i.e., an exit price). The fair values reflect the FHLB's judgment of how a market participant would estimate the fair values.

Fair Value Hierarchy. GAAP establishes a fair value hierarchy and requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The inputs are evaluated and an overall level for the measurement is determined. This overall level is an indication of how market observable the fair value measurement is.

The fair value hierarchy prioritizes the inputs used to measure fair value into three broad levels:

Level 1 Inputs - Quoted prices (unadjusted) for identical assets or liabilities in an active market that the reporting entity can access on the measurement date. An active market for the asset or liability is a market in which the transactions for the asset or liability occur with sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2 Inputs - Inputs other than quoted prices within Level 1 that are observable inputs for the asset or liability, either directly or indirectly. If the asset or liability has a specified (contractual) term, a Level 2 input must be observable for substantially the full term of the asset or liability. Level 2 inputs include the following: (1) quoted prices for similar assets or liabilities in active markets; (2) quoted prices for identical or similar assets or liabilities in markets that are not active; (3) inputs other than quoted prices that are observable for the asset or liability (e.g., interest rates and yield curves that are observable at commonly quoted intervals, and implied volatilities); and (4) inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3 Inputs - Unobservable inputs for the asset or liability, which are supported by limited to no market activity and reflect the FHLB's own assumptions.

The FHLB reviews the fair value hierarchy classifications on a quarterly basis. Changes in the observability of the valuation inputs may result in a reclassification of certain financial assets or liabilities. The FHLB did not have any transfers of assets or liabilities into or out of Level 3 of the fair value hierarchy during the years ended December 31, 2022 or 2021.

Table 15.1 presents the carrying value, fair value, and fair value hierarchy of financial assets and liabilities of the FHLB. The FHLB records trading securities, available-for-sale securities, derivative assets, derivative liabilities, certain Advances and certain Consolidated Obligations at fair value on a recurring basis, and on occasion, certain mortgage loans held for portfolio on a nonrecurring basis. The FHLB records all other financial assets and liabilities at amortized cost. Refer to Table 15.2 for further details about the financial assets and liabilities held at fair value on either a recurring or nonrecurring basis.

Table 15.1 - Fair Value Summary (in thousands)

	December 31, 2022					
		Fair Value				
Financial Instruments	Carrying Value (1)	Total	Level 1	Level 2	Level 3	Netting Adjustments and Cash Collateral (2)
Assets:						
Cash and due from banks	$ 19,604	$ 19,604	$ 19,604	$ —	$ —	$ —
Interest-bearing deposits	1,770,194	1,770,194	—	1,770,194	—	—
Securities purchased under agreements to resell	519,540	519,545	—	519,545	—	—
Federal funds sold	5,399,000	5,399,000	—	5,399,000	—	—
Trading securities	1,979,816	1,979,816	—	1,979,816	—	—
Available-for-sale securities	8,631,765	8,631,765	—	8,631,765	—	—
Held-to-maturity securities	15,304,359	14,983,043	—	14,983,043	—	—
Advances (3)	67,019,555	66,907,691	—	66,907,691	—	—
Mortgage loans held for portfolio	7,162,509	6,272,030	—	6,259,805	12,225	—
Accrued interest receivable	283,132	283,132	—	283,132	—	—
Derivative assets	490,560	490,560	—	50,792	—	439,768
Liabilities:						
Deposits	1,039,427	1,038,580	—	1,038,580	—	—
Consolidated Obligations:						
Discount Notes (4)	40,691,180	40,680,714	—	40,680,714	—	—
Bonds (5)	59,667,745	58,698,959	—	58,698,959	—	—
Mandatorily redeemable capital stock	17,453	17,453	17,453	—	—	—
Accrued interest payable	290,194	290,194	—	290,194	—	—
Derivative liabilities	460	460	—	88,045	—	(87,585)

(1) For certain financial instruments, the amounts represent net carrying value, which include an allowance for credit losses.

(2) Amounts represent the application of the netting requirements that allow the FHLB to settle positive and negative positions and also cash collateral and related accrued interest held or placed by the FHLB with the same counterparty.

(3) Includes (in thousands) $4,954 of Advances recorded under the fair value option at December 31, 2022.

(4) Includes (in thousands) $21,010,746 of Consolidated Obligation Discount Notes recorded under the fair value option at December 31, 2022.

(5) Includes (in thousands) $5,469,583 of Consolidated Obligation Bonds recorded under the fair value option at December 31, 2022.

Financial Instruments	Carrying Value (1)	December 31, 2021 Fair Value Total	Level 1	Level 2	Level 3	Netting Adjustments and Cash Collateral (2)
Assets:						
Cash and due from banks	$ 167,822	$ 167,822	$ 167,822	$ —	$ —	$ —
Interest-bearing deposits	340,147	340,147	—	340,147	—	—
Securities purchased under agreements to resell	1,282,440	1,282,440	—	1,282,440	—	—
Federal funds sold	5,505,000	5,505,000	—	5,505,000	—	—
Trading securities	6,780,817	6,780,817	—	6,780,817	—	—
Available-for-sale securities	5,267,123	5,267,123	—	5,267,123	—	—
Held-to-maturity securities	10,216,756	10,269,821	—	10,269,821	—	—
Advances (3)	23,054,748	23,191,040	—	23,191,040	—	—
Mortgage loans held for portfolio	7,588,184	7,728,670	—	7,705,035	23,635	—
Accrued interest receivable	88,672	88,672	—	88,672	—	—
Derivative assets	297,736	297,736	—	3,238	—	294,498
Liabilities:						
Deposits	1,415,651	1,415,456	—	1,415,456	—	—
Consolidated Obligations:						
Discount Notes (4)	29,837,696	29,837,184	—	29,837,184	—	—
Bonds (5)	24,601,838	24,906,306	—	24,906,306	—	—
Mandatorily redeemable capital stock	21,211	21,211	21,211	—	—	—
Accrued interest payable	60,682	60,682	—	60,682	—	—
Derivative liabilities	3,291	3,291	—	79,112	—	(75,821)

(1) For certain financial instruments, the amounts represent net carrying value, which include an allowance for credit losses.

(2) Amounts represent the application of the netting requirements that allow the FHLB to settle positive and negative positions and also cash collateral and related accrued interest held or placed by the FHLB with the same counterparty.

(3) Includes (in thousands) $25,805 of Advances recorded under the fair value option at December 31, 2021.

(4) Includes (in thousands) $10,420,974 of Consolidated Obligation Discount Notes recorded under the fair value option at December 31, 2021.

(5) Includes (in thousands) $7,175,060 of Consolidated Obligation Bonds recorded under the fair value option at December 31, 2021.

Summary of Valuation Methodologies and Primary Inputs.

The valuation methodologies and primary inputs used to develop the measurement of fair value for assets and liabilities that are measured at fair value on a recurring or nonrecurring basis in the Statement of Condition are listed below. The fair values and level within the fair value hierarchy of these assets and liabilities are reported in Table 15.2.

Investment securities – MBS: To value MBS holdings, the FHLB incorporates prices from multiple designated third-party pricing vendors, when available. The pricing vendors use various proprietary models to price MBS. The inputs to those models are derived from various sources including, but not limited to: benchmark yields, reported trades, dealer estimates, issuer spreads, benchmark securities, bids, offers and other market-related data. As many MBS do not trade on a daily basis, the pricing vendors use available information such as benchmark curves, benchmarking of like securities, sector groupings and matrix pricing to determine the prices for individual securities. Each pricing vendor has an established challenge process in place for all MBS valuations, which facilitates resolution of potentially erroneous prices identified by the FHLB. The FHLB has conducted reviews of multiple pricing vendors to confirm and further augment its understanding of the vendors' pricing processes, methodologies and control procedures for specific instruments.

The FHLB's valuation technique for estimating the fair values of MBS first requires the establishment of a "median" price for each security. All prices that are outside the threshold ("outliers") are subject to further analysis (including, but not limited to, comparison to prices provided by an additional third-party valuation service, prices for similar securities, non-binding dealer estimates, and/or use of an internal model that is deemed most appropriate) to determine if an outlier is a better estimate of fair value. If an outlier (or some other price identified in the analysis) is determined to be a better estimate of fair value, then the outlier (or the other price as appropriate) is used as the final price rather than the default price. Alternatively, if the analysis confirms that an outlier is in fact not representative of fair value and the default price is the best estimate, then the default price is used as the final price. In all cases, the final price is used to determine the fair value of the security.

If all prices received for a security are outside the tolerance threshold level of the median price, then there is no default price, and the final price is determined by an evaluation of all outlier prices as described above.

Multiple prices were received for substantially all of the FHLB's MBS holdings and the final prices for those securities were computed by averaging the prices received. Based on the FHLB's review of the pricing methods and controls employed by the third-party pricing vendors and the relative lack of dispersion among the vendor prices, the FHLB believes its final prices result in reasonable estimates of fair value and further that the fair value measurements are classified appropriately in the fair value hierarchy.

Investment securities – Non-MBS: To determine the estimated fair values of non-MBS investment securities, the FHLB can use either (a) an income approach based on a market-observable interest rate curve that may be adjusted for a spread, or (b) prices received from third-party pricing vendors. For its U.S. Treasury obligations, the FHLB determines the fair value using the income approach. The income approach uses indicative fair values derived from a discounted cash flow methodology. The FHLB uses the Treasury curve as the market-observable interest rate curve. For GSE obligations, the fair value is determined using prices received from multiple third-party pricing vendors. The pricing vendors' methodology and the FHLB's validation process is consistent with the MBS process described above.

Advances recorded under the fair value option: The FHLB determines the fair values of Advances recorded under the fair value option by calculating the present value of expected future cash flows from these Advances. The discount rates used in these calculations are the replacement rates for Advances with similar terms, as approximated either by adding an estimated current spread to the SOFR or LIBOR Swap Curve or by using current indicative market yields, as indicated by the FHLB's pricing methodologies for Advances with similar current terms. Advance pricing is determined based on the FHLB's rates on Consolidated Obligations. To determine the estimated fair value for Advances with optionality, market-based expectations of future interest rate volatility implied from current prices for similar options are also used. In accordance with Finance Agency regulations, Advances with a maturity and repricing period greater than six months require a prepayment fee sufficient to make the FHLB financially indifferent to the borrower's decision to prepay the Advances. Therefore, the fair value of Advances does not assume prepayment risk.

Derivative assets/liabilities: The FHLB's derivative assets/liabilities generally consist of interest rate swaps, interest rate swaptions, and mortgage delivery commitments.

The FHLB's interest rate related derivatives (swaps and swaptions) are traded in the over-the-counter market. Therefore, the FHLB determines the fair value of each individual instrument using market value models that use readily observable market inputs as their basis (inputs that are actively quoted and can be validated to external sources). The FHLB uses a mid-market pricing convention as a practical expedient for fair value measurements within a bid-ask spread. These models reflect the contractual terms, including the period to maturity, as well as the significant inputs noted below. The fair value determination uses the standard valuation technique of discounted cash flow analysis. The FHLB performs several validation steps to verify the reasonableness of the fair value output generated by the primary market value model. In addition to an annual model validation, the FHLB prepares a monthly reconciliation of the model's fair values to estimates of fair values provided by the derivative counterparties. The FHLB believes these processes provide a reasonable basis for it to place continued reliance on the derivative fair values generated by the model.

The FHLB determines the fair value of mortgage delivery commitments using market prices from the TBA/mortgage-backed security market or TBA/Ginnie Mae market and adjustments noted below.

The FHLB's discounted cash flow analysis uses market-observable inputs. Inputs, by class of derivative, are as follows:

Interest rate swaps and interest rate swaptions:

- Discount rate assumption. OIS or SOFR Swap Curve;
- Forward interest rate assumption. OIS, SOFR, or LIBOR Swap Curve; and
- Volatility assumption. Market-based expectations of future interest rate volatility implied from current market prices for similar options.

Mortgage delivery commitments:

- TBA securities prices. Market-based prices by coupon class and expected term until settlement, adjusted to reflect the contractual terms of the mortgage delivery commitments. The adjustments to the market prices are market observable, or can be corroborated with observable market data.

The FHLB is subject to credit risk due to the risk of nonperformance by counterparties to its derivative transactions. 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. The FHLB has evaluated the potential for the fair value of the instruments to be impacted by counterparty credit risk and has determined that no adjustments were significant or necessary to the overall fair value measurements.

The fair values of the FHLB's derivatives include accrued interest receivable/payable and related cash collateral. The estimated fair values of the accrued interest receivable/payable and cash collateral approximate their carrying values due to their short-term nature. Derivatives are presented on a net basis 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.

Consolidated Obligations recorded under the fair value option: The FHLB determines the fair values of non-option-based Consolidated Obligation Bonds and all Consolidated Obligation Discount Notes recorded under the fair value option by calculating the present value of scheduled future cash flows. Inputs used to determine the fair value of these Consolidated Obligation Bonds and Discount Notes are the discount rates, which are estimated current market yields. For non-option-based Bonds and all Discount Notes, the market yields are either indicated by the Office of Finance for Consolidated Obligations with similar current terms or the SOFR swap curve for SOFR indexed Consolidated Obligations.

The FHLB determines the fair values of option-based Consolidated Obligation Bonds recorded under the fair value option based on pricing received from designated third-party pricing vendors. The pricing vendors used apply various proprietary models to price these Consolidated Obligation Bonds. The inputs to those models are derived from various sources including, but not limited to, benchmark yields, reported trades, dealer estimates, issuer spreads, benchmark securities, bids, offers, and other market-related data. Since many Consolidated Obligation Bonds do not trade on a daily basis, the pricing vendors use available information, as applicable, such as benchmark curves, benchmarking of like securities, sector groupings and matrix pricing to determine the prices for individual Consolidated Obligation Bonds. Each pricing vendor has an established challenge process in place for all valuations, which facilitates resolution of potentially erroneous prices identified by the FHLB.

When pricing vendors are used, the FHLB's valuation technique first requires the establishment of a “median” price for each Consolidated Obligation Bond. All prices that are outside the threshold (“outliers”) are subject to further analysis (including, but not limited to, comparison to prices provided by an additional third-party valuation service, prices for similar securities, non-binding dealer estimates, and/or use of an internal model that is deemed most appropriate) to determine if an outlier is a better estimate of fair value. If an outlier (or some other price identified in the analysis) is determined to be a better estimate of fair value, then the outlier (or the other price as appropriate) is used as the final price rather than the default price. Alternatively, if the analysis confirms that an outlier is in fact not representative of fair value and the default price is the best estimate, then the default price is used as the final price. In all cases, the final price is used to determine the fair value of the security.

If all prices received for a Consolidated Obligation Bond are outside the tolerance threshold level of the median price, then there is no default price, and the final price is determined by an evaluation of all outlier prices as described above.

Multiple vendor prices were received for the FHLB's Consolidated Obligation Bonds and the final prices for those bonds were computed by averaging the prices received. Based on the FHLB's review of the pricing methods and controls employed by the third-party pricing vendors and the relative lack of dispersion among the vendor prices, the FHLB believes its final prices result in reasonable estimates of fair value and that the fair value measurements are classified appropriately in the fair value hierarchy.

The FHLB has conducted reviews of its pricing vendors to confirm and further augment its understanding of the vendors' pricing processes, methodologies and control procedures for Consolidated Obligation Bonds.

Adjustments may be necessary to reflect the 11 FHLBanks' credit quality when valuing Consolidated Obligation Bonds recorded under the fair value option. Due to the joint and several liability for Consolidated Obligations, the FHLB monitors its own creditworthiness and the creditworthiness of the other FHLBanks to determine whether any credit adjustments are necessary in its fair value measurement of Consolidated Obligation Bonds. No adjustments were considered necessary at December 31, 2022 or 2021.

Subjectivity of estimates. Estimates of the fair values of financial assets and liabilities using the methods described above and other methods are highly subjective and require judgments regarding significant matters such as the amount and timing of future cash flows, prepayment speeds, interest rate volatility, distributions of future interest rates used to value options, and discount rates that appropriately reflect market and credit risks. The judgments also include the parameters, methods, and assumptions used in models to value the options. The use of different assumptions could have a material effect on the fair value estimates. Since these estimates are made as of a specific point in time, they are susceptible to material near term changes.

Fair Value Measurements.

Table 15.2 presents the fair value of financial assets and liabilities that are recorded on a recurring basis at December 31, 2022 by level within the fair value hierarchy.

Table 15.2 - Fair Value Measurements (in thousands)

	Fair Value Measurements at December 31, 2022				
	Total	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustments and Cash Collateral** [1]
Recurring fair value measurements - Assets					
Trading securities:					
U.S. Treasury obligations	$ 491,464	$ —	$ 491,464	$ —	$ —
GSE obligations	1,488,235	—	1,488,235	—	—
U.S. obligation single-family MBS	117	—	117	—	—
Total trading securities	1,979,816	—	1,979,816	—	—
Available-for-sale securities:					
U.S. Treasury obligations	7,194,271	—	7,194,271	—	—
GSE obligations	118,082	—	118,082	—	—
GSE multi-family MBS	1,319,412	—	1,319,412	—	—
Total available-for-sale securities	8,631,765	—	8,631,765	—	—
Advances	4,954	—	4,954	—	—
Derivative assets:					
Interest rate related	490,548	—	50,780	—	439,768
Mortgage delivery commitments	12	—	12	—	—
Total derivative assets	490,560	—	50,792	—	439,768
Total assets at fair value	$ 11,107,095	$ —	$ 10,667,327	$ —	$ 439,768
Recurring fair value measurements - Liabilities					
Consolidated Obligations:					
Discount Notes	$ 21,010,746	$ —	$ 21,010,746	$ —	$ —
Bonds	5,469,583	—	5,469,583	—	—
Total Consolidated Obligations	26,480,329	—	26,480,329	—	—
Derivative liabilities:					
Interest rate related	372	—	87,957	—	(87,585)
Mortgage delivery commitments	88	—	88	—	—
Total derivative liabilities	460	—	88,045	—	(87,585)
Total liabilities at fair value	$ 26,480,789	$ —	$ 26,568,374	$ —	$ (87,585)

(1) Amounts represent the application of the netting requirements that allow the FHLB to settle positive and negative positions and also cash collateral and related accrued interest held or placed by the FHLB with the same counterparty.

	Fair Value Measurements at December 31, 2021				
	Total	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustments and Cash Collateral (1)**
Recurring fair value measurements - Assets					
Trading securities:					
U.S. Treasury obligations	$ 5,030,946	$ —	$ 5,030,946	$ —	$ —
GSE obligations	1,749,661	—	1,749,661	—	—
U.S. obligation single-family MBS	210	—	210	—	—
Total trading securities	6,780,817	—	6,780,817	—	—
Available-for-sale securities:					
U.S. Treasury obligations	4,498,870	—	4,498,870	—	—
GSE obligations	135,308	—	135,308	—	—
GSE multi-family MBS	632,945	—	632,945	—	—
Total available-for-sale securities	5,267,123	—	5,267,123	—	—
Advances	25,805	—	25,805	—	—
Derivative assets:					
Interest rate related	297,659	—	3,161	—	294,498
Mortgage delivery commitments	77	—	77	—	—
Total derivative assets	297,736	—	3,238	—	294,498
Total assets at fair value	$ 12,371,481	$ —	$ 12,076,983	$ —	$ 294,498
Recurring fair value measurements - Liabilities					
Consolidated Obligations:					
Discount Notes	$ 10,420,974	$ —	$ 10,420,974	$ —	$ —
Bonds	7,175,060	—	7,175,060	—	—
Total Consolidated Obligations	17,596,034	—	17,596,034	—	—
Derivative liabilities:					
Interest rate related	2,462	—	78,283	—	(75,821)
Mortgage delivery commitments	829	—	829	—	—
Total derivative liabilities	3,291	—	79,112	—	(75,821)
Total liabilities at fair value	$ 17,599,325	$ —	$ 17,675,146	$ —	$ (75,821)

(1) Amounts represent the application of the netting requirements that allow the FHLB to settle positive and negative positions and also cash collateral and related accrued interest held or placed by the FHLB with the same counterparty.

Fair Value Option. The fair value option provides an irrevocable option to elect fair value as an alternative measurement for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments not previously carried at fair value. It requires a company to display the fair value of those assets and liabilities for which it has chosen to use fair value on the face of the Statements of Condition. Fair value is used for both the initial and subsequent measurement of the designated assets, liabilities and commitments, with the changes in fair value recognized in net income. If elected, interest income and interest expense on Advances and Consolidated Obligations carried at fair value are recognized based solely on the contractual amount of interest due or unpaid. Any transaction fees or costs are immediately recognized into other non-interest income or other non-interest expense.

The FHLB has elected the fair value option for certain financial instruments 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.

Table 15.3 presents net gains (losses) recognized in earnings related to financial assets and liabilities in which the fair value option was elected during the years ended December 31, 2022 and 2021 and 2020.

Table 15.3 – Fair Value Option - Financial Assets and Liabilities (in thousands)

Net Gains (Losses) from Changes in Fair Value Recognized in Earnings	For the Years Ended December 31, 2022	2021	2020
Advances	$ 674	$ (1,397)	$ 439
Consolidated Discount Notes	4,884	1,336	1,060
Consolidated Bonds	69,154	10,196	(8,792)
Total net gains (losses)	$ 74,712	$ 10,135	$ (7,293)

For instruments recorded under the fair value option, the related contractual interest income, contractual interest expense and the discount amortization on Discount Notes are recorded as part of net interest income on the Statements of Income. The remaining changes in fair value for instruments in which the fair value option has been elected are recorded as "Net gains (losses) on financial instruments held under fair value option" in the Statements of Income, except for changes in fair value related to instrument specific credit risk, which are recorded in accumulated other comprehensive income in the Statement of Condition. The FHLB has determined that none of the remaining changes in fair value were related to instrument-specific credit risk for the years ended December 31, 2022 or 2021. In determining that there has been no change in instrument-specific credit risk period to period, the FHLB primarily considered the following factors:

- The FHLB is a federally chartered GSE, and as a result of this status, the FHLB's Consolidated Obligations have historically received the same credit ratings as the government bond credit rating of the United States, even though they are not obligations of the United States and are not guaranteed by the United States.

- The FHLB is jointly and severally liable with the other 10 FHLBanks for the payment of principal and interest on all Consolidated Obligations of each of the other FHLBanks.

The following table reflects the difference between the aggregate unpaid principal balance outstanding and the aggregate fair value for Advances and Consolidated Obligations for which the fair value option has been elected.

Table 15.4 – Aggregate Unpaid Balance and Aggregate Fair Value (in thousands)

	December 31, 2022			December 31, 2021		
	Aggregate Unpaid Principal Balance	Aggregate Fair Value	Aggregate Fair Value Over/ (Under) Aggregate Unpaid Principal Balance	Aggregate Unpaid Principal Balance	Aggregate Fair Value	Aggregate Fair Value Over/ (Under) Aggregate Unpaid Principal Balance
Advances	$ 5,000	$ 4,954	$ (46)	$ 26,500	$ 25,805	$ (695)
Consolidated Discount Notes	21,182,801	21,010,746	(172,055)	10,426,400	10,420,974	(5,426)
Consolidated Bonds	5,513,500	5,469,583	(43,917)	7,175,000	7,175,060	60

Note 16 - Commitments and Contingencies

Off-Balance Sheet Commitments. Table 16.1 represents off-balance sheet commitments at December 31, 2022 and 2021. The FHLB has deemed it unnecessary to record any liabilities for credit losses on these commitments at December 31, 2022 and 2021.

Table 16.1 - Off-Balance Sheet Commitments (in thousands)

	December 31, 2022			December 31, 2021		
Notional Amount	Expire within one year	Expire after one year	Total	Expire within one year	Expire after one year	Total
Letters of Credit	$ 41,122,833	$ 222,439	$41,345,272	$ 34,281,457	$ 355,646	$34,637,103
Commitments for standby bond purchases	11,015	—	11,015	14,035	12,885	26,920
Commitments to purchase mortgage loans	14,291	—	14,291	249,581	—	249,581
Unsettled Consolidated Bonds, principal amount (1)	3,000,000	—	3,000,000	—	—	—
Unsettled Consolidated Discount Notes, principal amount (1)	182,205	—	182,205	—	—	—

(1) Expiration is based on settlement period rather than underlying contractual maturity of Consolidated Obligations.

Letters of Credit: The FHLB issues Letters of Credit on behalf of its members to support certain obligations of the members (or member's customer) to third-party beneficiaries. Letters of Credit may be offered to assist members and non-member housing associates in facilitating residential housing finance, community lending, and asset-liability management, and to provide liquidity. In particular, members often use Letters of Credit as collateral for deposits from federal and state government agencies. Letters of Credit are executed for members for a fee. If the FHLB is required to make payment for a beneficiary's draw, the member either reimburses the FHLB for the amount drawn or, subject to the FHLB's discretion, the amount drawn may be converted into a collateralized Advance to the member. However, Letters of Credit usually expire without being drawn upon. Letters of Credit issued by the FHLB expire no later than 2034. The carrying value of guarantees related to Letters of Credit are recorded in other liabilities and were (in thousands) $9,691 and $8,751 at December 31, 2022 and 2021.

The FHLB monitors the creditworthiness of its members that have Letters of Credit. In addition, Letters of Credit are subject to the same collateralization and borrowing limits that apply to Advances and are fully collateralized at the time of issuance.

Standby Bond Purchase Agreements: The FHLB has executed standby bond purchase agreements with one state housing authority whereby the FHLB, for a fee, agrees as a liquidity provider if required, to purchase and hold the authority's bonds until the designated marketing agent can find a suitable investor or the housing authority repurchases the bonds according to a schedule established by the standby agreement. Each standby agreement dictates the specific terms that would require the FHLB to purchase the bonds and typically allows the FHLB to terminate the agreement upon the occurrence of a default event of the issuer. The bond purchase commitments entered into by the FHLB expire no later than 2023, although some are renewable at the option of the FHLB. During 2022 and 2021, the FHLB was not required to purchase any bonds under these agreements.

Commitments to Purchase Mortgage Loans: The FHLB enters into commitments that unconditionally obligate the FHLB to purchase mortgage loans. Commitments are generally for periods not to exceed 90 days. The delivery commitments are recorded as derivatives at their fair values.

Consolidated Obligations: As previously described, Consolidated Obligations are backed only by the financial resources of the FHLBanks. The joint and several liability Finance Agency regulation authorizes the Finance Agency to require any FHLBank to repay all or a portion of the principal and interest on Consolidated Obligations for which another FHLBank is the primary obligor. No FHLBank has ever been asked or required to repay the principal or interest on any Consolidated Obligation on behalf of another FHLBank, and as of December 31, 2022, and through the filing date of this report, the FHLB does not believe that it is probable that it will be asked to do so.

The FHLB determined that it was not necessary to recognize a liability for the fair values of its joint and several obligation related to other FHLBanks' Consolidated Obligations at December 31, 2022, 2021, or 2020. The joint and several obligations are mandated by Finance Agency regulations and are not the result of arms-length transactions among the FHLBanks. The FHLBanks have no control over the amount of the guaranty or the determination of how each FHLBank would perform under the joint and several obligation.

Pledged Collateral. The FHLB may pledge securities, as collateral, related to derivatives. See Note 7 - Derivatives and Hedging Activities for additional information about the FHLB's pledged collateral and other credit-risk-related contingent features.

Legal Proceedings. From time to time, the FHLB is subject to legal proceedings arising in the normal course of business. The FHLB would record an accrual for a loss contingency when it is probable that a loss has been incurred and the amount could be reasonably estimated. After consultation with legal counsel, management does not anticipate that the ultimate liability and the range of reasonably possible losses, if any, arising out of any matters will have a material effect on the FHLB's financial condition or results of operations.

Note 17 - Transactions with Other FHLBanks

The FHLB notes all transactions with other FHLBanks on the face of its financial statements. Occasionally, the FHLB loans short-term funds to and borrows short-term funds from other FHLBanks. These loans and borrowings are transacted at then current market rates when traded. There were no such loans or borrowings outstanding at December 31, 2022, 2021 or 2020. The following table details the average daily balance of lending and borrowing between the FHLB and other FHLBanks for the years ended December 31.

Table 17.1 - Lending and Borrowing Between the FHLB and Other FHLBanks (in thousands)

	Average Daily Balances for the Years Ended December 31,		
	2022	2021	2020
Loans to other FHLBanks	$ 24,797	$ —	$ 4,918
Borrowings from other FHLBanks	27	137	137

In addition, the FHLB may, from time to time, assume the outstanding primary liability for Consolidated Obligations of another FHLBank (at then current market rates on the day when the transfer is traded) rather than issuing new debt for which the FHLB is the primary obligor. The FHLB then becomes the primary obligor on the transferred debt. There are no formal arrangements governing the transfer of Consolidated Obligations between the FHLBanks, and these transfers are not investments of one FHLBank in another FHLBank. Transferring debt at current market rates enables the FHLBank System to satisfy the debt issuance needs of individual FHLBanks without incurring the additional selling expenses (concession fees) associated with new debt. It also provides the transferring FHLBanks with outlets for extinguishing debt structures no longer required for their balance sheet management strategies.

There were no Consolidated Obligations transferred to the FHLB during the years ended December 31, 2022, 2021 or 2020. The FHLB had no Consolidated Obligations transferred to other FHLBanks during these periods.

Note 18 - Transactions with Stockholders

As a cooperative, the FHLB's capital stock is owned by its members, by former members that retain the stock as provided in the FHLB's Capital Plan and by nonmember institutions that have acquired members and must retain the stock to support Advances or other activities with the FHLB. All Advances are issued to members and all mortgage loans held for portfolio are purchased from members. The FHLB also maintains demand deposit accounts for members, primarily to facilitate settlement activities that are directly related to Advances and mortgage loan purchases. Additionally, the FHLB may enter into interest rate swaps with its stockholders. The FHLB may not invest in any equity securities issued by its stockholders and it has not purchased any MBS securitized by, or other direct long-term investments in, its stockholders.

For financial statement purposes, the FHLB defines related parties as those members with more than 10 percent of the voting interests of the FHLB capital stock outstanding. Federal statute prescribes the voting rights of members in the election of both Member and Independent directors. For Member directorships, the Finance Agency designates the number of Member directorships in a given year and an eligible voting member may vote only for candidates seeking election in its respective state. For Independent directors, the FHLB's Board of Directors nominates candidates to be placed on the ballot in an at-large election. For both Member and Independent director elections, a member is entitled to vote one share of required capital stock, subject to a statutory limitation, for each applicable directorship. Under this limitation, the total number of votes that a member may cast is limited to the average number of shares of the FHLB's capital stock that were required to be held by all members in that state as of the record date for voting. Nonmember stockholders are not eligible to vote in director elections. Due to these statutory limitations, no member owned more than 10 percent of the voting interests of the FHLB at December 31, 2022 or 2021.

All transactions with stockholders are entered into in the ordinary course of business. Finance Agency regulations require the FHLB to offer the same pricing for Advances and other services to all members regardless of asset or transaction size, charter type, or geographic location. However, the FHLB may, in pricing its Advances, distinguish among members based upon its assessment of the credit and other risks to the FHLB of lending to any particular member or upon other reasonable criteria that may be applied equally to all members. The FHLB's policies and procedures require that such standards and criteria be applied consistently and without discrimination to all members applying for Advances.

Transactions with Directors' Financial Institutions. In the ordinary course of its business, the FHLB provides products and services to members whose officers or directors serve as directors of the FHLB (Directors' Financial Institutions). Finance Agency regulations require that transactions with Directors' Financial Institutions be made on the same terms as those with any other member. The following table reflects balances with Directors' Financial Institutions for the items indicated below. The FHLB had no MBS or derivatives transactions with Directors' Financial Institutions at December 31, 2022 or 2021.

Table 18.1 - Transactions with Directors' Financial Institutions (dollars in millions)

	December 31, 2022		December 31, 2021	
	Balance	% of Total [(1)]	Balance	% of Total [(1)]
Advances	$ 22,009	32.6 %	$ 6,131	26.7 %
MPP	56	0.8	166	2.2
Regulatory capital stock	1,501	29.0	393	15.7

(1) Percentage of total principal (Advances), unpaid principal balance (MPP), and regulatory capital stock.

Concentrations. The following table shows regulatory capital stock balances, outstanding Advance principal balances, and unpaid principal balances of mortgage loans held for portfolio of stockholders holding five percent or more of regulatory capital stock and includes any known affiliates that are members of the FHLB.

Table 18.2 - Stockholders Holding Five Percent or more of Regulatory Capital Stock (dollars in millions)

	Regulatory Capital Stock		Advance	MPP Unpaid
December 31, 2022	Balance	% of Total	Principal	Principal Balance
U.S. Bank, N.A.	$ 1,293	25 %	$ 19,000	$ 8
Keybank, N.A.	670	13	11,344	—
Fifth Third Bank	381	7	4,301	—
The Huntington National Bank	303	6	1,702	348

	Regulatory Capital Stock		Advance	MPP Unpaid
December 31, 2021	Balance	% of Total	Principal	Principal Balance
U.S. Bank, N.A.	$ 186	7 %	$ 3,272	$ 10
Third Federal Savings & Loan Association	163	6	3,179	29
Protective Life Insurance Company	143	6	2,800	—
Nationwide Life Insurance Company	143	6	2,702	—

Nonmember Affiliates. The FHLB has relationships with three nonmember affiliates, the Kentucky Housing Corporation, the Ohio Housing Finance Agency and the Tennessee Housing Development Agency. The FHLB had no investments in or borrowings to any of these nonmember affiliates at December 31, 2022 or 2021. The FHLB executed standby bond purchase agreements with the Ohio Housing Finance Agency whereby the FHLB, for a fee, agrees as a liquidity provider if required, to purchase and hold the authority's bonds until the designated marketing agent can find a suitable investor or the housing authority repurchases the bond according to a schedule established by the standby agreement. For the years ended December 31, 2022 and 2021, the FHLB was not required to purchase any bonds under these agreements.

SUPPLEMENTAL FINANCIAL DATA

Supplemental financial data required is set forth in the “Other Financial Information” caption at Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations of this report.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

There were no changes in or disagreements with our accountants on accounting and financial disclosure during the two most recent fiscal years.

Item 9A. Controls and Procedures.

DISCLOSURE CONTROLS AND PROCEDURES

As of December 31, 2022, the FHLB's management, including its principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934 (the "Exchange Act"). Based upon that evaluation, these two officers each concluded that, as of December 31, 2022, the FHLB maintained effective disclosure controls and procedures designed to ensure that information required to be disclosed in the reports that it files under the Exchange Act is (1) accumulated and communicated to management as appropriate to allow timely decisions regarding disclosure and (2) recorded, processed, summarized and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission (SEC).

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

The management of the FHLB is responsible for establishing and maintaining adequate internal control over financial reporting. The FHLB's internal control over financial reporting is designed by, or under the supervision of, the FHLB's management, including its principal executive officer and principal financial officer, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

The FHLB's management assessed the effectiveness of the FHLB's internal control over financial reporting as of December 31, 2022. In making this assessment, it used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control-Integrated Framework (2013)*. Based on its assessment, management of the FHLB determined that, as of December 31, 2022, the FHLB's internal control over financial reporting was effective based on those criteria.

The effectiveness of the FHLB's internal control over financial reporting as of December 31, 2022 has been audited by PricewaterhouseCoopers LLP (PwC), an independent registered public accounting firm, as stated in their report which is included in Item 8. Financial Statements and Supplementary Data.

CHANGES IN INTERNAL CONTROL OVER FINANCIAL REPORTING

There were no changes in the FHLB's internal control over financial reporting that occurred during the fourth quarter ended December 31, 2022 that materially affected, or are reasonably likely to materially affect, the FHLB's internal control over financial reporting.

Item 9B. Other Information.

Not applicable.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

NOMINATION AND ELECTION OF DIRECTORS

The Finance Agency authorized us to have a total of 17 directors: 10 Member directors and seven Independent directors. Three of our Independent directors are designated as Public Interest directors and all 17 directors are elected by our members.

For both Member and Independent directorship elections, a member institution may cast one vote per seat or directorship up for election for each share of stock that the member was required to hold as of December 31 of the calendar year immediately preceding the election year. However, the number of votes that any member may cast for any one directorship cannot exceed the average number of shares of FHLB stock that were required to be held by all members located in its state. The election process is conducted electronically. Our Board of Directors does not solicit proxies nor is any member institution permitted to solicit proxies in an election.

Finance Agency regulations also provide for two separate selection processes for Member and Independent director candidates.

Member director candidates are nominated by any officer or director of a member institution eligible to vote in the respective statewide election, including the candidate's own institution. After the FHLB determines that the candidate meets all Member director eligibility requirements per Finance Agency regulations, the candidate may run for election and the candidate's name is placed on the ballot.

Independent director candidates are self-nominated. Any individual may submit an Independent director application form to the FHLB and request to be considered for election. The FHLB reviews all application forms to determine that the individual satisfies the appropriate public interest or non-public interest Independent director eligibility requirements per Finance Agency regulations before forwarding the application form to the Board for review of the candidate's qualifications and skills. The Board then nominates an individual whose name will appear on the ballot after consultation with the Affordable Housing Advisory Council and after the nominee information has been submitted to the Finance Agency for review. As part of the nomination process, the Board may consider several factors including the individual's contributions and service on the Board, if a former or incumbent director, and the specific experience and qualifications of the candidate. The Board also considers diversity in nominating Independent directors and how the attributes of the candidate may add to the overall strength and skill set of the Board. These same factors are considered when the Board fills a Member or Independent director vacancy.

DIRECTORS

The following table sets forth certain information (ages as of March 1, 2023) regarding each of our current directors.

Name	Age	Director Since	Expiration of Term as a Director	Independent or Member (State)
J. Lynn Anderson, Chair	59	2017 (1)	12/31/24	Independent (OH)
J. Wade Berry	53	2022	12/31/25	Member (KY)
Brady T. Burt	50	2017	12/31/24	Member (OH)
Greg W. Caudill	64	2014	12/31/25	Member (KY)
Kristin H. Darby	48	2021	12/31/24	Independent (TN)
Lewis Diaz (2)	44	2022	12/31/23	Independent (KY)
Roy Molitor Ford, Jr.	57	2023	12/31/26	Member (TN)
Danny J. Herron	65	2022	12/31/25	Independent (TN)
Robert T. Lameier	70	2016	12/31/23	Member (OH)
Donald J. Mullineaux	77	2010	12/31/23	Independent (KY)
Michael P. Pell	59	2019	12/31/26	Member (OH)
Kathleen A. Rogers	57	2020	12/31/25	Member (OH)
Leslie Scott Spivey	65	2022	12/31/26	Independent (OH)
Nancy E. Uridil	71	2015	12/31/26	Independent (OH)
James J. Vance, Vice Chair	61	2017	12/31/24	Member (OH)
Jonathan D. Welty	53	2020	12/31/23	Member (OH)
H. McCall Wilson, Jr.	57	2023	12/31/26	Member (TN)

(1) Ms. Anderson, an Independent director beginning in 2017, also served as a Member director from 2012-2016.

(2) Mr. Diaz was elected by the Board on November 18, 2021 to fill an Independent director vacancy. Mr. Diaz's term commenced on January 1, 2022 and will end on December 31, 2023 (what would have been the end of the unexpired term).

Member Directors

Finance Agency regulations govern the eligibility requirements for our Member directors. Each Member director, and each nominee to a Member directorship, must be a U.S. citizen and an officer or director of a member that: is located in the voting state to be represented by the Member directorship, was a member of the FHLB as of the record date, and meets all minimum capital requirements established by its appropriate Federal banking agency or state regulator.

Generally, each Member director is nominated and elected by our members through an annual voting process administered by us. Any member that is entitled to vote in the election may nominate an eligible individual to fill each available Member directorship for its voting state, and all eligible nominees must be presented to the membership in the voting state. Our directors are not permitted to nominate or elect Member directors, except to fill a vacancy for the remainder of an unexpired term or to fill a vacancy for which no nominations were received. In accordance with Finance Agency regulations, except when acting in a personal capacity, no director, officer, attorney, employee or agent of the FHLB may communicate in any manner that he or she directly or indirectly, supports or opposes the nomination or election of a particular individual for a Member directorship or take any other action to influence the voting with respect to a particular individual. As a result, the FHLB is not in a position to know which factors its member institutions considered in nominating candidates for Member directorships or in voting to elect Member directors. However, if the Board takes action to fill a vacant Member directorship, facts considered in electing such director may be communicated to the FHLB.

Mr. Berry has been the President and Chief Executive Officer of Farmers Bank & Trust Company, Marion, Kentucky, since 2011.

Mr. Burt has been the Senior Vice President and Chief Financial Officer of The Park National Bank, Newark, Ohio, a subsidiary of Park National Corporation, since December 2012. He also serves as the Secretary, Treasurer, and Chief Financial Officer of Park National Corporation.

Mr. Caudill has served on the Board of Directors of Farmers National Bank, Danville, Kentucky since 1996. Previously, Mr. Caudill was the Chief Executive Officer of Farmers National Bank from December 2002 to December 2020. He also served as the President of Farmers National Bank from December 2002 until April 2016.

Mr. Ford has been the Chairman of Commercial Bank and Trust Company, Memphis, Tennessee, since May 2019 and the Chief Executive Officer of Commercial Bank and Trust Company since 1998.

Mr. Lameier has been a director of Miami Savings Bank, Miamitown, Ohio since 1993. He also served as the Chief Executive Officer of Miami Savings Bank from 1993 to December 2022 as well as President from 1993 to February 2022.

Mr. Pell has been the President and Chief Executive Officer of First State Bank, Winchester, Ohio since March 2006.

Ms. Rogers has been the Executive Vice President, Chief Finance Data Officer and Chief Finance Administrative Officer of U.S. Bank, N.A., Cincinnati, Ohio since February 2022. Previously, she was the Executive Vice President, Director of Capital Stress Testing and Financial Systems of U.S. Bank, N.A., from August 2016 to August 2021 when she moved to the Transformation Office until moving to her current role as mentioned above. She also served as the Vice Chairman and Chief Financial Officer of U.S. Bancorp from January 2015 to August 2016.

Mr. Vance has been the Senior Vice President and Co-Chief Investment Officer of Western-Southern Life Assurance Company and related subsidiaries (Cincinnati, Ohio) since October 2020. Previously, he served as the Senior Vice President and Treasurer of Western-Southern Life Assurance Company and related subsidiaries from March 2016 to October 2020 and as the Vice President and Treasurer from 1999 to March 2016.

Mr. Welty has been the President of Ohio Capital Finance Corporation (OCFC), Columbus, Ohio since August 2019 and the Executive Vice President of Ohio Capital Corporation for Housing (OCCH), an affiliate of OCFC, since November 2020. Prior to serving as the President of OCFC, Mr. Welty served as an Executive Director from January 2010 to August 2019 and as the Vice President of OCCH from May 2000 until November 2020.

Mr. Wilson has been the President and Chief Executive Officer of The Bank of Fayette County, Collierville, Tennessee since June 2001.

Independent Directors

Finance Agency regulations also govern the eligibility requirements of our Independent directors. Each Independent director, and each nominee to an Independent directorship, must be a U.S. citizen and bona fide resident of our District. At least two of our Independent directors must be designated by our Board as public interest directors. Public interest Independent directors must have more than four years' experience representing consumer or community interest in banking services, credit needs, housing, or consumer financial protections. All other Independent directors must have knowledge of or experience in one or more of the following areas: auditing and accounting; derivatives; financial management; organizational management; project development; risk management practices; and the law. Our Board of Directors nominates candidates for Independent directorships. Directors, officers, employees, attorneys, or agents of the FHLB are permitted to support directly or indirectly the nomination or election of a particular individual for an Independent directorship.

Ms. Anderson served as the President of Nationwide Bank from November 2009 to March 2016. Prior to retiring, she served as the Senior Vice President-Member Solutions Integration for Nationwide Mutual Insurance Company from March 2016 to December 2016. Ms. Anderson is a Certified Public Accountant and Certified Internal Auditor. She served over 10 years on the board of National Church Residences, which is the nation's largest not-for-profit provider of affordable senior housing with over 400 communities serviced. Ms. Anderson is a member of Women Corporate Directors and Women for Economic Leadership Development. Ms. Anderson's leadership positions within the banking and insurance industries contribute skills to the Board in the areas of auditing and accounting, operations and corporate governance. In addition, her not-for-profit housing experience provides public interest viewpoints that connect to the FHLB's mission.

Ms. Darby has been the Chief Information Officer at U.S. Medical Management since January 2022, and a Strategic Technology Advisor at KHD Consulting since August 2021. Prior to that, Ms. Darby served as the Chief Information Officer of Envision Healthcare from November 2018 to July 2021, and was the Chief Information Officer of Cancer Treatment Centers of America from April 2014 to November 2018. Ms. Darby is a Certified Public Accountant and Certified Fraud Examiner. Having served as a technology leader at a large public organization, Ms. Darby offers the Board comprehensive knowledge on technology strategy and operations, and digital and cybersecurity.

Mr. Diaz has been a Partner at the law firm of Dinsmore & Shohl, LLP since April 2014 where he concentrates his practice on affordable housing and traditional governmental finance. Mr. Diaz also served from 2002 to 2008 in multiple capacities, including Program Counsel and interim Chief Council, at the Kentucky Housing Corporation, the state's housing finance agency. Mr. Diaz contributes a diverse skill set to the Board including public interest representation, public and private housing development, legal expertise and complex financing structures to support affordable housing.

Mr. Herron has been the President and Chief Executive Officer of Habitat for Humanity of Greater Nashville since 2010. Previously, he was the President and Chief Executive Officer of Cumberland Bank, Franklin, Tennessee from 1993 to 2007. He has also served as a member of the FHLB's Advisory Council from 2014 to 2021 and was Council Chair from 2019 to 2020. Mr. Herron's years of experience in non-profit housing development and community banking brings insight to the Board that contributes to the FHLB's vision of helping members achieve business success and enhance communities.

Dr. Mullineaux is the Emeritus duPont Endowed Chair in Banking and Financial Services in the Gatton College of Business and Economics at the University of Kentucky. He was the duPont Endowed Chair from 1984 until 2014. Previously, he was on the staff of the Federal Reserve Bank of Philadelphia, where he served as Senior Vice President and Director of Research from 1979 until 1984. He also served as a director of Farmers Capital Bank Corporation from 2005 until 2009. He has published numerous articles and lectured on a variety of banking topics, including risk management, financial markets and economics. He served as the Curriculum Director for the ABA's Stonier Graduate School of Banking from 2001 to 2016. Dr. Mullineaux brings knowledge and experience to the Board in areas vital to the operation of financial institutions in today's economy.

Mr. Spivey is retired from First Student, Inc., where he served as the Senior Vice President, Chief Financial Officer from January 2015 to October 2022. Mr. Spivey also served as the Senior Vice President of Finance of CHEP Global Pallets from 2013 to 2014 and as Senior Vice President, Chief Financial Officer of CHEP Americas from 2008 to 2013. Mr. Spivey has extensive experience in financial operations across multiple industries ranging from transportation and logistics to telecommunications and packaged goods. Mr. Spivey contributes private sector strategic financial leadership and diversity of perspective to the Board.

Ms. Uridil has more than 18 years of experience as a Senior Vice President of $1 billion to $6 billion global businesses (consumer packaged goods, cosmetics, durables) creating and delivering corporate and functional strategies. Specifically, she was the Senior Vice President of Global Operations for Moen Incorporated from 2005 to 2014, Senior Vice President at Estée Lauder Cos from 2000 to 2005 and Senior Vice President at Mary Kay, Inc. from 1996 to 2000. Ms. Uridil served on the Board of Directors of Flexsteel Industries, Inc. (Nasdaq: FLXS) from 2010 to 2019, where she served on the Compensation Committee and led the Governance Committee. Ms. Uridil has extensive experience in strategy, expense and capital management, merger and acquisition integration and sourcing. Ms. Uridil's qualifications and insight provide valuable skills to the Board in the important areas of personnel, compensation, information technology and operations.

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EXECUTIVE OFFICERS

The following table sets forth certain information (ages as of March 1, 2023) regarding our executive officers.

Name	Age	Position	Employee of the FHLB Since
Andrew S. Howell	61	President and Chief Executive Officer	1989
Stephen J. Sponaugle	60	Executive Vice President, Chief Financial Officer	1992
Roger B. Batsel	51	Executive Vice President, Chief Operating Officer	2014
Damon v. Allen	52	Senior Vice President, Chief Marketing and Community Investment Officer	1999
J. Christopher Bates	47	Senior Vice President, Chief Accounting Officer	2005
James C. Frondorf	45	Senior Vice President, Chief Credit Officer	2001
Tami L. Hendrickson	62	Senior Vice President, Treasurer	2006
Bridget C. Hoffman	46	Senior Vice President, General Counsel	2018
Amy L. Konow	48	Senior Vice President, Chief Audit Executive	2020
Karla M. Russo	54	Senior Vice President, Chief Human Resources and Inclusion Officer	2014
Daniel A. Tully	45	Senior Vice President, Chief Risk and Compliance Officer	2006

Mr. Howell became the President and Chief Executive Officer in June 2012. Previously, he served as the Executive Vice President, Chief Operating Officer since January 2008. His career with the FHLB also included multiple years in the roles of Senior Vice President, Chief Credit Officer and Executive Vice President, Chief Business Officer.

Mr. Sponaugle became the Executive Vice President, Chief Financial Officer in January 2018. Previously, he served as the Executive Vice President, Chief Risk and Compliance Officer since January 2017.

Mr. Batsel became the Executive Vice President, Chief Operating Officer in January 2020. Previously, he served as the FHLB's Senior Vice President, Chief Information and Operations Officer since July 2018. Prior to that, Mr. Batsel served as the FHLB's Senior Vice President, Chief Information Officer since January 2014.

Mr. Allen became the Senior Vice President, Chief Marketing and Community Investment Officer in January 2023. Previously, he served as the FHLB's Senior Vice President, Housing and Community Investment Officer since January 2012.

Mr. Bates became the Senior Vice President, Chief Accounting Officer in January 2015. Previously, he served as the FHLB's Vice President, Controller since January 2013.

Mr. Frondorf became the Senior Vice President, Chief Credit Officer in June 2021 after serving as the Senior Vice President, Assistant Chief Credit Officer since January 2021. Prior to that, he served as the FHLB’s First Vice President, Credit Services since January 2018.

Ms. Hendrickson became the Senior Vice President, Treasurer in January 2015. Previously, she served as the FHLB's Vice President, Treasurer since January 2010.

Ms. Hoffman became the Senior Vice President, General Counsel in May 2018. Previously, she was a partner of the law firm Taft Stettinius & Hollister LLP from January 2011 to May 2018.

Ms. Konow became the Senior Vice President, Chief Audit Executive in July 2020. Previously, she was the Chief Financial Officer at Landrum & Brown, Inc. from November 2019 to June 2020 and the Vice President, Accounting and Finance from April 2018 to November 2019. Prior to that, she served as the Vice President, Operations - Financial Institutions Division at American Modern Insurance Group from November 2013 to February 2018.

Ms. Russo became the Senior Vice President, Chief Human Resources and Inclusion Officer in January 2022. Previously, she served as the FHLB's First Vice President, Human Resources and Office of Minority and Woman Inclusion (OMWI) Officer since January 2018.

Mr. Tully became the Senior Vice President, Chief Risk and Compliance Officer in April 2020. Previously, he served as the Senior Vice President, Assistant Chief Risk and Compliance Officer since January 2020. Prior to that, he served as the FHLB's First Vice President, Assistant Chief Risk and Compliance Officer since July 2018. Mr. Tully also served as the FHLB's First Vice President, Financial and Market Risk Analysis since January 2018.

All officers are appointed annually by our Board of Directors.

AUDIT COMMITTEE FINANCIAL EXPERT

The Board of Directors has determined (1) that Mr. Brady T. Burt, Chair of the Audit Committee, and Committee member Mr. Leslie Scott Spivey, have the relevant accounting and related financial management expertise, and therefore are qualified, to serve as the Audit Committee financial experts within the meaning of the regulations of the SEC and (2) that each is independent under SEC Rule 10A-3(b)(1). Mr. Burt is a Certified Public Accountant and his experience has principally been in the accounting and finance disciplines within the financial industry, and has included managing various accounting functions. Mr. Spivey's experience has principally been in the finance disciplines crossing multiple industries. For additional information regarding the independence of the directors of the FHLB, see Item 13. Certain Relationships and Related Transactions, and Director Independence.

CODES OF ETHICS

The Board of Directors has adopted a “Code of Ethics for Senior Financial Officers” that applies to the principal executive officer and the principal financial officer, as well as all other executive officers. This policy serves to promote honest and ethical conduct, full, fair and accurate disclosure in the FHLB's reports to regulatory authorities and other public communications, and compliance with applicable laws, rules and regulations. The Code is posted on the FHLB's website (www.fhlbcin.com). If a waiver of any provision of the Code is granted to a covered officer, or if any amendment is made to the Code, information concerning the waiver or amendment will be posted on our website.

The Board of Directors has also adopted a “Standards of Conduct” policy that applies to all employees. The purpose of this policy is to promote a strong ethical climate that protects the FHLB against fraudulent activities and fosters an environment in which open communication is expected and protected.

Item 11. Executive Compensation.

2022 COMPENSATION DISCUSSION AND ANALYSIS

The following provides discussion and analysis regarding our compensation program for executive officers for 2022, and in particular our Named Executive Officers. Named Executive Officers for 2022 were: Andrew S. Howell, President and Chief Executive Officer (CEO); Stephen J. Sponaugle, Executive Vice President, Chief Financial Officer; Roger B. Batsel, Executive Vice President, Chief Operating Officer; Bridget C. Hoffman, Senior Vice President, General Counsel and Tami L. Hendrickson, Senior Vice President, Treasurer.

Compensation Program Overview (Philosophy and Objectives)

Our Board of Directors (the Board) is responsible for determining the philosophy and objectives of the compensation program. The philosophy of the program is to provide a flexible and market-based approach to compensation that attracts, retains and motivates high performing, accomplished financial services executives who, by their individual and collective performance, achieve strategic business initiatives to fulfill our mission. The program is primarily designed to focus executives on increasing business with member institutions within established profitability and risk tolerance levels, while also encouraging teamwork.

We compensate executive officers using a combination of base salary, short-term and deferred incentive-based cash compensation, retirement benefits and modest fringe benefits. We believe the compensation program communicates short and long-term goals and standards of performance for our mission and key business objectives and appropriately motivates and rewards executives commensurate with their contributions and achievements. The combination of base salary and short-term and deferred incentive pay creates a total compensation opportunity for executives who contribute to and influence strategic plans and who are primarily responsible for the strategic business plan, execution, and performance.

Oversight of the compensation program is the responsibility of the Board's Human Resources, Compensation and Inclusion Committee (the Committee). The Committee annually reviews the components of the compensation program to ensure it is consistent with and supports our mission, strategic business objectives, and short and long-term goals. In carrying out its responsibilities, the Committee may engage executive compensation consultants to assist in evaluating the effectiveness of the program and in determining the appropriate mix of compensation provided to executive officers. Because individuals are not permitted to own our capital stock, all compensation is paid in cash and we have no equity compensation plans or arrangements.

The Committee recommends the CEO's annual compensation package to the Board, which is responsible for approving all compensation provided to the CEO. Additionally, the Committee is responsible for reviewing and approving the compensation program's budget for all officers, including the other Named Executive Officers, and submitting its recommendations to the Board for final approval.

Management Involvement - Executive Compensation

While the Board is ultimately responsible for determining the compensation of the CEO and all other executive officers, the CEO and the Human Resources department periodically advise the Committee regarding competitive and administrative issues affecting the compensation program. The CEO and the Human Resources department also present recommendations to the Committee regarding the compensation of all other executive officers, and administer programs approved by the Committee and the Board.

Finance Agency Oversight - Executive Compensation

The Director of the Finance Agency is required by regulation to prohibit an FHLBank from paying compensation to its executive officers that is not reasonable and comparable to that paid for employment in similar businesses involving similar duties and responsibilities. Finance Agency rules direct the FHLBanks to provide all compensation actions affecting their Named Executive Officers to the Finance Agency for review. Accordingly, following our Board's approval, we submitted the 2023 base salaries as well as incentive payments earned for 2022 for the Named Executive Officers to the Finance Agency. At this time, we do not expect the regulatory requirements to have a material impact on our executive compensation programs.

Use of Comparative Compensation Data

The compensation program aims to provide a market competitive compensation package when recruiting and retaining highly talented executives seeking stable, long-term employment. To this end, we gather compensation data from a wide variety of sources, including broad-based national and regional surveys, information on compensation programs at other FHLBanks, and formal and informal interactions with our compensation consultant. Our consultant, McLagan (an Aon company), is a nationally recognized compensation consulting firm specializing in the financial services industry. We also participate in multiple surveys including the annual McLagan Federal Home Loan Bank Custom Survey and the annual Federal Home Loan Bank System Key Position Compensation Survey. Both surveys contain executive and non-executive compensation information for various key positions across all FHLBanks. When determining the compensation program, the Committee and the CEO use compensation data collected from these sources to inform themselves regarding trends in compensation practices and as a comparison check against general market data (market check).

In setting 2022 and 2023 compensation, we primarily relied upon information from the McLagan Custom Survey. It encompasses information relating to the prior year's compensation from mortgage banks, commercial financial institutions that typically have assets of less than $20 billion, and other FHLBanks. However, we believe the positions at other FHLBanks generally are more directly comparable to ours given the unique nature of the FHLBank System. The FHLBanks share the same public policy mission, interact routinely with each other, and share a common regulator and regulatory constraints, including the need for Finance Agency review of all compensation actions affecting executive officers. However, there are significant differences across the FHLBank System, including the sizes of the various FHLBanks, the complexity of their operations, their organizational and cost structures and the types of compensation packages offered. Thus, we do not and, as a practical matter could not, calculate compensation packages for our Named Executive Officers based solely on comparisons to the other FHLBanks.

Compensation Program Approach

The Committee utilizes a balanced approach for delivering base salary, short-term incentive and deferred pay with our compensation program. The annual (short-term) incentive compensation component rewards all officers and staff for the achievement of the annual strategic business goals. The deferred compensation component is payable to certain officers, including the Named Executive Officers, after a three-year deferral period if the value of our members' capital stock is maintained above a minimum threshold over the period. The Committee has not established or assigned specific percentages to each element of the compensation program. Instead, the Committee strives to create a program that generally delivers a total compensation opportunity, i.e., base salary, annual and deferred incentive compensation and other benefits (including a retirement plan), to each executive officer that, when target performance goals are met, is at or near the median of the other FHLBanks and is generally consistent with the market check. However, individual elements of compensation as well as total compensation for individual executives may vary from the median due to an executive's tenure, experience and responsibilities.

While the competitiveness of the compensation program is an important factor for attracting and retaining executives, the Committee also reviews all elements of the program to ensure it is well designed and fiscally responsible from both a regulatory and corporate governance perspective.

Impact of Risk-Taking on Compensation Program

The Committee reviews the overall program to ensure the compensation of executive officers does not encourage unnecessary or excessive risk-taking that could threaten our long-term value. Strong risk management is an integral part of our culture. The Committee believes that base salary is a sufficient percentage of total compensation to discourage excessive risk-taking by executive officers. The Committee also believes the mix of incentive goals, which include risk-related metrics, does not encourage unnecessary or excessive risk-taking and achieves an appropriate balance of incentive for meeting short and long-term organizational goals. Moreover, the Committee and the Board retain the discretion to reduce or withhold incentive compensation payments if a determination is made that an executive has caused us to incur such a risk that could threaten our long-term value.

Elements of Total Compensation Program

The following table summarizes all compensation to our Named Executive Officers for the years ended December 31, 2022, 2021 and 2020. Discussion of each component follows the table.

Summary Compensation Table

Name and Principal Position	Year	Salary[(1)]	Non-Equity Incentive Plan Compensation[(2)]	Change in Pension Value & Non-Qualified Deferred Compensation Earnings[(3)]	All Other Compensation[(4)]	Total
Andrew S. Howell	2022	$ 1,026,923	$ 841,215	$ —	$ 69,456	$ 1,937,594
President and CEO	2021	948,462	779,309	964,000	36,993	2,728,764
	2020	947,115	785,578	3,225,000	36,097	4,993,790
Stephen J. Sponaugle	2022	457,866	315,948	—	48,800	822,614
Executive Vice President-	2021	451,969	292,092	428,000	17,400	1,189,461
Chief Financial Officer	2020	442,475	292,190	1,435,000	17,100	2,186,765
Roger B. Batsel	2022	384,000	253,694	—	18,300	655,994
Executive Vice President-	2021	373,000	228,101	80,000	17,400	698,501
Chief Operating Officer	2020	368,000	230,116	131,000	17,100	746,216
Bridget C. Hoffman [(5)]	2022	384,352	237,442	—	13,725	635,519
Senior Vice President-	2021	374,783	175,953	55,000	9,351	615,087
General Counsel						
Tami L. Hendrickson [(6)]	2022	352,769	205,422	—	18,300	576,491
Senior Vice President-						
Treasurer	2020	322,500	182,224	254,000	10,224	768,948

(1) Includes excess accrued vacation benefits automatically paid in accordance with established policy (applicable to all employees), which for 2022 were as follows: Mr. Howell, $96,923; Mr. Sponaugle, $19,866; Ms. Hoffman, $6,352 and Ms. Hendrickson, $22,769.

(2) Amounts shown for 2022 reflect total payments pursuant to the current portion of the 2022 Incentive Plan and the deferred portion of the 2019 Incentive Plan (2020 - 2022 performance period), as follows.

Name	2022 Incentive Plan (current incentive)	2019 Incentive Plan (three-year deferred incentive)	Total
Andrew S. Howell	$ 420,909	$ 420,306	$ 841,215
Stephen J. Sponaugle	158,586	157,362	315,948
Roger B. Batsel	139,035	114,659	253,694
Bridget C. Hoffman	119,756	117,686	237,442
Tami L. Hendrickson	104,549	100,873	205,422

(3) Represents change in the actuarial present value of accumulated pension benefits only, which is primarily dependent on changes in interest rates, years of benefit service and salary. Decreases in pension values are reported in the table as $0. For 2022, the change in pension value decreased as follows: Mr. Howell, $4,409,000; Mr. Sponaugle, $1,701,000; Mr. Batsel, $91,000; Ms. Hoffman, $35,000; and Ms. Hendrickson, $93,000. See "Retirement Benefits" and "2022 Pension Benefits" for additional information.

(4) Amounts represent matching contributions to the qualified defined contribution pension plan in 2022. For Mr. Howell and Mr. Sponaugle, 2022 also includes a transitional service credit in the form of an annual contribution to their Defined Contribution account. Additionally, for Mr. Howell, 2022 includes perquisites totaling $20,656, which consisted of personal use of an FHLB-owned vehicle, premiums for an Executive long-term disability plan, guest travel expenses and an airline program membership. The value of perquisites are based on the actual cash cost.

(5) Ms. Hoffman's 2020 compensation amount is not included as she was not a Named Executive Officer in that year.

(6) Ms. Hendrickson's 2021 compensation amount is not included as she was not a Named Executive Officer in that year.

Salary

Base salary is both a key component of the total compensation program and a key factor when attracting and retaining executive talent. While base salaries for the Named Executive Officers are influenced by a number of factors, the Board generally targets the median of the competitive market. Other factors affecting an executive's base salary include length of time in position, relevant experience, individual achievement, and the size and scope of assigned responsibilities as compared to the responsibilities of other executives. Base salary increases traditionally take effect at the beginning of each calendar year and are granted after a review of the individual's performance and leadership contributions to the achievement of our annual business plan goals and strategic objectives.

Each of the current Named Executive Officers received a base salary increase at the beginning of 2022. For each of the current Named Executive Officers other than the CEO, total salary increases, including merit, market, and promotional adjustments, ranged from 2.82 percent to 3.13 percent. These increases were based on the CEO's recommendation for each executive, which took into consideration market data, and expected business trends. For Mr. Howell, directors provided feedback to the Chair, and the Committee recommended, and the Board subsequently approved a salary increase of 3.33 percent. In recommending and approving Mr. Howell's 2022 increase, the Committee and Board took into consideration competitive market analysis and the Committees' appraisals of his performance during the year.

In October 2022, the Committee recommended and the Board approved a 6.44 percent salary increase pool for 2023 for all employees, comprised of 4.50 percent for merit increases and 1.94 percent for market and promotional adjustments. Using the same process as described above and considering the current labor market environment and the recent total rewards analysis, in November 2022, the Committee recommended, and the Board approved, the following 2023 base salaries and percent increases for the Named Executive Officers: Mr. Howell, $995,000 (6.99 percent); Mr. Sponaugle, $468,000 (6.85 percent); Mr. Batsel, $414,000 (7.81 percent); Ms. Hoffman, $409,000 (8.20 percent); and Ms. Hendrickson, $360,000 (9.09 percent). In January 2023, we were informed that the Finance Agency had completed its review and did not object to the Board-approved compensation actions affecting the Named Executive Officers in 2023.

Non-Equity Incentive Compensation Plan (Incentive Plan)

The Incentive Plan is a cash-based total incentive award that is divided into two equal parts: (1) a current incentive award, and (2) a three-year deferred incentive award. The current component of the Incentive Plan is awarded annually and designed to promote and reward higher levels of performance for accomplishing Board-approved annual goals. The long-term component of the Incentive Plan is a three-year deferred incentive award that is designed to promote safety and soundness and serve as an employment retention tool for executive officers, including the Named Executive Officers.

The Incentive Plan annual goals reflect desired financial, operational, risk and public mission objectives for the current and future fiscal years. Each goal is weighted reflecting its relative importance and potential impact on our mission and annual strategic business plan. Each goal is assigned a quantitative threshold, target and maximum level of performance. Each Named Executive Officer's award opportunity is based entirely on bank-wide performance.

When establishing the Incentive Plan goals and corresponding performance levels, the Board anticipates that we will successfully achieve a threshold level of performance nearly every year. The target level is aligned with expected performance and is anticipated to be reasonably achievable in a majority of plan years. The maximum level of performance reflects a graduated level of difficulty from the target performance level and is designed to require superior performance to achieve.

Each Named Executive Officer is assigned a total incentive award opportunity, stated as a percentage of base salary, which corresponds to the individual's level of organizational responsibility and ability to contribute to and influence overall performance. The total incentive award opportunity established for executives is designed to be comparable to incentive opportunities for executives with similar duties and responsibilities at other financial institutions, primarily other FHLBanks, and generally consistent with our market check. The Board believes the total incentive opportunity and plan design provide an appropriate, competitive reward to all officers, including the Named Executive Officers, commensurate with the achievement levels expected for the incentive goals.

The total incentive award earned is determined based on the actual achievement level for each goal in comparison with the performance levels established for that goal.

The total incentive award opportunities for the 2022 plan year stated as a percentage of base salary were as follows:

	Incentive Opportunity		
Name	Threshold	Target	Maximum
Andrew S. Howell	50.0 %	75.0 %	100.0 %
Stephen J. Sponaugle	40.0	60.0	80.0
Roger B. Batsel	40.0	60.0	80.0
Bridget C. Hoffman	35.0	52.5	70.0
Tami L. Hendrickson	35.0	52.5	70.0

If actual performance falls below the threshold level of performance, no payment is made for that goal. If actual performance exceeds the maximum level, only the value assigned as the performance maximum is paid. When actual performance falls between the assigned threshold, target and maximum performance levels, an interpolated achievement is calculated for that goal. The achievement for each goal is then multiplied by the corresponding incentive weight assigned to that goal and the results for each goal are summed to arrive at the final incentive award payable to the executive. No final awards (or payments) will be made to executives under the Incentive Plan if we receive the lowest "Composite Rating" during the most recent examination by the Finance Agency. Such a rating would indicate that we have been found to be operating in an unacceptable manner, that we exhibit serious deficiencies in corporate governance, risk management or financial condition and performance, or that we are in substantial noncompliance with laws, Finance Agency regulations or supervisory guidance.

Fifty percent of the total opportunity for the Incentive Plan is awarded in cash following the plan year (current incentive award) and 50 percent is mandatorily deferred for three years after the end of the Plan year (deferred incentive award). The deferred incentive awards earned from 2020 - 2022 were based on the safety and soundness metric, which is tied to our market capitalization ratio defined as the market value of total capital divided by the par value of capital stock. The market capitalization ratio is measured as the simple average at 36 month ends in the three-year performance period using the base-case interest rate and business environment used in reports to the Board at each month end. If our market capitalization ratio is greater than 100 percent during the deferred performance period, the final value will be 100 percent of the deferred award plus interest based on the annual interest rates applicable to the qualified defined benefit plan. No payment would be made for the deferred incentive award if the market capitalization ratio, calculated as noted above, was less than 100 percent for the three-year deferral period.

Except as noted above with respect to exam ratings, the Board has ultimate authority over the Incentive Plan and may modify or terminate the Plan at any time or for any reason. The Board also has discretion to increase or decrease any Incentive Plan awards. In addition, payments under the Plan are subject to certain claw back provisions that allow us to recover any incentive paid to a participant based on achievement of financial or operational goals that subsequently are deemed to be inaccurate, misstated or misleading. The Board believes these claw back requirements serve as a deterrent to any manipulation of financial statements or performance metrics in a manner that would assure and/or increase an incentive payment.

2022 Incentive Plan. For calendar year 2022, the Board approved a total of six performance measures in the functional areas of Franchise Value Promotion, Mission Assets and Activities and Stockholder Risk/Return. The mix of financial and non-financial goals measures performance across our mission and corporate objectives and is intended to discourage unnecessary or excessive risk-taking. Because we consider risk management to be an essential component in the achievement of our mission and corporate objectives, the goals below include a separate risk-related metric.

At its January 2023 meeting, following certification of the 2022 performance results and in accordance with those results, the Board authorized the distribution to the Named Executive Officers of the current awards shown in Note 2 to the Summary Compensation Table. For the 2022 plan year, we cumulatively achieved approximately 91 percent of the available maximum incentive opportunity. This was higher than the 81 percent overall performance achieved for 2021 primarily due to exceeding the target performance level for five of the six goals in 2022.

The following table presents the incentive weights, threshold, target and maximum performance levels, and the actual results achieved for the 2022 Incentive Plan performance measures for all Named Executive Officers.

2022 Incentive Plan Performance Levels and Results

	Incentive Weight	Threshold Performance	Target Performance	Maximum Performance	Results Achieved
Franchise Value Promotion					
1) Diversity and Inclusion Strategic Plan Achievement	10.0 %	Pass 6 of 11 metrics	Pass 8 of 11 metrics	Pass all 11 metrics and exceed goals on 3 by 5%	7 pass and 5 exceeded by 5%
2) Strategic Initiatives	15.0	Pass 7 of 12 objectives	Pass 9 of 12 objectives	Pass all 12 objectives	Pass 11 of 12 objectives
Mission Assets and Activities					
3) Mission Assets and Activities Participation	15.0	55 %	70 %	80 %	76 %
4) Core Mission Assets and Activities Ratio	20.0	70 %	78 %	85 %	81 %
Stockholder Risk/Return					
5) Decline in Market Value of Equity	20.0				
+200 bps		< 7%	< 6%	< 4%	(4.1)%
-100 bps		< 4%	< 3%	< 1%	1.7 %
6) Profitability-Available Earnings vs. Average Overnight Rates (SOFR and Federal funds effective)	20.0	175 bps	250 bps	350 bps	417 bps

During 2022, the Board, the Committee and the CEO periodically reviewed the Incentive Plan goals presented above to determine progress toward the goals. Although the Board and the CEO discussed various external factors that were affecting achievement of the performance measures, the Board did not take any actions to revise or change the Incentive Plan goals.

2023 Incentive Plan. At its January 2023 meeting, the Board finalized and approved the 2023 Incentive Plan goals, the incentive weights and the performance measures corresponding to each Incentive Plan goal and award opportunity for the 2023 Incentive Plan. After that meeting, the 2023 Incentive Plan was sent to the Finance Agency and we subsequently received notification of the completion of their review and non-objection. The 2023 Incentive Plan goals for our executives are set forth below.

2023 Incentive Plan Goals

Franchise Value Promotion		
Diversity and Inclusion Strategic Plan Achievement	*Weight:*	*10.0%*
Strategic Initiatives	*Weight:*	*15.0%*
Mission Assets and Activities		
Mission Assets and Activities Participation	*Weight:*	*15.0%*
Core Mission Assets and Activities Ratio	*Weight:*	*20.0%*
Stockholder Risk/Return		
Change in Market Value of Equity	*Weight:*	*20.0%*
Profitability - Available Earnings vs. Average Overnight Rates (SOFR and Federal funds effective)	*Weight:*	*20.0%*

As reflected above, the Board decided to keep all of the 2023 goals the same as those in 2022. However, some of the performance metric calculations have been adjusted. In setting the performance measures for the 2023 Incentive Plan, the Board reviewed the results against target for 2022 and considered relevant aspects of our financial outlook for 2023 including the expected interest rate environment and member demand for Advances. The Board also considered opportunities to increase mission asset participation by members and the objectives for strategic initiatives in 2023.

Three-Year Deferred Incentive Awards. During 2022, the Board, the Committee and the CEO periodically reviewed progress toward the deferred plan safety and soundness metric for each ongoing performance period. At its January 2023 meeting, following certification of the performance results for the deferred portion of the 2019 Incentive Plan (2020 - 2022 performance period) and in accordance with those results, the Board authorized the distribution of payments to eligible officers including the Named Executive Officers. Cumulatively, our market capitalization ratio was greater than 100 percent during the 2020 - 2022 performance period. As a result, the final value was 100 percent of the deferred award plus interest based on the annual interest rates applicable to the qualified defined benefit plan. The deferred payments for the 2020 - 2022 performance period are shown in Note 2 to the Summary Compensation Table.

As described above, the deferred portion of the 2022 Incentive Plan (2023 - 2025 performance period) is payable based on the result of a safety and soundness metric tied to the market capitalization ratio as defined in the 2023 Incentive Plan. If our market capitalization ratio is greater than 100 percent during the 2023 - 2025 performance period, the final value will be 100 percent of the deferred award plus interest based on the annual interest rates applicable to the qualified defined benefit plan.

Non-Equity Incentive Plan Compensation Grants

The following table provides information on grants made under our Incentive Plan.

Grants of Plan-Based Awards

		Estimated Future Payouts Under Non-Equity Incentive Plan Awards		
Name	Grant Date [(1)]	Threshold	Target	Maximum
Andrew S. Howell	November 17, 2022	$ 497,500	$ 746,250	$ 995,000
Stephen J. Sponaugle	November 17, 2022	187,200	280,800	374,400
Roger B. Batsel	November 17, 2022	165,600	248,400	331,200
Bridget C. Hoffman	November 17, 2022	143,150	214,725	286,300
Tami L. Hendrickson	November 17, 2022	126,000	189,000	252,000

(1) Awards granted on this date are for the 2023 Incentive Plan.

Under the awards shown above, 50 percent of the estimated future payout will be awarded in cash following the Plan year. The other 50 percent of the estimated future payout will be mandatorily deferred for three years after the end of the Plan year. If we operate in a safe and sound manner according to the market capitalization ratio metric during the deferred performance period, the final value will be 100 percent of the deferred award plus interest based on the annual interest rates applicable to the qualified defined benefit plan. See the "Non-Equity Incentive Compensation Plan (Incentive Plan)" section above for further detail.

Retirement Benefits

We maintain a comprehensive retirement program for executive officers comprised of two qualified retirement plans (a defined benefit plan and a defined contribution plan) and a non-qualified pension plan. For our qualified plans, we participate in the Pentegra Defined Benefit Plan for Financial Institutions and a Defined Contribution Plan administered by Fidelity. The non-qualified plan, the Benefit Equalization Plan (BEP), restores benefits that eligible highly compensated employees would have received were it not for Internal Revenue Service limitations on benefits from the defined benefit plan. Benefits under the BEP vest and are payable according to the corresponding provisions of the qualified plan.

The plans provide benefits based on a combination of an employee's tenure and annual compensation. As such, the benefits provided by the plans are one component of the total compensation opportunity for executive officers and, the Board believes, serve as valuable retention tools since retirement benefits increase as executives' tenure and compensation grow.

Qualified Defined Benefit Pension Plan. The Pentegra Defined Benefit Plan for Financial Institutions (Pentegra DB) is a funded tax-qualified plan that is maintained on a non-contributory basis, meaning, employee contributions are not required. Participants' pension benefits vest upon completion of five years of service. The pension benefits payable under the Pentegra DB plan are determined using a pre-established formula that provides a single life annuity payable monthly at age 65 or normal retirement.

Prior to July 1, 2021, the benefit formula for employees hired before January 1, 2006, which includes Messrs. Howell and Sponaugle, was 2.50 percent for each year of benefit service multiplied by the highest three-year average compensation. Compensation was defined as base salary, excess accrued vacation benefits and annual incentive compensation, and excludes any deferred incentive payments. In the event of retirement prior to attainment of age 65, a reduced pension benefit was payable under the plan, with payments commencing as early as age 45.

For employees who were hired after January 1, 2006, which includes Mr. Batsel and Mses. Hoffman and Hendrickson, the benefit formula was 1.25 percent for each year of benefit service multiplied by the highest five-year average compensation. Compensation is defined as base salary, excess accrued vacation benefits (if applicable) and annual incentive compensation, and excludes any deferred incentive payments. In addition, the plan provided for a reduced pension benefit in the event of retirement prior to attainment of age 65 with payment commencing as early as age 55 if the participant had 10 years or more of service.

Effective July 1, 2021, the Pentegra DB plan design that applies to future benefits for all employees was adjusted. The revised benefit formula is 1.25 percent for each year of benefit service multiplied by the highest five-year average compensation. The plan maintains the reduced benefit for those retiring before age 65 and extends early retirement eligibility for all employees to as early as age 45 with 10 years of service. To offset future benefit losses, employees hired prior to January 1, 2006 will receive a transitional service credit beginning in 2022 and concluding in 2026 in the form of an annual contribution to their Defined Contribution account. The annual contribution is equal to 10 percent of their eligible pension income up to the IRS maximum. Employees must be employed for the full plan year to receive the transition contribution for that year.

Lastly, the Pentegra DB plan provides certain actuarially equivalent forms of benefit payments other than a single life annuity, including a limited lump sum distribution option, which is available only for those benefits accrued prior to January 1, 2006.

Non-Qualified Defined Benefit Pension Plan. Executive officers and other employees whose pay or pension benefit exceeds IRS pension limitations are eligible to participate in the Defined Benefit component of the Benefit Equalization Plan (DB/BEP), an unfunded, non-qualified pension plan that mirrors the Pentegra DB plan in all material respects. In determining whether a restoration of retirement benefits is due an eligible employee, the DB/BEP utilizes the identical benefit formula applicable to the Pentegra DB plan. In the event that the benefits payable from the Pentegra DB plan have been reduced or otherwise limited, the executive's lost benefits are payable under the terms of the DB/BEP. Because the DB/BEP is a non-qualified plan, the benefits received from this plan do not receive the same tax treatment and funding protection associated with the qualified plan.

The following table provides the present value of benefits payable to the Named Executive Officers upon retirement at age 65 from the Pentegra DB plan and the DB/BEP, and is calculated in accordance with the formula currently in effect for specified years-of-service and remuneration for participating in both plans. Our pension benefits do not include any reduction for a participant's Social Security benefits.

2022 Pension Benefits

Name	Plan Name	Number of Years Credited Service (1)	Present Value (2) of Accumulated Benefits
Andrew S. Howell	Pentegra DB	32.50	$ 2,697,000
	DB/BEP	32.50	10,620,000
Stephen J. Sponaugle	Pentegra DB	29.33	2,382,000
	DB/BEP	29.33	2,562,000
Roger B. Batsel	Pentegra DB	7.92	194,000
	DB/BEP	7.92	121,000
Bridget C. Hoffman	Pentegra DB	3.58	70,000
	DB/BEP	3.58	41,000
Tami L. Hendrickson	Pentegra DB	15.92	666,000
	DB/BEP	15.92	284,000

(1) For pension plan purposes, the calculation of credited service begins upon completion of a required waiting period following the date of employment. Accordingly, the years shown are less than the executive's actual years of employment. Because IRS regulations generally prohibit the crediting of additional years of service under the qualified plan, such additional service also is precluded under the DB/BEP, which only restores those benefits lost under the qualified plan.

(2) See Note 13 of the Notes to Financial Statements for details regarding valuation assumptions.

Qualified Defined Contribution Plan. Our Defined Contribution Plan (DC) is a tax-qualified defined contribution plan to which we make tenure-based matching contributions. Matching contributions begin immediately and subsequently increase based on length of employment to a maximum of six percent of eligible compensation. For 2022, eligible compensation in the DC plan was defined as base salary, excess accrued vacation benefits (if applicable) and annual incentive compensation, and excludes any deferred incentive awards.

Under the DC plan, a participant may elect to contribute up to 75 percent of eligible compensation on either a before-tax or after-tax basis. The plan permits participants to self-direct investment elections into one or more investment funds. All returns are at the market rate of the related fund. Investment fund elections may be changed daily by the participants. A participant may withdraw vested account balances while employed, subject to certain plan limitations, which include those under IRS regulations. Participants also are permitted to revise their contribution/deferral election once each pay period. However, the revised election is only applicable to future earnings and may also be limited by IRS regulations.

Fringe Benefits and Perquisites
Executive officers are eligible to participate in the traditional fringe benefit plans made available to all other employees, including participation in the retirement plans, medical, dental and vision insurance program and group term life and standard long term disability (LTD) insurance plans, as well as short-term disability coverage and paid time off. Executives participate in our subsidized medical, dental and vision insurance and group term life and standard LTD insurance programs on the same basis and terms as all of our employees. However, executives are required to pay higher premiums for medical coverage. Executive officers also receive on-site parking at our expense.

During 2022, the CEO was also provided with an FHLB-owned vehicle for his business and personal use, along with the operating expenses associated with the vehicle. An executive officer's personal use of an FHLB-owned vehicle, including use for the daily commute to and from work, is reported as a taxable fringe benefit. In addition to the standard LTD insurance plan provided to all employees, Named Executive Officers may elect to receive additional LTD coverage. The premiums the FHLB pays for the additional LTD coverage are considered a taxable fringe benefit. Additionally, with prior approval, our current Travel Policy permits a guest to accompany an executive officer on authorized business trips. Executive officers are reimbursed for transportation and other related expenses associated with their guest's travel. Such reimbursements are reported as a taxable fringe benefit.

The perquisites provided to an executive officer represent a small fraction of annual compensation. During 2022, perquisites totaled $20,656 for Mr. Howell, as shown in the Summary Compensation Table. Perquisites did not individually or collectively exceed $10,000 for any other Named Executive Officers and are therefore excluded from the Summary Compensation Table.

Employment Arrangements and Severance Benefits

Pursuant to the FHLBank Act, all employees of the FHLB are “at will” employees. Accordingly, an employee may resign employment at any time and an employee's employment may be terminated at any time for any reason, with or without cause and with or without notice.

We have no employment agreements with any Named Executive Officer. Other than normal pension benefits and eligibility to participate in our retiree medical and life insurance programs (if hired prior to August 1, 1990), no perquisites, tax gross-ups or other special benefits are provided to our executive officers in the event of a resignation, retirement or other termination of employment. However, Named Executive Officers may receive certain benefits under our severance policy and Change in Control Plan, described below.

Severance Policy. We have a severance policy under which all employees may receive benefits in the event of termination of employment resulting from job elimination, substantial job modification, job relocation, or a planned reduction in staff. Under this policy, an executive officer is entitled to one month's pay for each year of continuous employment, rounded to the next whole year for partial years, with a minimum of one month and a maximum of six months' severance pay, as well as payment for all unused, accrued paid time off. At our discretion, executive officers and employees receiving benefits under this policy may also receive outplacement assistance as well as continuation of health insurance coverage on a limited basis.

Executive Change in Control Plan (Change in Control Plan). We have a Change in Control Plan that provides certain payments and benefits in the event of a qualifying termination within 24 months following a change in control. The purpose of the Change in Control Plan is to facilitate the hiring and retention of senior executives by providing them with certain protection and benefits in the event of a qualifying termination following a defined change in control. Change in control benefit payments are in lieu of, not in addition to, the severance benefit payments described above. The Change in Control Plan applies to officers as designated by the Board. Current designees are the CEO, all Executive Vice Presidents, and all Senior Vice Presidents.

Under the Change in Control Plan, a "qualifying termination" is defined as any separation, termination or other discontinuation of the employment relationship between the FHLB and a participant, (a) by the FHLB, other than for "cause" (as defined in the Change in Control Plan), death or disability; or (b) by the participant, for "good reason" (as defined in the Change in Control Plan).

"Change in Control" is defined under the Change in Control Plan as:

- the merger, reorganization, or consolidation of the FHLB with or into, or acquisition of the FHLB by, another Federal Home Loan Bank or other entity;
- the sale or transfer of all or substantially all of the business or assets of the FHLB to another Federal Home Loan Bank or other entity;
- a change in the composition of the board that causes the combined number of Member directors from the jurisdictions of Kentucky, Ohio and Tennessee to cease to constitute a majority of the Bank's directors; or
- liquidation or dissolution.

"Cause" is defined in the Change in Control Plan to include:

- the participant's failure to perform substantially his/her duties;
- the participant's engagement in illegal conduct or willful misconduct injurious to the FHLB;
- the participant's material violation of law or regulation or of the FHLB's written policies or guidelines;
- a written request from the Finance Agency requesting that the FHLB terminate the participant's employment;
- crimes involving a felony, fraud or other dishonest acts;
- certain other notices from or actions by the Finance Agency;
- the participant's breach of fiduciary duty or breach of certain covenants in the Change in Control Plan; or
- the participant's refusal to comply with a lawful directive from the CEO or the Board of Directors.

"Good Reason" is defined in the Change in Control Plan to include:

- a material diminution in the participant's base salary or in his/her duties or authority;
- the FHLB requiring the participant to be based at any office or location more than 100 miles from Cincinnati, Ohio; or
- a material breach of the Change in Control Plan by the FHLB.

In the event of a qualifying termination, the participant will receive a severance payment equal to a compensation multiplier times the sum of the participant's base salary plus target annual incentive amount for the year in which the Change in Control occurs. The CEO (Tier 1) is subject to a compensation multiplier of 2.50, Executive Vice Presidents (Tier 2) are subject to a compensation multiplier of 1.75 and Senior Vice Presidents (Tier 3) are subject to a compensation multiplier of 1.50. Participants will also receive a lump sum cash payment equal to accrued and unused paid time off and the amount that would have been payable pursuant to the participant's annual incentive compensation award for the year in which the date of a qualifying termination occurs based on actual performance, prorated based on the number of days the participant was employed that year. In addition, participants will receive a cash payment for outplacement assistance of $7,500 for Tier 1, $4,500 for Tier 2 and $2,500 for Tier 3, as well as the continuation of health care coverage for 24 months for Tier 1, 18 months for Tier 2 and 12 months for Tier 3.

The following table presents the total amounts that would be payable to our Named Executive Officers if their employment had terminated as of December 31, 2022.

Total Potential Payment Upon Termination [1]

Separation Event	Andrew S. Howell	Stephen J. Sponaugle	Roger B. Batsel	Bridget C. Hoffman	Tami L. Hendrickson
Involuntary termination for Cause	$ —	$ —	$ —	$ —	$ —
Voluntary resignation not due to a Change in Control or resignation without Good Reason due to a Change in Control [2]	103,459	29,028	17,581	31,314	37,735
Involuntary termination without Cause not due to a Change in Control [3]	568,459	248,028	209,581	188,814	202,735
Involuntary termination without Cause due to a Change in Control or resignation for Good Reason due to a Change in Control [4]	4,900,316	1,540,058	1,354,465	1,114,795	973,876

(1) Due to the number of factors that affect the nature and amounts of compensation and benefits provided upon the potential termination events, the actual amounts paid may be different than the estimates presented.
(2) Named Executive Officers would only receive payment for unused, accrued paid time off.
(3) Named Executive Officers would receive payment for one month's pay for each year of continuous employment, rounded to the next whole year for partial years, subject to a six months' pay maximum, plus unused, accrued paid time off.
(4) Named Executive Officers would receive payment as follows:

Component	Andrew S. Howell	Stephen J. Sponaugle	Roger B. Batsel	Bridget C. Hoffman	Tami L. Hendrickson
Salary	$ 2,325,000	$ 766,500	$ 672,000	$ 567,000	$ 495,000
Incentive compensation	1,743,750	459,900	403,200	297,675	259,875
Other [a]	831,566	313,658	279,265	250,120	219,001
Total	$ 4,900,316	$ 1,540,058	$ 1,354,465	$ 1,114,795	$ 973,876

(a) Includes accrued annual incentive compensation from the current year, accrued and unused paid time off, outplacement assistance and health care coverage.

COMPENSATION COMMITTEE REPORT

The Committee has furnished the following report for inclusion in this Annual Report on Form 10-K:

> The Committee has reviewed and discussed the 2022 Compensation Discussion and Analysis set forth above with the FHLB's management. Based on such review and discussions, the Committee recommended to the Board of Directors that the Compensation Discussion and Analysis be included in this Annual Report on Form 10-K.

J. Lynn Anderson (Chair)
Lewis Diaz
Danny J. Herron
Robert T. Lameier
Donald J. Mullineaux
Nancy E. Uridil

COMPENSATION OF DIRECTORS

As required by Finance Agency regulations and the FHLBank Act, we have established a formal policy governing the compensation and travel reimbursement provided to our directors. The goal of the policy is to compensate Board members for work performed. Under our policy, compensation is comprised of per meeting fees, subject to an annual cap, and reimbursement for reasonable travel-related expenses. The fees are intended to compensate directors for time spent reviewing materials sent to them, preparing for meetings, participating in other activities and attending the meetings of the Board of Directors and its committees.

The annual maximum base fee increased from 2022 to 2023. The following table sets forth the maximum base fees for 2022 and 2023:

	2022	2023
	Maximum Base Fees	Maximum Base Fees
Chair	$ 145,000	$ 155,000
Vice Chair	125,500	133,658
Other members	110,000	118,690

In addition to the base fees, under the 2022 policy, annual fees were paid to the Audit Committee Chair and Other Committee Chairs of $15,500 and $12,500, respectively. Under the 2023 policy, annual fees are paid to the Audit Committee Chair and Other Committee Chairs of $14,340 and $11,520, respectively. Additionally, under the 2023 policy, Audit Committee members other than the Audit Committee Chair, Chair or Vice Chair of the Board are paid an annual fee of $5,000. These fees are subject to certain attendance requirements.

During 2022, total directors' fees and travel expenses incurred were $1,986,000 and $165,588, respectively.

With prior approval, our Travel Policy permits a guest to accompany a director on authorized business trips. We reimburse the transportation and other related expenses associated with the guest's travel, subject to certain limitations, which are reported as a taxable fringe benefit. During 2022, there were 10 directors that received reimbursement for guest travel expenses. These expenses did not exceed $10,000 for any director and, therefore, are excluded from the Directors Compensation Table below.

The following table sets forth the fees earned by each director for the year ended December 31, 2022.

2022 Directors Compensation Table

Name	Fees Earned or Paid in Cash
J. Lynn Anderson, Chair	$ 145,000
J. Wade Berry	110,000
Brady T. Burt	125,500
Greg W. Caudill	110,000
Kristin H. Darby	122,500
Lewis Diaz	110,000
James A. England	110,000
Danny J. Herron	110,000
Robert T. Lameier	110,000
Donald J. Mullineaux	122,500
Michael P. Pell	110,000
Kathleen A. Rogers	110,000
Leslie Scott Spivey	110,000
William S. Stuard, Jr.	110,000
Nancy E. Uridil	122,500
James J. Vance, Vice Chair	125,500
Jonathan D. Welty	122,500
Total	$ 1,986,000

The following table summarizes the total number of board meetings and meetings of its designated committees held in 2021 and 2022.

	Number of Meetings Held	
Meeting Type	2021	2022
Board Meeting	8	9
Audit Committee	11	11
Risk Committee	6	6
Business and Operations Committee	5	5
Governance	7	6
Housing and Community Development Committee	4	4
Human Resources, Compensation and Inclusion Committee	6	7

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

The Committee is charged with responsibility for the FHLB's compensation policies and programs. None of the 2022 or 2023 Committee members are or previously were officers or employees of the FHLB. Additionally, none of the FHLB's executive officers served or serve on the board of directors or the compensation committee of any entity whose executive officers served on the Committee or Board of Directors. This Committee was and is composed of the following members:

2022	2023
J. Lynn Anderson (Chair)	J. Lynn Anderson (Chair)
Lewis Diaz	Lewis Diaz
James A. England	Danny J. Herron
Robert T. Lameier	Robert T. Lameier
Donald J. Mullineaux	Donald J. Mullineaux
Nancy E. Uridil	Nancy E. Uridil

PAY RATIO

As required by the Dodd-Frank Act, information about the 2022 total compensation for our median employee and the President and CEO, Mr. Howell, is as follows:

- the median of the annual total compensation of all of our employees (other than the CEO) was $120,622; and
- the annual total compensation of the CEO, as reported in the Summary Compensation Table, was $1,937,594.

Based on this information, for 2022, the ratio of the annual total compensation of the CEO to the median of the annual total compensation of all employees was 16 to 1. The annual total compensation for the CEO and median employee excluded the change in the actuarial present value of accumulated pension benefits as those amounts decreased in 2022.

The median employee was identified in 2022. To identify the median employee, we compared the compensation of all full-time and part-time employees who were employed as of December 15, 2022. We annualized the compensation of employees who were hired in 2022 but did not work for us the entire fiscal year. This compensation measure, which was consistently applied to all employees, included base salary, overtime pay and incentive compensation that was all payable in cash.

The median employee's compensation for 2022 includes base salary, excess accrued vacation benefits, incentive compensation, matching contributions to the qualified defined contribution plan, and the value of such employee’s pension benefits (if applicable). The value of the pension benefits represents only the change in the actuarial present value of accumulated pension benefits, which is primarily dependent on changes in interest rates, years of benefit service and salary. With respect to the annual total compensation of the CEO, we used the amount reported in the “Total” column of our 2022 Summary Compensation Table.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

We have one class of capital stock, Class B Stock, all of which is owned by our current and former member institutions. Individuals, including directors and officers of the FHLB, are not permitted to own our capital stock. Therefore, we have no equity compensation plans.

The following table lists institutions holding five percent or more of outstanding capital stock at February 28, 2023 and includes any known affiliates that are members of the FHLB:

(Dollars in thousands)

Name	Address	Capital Stock	Percent of Total Capital Stock	Number of Shares
U.S. Bank, N.A.	425 Walnut Street Cincinnati, OH 45202	$1,188,298	25 %	11,882,976
Keybank, N.A.	127 Public Square Cleveland, OH 44114	642,676	13	6,426,760
The Huntington National Bank	41 South High Street Columbus, OH 43215	289,315	6	2,893,150
Fifth Third Bank	38 Fountain Square Plaza Cincinnati, OH 45202	260,443	5	2,604,428

The following table lists capital stock outstanding as of February 28, 2023 held by member institutions that have an officer or director who serves as a director of the FHLB:

(Dollars in thousands)

Name	Address	Capital Stock	Percent of Total Capital Stock
U.S. Bank, N.A.	425 Walnut Street Cincinnati, OH 45202	$ 1,188,298	24.6 %
Western & Southern Financial Group (1)	400 Broadway Street Cincinnati, OH 45202	174,195	3.6
The Park National Bank	50 North Third Street Newark, OH 43058	8,667	0.2
Farmers Bank & Trust Company	201 South Main Street Marion, KY 42064	1,834	0.0
The Bank of Fayette County	1265 Highway 57 E Collierville, TN 38017	1,360	0.0
First State Bank	19230 State Route 136 Winchester, OH 45697	1,291	0.0
Farmers National Bank	304 West Main Street Danville, KY 40422	1,178	0.0
Commercial Bank & Trust Company	107 North Poplar Paris, TN 38242	1,121	0.0
Miami Savings Bank	8008 Ferry Street Miamitown, OH 45041	1,100	0.0
Ohio Capital Finance Corporation	88 East Broad Street, Suite 1800 Columbus, OH 43215	155	0.0

(1) Includes five subsidiaries (Western-Southern Life Assurance Co., Integrity Life Insurance Company, Lafayette Life Insurance Company, Columbus Life Insurance Company and National Integrity Life Insurance Company), which are FHLB members.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

DIRECTOR INDEPENDENCE

Because we are a cooperative, capital stock ownership is a prerequisite to transacting any business with us. Transactions with our stockholders are part of the ordinary course of - and are essential to the purpose of - our business.

Our capital stock is not permitted to be publicly traded and is not listed on any stock exchange. Therefore, we are not governed by stock exchange rules relating to director independence. If we were so governed, arguably none of our industry directors, who are elected by our members, would be deemed independent because all are directors and/or officers of members that do business with us. Messrs. Diaz, Herron, Mullineaux and Spivey and Mses. Anderson, Darby and Uridil, our seven non-industry directors, have no material transactions, relationships or arrangements with the FHLB other than in their capacity as directors. Therefore, our Board of Directors has determined that each of them is independent under the independence standards of the New York Stock Exchange.

The Finance Agency director independence standards specify independence criteria for members of our Audit Committee. Under these criteria, all of our directors serving on the Audit Committee are independent.

TRANSACTIONS WITH RELATED PERSONS

See Note 18 of the Notes to Financial Statements for information on transactions with stockholders, including information on transactions with Directors' Financial Institutions and concentrations of business, and transactions with nonmember affiliates, which information is incorporated herein by reference.

See also “Compensation Committee Interlocks and Insider Participation” in Item 11. Executive Compensation.

Review and Approval of Related Persons Transactions. Ordinary course transactions with Directors' Financial Institutions and with members holding five percent or more of our capital stock are reviewed and approved by our management in the normal course of events so as to assure compliance with Finance Agency regulations.

As required by Finance Agency regulations, we have a written conflict of interest policy. This policy requires directors (1) to disclose to the Board of Directors any known personal financial interests that they, their immediate family members or their business associates have in any matter to be considered by the Board and in any other matter in which another person or entity does or proposes to do business with the FHLB and (2) to recuse themselves from considering or voting on any such matter. The scope of the Finance Agency's conflict of interest regulation (available at www.fhfa.gov) and our conflict of interest policy (posted on our website at www.fhlbcin.com) is similar, although not identical, to the scope of the SEC's requirements governing transactions with related persons. In 2007, our Board of Directors adopted a written related person transaction policy that is intended to close any gaps between Finance Agency and SEC requirements. The policy includes procedures for identifying, approving and reporting related person transactions as defined by the SEC. One of the tools that we used to monitor non-ordinary course transactions and other relationships with our directors and executive officers is an annual questionnaire that uses the New York Stock Exchange criteria for independence. Finally, our Insider Trading Policy provides that any request for redemption of excess stock (except for de minimis amounts) held by a Director's Financial Institution must be approved by the Board of Directors or by the Executive Committee of the Board.

We believe these policies are effective in bringing to the attention of management and the Board any non-ordinary course transactions that require Board review and approval and that all such transactions since January 1, 2022 have been so reviewed and approved.

Item 14. Principal Accountant Fees and Services.

The following table sets forth the aggregate fees billed to the FHLB for the years ended December 31, 2022 and 2021 by its independent registered public accounting firm, PwC:

(In thousands)	For the Years Ended December 31, 2022	2021
Audit fees	$ 843	$ 774
Audit-related fees	79	91
Tax fees	—	—
All other fees	1	1
Total fees	$ 923	$ 866

Audit fees were for professional services rendered for the audits of the FHLB's financial statements.

Audit-related fees were for assurance and services related to the performance of the audit and review of the FHLB's financial statements and primarily consisted of accounting consultations and fees related to participation in and presentations at conferences.

The FHLB is exempt from all federal, state and local income taxation. Therefore, no fees were paid for tax services during the years presented.

All other fees were for the annual license of a disclosure compliance checklist.

The Audit Committee approves the annual engagement letter for the FHLB's audit. In evaluating the performance of the independent registered public accounting firm, the Audit Committee considers a number of factors, such as:

- PwC's independence and process for maintaining independence;
- PwC's historical and recent performance on the FHLB's audit, including the results of an internal survey of PwC service and quality with the FHLB and the FHLBank System;
- external data related to audit quality and performance, including recent Public Company Accounting Oversight Board audit quality inspection reports on PwC; and

- the appropriateness of PwC's audit fees.

The Audit Committee also establishes a fixed dollar limit for other recurring annual accounting related consultations, which include the FHLB's share of FHLBank System-related accounting issues. The status of these services is periodically reviewed by the Audit Committee throughout the year with any increase in these services requiring pre-approval. All other services provided by the independent accounting firm are specifically approved by the Audit Committee in advance of commitment.

The FHLB paid additional fees to PwC in the form of assessments paid to the Office of Finance. The FHLB is assessed its proportionate share of the costs of operating the Office of Finance, which includes the expenses associated with the annual audits of the combined financial statements of the FHLBanks. These assessments, which totaled $61,000 and $47,000 in 2022 and 2021, respectively, are not included in the table above.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) *Financial Statements.* The following financial statements of the Federal Home Loan Bank of Cincinnati, set forth in Item 8. Financial Statements and Supplementary Data above, are filed as a part of this registration statement.

Report of Independent Registered Public Accounting Firm (PCAOB ID 238)
Statements of Condition as of December 31, 2022 and 2021
Statements of Income for the years ended December 31, 2022, 2021 and 2020
Statements of Comprehensive Income for the years ended December 31, 2022, 2021 and 2020
Statements of Capital for the years ended December 31, 2022, 2021 and 2020
Statements of Cash Flows for the years ended December 31, 2022, 2021 and 2020
Notes to Financial Statements

(b) *Exhibits.*

Exhibit Number [1]	Description of exhibit	Document filed or furnished, as indicated below
3.1	Organization Certificate	Form 10, filed December 5, 2005
3.2	Bylaws, as amended through January 17, 2019	Form 10-K, filed March 21, 2019
4.1	Capital Plan, effective January 11, 2022	Form 8-K, filed December 27, 2021
4.2	Description of Capital Stock	Form 10-K, filed March 17, 2022
10.1	Form of Blanket Agreement for Advances and Security Agreement, as in effect for signatories prior to November 21, 2005	Form 10, filed December 5, 2005
10.2	Form of Blanket Security Agreement, for new signatories on and after November 21, 2005	Form 10, filed December 5, 2005
10.3	Form of Mortgage Purchase Program Master Selling and Servicing Master Agreement	Form 10, filed December 5, 2005
10.4	Federal Home Loan Banks P&I Funding and Contingency Plan Agreement, entered into as of July 20, 2006, by and among the Office of Finance and each of the Federal Home Loan Banks, as amended and restated on January 1, 2017	Form 10-K, filed March 16, 2017
10.5	Joint Capital Enhancement Agreement, as amended on August 5, 2011, by and among each of the Federal Home Loan Banks	Form 8-K, filed August 5, 2011
10.6 [2]	Incentive Compensation Plan as of January 1, 2021	Form 10-K, filed March 18, 2021
10.7 [2]	Incentive Compensation Plan as of January 1, 2022	Form 10-K, filed March 17, 2022
10.8 [2]	Incentive Compensation Plan as of January 1, 2023	Filed Herewith
10.9 [2]	Federal Home Loan Bank of Cincinnati Benefit Equalization Plan (December 2008 Restatement)	Form 10-K, filed March 18, 2010

10.10 (2)	First Amendment to the Federal Home Loan Bank of Cincinnati Benefit Equalization Plan (December 2008 Restatement)	Form 10-K, filed March 18, 2010
10.11	Form of indemnification agreement between the Federal Home Loan Bank and each of its directors and executive officers (used from July 29, 2009 to December 31, 2016)	Form 8-K, filed July 30, 2009
10.12	Form of indemnification agreement between the Federal Home Loan Bank and each of its directors and executive officers (used from January 1, 2017 to November 4, 2018)	Form 10-K, filed March 16, 2017
10.13	Form of indemnification agreement between the Federal Home Loan Bank and each of its directors and executive officers (used after November 5, 2018)	Form 10-K, filed March 21, 2019
10.14	Federal Home Loan Bank of Cincinnati Executive Change in Control Severance Plan	Form 10-Q, filed November 9, 2017
24	Power of Attorney (included in Signature Page)	Filed Herewith
31.1	Rule 13a-14(a)/15d-14(a) Certification of Principal Executive Officer	Filed Herewith
31.2	Rule 13a-14(a)/15d-14(a) Certification of Principal Financial Officer	Filed Herewith
32	Section 1350 Certifications	Furnished Herewith
99.1	Audit Committee Letter	Furnished Herewith
99.2	Audit Committee Charter	Furnished Herewith
101.INS	XBRL Instance Document	The instance document does not appear in the interactive data file because its XBRL tags are embedded within the inline XBRL document
101.SCH	XBRL Taxonomy Extension Schema Document	Filed Herewith
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	Filed Herewith
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	Filed Herewith
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	Filed Herewith
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Filed Herewith
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)	Filed Herewith

(1) Numbers coincide with Item 601 of Regulation S-K.
(2) Indicates management compensation plan or arrangement.

Item 16. Form 10-K Summary.

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, as of the 16th day of March 2023.

FEDERAL HOME LOAN BANK OF CINCINNATI
(Registrant)

By: /s/ Andrew S. Howell
Andrew S. Howell
President and Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned directors of the Federal Home Loan Bank of Cincinnati, hereby appoint Andrew S. Howell and Stephen J. Sponaugle, or either of them, our true and lawful attorneys and agents to do any and all acts and things in our names and on our behalves, in our capacities indicated below, which said attorneys and agents, or either of them, may deem necessary or advisable to enable said registrant to comply with the Securities Act of 1934, as amended, and any rules, regulations and requirements of the Securities and Exchange Commission, in connection with the registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2022, including, without limitation, power and authority to sign for us, or any of us, in our names in the capacities indicated below, the Report and any and all amendments to the Report, and we hereby ratify and confirm all that said attorneys and agents, or each of them, shall do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated as of the 16th day of March 2023.

Signatures	Title
/s/ Andrew S. Howell Andrew S. Howell	President and Chief Executive Officer (principal executive officer)
/s/ Stephen J. Sponaugle Stephen J. Sponaugle	Executive Vice President, Chief Financial Officer (principal financial officer)
/s/ J. Christopher Bates J. Christopher Bates	Senior Vice President, Chief Accounting Officer (principal accounting officer)
/s/ J. Lynn Anderson J. Lynn Anderson, Chair	Director (Chair)
/s/ J. Wade Berry J. Wade Berry	Director
/s/ Brady T. Burt Brady T. Burt	Director
/s/ Greg W. Caudill Greg W. Caudill	Director
/s/ Kristin H. Darby Kristin H. Darby	Director
/s/ Lewis Diaz Lewis Diaz	Director

/s/ Roy Molitor Ford, Jr.	Director
Roy Molitor Ford, Jr.	
/s/ Danny J. Herron	Director
Danny J. Herron	
/s/ Robert T. Lameier	Director
Robert T. Lameier	
/s/ Donald J. Mullineaux	Director
Donald J. Mullineaux	
/s/ Michael P. Pell	Director
Michael P. Pell	
/s/ Kathleen A. Rogers	Director
Kathleen A. Rogers	
/s/ Leslie Scott Spivey	Director
Leslie Scott Spivey	
/s/ Nancy E. Uridil	Director
Nancy E. Uridil	
/s/ James J. Vance	Director (Vice Chair)
James J. Vance, Vice Chair	
/s/ Jonathan D. Welty	Director
Jonathan D. Welty	
/s/ H. McCall Wilson, Jr.	Director
H. McCall Wilson, Jr.	