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, 2019

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	**31-6000228**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
600 Atrium Two, P.O. Box 598, Cincinnati, OH	**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).
☐ 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 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, 2019, the aggregate par value of all Class B stock held by members and former members was $3,829,090,700. As of February 29, 2020, the registrant had 32,572,324 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 document 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, including acts of war, terrorism, natural disasters, pandemics, 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 favorable terms or preserve our profitability, or could alter the regulations and legislation to which we are subject;

- 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 expected phasing out of London InterBank Offered Rate (LIBOR) that could impact our mortgage-backed security (MBS) investments, Advances, Consolidated Obligations, 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 document.

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 mortgage lenders, 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.

All federally insured depository institutions, certain insurance companies, and 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.

The combination of public sponsorship and private ownership that drives our business model is reflected in the composition of our 18-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.

At December 31, 2019, we had 640 members, 233 full-time employees, and one part-time employee. Our employees are not represented by a collective bargaining unit. We consider our relationship with our employees to be good.

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 financial services and a competitive return on their capital investment to help them facilitate and expand housing finance and community investment and achieve their objectives for liquidity and asset liability 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, who we believe typically rely more on us for access to liquidity and mortgage markets compared with larger members. 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, which we call Mission Assets, 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, which due to its GSE status, confers an implied guarantee from the U.S. federal government, 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, LIBOR 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 percentages 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 Mission Asset Activity at relatively narrow spreads over funding costs, compared with other financial institutions, while still achieving acceptable profitability. Our cooperative ownership structure and deep 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 favorable 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 Asset Activity:*** Implement strategies and tactics and effectively manage operations to promote members' usage of Mission Assets and stand ready at all times to provide liquidity to members.
- ***Stock Return:*** Earn adequate profitability so that members receive a competitive long-term dividend on their capital stock investment.
- ***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.
- ***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 Asset Activity
The following are our principal business activities with members:

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

Together, these product offerings constitute "Mission Asset Activity." 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 provide 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. Acquiring capital in connection with growth in Mission Assets 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.

Tax Status

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 14 of the Notes to Financial Statements provide additional details regarding the assessment for the Affordable Housing Program.

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 2019 and maintained a stable outlook. In 2019, 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.

Regulatory Oversight

The Finance Agency is headed by a Director who has authority to promulgate regulations and to make other decisions. The Finance Agency 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.

To carry out these responsibilities, the Finance Agency conducts on-site examinations of each FHLBank at least annually, as well as periodic on- and off-site 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.

BUSINESS SEGMENTS

We manage the development, resource allocation, product delivery, pricing, credit risk management, and operational administration of our Mission Asset Activity 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 18 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. A majority of REPO Advances outstanding have overnight maturities.

Adjustable-rate Advances have interest rates typically priced off benchmark rate indices such as LIBOR or 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. The net effect is that in practice we mitigate nearly all of the market risk exposure associated with 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.

We manage credit risk on Advances by requiring 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-family loans, multi-family loans, commercial real estate loans, home equity loans and bond securities. The combination of conservative collateral policies and risk-based credit underwriting activities mitigates virtually all potential credit risk associated with Advances and Letters of Credit. We have never experienced a credit loss on Advances, nor have we ever determined it necessary to establish a loan loss reserve for Advances. "Quantitative and Qualitative Disclosures About Risk Management” in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations and Notes 8 and 10 of the Notes to Financial Statements have more detail on our credit risk management of member borrowings.

Housing and Community Investment

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. See Note 14 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. 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 currently distribute funds in the form of grants 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.

Our Board of Directors also may allocate funds to voluntary housing programs. In 2019, the Board re-authorized an additional $2.1 million to the Carol M. Peterson Housing Fund for use during the year. In January 2020, the Board authorized $2.0 million to this fund for use in 2020. These funds are primarily used as grants to pay for accessibility rehabilitation and emergency repairs for special needs and elderly homeowners. In 2012, the Board of Directors also established the Disaster Reconstruction Program, a voluntary housing program that provides grants for purchase or rehabilitation of a home within the Fifth District for residents that have suffered loss or damage to their primary residence as a result of a state or federally declared disaster. Since the program's inception, we have disbursed over $3.9 million to assist 275 households.

Two other housing programs that fall outside the auspices 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 three basis points. 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.

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. The first five categories represent unsecured lending to private counterparties. 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.

Subject to regulatory limitations on LIBOR-based investments, 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 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, on a book value basis, 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. We also may be able to obtain liquidity by selling certain investments for cash without a significant loss of value.

- *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 Asset Activity, 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 having similar maturities. 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, by funding them with a portfolio of long-term fixed-rate callable and non-callable Obligations, and by managing 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 permitted to invest only in the instruments of counterparties with high credit ratings, and because of our conservative investment policies and practices, we believe all of our investments have high credit quality. 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 less than one 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 the maximum amount permissible to be lent as a regular prime (i.e., non-jumbo, non-subprime) mortgage. For 2020, the Finance Agency established the conforming limit at $510,400 with loans originated in a limited number of high-cost cities and counties receiving higher conforming limits. We have elected not to purchase mortgages subject to these higher conforming limits.

Loan Purchase Process. A Master Commitment Contract is negotiated with each PFI, in which the PFI agrees to make a best efforts attempt to sell us a specific dollar amount of mortgage loans generally over a period of up to 12 months. We purchase loans 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, include available primary mortgage insurance, the Lender Risk Account (discussed below), and Supplemental Mortgage Insurance. Supplemental Mortgage Insurance is applicable to loans acquired before February 2011 and was purchased by the PFI from one of our approved third-party providers naming us as the beneficiary. 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 pre-defined 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 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);
- minus the cost of Supplemental Mortgage Insurance (for applicable 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. The pricing of each structure depends on a number of factors and is specific to the PFI and to the loan pool. 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 these institutions.

There are two types of Consolidated Obligations: Consolidated Bonds (Bonds) and Consolidated Discount Notes (Discount Notes). We participate in the issuance of Bonds for three purposes:

- to finance and hedge intermediate- and long-term fixed-rate Advances and mortgage assets;
- to finance and hedge short-term, adjustable-rate Advances, and swapped Advances, typically by synthetically transforming fixed-rate Bonds to adjustable-rate funding through the execution of interest rate swaps; and
- to acquire liquidity investments.

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 typically ranges from one year to 20 years. Adjustable-rate Bonds use a benchmark market interest rate, typically LIBOR or SOFR, for interest rate resets. We do not participate in the issuance of range Bonds, zero coupon Bonds, or indexed principal redemption Bonds.

We use fixed-rate Bonds to fund longer-term fixed-rate Advances and longer-term fixed-rate mortgage assets, and use adjustable-rate Bonds to fund adjustable-rate Advances and certain longer-term fixed rate investments that have been swapped to an adjustable-rate.

We transact in interest rate swaps to synthetically convert some fixed-rate Bonds to adjustable-rate terms. These are used to hedge adjustable-rate Advances.

We participate in the issuance of Discount Notes to fund short-term Advances, adjustable-rate Advances, putable Advances (which we normally swap to an adjustable-rate), liquidity investments, and a portion of longer-term fixed-rate assets. Discount Notes have maturities from one day to one year, with most of ours normally maturing within three months.

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 of interest rates and the shape of the U.S. Treasury curve and the LIBOR swap curve; 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 or economic 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 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 securities.

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 and is available to absorb financial losses.

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. This requirement historically has been closest to affecting our operations.
- 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 Mission Asset 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 Mission Asset Activity (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).

- The concept of “cooperative capital,” explained below, better aligns the interests of heavy users of our products with light users by enhancing the dividend return and providing a more stable base of capital.

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 Asset Activity. This enables us to maintain a prudent amount of financial leverage and consistently generate a competitive dividend return.

At December 31, 2019, the amount of membership stock required for each member ranged from a minimum of $1,000 to a maximum of $30 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 its Mission Asset Activity. For purposes of the Capital Plan, Mission Asset Activity includes the principal balance of Advances, guaranteed funds and rate Advance commitments, and the principal balance of loans and commitments in the MPP.

The FHLB must capitalize all Mission Asset Activity with capital stock at a rate of at least four percent. However, each member is permitted to maintain an amount of activity stock within the range of minimum and maximum percentages for each type of Mission Asset Activity. The current percentages are as follows:

Mission Asset Activity	Minimum Activity Percentage	Maximum Activity Percentage
Advances	2%	4%
Advance Commitments	2	4
MPP	0	4

If a member owns more stock than is needed to satisfy both its membership stock requirement and the maximum activity stock percentages for its Mission Asset Activity, we designate the remaining stock as the member's excess capital stock. The member may utilize its excess stock to capitalize additional Mission Asset Activity.

If an individual member's excess stock reaches zero, the Capital Plan normally permits us, with certain limits, to capitalize additional Mission Asset Activity of that member with excess stock owned by other members at the maximum percentage rate. This feature, called “cooperative capital,” enables us to more effectively utilize our capital stock. The limit to how much cooperative capital a member may use is currently set at $100 million. A member's use of cooperative capital reduces the ratio of its activity stock to its Mission Asset Activity for each type of Mission Asset Activity. When a member's ratio of activity stock to its Mission Asset Activity reaches the minimum activity stock percentage for all types of Mission Asset Activity, the member must capitalize additional Mission Asset Activity of a given type by purchasing capital stock at that asset type's minimum percentage rate, assuming availability of cooperative capital.

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 other-than-temporary 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 range for the 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, 2019, the minimum retained earnings requirement ranges from $200 million to $375 million, based on mitigating quantifiable risks under very stressed business and market scenarios to a 99 percent confidence level. At the end of 2019, our retained earnings totaled $1,094 million. 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 allocate quarterly at least 20 percent of its net income to a restricted retained earnings account (the “Account”). 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 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 our products 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. In addition, our competitive environment continues to be impacted by the Federal Reserve's low interest-rate environment. 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.

Item 1A. Risk Factors.

The following are the most important risks 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 Asset Activity, lower earnings and dividends, and, at the extreme, impairment of our capital or an inability 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.

***Economy.* An economic downturn could lower Mission Asset Activity and profitability.**

Member demand for Mission Asset Activity depends in large part on the general health of the economy and overall business conditions. Numerous external factors can affect our Mission Asset Activity 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;
- competitive alternatives to our products, such as retail deposits and other sources of wholesale funding;
- regulations affecting our members' liquidity requirements;
- actions of the Federal Reserve to affect liquidity reserves of financial institutions and the money supply; and
- the willingness and ability of financial institutions to expand lending.

A recessionary economy may lower the demand for Mission Asset Activity, decrease profitability, and cause stockholders to request redemption of a portion of their capital or request withdrawal from membership (both referred to in this document as “request withdrawal of capital”). These unfavorable effects are more likely to occur and be more severe if a weak economy 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.

In addition, we believe overall Advance demand has been and continues to be unfavorably affected by the substantial amount of deposit-based liquidity provided to financial institutions through the monetary actions of the Federal Reserve and changes in our members' ability to manage their regulatory liquidity requirements. See the "Competition" risk factor for further discussion.

As noted above, our business and results of operations may be affected by the fiscal and monetary policies of the federal government and its agencies, including the Federal Reserve, which regulates the supply of money and credit in the United States. The Federal Reserve’s policies directly and indirectly influence the financial markets. For example, the Federal Open Market Committee (FOMC) approved emergency reductions to the target range for the Federal funds rate in March 2020, in response to the coronavirus pandemic (COVID-19) and the potential negative impact on the U.S. economy. In addition, U.S. Treasury yields have declined in 2020, with the 10-year U.S. Treasury yield and fixed mortgage rates reaching record lows in March. Further adverse changes in the markets or further action in response to this widespread health emergency could adversely affect our financial condition, results of operations, and ability to pay dividends. Refer to "Executive Overview" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations for additional information on recent market activity.

***Competition.* The competitive environment for our products could adversely affect business activities, including decreasing the level and utilization rates of Mission Asset Activity, 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 and wholesale funding, which 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 face increased origination competition from originators 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 on those products, both of which could cause stockholders to request withdrawals of capital.

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.

***Business Concentration and Consolidation and Composition of the Financial Industry.* Sharp reductions in Mission Asset Activity 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 Asset Activity 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 Asset Activity 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, 2019, one member, U.S. Bank, N.A., held nearly 30 percent of our Advances and one member PFI, Union Savings Bank, accounted for over 30 percent of the outstanding MPP principal balance. Our business model is structured to be able to absorb sharp changes in Mission Asset Activity 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 Asset Activity 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.

***GSE Reform.* 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.

***FHLB Regulatory Environment.* 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 significantly affect our business model, financial condition, or results of operations. Legislative and regulatory actions have also raised our operating costs and imparted added uncertainty regarding the business model and membership base under which the FHLBanks may operate in the future. We are unable at this time to predict the ultimate effects the regulatory environment could have on the FHLBank System's business model, our members' view on the value of FHLBank membership, or on our financial condition and results of operations.

***Liquidity and Market Access.* Impaired access to the capital markets for debt issuance could decrease the amount of Mission Asset Activity, 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 favorable 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 was able to maintain access to the capital markets for debt issuances on acceptable terms during 2019, there is no assurance this will continue to be the case. Future ability to effectively access the capital markets could be adversely affected by external events (such as general economic and financial instabilities, political instability, wars, natural disasters, or widespread health emergencies), deterioration in the perception of financial market participants about the financial strength of Consolidated Obligations, or downgrades to the System's credit ratings. 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 and Counterparty 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 related to Credit Services, purchases of investments, and transactions in derivatives, and a minimal amount of credit risk exposure related to the MPP. However, we can make no assurances that credit losses could not materially affect our financial condition or results of operations in all scenarios. An extremely severe and prolonged economic downturn, especially if combined with continued significant disruptions in housing or mortgage markets, could result in credit losses on assets that could impair our financial condition or results of operations.

The FHLB is an asset-based lender for Advances and Letters of Credit. Advances and Letters of Credit are over-collateralized and we have a perfected first lien position on collateral. However, we do not have full information on the characteristics of nor do we estimate current market values on a large portion of collateral. This results in a degree of uncertainty as to the precise amount of over-collateralization.

Although credit losses in the MPP have historically been minimal, they could increase under adverse economic scenarios involving significant and sustained reductions in home prices and sustained elevated levels of unemployment and other factors that influence delinquencies and defaults.

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 making it difficult for us to find qualified counterparties for transactions.

***Market 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. 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.

Because it is normally cost-prohibitive to completely mitigate 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 Asset Activity 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.

***Asset Profitability.* Spreads on assets to funding costs may narrow because of changes in other risk factors such as the economy, interest rates, and competition, resulting in lower profitability.**

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, as discussed above, 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 LIBOR or SOFR. 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 Asset Activity.

***Capital Adequacy.* Failure to meet capital adequacy requirements mandated by Finance Agency regulations and supervisory guidance and by our internal policies, or not being able to pay dividends or repurchase or redeem capital stock, may lower demand for Mission Asset Activity, harm results of operations, and lower membership value.**

To ensure safe and sound operations, we must hold a minimum amount of capital relative to our asset levels. We must also hold a sufficient amount of retained earnings to help protect members' capital stock investment against impairment risk. If our capital levels fall significantly, we may be unable to pay dividends or redeem and repurchase capital stock in a timely manner (or at all). Such events could adversely affect the value of membership including causing impairment in the value of members' capital investment in our company. Outcomes could be reduced demand for Mission Asset Activity, decreased profitability, requests from members to redeem a portion of their capital or to withdraw from membership, or increased investors' perception of the riskiness of our FHLB.

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

In July 2017, the United Kingdom's Financial Conduct Authority (FCA), which regulates LIBOR, announced that after 2021 it will no longer persuade or compel banks to submit rates for the calculation of LIBOR. In response, the Federal Reserve Bank of New York convened the Alternative Reference Rates Committee (ARRC) to 1) develop a robust alternative to U.S. dollar LIBOR and 2) develop a plan to encourage its use in derivatives and other transactions as appropriate. The ARRC has settled on the establishment of SOFR as its recommended alternative to U.S. dollar LIBOR. 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. The Federal Reserve Bank of New York began publishing SOFR in April 2018. As of December 31, 2019, a portion of our assets and liabilities remain indexed to LIBOR. There is no assurance that LIBOR will continue to be generally accepted or used by the financial markets through 2021, even if LIBOR continues to be available.

In September 2019, the Finance Agency issued a supervisory letter providing LIBOR transition guidance. Under the supervisory letter, the FHLBanks were directed, by December 31, 2019, to cease purchasing investments that reference LIBOR and mature after December 31, 2021, and, by March 31, 2020, to no longer enter into any other new LIBOR referenced financial assets, liabilities and derivatives with maturities beyond December 31, 2021. Except for investments and option embedded products, the ability to enter into new LIBOR referenced transactions has been extended to June 30, 2020. As a result of the limitations introduced by the Finance Agency, we may experience less flexibility in our access to funding, higher funding costs, lower overall demand or increased costs of Advances, and a lack of suitable investment alternatives. Accordingly, the composition of our balance sheet, capital stock level, primary mission assets ratio and net income may be negatively impacted. Additionally, the limitations within the supervisory letter may impact our ability to manage interest-rate risk, which may have a negative effect on our financial condition and results of operations.

During the market transition away from LIBOR, 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. While market activity in SOFR-linked financial instruments has continued to develop, there can be no guarantee that SOFR will become widely accepted and used across market segments and financial products in a timely manner or that any other alternative reference rate will be developed. 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.

Exposure to Other FHLBanks. ***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.

Exposure to the Office of Finance. ***Failures of the Office of Finance 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.

Operational and Compliance Risks. ***Failures or interruptions in our internal controls, compliance activities, information systems and other technologies, models, and third-party vendors could harm our financial condition, results of operations, reputation, and relations with members.***

Control failures, including failures in our internal controls over financial reporting as well as business interruptions with members and counterparties, could occur from human error, fraud, breakdowns in information and computer systems, errors or misuse of financial and business models and services we employ (including third-party vendor services), lapses in operating processes, or natural or man-made disasters. If a significant control failure or business interruption were to occur, it could materially damage 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 or interruptions.

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 and other 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.

Computer systems, software and networks can be vulnerable to failures and interruptions including cyberattacks, which may include breaches, unauthorized access, misuse, computer viruses or other malicious code 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. 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.

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

The success of our mission depends, in large part, on the ability to attract and retain key personnel. Competition for qualified people or ineffective succession planning could affect the ability to hire or retain effective key personnel, thereby harming 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 December 31, 2019, we had 666 member and former member stockholders and approximately 34 million shares of capital stock outstanding, all of which were Class B Stock.

We paid quarterly dividends in 2019 and 2018 as outlined in the table below.

(Dollars in millions)

	2019				2018		
Quarter	Amount	Annualized Rate	Form	Quarter	Amount	Annualized Rate	Form
First	$ 65	6.00%	Cash	First	$ 61	5.75%	Cash
Second	58	5.50	Cash	Second	62	5.75	Cash
Third	45	4.50	Cash	Third	68	6.00	Cash
Fourth	37	4.00	Cash	Fourth	65	6.00	Cash
Total	$ 205	5.05		Total	$ 256	5.88	

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.

A Finance Agency rule prohibits us from issuing new excess capital stock to members, either by paying stock dividends or otherwise, if before or after the issuance the amount of member excess capital stock exceeds or would exceed one percent of the FHLB's assets. Excess capital stock for this regulatory purpose is calculated as the aggregate of capital stock owned that is in excess of all membership and Mission Asset Activity requirements (as defined in our Capital Plan). At December 31, 2019, we had excess capital stock outstanding totaling less than one percent of total assets.

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 15 of the Notes to the Financial Statements for additional information regarding our capital stock.

RECENT SALES OF UNREGISTERED SECURITIES

From time to time, 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 $3 million and $12 million of such credit support during 2019 and 2017. We did not provide such credit support during 2018. 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. Selected Financial Data.

The following table presents selected Statement of Condition data, Statement of Income data and financial ratios for the five years ended December 31, 2019.

	Year Ended December 31,				
(Dollars in millions)	2019	2018	2017	2016	2015
STATEMENT OF CONDITION DATA AT PERIOD END:					
Total assets	$ 93,492	$ 99,203	$ 106,895	$ 104,635	$ 118,756
Advances	47,370	54,822	69,918	69,882	73,292
Mortgage loans held for portfolio	11,236	10,502	9,682	9,150	7,954
Allowance for credit losses on mortgage loans	1	1	1	1	2
Investments [(1)]	34,389	33,614	27,058	25,334	37,356
Consolidated Obligations, net:					
Discount Notes	49,084	46,944	46,211	44,690	77,199
Bonds	38,440	45,659	54,163	53,191	35,092
Total Consolidated Obligations, net	87,524	92,603	100,374	97,881	112,291
Mandatorily redeemable capital stock	22	23	30	35	38
Capital:					
Capital stock - putable	3,367	4,320	4,241	4,157	4,429
Retained earnings	1,094	1,023	940	834	737
Accumulated other comprehensive loss	(16)	(13)	(16)	(13)	(13)
Total capital	4,445	5,330	5,165	4,978	5,153
STATEMENT OF INCOME DATA:					
Net interest income	$ 406	$ 499	$ 429	$ 363	$ 327
Non-interest income (loss)	(10)	(37)	(1)	46	30
Non-interest expense	89	85	79	111	75
Affordable Housing Program assessments	31	38	35	30	28
Net income	$ 276	$ 339	$ 314	$ 268	$ 254
FINANCIAL RATIOS:					
Dividend payout ratio [(2)]	74.1%	75.6%	66.3%	63.9%	67.7%
Weighted average dividend rate [(3)]	5.05	5.88	5.00	4.00	4.00
Return on average equity	5.65	6.29	6.15	5.35	5.04
Return on average assets	0.28	0.32	0.31	0.25	0.24
Net interest margin [(4)]	0.42	0.47	0.42	0.35	0.31
Average equity to average assets	5.04	5.11	5.00	4.76	4.78
Regulatory capital ratio [(5)]	4.79	5.41	4.88	4.80	4.38
Operating expenses to average assets [(6)]	0.070	0.063	0.060	0.061	0.054

(1) Investments include interest-bearing deposits in banks, securities purchased under agreements to resell, Federal funds sold, trading securities, available-for-sale securities, and held-to-maturity securities.
(2) Dividend payout ratio is dividends declared in the period as a percentage of net income.
(3) Weighted average dividend rates are dividends paid divided by the average number of shares of capital stock eligible for dividends.
(4) Net interest margin is net interest income before provision/(reversal) for credit losses as a percentage of average earning assets.
(5) Regulatory capital ratio is period-end regulatory capital (capital stock, mandatorily redeemable capital stock and retained earnings) as a percentage of period-end total assets.
(6) Operating expenses comprise compensation and benefits and other operating expenses, which are included in non-interest expense.

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

Financial Condition

Mission Asset Activity

In 2019, the FHLB fulfilled its mission by providing access to a key source of readily available and competitively priced wholesale funding to its member financial institutions, supporting its commitment to affordable housing and community investment, and paying stockholders a competitive dividend return on their capital investment.

Mission Assets, which we define as Advances, Letters of Credit, and total MPP are the primary means by which we fulfill our mission with direct connections to members. We regularly monitor our balance sheet concentration of Mission Asset Activity. 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 2019, the Primary Mission Asset ratio averaged slightly over 69 percent, just below the Finance Agency's preferred ratio of 70 percent. In assessing overall mission achievement, we also consider supplemental sources of Mission Asset Activity, the most significant of which is Letters of Credit issued to members.

The following table summarizes our Mission Asset Activity.

	Year Ended December 31,			
	Ending Balances		Average Balances	
(In millions)	2019	2018	2019	2018
Mission Asset Activity:				
Advances (principal)	$ 47,264	$ 54,872	$ 47,894	$ 65,593
Mortgage Purchase Program (MPP):				
Mortgage loans held for portfolio (principal)	10,981	10,272	10,499	9,743
Mandatory Delivery Contracts (notional)	936	146	516	287
Total MPP	11,917	10,418	11,015	10,030
Letters of Credit (notional)	16,205	14,847	15,150	14,619
Total Mission Asset Activity	$ 75,386	$ 80,137	$ 74,059	$ 90,242

The balance of Mission Asset Activity was $75.4 billion at December 31, 2019, a decrease of $4.8 billion (six percent) from year-end 2018, which was driven by lower Advance balances. Advance principal balances decreased $7.6 billion (14 percent) from year-end 2018. Average Advance principal balances for 2019 declined $17.7 billion compared to 2018 primarily due to a reduction in borrowings from a few large-asset members. Advance balances are often volatile due to members' ability to quickly, normally on the same day, increase or decrease their amount of Advances. We believe providing members flexibility in their funding levels helps support their asset-liability management needs and is a key benefit of membership. At December 31, 2019, 67 percent of members held Mission Asset Activity, which was relatively stable compared to prior periods.

As in recent years, most members continued to have modest demand for Advance borrowings. Based on the most-recently available figures, members funded an average of 2.7 percent of their assets with Advances.

The MPP principal balance rose $0.7 billion (seven percent) from year-end 2018. During 2019, we purchased $2.6 billion of mortgage loans, while principal reductions totaled $1.9 billion.

Based on earnings in 2019, we accrued $31 million for the Affordable Housing Program (AHP) pool of funds to be available to members in 2020. In addition to the required AHP assessment, we continued our voluntary sponsorship of two other housing programs, which provide resources to pay for accessibility rehabilitation and emergency repairs for special needs and elderly homeowners and to help members aid their communities following natural disasters.

Investments

The balance of investments at December 31, 2019 was $34.4 billion, an increase of $0.8 billion (two percent) from year-end 2018. At December 31, 2019, investments included $13.5 billion of MBS and $20.9 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, 2019 were issued and guaranteed by Fannie Mae, Freddie Mac or a U.S. agency.

Investments averaged $37.8 billion in 2019, an increase of $8.0 billion (27 percent) from the average balance during 2018. We increased investments in order to hold more asset liquidity, which we obtained primarily by purchasing U.S. Treasury obligations as part of our plan to manage the implementation of the Finance Agency's Advisory Bulletin on the maintenance of sufficient liquidity. In addition, 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 2019 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 2019. The GAAP capital-to-assets ratio at December 31, 2019 was 4.75 percent, while the regulatory capital-to-assets ratio was 4.79 percent. Both ratios exceeded the regulatory required minimum of four percent. Regulatory capital includes mandatorily redeemable capital stock accounted for as a liability under GAAP. Both GAAP and regulatory capital decreased $0.9 billion in 2019, due to our repurchase of over $1.5 billion in excess stock from members. These repurchases were in response to the decrease in Advances in 2019. Retained earnings totaled $1.1 billion at December 31, 2019, an increase of seven percent from year-end 2018. The decreases in GAAP and regulatory capital were partially offset by purchases of capital stock associated with new Advance activity from certain members.

Results of Operations

Overall Results

The table below summarizes our results of operations.

	Year Ended December 31,		
(Dollars in millions)	2019	2018	2017
Net income	$ 276	$ 339	$ 314
Affordable Housing Program assessments	31	38	35
Return on average equity (ROE)	5.65%	6.29%	6.15%
Return on average assets	0.28	0.32	0.31
Weighted average dividend rate	5.05	5.88	5.00
Average 3-month LIBOR	2.33	2.31	1.26
ROE spread to 3-month LIBOR	3.32	3.98	4.89
Dividend rate spread to 3-month LIBOR	2.72	3.57	3.74

Net income in 2019 decreased $63 million (19 percent) compared to 2018. Net income was lower primarily due to a decline in spreads earned on Advances and a decrease in Advance balances. However, the lower net income was partially offset by increases in the fair values of certain derivatives and other financial instruments carried at fair value.

Despite the reduction in net income, earnings levels continued to represent competitive returns on stockholders' capital investment. ROE was higher than short-term rates in the periods presented above, while we maintained risk exposures in line with our appetite for a moderate risk profile. The spread between ROE and short-term rates, such as 3-month LIBOR, is a market benchmark we believe member stockholders actively use to assess the competitiveness of the return on their capital investment.

In December 2019, we paid stockholders a quarterly 4.00 percent annualized dividend rate on their capital investment in our company. The lower weighted average dividend rate in 2019 compared to 2018 was in part due to the decline in the interest rate environment over the last several quarters.

We believe that our operations and financial condition will continue to generate competitive profitability over time, reflecting the combination of a stable business model and conservative management of risk. Our business model is structured to be able to absorb sharp changes in Mission Asset Activity because we can execute commensurate changes in liability and capital stock balances. Key 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 due to accelerated prepayments of mortgage assets, and fair value adjustments related to the use of derivatives and the associated hedged items.

Effect of Interest Rate Environment

Trends in market interest rates and the resulting shapes of the market yield curves strongly influence the results of operations and profitability because of how they affect members' demand for Mission Asset Activity, 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 2019		Year 2018		Year 2017	
	Ending	Average	Ending	Average	Ending	Average
Federal funds effective	1.55%	2.16%	2.40%	1.83%	1.33%	1.00%
SOFR	1.55	2.20	3.00	1.85	1.47	0.90
3-month LIBOR	1.91	2.33	2.81	2.31	1.69	1.26
2-year LIBOR	1.70	2.03	2.66	2.75	2.08	1.65
10-year LIBOR	1.90	2.09	2.71	2.95	2.40	2.29
2-year U.S. Treasury	1.57	1.97	2.49	2.52	1.89	1.39
10-year U.S. Treasury	1.92	2.14	2.69	2.91	2.41	2.33
15-year mortgage current coupon (1)	2.28	2.52	3.06	3.20	2.52	2.40
30-year mortgage current coupon (1)	2.71	2.95	3.51	3.65	3.00	3.03

	Year 2019 by Quarter - Average			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Federal funds effective	2.40%	2.40%	2.19%	1.65%
SOFR	2.44	2.43	2.26	1.66
3-month LIBOR	2.69	2.51	2.20	1.93
2-year LIBOR	2.62	2.20	1.70	1.63
10-year LIBOR	2.67	2.30	1.70	1.72
2-year U.S. Treasury	2.49	2.13	1.69	1.59
10-year U.S. Treasury	2.65	2.33	1.79	1.79
15-year mortgage current coupon (1)	2.97	2.63	2.22	2.27
30-year mortgage current coupon (1)	3.41	3.07	2.62	2.70

(1) Simple average of current coupon rates of Fannie Mae and Freddie Mac par MBS indications.

The target overnight Federal funds rate was in the range of 1.50 to 1.75 percent at December 31, 2019, a decrease from the range of 2.25 to 2.50 percent at December 31, 2018. In March 2020, the Federal Reserve first decreased the target Federal funds rate to a range of 1.00 to 1.25 percent and then subsequently decreased the target to a range of zero to 0.25 percent due to the evolving risks to economic activity from the coronavirus pandemic (COVID-19).

Average overnight rates (i.e., federal funds effective and SOFR) were still approximately 0.35 percentage points higher in 2019 compared to 2018, while average 3-month LIBOR was relatively flat and average long-term rates decreased by approximately 0.65 to 0.85 percentage points during that same period. The higher interest rates on overnight assets continued to benefit income in 2019 primarily because of the earnings generated by funding assets with interest-free capital. Both short-term and long-term interest rates trended downward throughout the second half of 2019. By the end of 2019, the trend of higher short-term interest rates with lower long-term rates experienced in the first three quarters no longer existed. In addition, for much of 2019, the market yield curves were relatively flat, and at certain maturity points inverted, which lowered profitability.

Business Outlook and Risk Management

This section summarizes the business outlook and what we believe are our current major risk exposures. See Item 1A. Risk Factors for a detailed discussion of certain factors that could affect our corporate objectives, financial condition, and results of operations. "Quantitative and Qualitative Disclosures About Risk Management" provides details on current risk exposures.

Recent Developments

Coronavirus Pandemic (COVID-19): The recent outbreak of COVID-19, which has now spread globally, including within the United States, has resulted in the declaration of the COVID-19 pandemic. The effects of COVID-19 are rapidly evolving, and the full impact and duration of the virus are unknown. Managing COVID-19 has strained and is expected to severely tax healthcare systems and businesses worldwide. The effects of COVID-19 and the response to the virus have negatively impacted financial markets and overall economic conditions. We have employees who are not operationally critical working remotely, and have implemented a split location model for critical staff in our downtown Cincinnati location and our back-up facility.

Strategic/Business Risk

Advances: Our business is cyclical and Mission Asset Activity normally grows slowly or stabilizes in periods of moderate macro-economic growth, when financial institutions have ample liquidity, or when there is significant growth in the money supply. Other factors that constrain widespread demand for Advances are the low levels of interest rates and competitiveness of Advances relative to deposits and other sources of wholesale funding.

In the last several years, the percentage of assets that members funded with Advances has shown little variation, in the range of two to four percent. We may see a broad-based increase in Advance demand if one or more of the following occur: aggregate loan portfolios of our members grow quicker than aggregate deposits, interest rates begin to increase over time, or changes in Federal Reserve policy reduce other sources of liquidity available to members.

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.

Market Risk

During 2019, as in 2018, the market risk exposure to changing interest rates was moderate overall and well within policy limits. We believe that longer-term profitability would not become uncompetitive unless interest rates were to change quickly and significantly. In the short-term, profitability could become uncompetitive if long-term interest rates decrease more than 100 basis points leading to faster prepayments of mortgage assets, which would accelerate the recognition of purchased premiums.

Capital Adequacy

We believe members place a high value on their capital investment in our company. Capital ratios at December 31, 2019, and all throughout the year, exceeded the regulatory required minimum of four percent. 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. Our capital policies and Capital Plan also have safeguards to ensure we meet regulatory and prudential capital requirements.

Credit Risk

In 2019, we continued to maintain a de minimis level of overall residual credit risk exposure from our Credit Services, investments, and derivative transactions. We believe policies and procedures related to credit underwriting, Advance collateral management, and transactions with investment and derivative counterparties continue to mitigate these risks. We have never experienced any credit losses, and we continue to have no loan loss reserves or impairment recorded for these instruments. Residual credit risk exposure in the mortgage loan portfolio was minimal. The allowance for credit losses in the MPP was stable during the year and was $1 million at December 31, 2019.

Liquidity Risk

Our liquidity position remained strong during 2019, as did our overall ability to fund operations through the issuance of Consolidated Obligations at acceptable interest costs. Investor demand for FHLBank System debt continued to be robust. There were no substantive stresses on market access or liquidity from external market and political events. Although we can make no assurances, we believe there is only a remote possibility of a liquidity or funding crisis in the System that could impair our ability to participate, on a cost-effective basis, in issuances of new debt, service outstanding debt, maintain adequate capital levels, or pay competitive dividends.

Regulatory and Legislative Risk and Significant 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 future GSE reform, and the evolution of mortgage financing moving towards financial institutions currently not eligible for FHLBank membership. See Item 1A. Risk Factors for more discussion. We cannot predict the ultimate outcome of GSE reform and whether our membership base will be legislatively and regulatorily permitted to evolve in concert with the housing finance market.

LIBOR Replacement; Finance Agency Supervisory Letter: We are planning for the replacement of LIBOR given the announcement that the LIBOR index is expected to be phased out by no later than the end of 2021 and the Federal Reserve Bank of New York's establishment of SOFR as its recommended alternative to U.S. dollar LIBOR. In 2019, we continued to participate in the FHLBank System's issuances of SOFR-linked Consolidated Bonds. At December 31, 2019, $10.9 billion (99 percent) of our adjustable-rate Consolidated Bonds were indexed to SOFR. We also continued to offer SOFR-linked Advances and began swapping certain instruments to adjustable-rates tied to SOFR and the overnight Federal funds effective rate in 2019. However, the majority of our variable-rate assets still remain indexed to LIBOR. Therefore, we are continuing to plan for the eventual replacement of our LIBOR-indexed instruments away from the LIBOR benchmark interest rate. Part of our LIBOR transition plan includes having implemented fallback language for our LIBOR-indexed Advances and Consolidated Bonds in new and legacy contracts. As for our derivatives and investments that are tied to LIBOR, we are monitoring market-wide efforts to enhance fallback language for new activity and develop frameworks to address existing transactions. We are also evaluating the transition relief provided by the Financial Accounting Standards Board (FASB) concerning the accounting for contract modifications during the replacement of LIBOR.

On September 27, 2019, the Finance Agency issued a Supervisory Letter - Planning for LIBOR Phase-Out (Supervisory Letter) to the FHLBanks that the Finance Agency stated is designed to ensure the FHLBanks will be able to identify and prudently manage the risks associated with the termination of LIBOR in a safe and sound manner. The Supervisory Letter provided that the FHLBanks should, by March 31, 2020, cease entering into new LIBOR referenced financial assets, liabilities, and derivatives with maturities beyond December 31, 2021 for all product types except investments. With respect to investments, the Supervisory Letter required the FHLBanks, by December 31, 2019, to stop purchasing investments that reference LIBOR and mature after December 31, 2021. These phase-out dates do not apply to collateral accepted by the FHLBanks. The Supervisory Letter also directed the FHLBanks to update their pledged collateral certification reporting requirements by March 31, 2020 in an effort to encourage members to identify LIBOR-linked collateral maturing after December 31, 2021. The Finance Agency may permit certain exceptions to its Supervisory Letter because there may be LIBOR-linked products serving compelling mission, risk mitigating, and/or hedging purposes for the FHLBanks that do not currently have readily available alternatives.

As a result of the recent market conditions triggered in part by COVID-19, the FHLBanks' ability to enter into LIBOR-based instruments that mature after December 31, 2021 has been extended from March 31, 2020 to June 30, 2020, except for investments and option embedded products.

We have Advances, investment securities, Consolidated Bonds and derivatives with interest rates indexed to LIBOR. The following table presents LIBOR-indexed Advances, investment securities, Consolidated Bonds and derivatives at December 31, 2019.

(In millions)	Maturing in 2020-2021	Maturing after 2021
LIBOR-Indexed Variable Rate Financial Instruments		
Advances by redemption term	$ 6,906	$ 3,524
MBS by contractual maturity [(1)]	266	7,759
Consolidated Bonds by contractual maturity	65	—
Total principal amount	$ 7,237	$ 11,283
Derivatives, notional amount by termination date	$ 12,198	$ 7,467

(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 expected to be gradual and complicated, including the development of term structures and credit adjustments to accommodate differences between LIBOR and SOFR. As such, we are not currently able to predict the ultimate impact of such a transition on our business, financial condition, and results of operations.

Acquired Member Assets Advisory Bulletin: *Advisory Bulletin 2020-01 - Federal Home Loan Bank Risk Management of Acquired Member Assets (AMA).* On January 31, 2020, the Finance Agency issued an Advisory Bulletin providing guidance on the risk management of acquired member assets, such as the MPP. The guidance includes expectations that an FHLBank will have Board-established limits on AMA portfolios and management-established thresholds to serve as monitoring tools to manage AMA-related risk exposure. The guidance provides that the board of an FHLBank should ensure that it serves as a liquidity source for members, while ensuring its portfolio limits do not result in the FHLBank's acquisition of mortgages from smaller members being "crowded out" by the acquisition of mortgages from larger members. The Advisory Bulletin contains the expectation that the board of an FHLBank should set limits on the size and growth of portfolios and on acquisitions from a single participating financial institution. In addition, the guidance sets forth that the board of an FHLBank should consider concentration risk in the areas of geographic area, high-balance loans, and in third-party loan originations. We continue to evaluate the potential impact of this guidance, but currently do not expect it to materially affect our financial condition or results of operations.

Capital Stock Management Advisory Bulletin: *Advisory Bulletin 2019-03 - Capital Stock Management.* On August 14, 2019, the Finance Agency issued an Advisory Bulletin providing guidance that augments existing statutory and regulatory capital requirements to require each FHLBank to maintain at least a two percent ratio of capital stock to total assets. In February 2020, the Finance Agency began to consider the proportion of capital stock to assets, measured on a daily average basis at month end, when assessing each FHLBank's capital management practices. We do not expect this guidance to have a material impact on our capital management practices, financial condition, or results of operation.

Final Rule on FHLBank Capital Requirements: On February 20, 2019, the Finance Agency published a final rule, effective January 1, 2020, that adopts, with amendments, the regulations of the Federal Housing Finance Board (predecessor to the Finance Agency) (the Finance Board) pertaining to the capital requirements for the FHLBanks. The final rule carries over most of the prior Finance Board regulations without material change, but substantively revises the credit risk component of the risk-based capital requirement, as well as the limitations on extensions of unsecured credit. The main revisions remove requirements that we calculate credit risk capital charges and unsecured credit limits based on ratings issued by a NRSRO, and instead require that we establish and use our own internal rating methodology (which may include, but not solely rely on, NRSRO ratings). In addition, the rule imposes a new credit risk capital charge for cleared derivatives, revises the percentages used in the regulation's tables to calculate credit risk capital charges for Advances and for non-mortgage assets and rescinds certain contingency liquidity requirements, as these requirements are now addressed in an Advisory Bulletin on FHLBank Liquidity Guidance issued by the Finance Agency in 2018. We do not expect this rule to materially affect our financial condition or results of operations.

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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, 2019		December 31, 2018	
	Balance	Percent[1]	Balance	Percent[1]
Adjustable/Variable Rate-Indexed:				
LIBOR	$ 10,430	22%	$ 28,740	52%
SOFR	500	1	1,400	3
Other	221	1	744	1
Total	11,151	24	30,884	56
Fixed-Rate:				
Repurchase based (REPO)	19,386	41	7,003	13
Regular Fixed-Rate	11,476	24	10,972	20
Putable [2]	1,444	3	460	1
Amortizing/Mortgage Matched	2,358	5	2,702	5
Other	1,449	3	2,851	5
Total	36,113	76	23,988	44
Total Advances Principal	$ 47,264	100%	$ 54,872	100%
Letters of Credit (notional)	$ 16,205		$ 14,847	

(Dollars in millions)	December 31, 2019		September 30, 2019		June 30, 2019		March 31, 2019	
	Balance	Percent[1]	Balance	Percent[1]	Balance	Percent[1]	Balance	Percent[1]
Adjustable/Variable-Rate Indexed:								
LIBOR	$ 10,430	22%	$ 13,604	29%	$ 16,127	37%	$ 20,462	38%
SOFR	500	1	1,050	2	1,050	3	1,400	2
Other	221	1	379	1	416	1	394	1
Total	11,151	24	15,033	32	17,593	41	22,256	41
Fixed-Rate:								
REPO	19,386	41	13,399	29	7,520	17	15,187	28
Regular Fixed-Rate	11,476	24	12,364	27	11,486	27	10,991	20
Putable [2]	1,444	3	1,414	3	1,020	3	885	1
Amortizing/Mortgage Matched	2,358	5	2,583	6	2,646	6	2,753	5
Other	1,449	3	1,393	3	2,490	6	2,806	5
Total	36,113	76	31,153	68	25,162	59	32,622	59
Total Advances Principal	$ 47,264	100%	$ 46,186	100%	$ 42,755	100%	$ 54,878	100%
Letters of Credit (notional)	$ 16,205		$ 16,090		$ 15,697		$ 13,812	

(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.

Advance balances at December 31, 2019 decreased 14 percent compared to year-end 2018. Although a number of members increased their borrowings in 2019, a reduction in borrowings from one of our largest borrowers led to the net decrease in

Advances. REPOs, which traditionally have the most volatile balances because a majority of them have overnight maturities, allow our members the most flexibility as their liquidity needs may change daily.

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, 2019	September 30, 2019	June 30, 2019	March 31, 2019	December 31, 2018
Average Advances-to-assets for members					
Assets less than $1.0 billion (542 members)	2.55%	2.71%	2.67%	2.82%	3.05%
Assets over $1.0 billion (98 members)	3.31	3.87	3.65	3.67	4.26
All members	2.67	2.88	2.81	2.94	3.22

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

(Dollars in millions)	December 31, 2019		December 31, 2018	
	Principal Amount of Advances	Percent of Total Principal Amount of Advances	Principal Amount of Advances	Percent of Total Principal Amount of Advances
Commercial Banks	$ 31,590	67%	$ 39,195	71%
Savings Institutions	5,689	12	5,424	10
Credit Unions	1,307	3	1,564	3
Insurance Companies	8,629	18	8,676	16
Community Development Financial Institutions	1	—	1	—
Total member Advances	47,216	100	54,860	100
Former member borrowings	48	—	12	—
Total principal amount of Advances	$ 47,264	100%	$ 54,872	100%

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

(Dollars in millions)

December 31, 2019			December 31, 2018		
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.	$ 13,874	29%	JPMorgan Chase Bank, N.A.	$ 23,400	43%
JPMorgan Chase Bank, N.A.	4,500	10	U.S. Bank, N.A.	4,574	8
Third Federal Savings and Loan Association	3,883	8	Third Federal Savings and Loan Association	3,727	7
First Horizon Bank	2,200	5	Nationwide Life Insurance Company	2,510	5
Pinnacle Bank	2,063	4	Pinnacle Bank	1,444	3
Total of Top 5	$ 26,520	56%	Total of Top 5	$ 35,655	66%

Advance concentration ratios are influenced by, and generally similar to, concentration ratios of financial activity among our Fifth District financial institutions. We believe that having large financial institutions that actively use our Mission Assets 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 Mission Assets.

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

The table below shows principal purchases and reductions of loans in the MPP for each of the last two years.

(In millions)	2019	2018
Balance, beginning of year	$ 10,272	$ 9,454
Principal purchases	2,631	1,936
Principal reductions	(1,922)	(1,118)
Balance, end of year	$ 10,981	$ 10,272

Although there were 78 active members participating in the MPP at December 31, 2019, approximately 62 percent of the principal purchases in 2019 resulted from activity of our four largest sellers. All loans acquired in 2019 were conventional loans.

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, 2019			December 31, 2018	
	Principal	% of Total		Principal	% of Total
Union Savings Bank	$ 3,574	33%	Union Savings Bank	$ 3,449	34%
Guardian Savings Bank FSB	1,004	9	Guardian Savings Bank FSB	987	10
Firstbank	714	7	All others	5,836	56
All others	5,689	51	Total	$ 10,272	100%
Total	$ 10,981	100%			

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 in 2019 equated to a 14 percent annual constant prepayment rate, up from the eight percent rate for all of 2018. The reductions in mortgage rates that occurred in the first nine months of 2019 accelerated prepayment speeds in the second half of 2019. In the fourth quarter of 2019, mortgage rates were steady, remaining at historical low levels. As such, we expect the recent trend of faster prepayments to continue in 2020 unless mortgage rates rise.

The MPP's composition of balances by loan type, original final maturity, and weighted-average mortgage note rate did not change materially in 2019. MPP yields earned in 2019, after consideration of funding and hedging costs, continued to offer favorable returns relative to their market and credit risk exposure.

Housing and Community Investment

In 2019, we accrued $31 million of earnings for the Affordable Housing Program, which will be awarded to members in 2020 through either our competitive or Welcome Home programs. This amount represents a decrease of $7 million from 2018 due to the lower earnings in 2019.

Including funds available in 2019 from previous years, we had $32 million available for the competitive Affordable Housing Program in 2019, which we awarded to 53 projects through a single competitive offering. In addition, we disbursed nearly $13 million to 189 members on behalf of 2,519 homebuyers through the Welcome Home Program, which assists homebuyers with down payments and closing costs. In total, more than one-third of members applied for funding under the two Affordable Housing Programs.

Additionally, in 2019, our Board committed $2.1 million to the Carol M. Peterson Housing Fund, which helped 303 homeowners, and continued its commitment to the $5 million Disaster Reconstruction Program. Both are voluntary programs beyond the 10 percent of earnings that we are required by law to set aside for the Affordable Housing Program.

Our activities to support affordable housing and economic development also include offering Advances through the Affordable Housing Program, Community Investment Program and Economic Development Program with below-market interest rates at or near funding costs. At the end of 2019, Advance balances under these programs totaled $360 million.

Investments

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

(In millions)	2019		2018	
	Ending Balance	Average Balance	Ending Balance	Average Balance
Liquidity investments	$ 20,924	$ 22,525	$ 17,858	$ 13,989
MBS	13,465	15,029	15,756	15,741
Other investments (1)	—	232	—	64
Total investments	$ 34,389	$ 37,786	$ 33,614	$ 29,794

(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, but can be easily sold and converted to cash. 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, liquidity needs, the availability of acceptable net spreads, and the number of eligible counterparties that meet our unsecured credit risk criteria. The increase in liquidity investments in 2019 was driven by volatility in short-term and variable-rate Advance borrowings and the purchases of U.S. Treasury obligations to help meet new regulatory liquidity requirements that went into effect on March 31, 2019. Under the new regulatory requirements, liquidity includes certain high-quality liquid assets, which are defined as U.S. Treasury obligations with remaining maturities of 10 years or less held as trading securities or available-for-sale securities.

Our overarching strategy for balances of MBS is to keep holdings as close as possible to the regulatory maximum, subject to the availability of securities that we believe provide acceptable risk/return tradeoffs. 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 3.00 at December 31, 2019.

The balance of MBS at December 31, 2019 consisted of $11.8 billion of securities issued by Fannie Mae or Freddie Mac (of which $7.8 billion were floating-rate securities), $0.3 billion of floating-rate securities issued by the National Credit Union Administration (NCUA), and $1.4 billion of securities issued by Ginnie Mae (which are primarily fixed rate). At December 31, 2019, the floating-rate MBS issued by Fannie Mae, Freddie Mac and the NCUA were indexed to LIBOR. As noted in the "Business Outlook and Risk Management" section of the "Executive Overview," on December 31, 2019, we stopped purchasing investments that reference LIBOR and mature after December 31, 2021.

The table below shows principal purchases and paydowns of our MBS for each of the last two years.

(In millions)	MBS Principal	
	2019	2018
Balance, beginning of year	$ 15,734	$ 14,746
Principal purchases	1,205	3,839
Principal paydowns	(3,492)	(2,851)
Balance, end of year	$ 13,447	$ 15,734

MBS principal paydowns in 2019 equated to a 20 percent annual constant prepayment rate, up from the 16 percent rate experienced in 2018. The higher prepayment rate experienced in 2019 is a result of the decline in mortgage rates throughout the first three quarters of 2019.

Consolidated Obligations

We fund variable-rate assets with Discount Notes (a portion of which are 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 positive liquidity and asset/liability maturity funding gap requirements under the new regulatory liquidity guidance 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)	2019		2018	
	Ending Balance	Average Balance	Ending Balance	Average Balance
Discount Notes:				
Unswapped	$ 36,776	$ 39,286	$ 47,071	$ 49,273
Swapped	12,401	5,291	—	—
Total par Discount Notes	49,177	44,577	47,071	49,273
Other items [1]	(93)	(95)	(127)	(88)
Total Discount Notes	49,084	44,482	46,944	49,185
Bonds:				
Unswapped fixed-rate	22,420	24,423	25,982	26,566
Unswapped adjustable-rate [2]	11,012	16,132	15,470	16,967
Swapped fixed-rate	4,949	5,310	4,195	5,982
Total par Bonds	38,381	45,865	45,647	49,515
Other items [1]	59	44	12	(13)
Total Bonds	38,440	45,909	45,659	49,502
Total Consolidated Obligations [3]	$ 87,524	$ 90,391	$ 92,603	$ 98,687

(1) Includes unamortized premiums/discounts, fair value option valuation adjustments, hedging and other basis adjustments.
(2) Unswapped adjustable-rate Bonds are indexed to either LIBOR or SOFR. At December 31, 2019, 1 percent were indexed to LIBOR and 99 percent were indexed to SOFR. At December 31, 2018, 69 percent were indexed to LIBOR and 31 percent 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) $1,025,895 and $1,031,617 at December 31, 2019 and December 31, 2018, respectively.

The balances of Consolidated Obligations were relatively stable in the periods shown above with fluctuations resulting from changes in the balances of our assets. Beginning in the third quarter of 2019, we began swapping term Discount Notes to adjustable-rates tied to the overnight Federal funds effective rate in order to reduce the repricing risk of Discount Notes being used to fund certain overnight and shorter-term assets.

The balance of unswapped fixed-rate Bonds, which typically have initial maturities greater than one year, declined in 2019 compared to 2018 driven in part by the continued run-off and replacement of fixed rate MBS with adjustable rate products that require adjustable rate funding along with expanded use of derivatives to mitigate the interest rate exposure associated with existing fixed rate mortgage assets.

The following table shows the allocation on December 31, 2019 of unswapped fixed-rate Bonds according to their final remaining maturity and next call date (for callable Bonds). We believe that the allocations of Bonds among these classifications provide effective mitigation of market risk exposure to both higher and lower interest rates.

(In millions)	Year of Maturity			Year of Next Call
	Callable	Noncallable	Total	Callable
Due in 1 year or less	$ 876	$ 5,387	$ 6,263	$ 5,038
Due after 1 year through 2 years	1,203	3,247	4,450	130
Due after 2 years through 3 years	261	2,644	2,905	19
Due after 3 years through 4 years	780	2,343	3,123	—
Due after 4 years through 5 years	287	1,253	1,540	—
Thereafter	1,780	2,359	4,139	—
Total	$ 5,187	$ 17,233	$ 22,420	$ 5,187

Deposits

Total deposits with us are normally a relatively minor source of low-cost funding. Total interest-bearing deposits at December 31, 2019 were $0.9 billion, an increase of $0.3 billion from year-end 2018.

Derivatives Hedging Activity and Liquidity

Our use of derivatives is discussed in the "Effect of the Use of Derivatives on Net Interest Income" section 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.

(In millions)	Year Ended December 31, 2019		2018	
	Period End	Average	Period End	Average
GAAP and Regulatory Capital				
GAAP Capital Stock	$ 3,367	$ 3,827	$ 4,320	$ 4,387
Mandatorily Redeemable Capital Stock	22	25	23	30
Regulatory Capital Stock	3,389	3,852	4,343	4,417
Retained Earnings	1,094	1,069	1,023	1,025
Regulatory Capital	$ 4,483	$ 4,921	$ 5,366	$ 5,442

	2019		2018	
	Period End	Average	Period End	Average
GAAP and Regulatory Capital-to-Assets Ratio				
GAAP	4.75%	5.04%	5.37%	5.11%
Regulatory [(1)]	4.79	5.08	5.41	5.16

(1) At all times, the FHLBanks 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 2019 and 2018.

(In millions)	2019	2018
Regulatory stock balance at beginning of year	$ 4,343	$ 4,271
Stock purchases:		
Membership stock	157	25
Activity stock	435	413
Stock repurchases/redemptions:		
Redemption of member excess	—	(40)
Repurchase of member excess	(1,538)	(297)
Withdrawals	(8)	(29)
Regulatory stock balance at the end of the year	$ 3,389	$ 4,343

The table below shows the amount of excess capital stock.

(In millions)	December 31, 2019	December 31, 2018
Excess capital stock (Capital Plan definition)	$ 37	$ 1,015
Cooperative utilization of capital stock	$ 781	$ 558
Mission Asset Activity capitalized with cooperative capital stock	$ 19,536	$ 13,950

A portion of our capital stock is excess, meaning it is not required as a condition to being a member and is not currently capitalizing Mission Asset Activity. Excess capital stock provides a base of capital to manage financial leverage at prudent levels, augments loss protections for bondholders, and may be used to capitalize a portion of growth in Mission Assets. Throughout 2019, the amount of excess stock, as defined by our Capital Plan, grew as Advance balances decreased. In order to help manage our capital and financial performance, we repurchased over $1.5 billion of excess capital stock in 2019. As a result, excess stock decreased $978 million from year-end 2018. The repurchase of excess stock also resulted in decreases to GAAP and regulatory capital balances and the related capital-to-assets ratios.

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

Membership and Stockholders

In 2019, we added 11 new member stockholders and lost 17 member stockholders, ending the year at 640 member stockholders. The decline in membership during 2019 was primarily attributable to intra-district merger activity.

In 2019, there were no material changes in the allocation of membership by state, charter type, or asset size. At the end of 2019, the composition of membership by state was Ohio with 301, Kentucky with 171, and Tennessee with 168.

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

	December 31,	
	2019	2018
Commercial Banks	365	374
Savings Institutions	81	83
Credit Unions	136	134
Insurance Companies	52	48
Community Development Financial Institutions	6	7
Total	640	646

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

(In millions)	December 31, 2019	December 31, 2018
Commercial Banks	$ 2,296	$ 3,353
Savings Institutions	365	353
Credit Unions	175	176
Insurance Companies	530	437
Community Development Financial Institutions	1	1
Total GAAP Capital Stock	3,367	4,320
Mandatorily Redeemable Capital Stock	22	23
Total Regulatory Capital Stock	$ 3,389	$ 4,343

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.

Member Asset Size [1]	December 31, 2019	December 31, 2018
Up to $100 million	162	166
> $100 up to $500 million	307	319
> $500 million up to $1 billion	74	72
> $1 billion	97	89
Total Member Stockholders	640	646

(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 73 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, 2019, 2018 and 2017 and a comparison of the results between 2019 and 2018. For a comparison of the results between 2018 and 2017, see Part II, Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" of our 2018 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)	2019		2018		2017	
	Amount	ROE (1)	Amount	ROE (1)	Amount	ROE (1)
Net interest income	$ 406	8.31%	$ 499	9.24%	$ 429	8.42%
Provision for credit losses	—	—	—	—	—	0.01
Net interest income after provision for credit losses	406	8.31	499	9.24	429	8.41
Non-interest income (loss):						
Net gains (losses) on investment securities	210	4.30	7	0.13	—	—
Net gains (losses) on derivatives and hedging activities	(178)	(3.64)	(41)	(0.75)	(24)	(0.48)
Net gains (losses) on financial instruments held under fair value option	(54)	(1.10)	(14)	(0.26)	10	0.20
Other non-interest income, net	12	0.23	11	0.20	13	0.25
Total non-interest income (loss)	(10)	(0.21)	(37)	(0.68)	(1)	(0.03)
Total income	396	8.10	462	8.56	428	8.38
Non-interest expense	89	1.82	85	1.57	79	1.54
Affordable Housing Program assessments	31	0.63	38	0.70	35	0.69
Net income	$ 276	5.65%	$ 339	6.29%	$ 314	6.15%

(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.

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 periods are discussed below.

(Dollars in millions)	2019		2018		2017	
	Amount	% of Earning Assets	Amount	% of Earning Assets	Amount	% of Earning Assets
Components of net interest rate spread:						
Net (amortization)/accretion [(1)] [(2)]	$ (37)	(0.04)%	$ (17)	(0.02)%	$ (20)	(0.02)%
Prepayment fees on Advances, net [(2)]	8	0.01	1	—	1	—
Other components of net interest rate spread	317	0.33	407	0.39	382	0.38
Total net interest rate spread	288	0.30	391	0.37	363	0.36
Earnings from funding assets with interest-free capital	118	0.12	108	0.10	66	0.06
Total net interest income/net interest margin [(3)]	$ 406	0.42 %	$ 499	0.47 %	$ 429	0.42 %

(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"): While net amortization has been moderate over the past few years, it can become substantial and volatile when mortgage rates decrease. Amortization increased in 2019 compared to 2018 primarily due to the decline in mortgage rates during the first three quarters of 2019, which led to accelerated prepayments of mortgage assets.

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. Although Advance prepayment fees can be significant, they were minimal throughout most of 2019 and all of 2018, reflecting a low amount of member prepayments of Advances. However, at the end of 2019, one member prepaid its Advances, which was the primary driver of the $8 million in prepayment fees in 2019.

Other Components of Net Interest Rate Spread: The total other components of net interest rate spread decreased $90 million in 2019 compared to 2018. The net decrease was primarily due to the factors below.

2019 Versus 2018

- **Lower spreads on Advances-*Unfavorable*:** Lower spreads earned on certain Advances decreased net interest income by an estimated $54 million. The lower spreads were a result of a shift in composition of Advance balances to overnight and shorter-term Advances. However, the decrease in net interest income was partially offset by a decrease of $22 million in net interest payments on related derivatives not receiving hedge accounting, which was a benefit reflected in non-interest income (loss).
- **Lower average Advance balances-*Unfavorable*:** The $17.5 billion decline in average Advance balances decreased net interest income by an estimated $37 million. The decline in average Advance balances was primarily due to the reduction in borrowings by a few large-asset members.
- **Lower spreads on mortgage assets balances-*Unfavorable*:** Lower spreads on mortgage assets decreased net interest income by an estimated $10 million due to the falling interest rate environment.
- **Growth in average MPP balances-*Favorable*:** The $0.8 billion increase in the average balance of mortgage loans held for portfolio improved net interest income by an estimated $9 million.
- **Growth in average liquidity investment balances-*Favorable*:** The $8.7 billion increase in the average balance of non-mortgage investments improved net interest income by an estimated $8 million.
- **Gains (losses) on designated fair value hedges-*Unfavorable*:** Net unrealized losses on hedged items and derivatives in qualifying fair value hedge relationships lowered net interest income by $6 million. Prior to 2019, unrealized gains (losses) on fair value hedge relationships were included in "Non-interest income (loss)." See below for further discussion of the adoption of new accounting guidance effective January 1, 2019.

Earnings from Capital: Earnings from capital increased $10 million in 2019 compared to 2018 primarily due to average overnight rates being approximately 0.35 percentage points higher in 2019 compared to 2018. The higher earnings from capital was a benefit experienced in the first half of 2019 that began to dissipate in the second half of the year due to the actions taken by the Federal Reserve to decrease short-term interest rates and the lower 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. In connection with the January 1, 2019, prospective adoption of the FASB's *Targeted Improvements to Accounting for Hedging Activities* standard, interest amounts reported for Advances, Other investments and Swapped Bonds include gains (losses) on hedged items and derivatives in qualifying fair value hedge relationships for the year ended December 31, 2019.

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 hedging activities” 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)	2019			2018			2017		
	Average Balance	Interest	Average Rate [1]	Average Balance	Interest	Average Rate [1]	Average Balance	Interest	Average Rate [1]
Assets									
Advances	$ 47,968	$ 1,204	2.51%	$ 65,491	$ 1,409	2.15%	$ 67,656	$ 905	1.34%
Mortgage loans held for portfolio [2]	10,739	340	3.17	9,967	321	3.22	9,447	297	3.14
Federal funds sold and securities purchased under resale agreements	13,142	293	2.23	12,122	228	1.88	9,184	94	1.02
Interest-bearing deposits in banks [3] [4] [5]	1,701	38	2.25	1,843	41	2.22	624	6	1.03
MBS	15,029	386	2.57	15,741	380	2.41	14,710	306	2.08
Other investments [4]	7,914	184	2.33	88	2	2.69	33	—	0.83
Loans to other FHLBanks	3	—	2.43	1	—	1.46	—	—	—
Total interest-earning assets	96,496	2,445	2.54	105,253	2,381	2.26	101,654	1,608	1.58
Less: allowance for credit losses on mortgage loans	1			1			1		
Other assets	442			288			264		
Total assets	$ 96,937			$105,540			$101,917		
Liabilities and Capital									
Term deposits	$ 49	1	2.41	$ 77	1	1.78	$ 76	1	0.72
Other interest-bearing deposits [5]	768	15	1.91	747	13	1.69	621	4	0.68
Discount Notes	44,482	989	2.22	49,185	915	1.86	43,124	385	0.89
Unswapped fixed-rate Bonds	24,467	558	2.28	26,618	554	2.08	26,768	527	1.97
Unswapped adjustable-rate Bonds	16,131	371	2.30	16,967	317	1.87	18,500	185	1.00
Swapped Bonds	5,311	104	1.96	5,917	80	1.36	7,099	75	1.05
Mandatorily redeemable capital stock	25	1	4.50	30	2	6.00	46	2	5.42
Other borrowings	—	—	2.14	—	—	1.81	1	—	1.17
Total interest-bearing liabilities	91,233	2,039	2.24	99,541	1,882	1.89	96,235	1,179	1.22
Non-interest bearing deposits	9			4			2		
Other liabilities	811			599			582		
Total capital	4,884			5,396			5,098		
Total liabilities and capital	$ 96,937			$105,540			$101,917		
Net interest rate spread			0.30%			0.37%			0.36%
Net interest income and net interest margin [6]		$ 406	0.42%		$ 499	0.47%		$ 429	0.42%
Average interest-earning assets to interest-bearing liabilities			105.77%			105.74%			105.63%

(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) Non-accrual loans are included in average balances used to determine average rate.
(3) Includes certificates of deposit that are classified as available-for-sale securities.
(4) 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.
(5) 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.
(6) Net interest margin is net interest income before provision for credit losses as a percentage of average total interest-earning assets.

Rates on our short-term and adjustable-rate assets and liabilities increased in 2019 compared to 2018 due to the increases in short-term LIBOR and the Federal funds target rate in the second half of 2018 that persisted throughout the first two quarters of 2019. The decrease in net interest margin in 2019 compared to 2018 was primarily driven by lower spreads earned on certain Advances.

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)	2019 over 2018			2018 over 2017		
	Volume (1)(3)	Rate (2)(3)	Total	Volume (1)(3)	Rate (2)(3)	Total
Increase (decrease) in interest income						
Advances	$ (416)	$ 211	$ (205)	$ (30)	$ 534	$ 504
Mortgage loans held for portfolio	25	(6)	19	16	8	24
Federal funds sold and securities purchased under resale agreements	20	45	65	37	97	134
Interest-bearing deposits in banks	(3)	—	(3)	22	13	35
MBS	(18)	24	6	23	51	74
Other investments	182	—	182	1	1	2
Loans to other FHLBanks	—	—	—	—	—	—
Total	(210)	274	64	69	704	773
Increase (decrease) in interest expense						
Term deposits	(1)	1	—	—	—	—
Other interest-bearing deposits	—	2	2	1	8	9
Discount Notes	(93)	167	74	61	469	530
Unswapped fixed-rate Bonds	(47)	51	4	(3)	30	27
Unswapped adjustable-rate Bonds	(16)	70	54	(17)	149	132
Swapped Bonds	(9)	33	24	(14)	19	5
Mandatorily redeemable capital stock	—	(1)	(1)	—	—	—
Other borrowings	—	—	—	—	—	—
Total	(166)	323	157	28	675	703
Increase (decrease) in net interest income	$ (44)	$ (49)	$ (93)	$ 41	$ 29	$ 70

(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, for the year ended December 31, 2019, gains (losses) on hedged items and derivatives in qualifying fair value hedge relationships are recorded in interest income or expense as a result of the prospective adoption of new hedge accounting guidance. 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, beginning in 2019, 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 hedge accounting is provided in the "Non-Interest Income (Loss)" section below.

(In millions)	2019	2018	2017
Advances:			
Amortization of hedging activities in net interest income	$ (1)	$ (1)	$ (2)
Gains (losses) on designated fair value hedges	(6)	N/A	N/A
Net interest settlements included in net interest income	36	24	(18)
Mortgage loans:			
Amortization of derivative fair value adjustments in net interest income	(3)	(1)	(3)
Consolidated Obligation Bonds:			
Net interest settlements included in net interest income	2	(3)	(1)
Increase (decrease) to net interest income	$ 28	$ 19	$ (24)

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., LIBOR, the Federal funds effective rate, or SOFR). The larger positive net effect of derivatives on net interest income in 2019 was primarily due to higher short-term benchmark interest rates in the first half of 2019 compared to the same period of 2018, which resulted in an increase in net interest settlements received on certain Advances where the fixed interest rates were converted to adjustable-coupon rates. As short-term rates began to decrease in the second half of 2019, the positive net effect of derivatives on net interest income was muted as the net interest settlements received on certain Advances declined in the last quarter of 2019. 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 than would otherwise occur.

Non-Interest Income (Loss)

Non-interest income (loss) consists of certain realized and unrealized 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). In connection with the prospective adoption of new hedge accounting guidance, gains (losses) on hedged items and derivatives in a qualifying fair value hedge relationship are no longer recorded in non-interest income (loss) for the year ended December 31, 2019. As such, beginning in 2019, the effects of derivatives and hedging activities on non-interest income relate only to derivatives not qualifying for fair value hedge accounting.

(In millions)	2019 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	$ (2)	$ (194)	$ 4	$ 54	$ —	$ (19)	$ —	$ (157)
Net interest settlements on derivatives not receiving hedge accounting	2	—	—	(26)	—	—	—	(24)
Price alignment amount	—	—	—	—	—	—	3	3
Net gains (losses) on derivatives and hedging activities	—	(194)	4	28	—	(19)	3	(178)
Gains (losses) on trading securities [2]	—	210	—	—	—	—	—	210
Gains (losses) on financial instruments held under fair value option [3]	—	—	—	(53)	(1)	—	—	(54)
Total net effect on non-interest income	$ —	$ 16	$ 4	$ (25)	$ (1)	$ (19)	$ 3	$ (22)

(In millions)	2018 Advances	Investment Securities	Mortgage Loans	Bonds	Balance Sheet [1]	Total
Net effect of derivatives and hedging activities						
Gains (losses) on fair value hedges	$ 2	$ —	$ —	$ —	$ —	$ 2
Gains (losses) on derivatives not receiving hedge accounting	1	(9)	(1)	18	(6)	3
Net interest settlements on derivatives not receiving hedge accounting	—	—	—	(46)	—	(46)
Net gains (losses) on derivatives and hedging activities	3	(9)	(1)	(28)	(6)	(41)
Gains (losses) on trading securities [2]	—	7	—	—	—	7
Gains (losses) on financial instruments held under fair value option [3]	—	—	—	(14)	—	(14)
Total net effect on non-interest income	$ 3	$ (2)	$ (1)	$ (42)	$ (6)	$ (48)

(In millions)	2017 Advances	Mortgage Loans	Bonds	Balance Sheet [1]	Other	Total
Net effect of derivatives and hedging activities						
Gains (losses) on fair value hedges	$ (1)	$ —	$ 1	$ —	$ —	$ —
Gains (losses) on derivatives not receiving hedge accounting	2	4	(6)	(17)	—	(17)
Net interest settlements on derivatives not receiving hedge accounting	(1)	—	(7)	—	—	(8)
Price alignment amount	—	—	—	—	1	1
Net gains (losses) on derivatives and hedging activities	—	4	(12)	(17)	1	(24)
Gains (losses) on financial instruments held under fair value option [3]	—	—	10	—	—	10
Total net effect on non-interest income	$ —	$ 4	$ (2)	$ (17)	$ 1	$ (14)

(1) Balance sheet includes swaptions, which are not designated as hedging a specific financial instrument.
(2) 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.
(3) Includes only those gains or losses on financial instruments held at fair value that have an economic derivative "assigned."

The net amount of income volatility in derivatives and hedging activities was moderate and consistent with the close hedging relationships of our derivative transactions. Most of the volatility was a result of both unrealized fair value gains and losses on instruments we expect to hold to maturity and the costs of utilizing swaptions to hedge market risk exposure associated with mortgage assets. We may sell swaptions as interest rates change in order to offset actual and anticipated risks associated with holding fixed-rate mortgage assets.

In 2019, we began purchasing U.S. Treasury obligations to help meet the new regulatory liquidity requirements. At December 31, 2019, we held over $9.6 billion of fixed rate U.S. Treasury obligations and swapped them to a variable rate. These investments are classified as trading securities and 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 securities will generally be offset by the changes in fair value of the associated interest rate swaps.

Non-Interest Expense

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

(Dollars in millions)	2019	2018	2017
Non-interest expense			
Compensation and benefits	$ 46	$ 46	$ 42
Other operating expense	22	20	19
Finance Agency	7	7	7
Office of Finance	5	5	4
Other	9	7	7
Total non-interest expense	$ 89	$ 85	$ 79
Average total assets	$ 96,937	$ 105,540	$ 101,917
Average regulatory capital	4,921	5,442	5,157
Total non-interest expense to average total assets [(1)]	0.09%	0.08%	0.08%
Total non-interest expense to average regulatory capital [(1)]	1.80	1.56	1.53

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

Total non-interest expense remained relatively stable in 2019 compared to 2018. The ratio of non-interest expense to average regulatory capital increased in 2019 compared to 2018 due to the lower average capital balance, which resulted from the repurchases of excess stock throughout the year.

Analysis of Quarterly ROE

The following table summarizes the components of 2019's quarterly ROE and provides quarterly ROE for 2018 and 2017.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Components of 2019 ROE:					
Net interest income:					
Other net interest income	9.59%	8.32%	8.39%	9.21%	8.89%
Net amortization	(0.27)	(0.61)	(0.99)	(1.21)	(0.75)
Prepayment fees	—	0.01	0.06	0.66	0.17
Total net interest income	9.32	7.72	7.46	8.66	8.31
Net gains (losses) on derivatives and hedging activities	(1.98)	(12.06)	(5.15)	5.29	(3.64)
Other non-interest income (loss)	0.58	11.85	5.52	(4.72)	3.43
Total non-interest income (loss)	(1.40)	(0.21)	0.37	0.57	(0.21)
Total income	7.92	7.51	7.83	9.23	8.10
Total non-interest expense	1.71	1.85	1.87	1.85	1.82
Affordable Housing Program assessments	0.62	0.57	0.60	0.74	0.63
2019 ROE	5.59%	5.09%	5.36%	6.64%	5.65%
2018 ROE	6.23%	6.15%	6.87%	5.90%	6.29%
2017 ROE	5.25%	6.94%	5.97%	6.42%	6.15%

The volatility in quarterly ROE during 2019 and 2018 was primarily driven by unrealized gains and losses related to the net effect of derivatives and hedging activities. For example, ROE in the fourth quarter of 2019 was elevated as compared to the first three quarters of 2019 and most of 2018 primarily due to increases in the fair values of certain derivatives and other financial instruments carried at fair value and recognition of prepayment fees.

Segment Information

Note 18 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
2019			
Net interest income after provision for credit losses	$ 309	$ 97	$ 406
Net income	$ 206	$ 70	$ 276
Average assets	$ 83,867	$ 13,070	$ 96,937
Assumed average capital allocation	$ 4,226	$ 658	$ 4,884
Return on average assets [(1)]	0.25%	0.54%	0.28%
Return on average equity [(1)]	4.87%	10.71%	5.65%
2018			
Net interest income after provision for credit losses	$ 390	$ 109	$ 499
Net income	$ 255	$ 84	$ 339
Average assets	$ 93,531	$ 12,009	$ 105,540
Assumed average capital allocation	$ 4,781	$ 615	$ 5,396
Return on average assets [(1)]	0.27%	0.70%	0.32%
Return on average equity [(1)]	5.34%	13.65%	6.29%
2017			
Net interest income after provision for credit losses	$ 335	$ 94	$ 429
Net income	$ 243	$ 71	$ 314
Average assets	$ 91,485	$ 10,432	$ 101,917
Assumed average capital allocation	$ 4,576	$ 522	$ 5,098
Return on average assets [(1)]	0.27%	0.68%	0.31%
Return on average equity [(1)]	5.30%	13.60%	6.15%

(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

2019 Versus 2018: Net income decreased in 2019 compared to 2018 primarily due to lower spreads earned on certain Advances and lower average Advance balances. The decrease in net income in 2019 compared to 2018 was partially offset by increases in the fair value on certain derivatives and other financial instruments carried at fair value and lower net interest payments on certain derivatives.

MPP Segment

Compared to the Traditional Member Finance segment, the MPP segment can exhibit more earnings volatility relative to short-term interest rates and more credit risk exposure. However, the MPP segment also provides the opportunity to enhance risk-adjusted returns, which normally augments earnings. Although mortgage assets are the largest source of our market risk, we believe that we have historically managed this risk prudently and consistently with our risk appetite and corporate objectives. We also believe that these assets do not excessively elevate the balance sheet's overall market risk exposure.

2019 Versus 2018: The MPP continued to earn a substantial level of profitability compared to market interest rates, with a moderate amount of market risk and a minimal amount of credit risk. In 2019, the MPP averaged 13 percent of total average assets while accounting for 26 percent of earnings. Net income decreased in 2019 compared to 2018 due to higher net amortization as a result of accelerated prepayments, lower spreads earned on MPP assets due to falling interest rates and higher net losses on derivatives and hedging activities. The decrease in MPP's net income was partially offset by the growth in average MPP balances.

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) regulatory/legal risk, 3) market risk (also referred to as interest rate or prepayment risk), 4) credit risk, 5) funding/liquidity risk, and 6) operational risk. 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 Asset Activity, 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 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 Asset Activity.

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 swaptions derivative transactions to a limited extent to mitigate the market risk of mortgage assets. The Bonds and swaptions 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 current 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 current 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 six times the amount of regulatory capital.

- **MPP Assets as a Multiple of Regulatory Capital.** The amount of MPP assets must be less than five 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). We compiled average results using data for each month end. Given the current level of rates, 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							
2019 Full Year							
Market Value of Equity	$ 4,545	$ 4,580	$ 4,652	$ 4,729	$ 4,674	$ 4,586	$ 4,528
% Change from Flat Case	(3.9)%	(3.1)%	(1.6)%	—	(1.1)%	(3.0)%	(4.3)%
2018 Full Year							
Market Value of Equity	$ 4,936	$ 5,154	$ 5,306	$ 5,264	$ 5,176	$ 5,105	$ 5,045
% Change from Flat Case	(6.2)%	(2.1)%	0.8 %	—	(1.7)%	(3.0)%	(4.2)%
Month-End Results							
December 31, 2019							
Market Value of Equity	$ 4,257	$ 4,262	$ 4,236	$ 4,372	$ 4,313	$ 4,213	$ 4,144
% Change from Flat Case	(2.6)%	(2.5)%	(3.1)%	—	(1.3)%	(3.6)%	(5.2)%
December 31, 2018							
Market Value of Equity	$ 4,736	$ 4,911	$ 5,130	$ 5,149	$ 5,043	$ 4,951	$ 4,906
% Change from Flat Case	(8.0)%	(4.6)%	(0.4)%	—	(2.1)%	(3.8)%	(4.7)%

Duration of Equity

(In years)	Down 300	Down 200	Down 100	Flat Rates	Up 100	Up 200	Up 300
Average Results							
2019 Full Year	(0.8)	(1.4)	(1.7)	(0.8)	1.7	1.4	1.1
2018 Full Year	(4.5)	(4.7)	(0.9)	1.7	1.4	1.2	1.1
Month-End Results							
December 31, 2019	(0.1)	0.6	(2.1)	(1.2)	2.0	1.7	1.4
December 31, 2018	(3.8)	(5.6)	(2.5)	1.2	2.0	1.0	0.6

The overall market risk exposure to changing interest rates was within policy limits during the periods presented. At December 31, 2019, exposure to falling interest rates in the down 200 basis points and 300 basis points scenarios is muted as some rates become floored at near zero rate levels. The duration of equity provides an estimate of the change in market value of equity for a 1.00 percentage point further change in interest rates from the rate shock level.

Based on the totality of our risk analysis, we expect that profitability, defined as the level of ROE compared with short-term market rates, will remain competitive over the long term unless interest rates change by large amounts in a short period of time. Further declines in long-term interest rates could substantially decrease income in the near term (one to two years) before reverting over time to average levels. This temporary reduction in income would be driven by the accelerated recognition of mortgage asset premiums as the incentive for borrowers to refinance results in faster than anticipated repayments of those mortgage assets. We believe that profitability would not become uncompetitive in a rising rate environment unless interest rates were to permanently increase in a short period of time by three percentage points or more and persist at the higher levels for a long period of time.

Market Risk Exposure of the Mortgage Assets Portfolio

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. Sensitivities of the market value of equity allocated to the mortgage assets portfolio under interest rate shocks (in basis points) are shown below. The average mortgage assets portfolio had an assumed capital allocation of $1.3 billion in 2019 based on the entire balance sheet's average regulatory capital-to-assets ratio. Average results shown in the table below are compiled using data for each month end. The market value sensitivities are one measure we use to analyze the portfolio's estimated market risk exposure.

% Change in Market Value of Equity-Mortgage Assets Portfolio

	Down 300	Down 200	Down 100	Flat Rates	Up 100	Up 200	Up 300
Average Results							
2019 Full Year	(28.6)%	(24.1)%	(10.4)%	—	(2.4)%	(8.3)%	(11.7)%
2018 Full Year	(35.9)%	(15.2)%	0.3 %	—	(4.3)%	(7.4)%	(10.0)%
Month-End Results							
December 31, 2019	(17.7)%	(17.2)%	(12.5)%	—	(5.6)%	(14.6)%	(20.5)%
December 31, 2018	(41.2)%	(24.7)%	(3.6)%	—	(7.0)%	(13.2)%	(15.9)%

The average risk exposure of the mortgage assets portfolio in 2019 remained aligned with our preference to keep our exposure to market risk at a low to moderate level. The variances between periods shown reflect normal changes in the balance sheet composition and the impact of lower long-term interest rates observed in the second half of 2019. These lower long-term interest rates result in muted exposure to falling rate shocks as they become floored when they reach near zero rate levels. We believe the mortgage asset 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, 2019 increased by $31.8 billion from the end of 2018, primarily driven by actions taken in 2019 to reduce the repricing risk of term Discount Notes by swapping them to variable rates and due to purchases of fixed rate U.S. Treasury obligations throughout 2019 and swapping them to a variable rate.

(In millions)		December 31, 2019		December 31, 2018	
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.	$ 7,449	$ 5	$ 5,408	$ 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.	1,327	155	493	150
Pay-float with embedded features, receive-float interest rate swap (callable)	Reduces interest-rate sensitivity and repricing gaps by offsetting embedded option risk in the Advance.	200	—	—	—
Total Advances		8,976	160	5,901	160
Investment securities:					
Pay-fixed, receive-float interest rate swap (without options)	Converts the investment security's fixed rate to a variable-rate index.	124	11,202	52	222
Mortgage Loans:					
Forward settlement agreement	Protects against changes in market value of fixed-rate Mandatory Delivery Contracts resulting from changes in interest rates.	—	849	—	131
Consolidated Obligations Bonds:					
Receive-fixed, pay-float interest rate swap (without options)	Converts the Bond's fixed rate to a variable-rate index.	—	4,709	15	3,376
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.	210	30	239	565
Total Consolidated Obligations Bonds		210	4,739	254	3,941
Consolidated Discount Notes:					
Receive-fixed, pay-float interest rate swap (without options)	Converts the Discount Note's fixed rate to a variable-rate index.	—	12,401	—	—
Balance Sheet:					
Interest rate swaptions	Provides the option to enter into an interest rate swap to offset interest-rate or prepayment risk.	—	6,000	—	3,000
Stand-Alone Derivatives:					
Mandatory Delivery Contracts	Exposure to fair-value risk associated with fixed rate mortgage purchase commitments.	—	936	—	146
Total		$ 9,310	$ 36,287	$ 6,207	$ 7,600

See Note 11 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. We regularly conduct a variety of measurements and assessments for capital adequacy. At December 31, 2019, our capital management policy set forth a range of $200 million to $375 million as the minimum amount of retained earnings we believe is necessary to mitigate impairment risk and to provide for dividend stability from factors that could cause earnings to be volatile.

The following table presents retained earnings.

(In millions)	December 31, 2019	December 31, 2018
Unrestricted retained earnings	$ 648	$ 632
Restricted retained earnings [(1)]	446	391
Total retained earnings	$ 1,094	$ 1,023

(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 range, 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, 2019	Monthly Average 2019	December 31, 2018
Market risk-based capital	$ 264	$ 249	$ 327
Credit risk-based capital	367	377	317
Operational risk-based capital	190	187	194
Total risk-based capital requirement	821	813	838
Total permanent capital	4,483	4,921	5,366
Excess permanent capital	$ 3,662	$ 4,108	$ 4,528
Risk-based capital as a percent of permanent capital	18%	17%	16%

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 20 percent of permanent capital. As noted in the "Business Outlook and Risk Management" section of the "Executive Overview," in 2019, the Finance Agency issued a revised risk-based capital calculation effective for periods beginning on January 1, 2020. The revised calculation will not materially change the overall amount of risk-based capital required.

Dodd-Frank Stress Test
Under the Dodd-Frank Wall Street Reform and Consumer Protection Act, all FHLBanks are required to perform an annual stress test for capital adequacy. We completed and published the test in November 2019, based on our financial condition as of December 31, 2018 and the methodology prescribed by the Finance Agency. Capital adequacy was sufficient under all established scenarios to fully absorb losses under both adverse and severely adverse economic conditions.

In December 2019, the Finance Agency published a proposed rule amending its stress testing rule that, among other things, would raise the minimum threshold to conduct periodic stress tests to those regulated entities with consolidated assets of more than $250 billion, which otherwise eliminates the requirements for the FHLBanks to conduct stress tests.

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 down shocks used are either 100 or 200 basis points depending on the benchmark interest rate levels at the time.

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

	December 31, 2019	December 31, 2018
Market Value of Equity to Par Value of Regulatory Capital Stock - Base Case (Flat Rates) Scenario	129%	119%
Market Value of Equity to Par Value of Regulatory Capital Stock - Down Shock (1)	125	113
Market Value of Equity to Par Value of Regulatory Capital Stock - Up Shock (2)	124	114

(1) Given the level of interest rates at the time, this scenario represents down shocks of 100 basis points at December 31, 2019 and 200 basis points at December 31, 2018.
(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 2019, the market capitalization ratios in the scenarios presented continued to be above our policy requirements. The base case ratio at December 31, 2019 was well above 100 percent because retained earnings were 32 percent of regulatory capital stock and we maintained risk exposures at moderate levels.

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

	December 31, 2019	December 31, 2018
Market Value of Equity to Book Value of Capital - Base Case (Flat Rates) Scenario (1)	98%	96%
Market Value of Equity to Book Value of Capital - Down Shock (1)(2)	95	92
Market Value of Equity to Book Value of Capital - Up Shock (1)(3)	94	93

(1) Capital includes total capital and mandatorily redeemable capital stock.
(2) Given the level of interest rates at the time, this scenario represents down shocks of 100 basis points at December 31, 2019 and 200 basis points at December 31, 2018.
(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 98 percent at December 31, 2019 indicates that the market value of total capital is $95 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 $254 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.

Credit Risk

Overview

Our business entails a significant amount of inherent credit risk exposure. We believe our risk management practices, discussed below, bring the amount of residual credit risk to a minimal level. We have no loan loss reserves or impairment recorded for Credit Services, investments, and derivatives and a minimal amount of legacy credit risk exposure to 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 is to equalize risk exposure across members and counterparties to a zero level of expected losses, consistent with our conservative risk management principles and desire to have no residual credit risk related to member borrowings.

Collateral: We require each member to provide a security interest in eligible collateral before it can undertake any secured borrowing. Eligible collateral includes single-family loans, multi-family loans, home equity loans and lines of credit, commercial real estate, bond securities and farm real estate. 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. Over-collateralization by one member is not applied to another member. At December 31, 2019, our policy of over-collateralization resulted in total collateral pledged of $364.8 billion to serve members' total borrowing capacity of $290.1 billion of which $63.5 billion was used to support outstanding Advances and Letters of Credit. Borrowers often pledge collateral in excess of their collateral requirement to demonstrate available liquidity and to have the ability to borrow additional amounts in the future. The collateral composition remained relatively stable compared to the end of 2018.

The table below shows the total pledged collateral (unadjusted for Lendable Value Rates).

(Dollars in billions)	December 31, 2019 Collateral Amount	December 31, 2019 Percent of Total Pledged Collateral	December 31, 2018 Collateral Amount	December 31, 2018 Percent of Total Pledged Collateral
Single family loans	$ 208.9	57%	$ 204.6	59%
Multi-family loans	68.4	19	60.1	17
Commercial real estate	46.3	13	43.3	13
Home equity loans/lines of credit	29.2	8	27.9	8
Bond Securities	11.3	3	11.4	3
Farm real estate	0.7	—	0.7	—
Total	$ 364.8	100%	$ 348.0	100%

At December 31, 2019, 65 percent of collateral was related to residential mortgage lending in single-family loans and home equity loans/lines of credit.

We assign each member one of three levels of collateral status: Blanket, Listing, or Delivery. Assignment is based on a number of factors, including credit ratings, regulatory ratings, problem loan levels and stressed capitalization. Blanket collateral status, which we assign to approximately 88 percent of borrowers, is the least restrictive status and is available to lower-risk bank and credit union members. Approximately 63 percent of pledged collateral is under Blanket status. We monitor the level of eligible collateral pledged under Blanket status using quarterly regulatory financial reports or periodic collateral "Certification" documents submitted by all significant borrowers.

Under Listing collateral status, a member provides us detailed information on specifically identified individual loans that meet certain minimum qualifications. Securities collateral and loan collateral pledged by members in Listing status are subject to a periodic market valuation process. Delivery is the most restrictive collateral status, which we assign to members experiencing significant financial difficulties, insurance companies, Community Development Financial Institutions and newly chartered institutions. We require borrowers in Delivery status to deliver into our custody securities and/or original notes, mortgages or deeds of trust. Under any collateral status, members may elect to pledge bond securities, which we either hold in our custody or, less often, have third parties control on our behalf.

We use third-party services to regularly estimate market values of collateral under Listing and Delivery status. 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: We determine borrowing capacity against pledged collateral by applying collateral discounts, or haircuts, to the value of the collateral. These haircuts result in Lendable Value Rates (LVRs) that are less than the amount of pledged collateral.

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, 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 lendable values remaining after the application of LVRs for each major collateral type pledged at December 31, 2019.

	Lending Values Applied to Collateral
Blanket Status:	
Prime 1-4 family loans	75-80%
Multi-family loans	65-76%
Prime home equity loans/lines of credit	41-81%
Commercial real estate loans	72-84%
Farm real estate loans	69-81%
Listing Status/Physical Delivery:	
Cash/U.S. Government/U.S. Treasury/U.S. agency securities	91-100%
U.S. agency MBS/collateralized mortgage obligations	91-97%
Private-label residential MBS	66-92%
Private-label commercial MBS	55-91%
Municipal securities	79-95%
Small Business Administration certificates	92-95%
Prime 1-4 family loans	75-86%
Multi-family loans	69-80%
Prime home equity loans/lines of credit	64-86%
Commercial real estate loans	75-86%
Farm real estate loans	75-82%

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 borrowers 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 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 borrowers, which we use to help manage credit risk exposure.

(Dollars in billions)

December 31, 2019			December 31, 2018		
	Borrowers			Borrowers	
Credit Rating	Number	Collateral-Based Borrowing Capacity	Credit Rating	Number	Collateral-Based Borrowing Capacity
1-3	485	$ 276.3	1-3	486	$ 272.2
4	119	12.6	4	131	11.0
5	37	1.1	5	26	0.4
6	6	0.1	6	5	0.1
7	5	—	7	7	—
Total	652	$ 290.1	Total	655	$ 283.7

We consider members with credit ratings of "1" through "4" to be financially sound institutions. At December 31, 2019, only 48 borrowers (seven percent of the total) had credit ratings of "5" through "7," an increase of 10 borrowers compared to the end of 2018. These members had $1.2 billion of borrowing capacity at December 31, 2019. We believe the credit rating distribution continues to show a financially sound membership base.

Member Failures, Closures, and Receiverships: There were two member failures in 2019. We had no outstanding exposure to these institutions and the failure of these members did not have an impact on our financial condition or results of operations.

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;
- credit losses totaling $0.2 million in 2019 and $19.2 million since the introduction of the program in 2000, which represent an immaterial percentage of conventional loans' current unpaid principal balances at December 31, 2019 and of total purchases-to-date for the entire MPP; and
- in addition to the low program-to-date 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, 2019	December 31, 2018
< 620	—%	—%
620 to < 660	—	—
660 to < 700	6	6
700 to < 740	17	17
>= 740	77	77
Weighted Average	765	765

(1) Represents the FICO® score at origination.

There was no change in the distribution of FICO® scores at origination in 2019 compared to 2018. The distribution of FICO® scores at origination is one indication of the portfolio's overall favorable credit quality. At December 31, 2019, 77 percent of the portfolio had scores at an excellent level of 740 or above and 94 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, 2019	December 31, 2018	Loan-to-Value	December 31, 2019	December 31, 2018
<= 60%	13%	13%	<= 60%	48%	40%
> 60% to 70%	15	14	> 60% to 70%	26	27
> 70% to 80%	58	58	> 70% to 80%	23	27
> 80% to 90%	9	9	> 80% to 90%	3	5
> 90%	5	6	> 90% to 100%	—	1
			> 100%	—	—
Weighted Average	74%	74%	Weighted Average	59%	62%

The levels of loan-to-value ratios are consistent with the portfolio's excellent credit quality. At December 31, 2019, we estimated that three percent of loans have current loan-to-value ratios above 80 percent, compared to six percent at the end of 2018. The improvement in the 2019 current loan-to-value ratios reflected the four percent average increase in housing prices nationwide during the year.

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, 2019		December 31, 2018
Ohio	60%	Ohio	61%
Kentucky	13	Kentucky	13
Indiana	11	Indiana	11
Tennessee	3	Tennessee	3
Michigan	1	Michigan	1
All others	12	All others	11
Total	100%	Total	100%

Credit Enhancements: Conventional mortgage loans are supported against credit losses by various combinations of primary mortgage insurance (PMI), supplemental mortgage insurance (SMI) (for loans purchased before February 2011), 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 loan pools 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 $233 million and $213 million at December 31, 2019 and 2018, respectively. For more information, see Note 10 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, 2019	December 31, 2018
Early stage delinquencies - unpaid principal balance (1)	$ 40	$ 36
Serious delinquencies - unpaid principal balance (2)	$ 12	$ 13
Early stage delinquency rate (3)	0.4%	0.4%
Serious delinquency rate (4)	0.1%	0.1%
National average serious delinquency rate (5)	1.3%	1.6%

(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, 2019 rate is based on September 30, 2019 data.

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

We consider a high risk loan as having a current loan-to-value ratio above 100 percent. Historically, high risk loans have experienced a minimal amount of serious delinquencies (i.e., delinquencies that are 90 days or more past due or in the process of foreclosure). For example, of the $0.2 million of conventional principal balances with current estimated loan-to-values above 100 percent at December 31, 2019, none of them were seriously delinquent. We believe these data further support our view that the overall portfolio is comprised of high-quality, well-performing loans.

Credit Losses: The following table shows the effects of credit enhancements on the estimation of credit losses at the noted periods. Estimated incurred credit losses, after credit enhancements, are accounted for in the allowance for credit loss or as a charge off (i.e., a reduction to the principal of mortgage loans held for portfolio).

(In millions)	December 31, 2019	December 31, 2018
Estimated incurred credit losses, before credit enhancements	$ 4	$ 4
Estimated amounts deemed recoverable by:		
Primary mortgage insurance	—	(1)
Supplemental mortgage insurance	(2)	(1)
Lender Risk Account	(1)	(1)
Estimated incurred credit losses, after credit enhancements	$ 1	$ 1

The minimal amount of incurred credit losses provides further evidence of the aggregate health of the portfolio. 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, including PMI, the LRA, and SMI. We have assessed that we do not have any credit risk exposure to our PMI providers, and our estimation of credit exposure to SMI providers was not material at December 31, 2019.

In addition to the allowance for credit losses recorded, we regularly analyze potential ranges of additional lifetime credit risk exposure for the loans in the MPP. Even under adverse macroeconomic scenarios, we expect that further credit losses would not significantly decrease profitability.

Investments

Liquidity Investments: We purchase liquidity investments from counterparties that have a strong ability to repay principal and interest. Liquidity investments are either short-term, or longer-term, but can be easily 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 one percent to 15 percent. Through December 31, 2019, the range was based on the counterparty's lowest long-term credit rating of its debt from an NRSRO. In addition, pursuant to a Finance Agency regulation, we complemented reliance on NRSRO ratings for unsecured investment activity by also considering internal credit risk analytics on unsecured counterparties. Effective January 1, 2020, the permissible range is solely based on consideration of the internal credit risk ratings of unsecured counterparties as required by the Finance Agency's final rule issued in 2019. We do not expect the dollar amount limits to our unsecured liquidity investment counterparties to change materially as a result of this new rule.

The lowest long-term credit rating for a counterparty to which we are permitted to extend credit is double-B. However, we have generally invested funds only in those eligible institutions with 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.

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. For resale agreements, the ratings shown are based on ratings of the associated collateral. 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, 2019		
	Long-Term Rating		
	AA	A	Total
Unsecured Liquidity Investments			
Interest-bearing deposits	$ —	$ 550	$ 550
Federal funds sold	1,023	3,810	4,833
Certificates of deposit	500	910	1,410
Total unsecured liquidity investments	1,523	5,270	6,793
Guaranteed/Secured Liquidity Investments			
Securities purchased under agreements to resell	2,349	—	2,349
U.S. Treasury obligations	9,662	—	9,662
GSE obligations	2,120	—	2,120
Total guaranteed/secured liquidity investments	14,131	—	14,131
Total liquidity investments	$ 15,654	$ 5,270	$ 20,924

	December 31, 2018		
	Long-Term Rating		
	AA	A	Total
Unsecured Liquidity Investments			
Federal funds sold	$ 5,640	$ 5,153	$ 10,793
Certificates of deposit	800	1,550	2,350
Total unsecured liquidity investments	6,440	6,703	13,143
Guaranteed/Secured Liquidity Investments			
Securities purchased under agreements to resell	4,402	—	4,402
U.S. Treasury obligations	36	—	36
GSE obligations	277	—	277
Total guaranteed/secured liquidity investments	4,715	—	4,715
Total liquidity investments	$ 11,155	$ 6,703	$ 17,858

During 2019, we increased our balance of liquidity investments primarily through the purchases of U.S. Treasury obligations to more effectively meet the expanded regulatory liquidity requirements. In addition, 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 lowest long-term credit ratings provided by Standard & Poor's, Moody's, and/or Fitch Advisory Services of our unsecured investment credit exposures 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, 2019		
	Counterparty Rating		
Domicile of Counterparty	AA	A	Total
Domestic	$ 238	$ 1,950	$ 2,188
U.S. branches and agency offices of foreign commercial banks:			
Canada	500	360	860
Switzerland	—	810	810
Germany	—	800	800
United Kingdom	—	800	800
Australia	685	—	685
Netherlands	—	550	550
Norway	100	—	100
Total U.S. branches and agency offices of foreign commercial banks	1,285	3,320	4,605
Total unsecured investment credit exposure	$ 1,523	$ 5,270	$ 6,793

The following table presents the remaining contractual maturity 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.

(In millions)	December 31, 2019			
Domicile of Counterparty	Overnight	Due 2 days through 30 days	Due 31 days through 90 days	Total
Domestic	$ 2,188	$ —	$ —	$ 2,188
U.S. branches and agency offices of foreign commercial banks:				
Canada	250	110	500	860
Switzerland	810	—	—	810
Germany	—	800	—	800
United Kingdom	800	—	—	800
Australia	685	—	—	685
Netherlands	550	—	—	550
Norway	100	—	—	100
Total U.S. branches and agency offices of foreign commercial banks	3,195	910	500	4,605
Total unsecured investment credit exposure	$ 5,383	$ 910	$ 500	$ 6,793

At December 31, 2019, all of the $6.8 billion of unsecured investment exposure was to counterparties with holding companies domiciled in countries receiving either AAA or AA long-term sovereign ratings. Furthermore, 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, 2019, $11.8 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 and that the securities issued by these two GSEs are effectively government guaranteed. 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 and the NCUA. These investments totaled $1.7 billion at December 31, 2019. We believe that the strength of the issuers' guarantees 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 the lowest long-term counterparty credit ratings provided by Standard & Poor's, Moody's, and/or Fitch Advisory Services for derivative positions to which we had credit risk exposure at December 31, 2019. The historical or current ratings displayed in this table should not be taken as an indication of future ratings.

(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:				
AA-rated	$ 584	$ 1	$ (1)	$ —
A-rated	13	—	—	—
Total uncleared derivatives	597	1	(1)	—
Cleared derivatives (1)	29,785	13	242	255
Liability positions with credit exposure:				
Uncleared derivatives:				
A-rated	2,170	(4)	4	—
BBB-rated	2,520	(38)	40	2
Total uncleared derivatives	4,690	(42)	44	2
Cleared derivatives (1)	6,104	—	7	7
Total derivative positions with credit exposure to nonmember counterparties	41,176	(28)	292	264
Member institutions (2)	814	3	—	3
Total	$ 41,990	$ (25)	$ 292	$ 267

(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 our requirement to post initial margin through the clearing agent to the Derivatives Clearing Organizations. The amount of cash collateral pledged as initial margin has increased from our use of cleared derivatives. However, the use of cleared derivatives mitigates credit risk exposure because a central counterparty is substituted for individual counterparties.

At December 31, 2019, the net exposure of uncleared derivatives with residual credit risk exposure was less than $3 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, 2019, we had $491 million of notional principal of interest rate swaps with one member, JPMorgan Chase Bank, N.A., which also had outstanding credit services with us. Due to the amount of market value collateralization, we had no outstanding 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, the implicit U.S. government backing of our debt, 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 2019. Our overall ability to effectively fund our operations through debt issuances remained sufficient. Investor demand for System debt was robust in 2019. Although we can make no assurances, we expect this to continue to be the case. We believe the possibility 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 is remote.

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 2019, our portion of the System's debt issuances totaled $823.2 billion for Discount Notes and $27.9 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.

In August 2018, the Finance Agency issued *Advisory Bulletin 2018-07 Federal Home Loan Bank Liquidity Guidance* (Liquidity AB). The Liquidity AB increases the expectations with respect to the maintenance of sufficient liquidity for a specified number of days. The Liquidity AB rescinds the 2009 liquidity guidance previously issued by the Finance Agency. Under the new Liquidity AB, the calculation of 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. Under the new guidance, all Advance maturities are assumed to renew, unless the Advances relate to former members who are ineligible to borrow new Advances.

As part of the base case liquidity expectations, the Liquidity AB requires the FHLBanks to maintain sufficient liquidity for an increased period of between 10 to 30 calendar days. Contemporaneously with the issuance of the Liquidity AB, the Finance Agency issued a supervisory letter that identifies initial thresholds for measures of liquidity. As of December 31, 2019, we maintained a sufficient number of days of positive daily cash balances under the new guidance.

The Liquidity AB also provided guidance related to asset/liability maturity funding gap limits, which was implemented on December 31, 2018. 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 Liquidity AB provides guidance on maintaining appropriate funding gaps for three-month (-10 percent to -20 percent) and one-year (-25 percent to -35 percent) maturity horizons. The Finance Agency's supervisory letter set forth initial funding gap percentage limits. As of December 31, 2019, we were operating within those limits.

We also meet operational and contingency liquidity requirements. We satisfy the operational liquidity requirement by both meeting a contingency liquidity requirement, discussed below, and because we are able to adequately access the capital markets to issue debt. In addition, we focus on maintaining an adequate liquidity balance and a funding balance between our financial assets and financial liabilities.

Contingency liquidity risk is the potential inability to meet liquidity needs because our access to the capital markets to issue Consolidated Obligations is restricted or suspended for a period of time due to a market disruption, operational failure, or real or perceived credit quality problems. We continued to hold an ample amount of liquidity reserves to protect against contingency liquidity risk. The following table presents the components of the contingency liquidity requirement.

(In millions)	December 31, 2019	December 31, 2018
Contingency Liquidity Requirement		
Total Contingency Liquidity Reserves [1]	$ 45,703	$ 34,808
Total Requirement [2]	(26,182)	(18,745)
Excess Contingency Liquidity Available	$ 19,521	$ 16,063

(1) Includes, among others, cash, overnight Federal funds, overnight deposits, self-liquidating term Federal funds, 95 percent of the market value of available-for-sale negotiable securities, and 75 percent of the market value of certain held-to-maturity obligations, including obligations of the United States, U.S. government agency obligations and MBS.

(2) Includes net liabilities maturing in the next seven business days, assets traded not yet settled, Advance commitments outstanding, Advances maturing in the next seven business days, and a three percent hypothetical increase in Advances.

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, 2019	December 31, 2018
Deposit Reserve Requirement		
Total Eligible Deposit Reserves	$ 61,590	$ 66,643
Total Member Deposits	(942)	(664)
Excess Deposit Reserves	$ 60,648	$ 65,979

Contractual Obligations
The following table summarizes our contractual obligations at December 31, 2019. We believe that, as in the past, we will continue to have sufficient liquidity, including from access to the debt markets to issue Consolidated Obligations, to satisfy these obligations on a timely basis.

(In millions)	< 1 year	1 < 3 years	3 < 5 years	> 5 years	Total
Contractual Obligations					
Long-term debt (Bonds) - par [(1)]	$ 18,260	$ 11,318	$ 4,664	$ 4,139	$ 38,381
Operating leases (include premises and equipment)	1	3	2	2	8
Mandatorily redeemable capital stock	15	1	5	1	22
Commitments to fund mortgage loans	936	—	—	—	936
Pension and other postretirement benefit obligations	3	5	4	37	49
Total Contractual Obligations	$ 19,215	$ 11,327	$ 4,675	$ 4,179	$ 39,396

(1) Does not include Discount Notes and contractual interest payments related to Bonds. Total is based on contractual maturities; the actual timing of payments could be affected by factors affecting redemptions.

Off-Balance Sheet Arrangements
The following table summarizes our off-balance sheet items at December 31, 2019. For more information, see Note 20 of the Notes to Financial Statements.

(In millions)	< 1 year	1 < 3 years	3 < 5 years	> 5 years	Total
Off-balance sheet items [(1)]					
Standby Letters of Credit	$ 15,143	$ 993	$ 68	$ 1	$ 16,205
Standby bond purchase agreements	21	55	—	—	76
Total off-balance sheet items	$ 15,164	$ 1,048	$ 68	$ 1	$ 16,281

(1) Represents notional amount of off-balance sheet obligations.

Member Concentration Risk

We regularly assess concentration risks from business activity. We believe that the concentration of Advance activity is consistent with our risk management philosophy, and the impact of borrower concentration on market risk, credit risk, and operational risk, after considering mitigating controls, is minimal.

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. A key reason for this scalability is that the Capital Plan provides for additional capital when Mission Assets grow and the opportunity for us to retire capital when Mission Assets decline, thereby acting, along with our efficient operating expenses, to preserve competitive profitability.

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. In the remote possibility of failure of a member to whom we lent a large amount of Advances, combined with the Federal Deposit Insurance Corporation's decision not to repay Advances, we would implement our member failure plan. Our member failure plan, which we test periodically, would liquidate collateral to recover losses from losing principal and interest on the Advance balances.

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, applicable regulatory requirements and best practices.

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 validate the strength of our security and confirm that established policies and procedures are adequately followed.

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. We have an off-site facility in a suburb of Cincinnati, Ohio, which is kept ready for use and tested at least annually. 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 types of other coverage as well.

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. Human Capital Risk is the potential inability to attract and retain appropriate levels of qualified human resources to maintain efficient operations.

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. 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.

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, partially or fully, the change in fair value of the derivatives. For derivatives accounted 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 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 fair values of the derivative transaction have a close correlation with the 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 2019 was in a range of positive $10 million to negative $6 million. This range is minimal compared to the notional principal amount.

Fair Value Option—Economic Hedge

We account for a portion of Advance and Bond-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 19 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, 2019 and 2018, 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

Income Statements (Quarter amounts are unaudited)

Summary income statements for each quarter within the last two years are provided in the tables below.

	2019			
(In millions)	4th Quarter	3rd Quarter	2nd Quarter	1st Quarter
Interest income	$ 507	$ 591	$ 646	$ 701
Interest expense	408	504	549	579
Net interest income	99	87	97	122
Non-interest income (loss)	6	5	(3)	(18)
Non-interest expense	29	29	30	31
Net income	$ 76	$ 63	$ 64	$ 73

	2018			
(In millions)	4th Quarter	3rd Quarter	2nd Quarter	1st Quarter
Interest income	$ 665	$ 598	$ 594	$ 524
Interest expense	543	468	465	406
Net interest income	122	130	129	118
Non-interest income (loss)	(11)	(9)	(13)	(4)
Non-interest expense	31	30	31	31
Net income	$ 80	$ 91	$ 85	$ 83

Investments

Data on investments for the years ended December 31, 2019, 2018 and 2017 are provided in the tables below.

(In millions)	Carrying Value at December 31,		
	2019	2018	2017
Interest-bearing deposits	$ 550	$ —	$ —
Securities purchased under agreements to resell	2,349	4,402	7,702
Federal funds sold	4,833	10,793	3,650
Trading securities:			
U.S. Treasury obligations	9,627	—	—
GSE obligations	1,988	224	—
MBS:			
U.S. obligation single-family MBS	1	—	1
Total trading securities	11,616	224	1
Available-for-sale securities:			
Certificates of deposit	1,410	2,350	900
GSE obligations	132	53	—
Total available-for-sale securities	1,542	2,403	900
Held-to-maturity securities:			
U.S. Treasury obligations	35	36	34
MBS:			
U.S. obligation single-family MBS	1,671	2,041	2,484
GSE single-family MBS	4,500	5,544	6,703
GSE multi-family MBS	7,293	8,171	5,584
Total held-to-maturity securities	13,499	15,792	14,805
Total securities	26,657	18,419	15,706
Total investments	$ 34,389	$ 33,614	$ 27,058

As of December 31, 2019, investments 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
Interest-bearing deposits	$ 550	$ —	$ —	$ —	$ 550
Securities purchased under agreements to resell	2,349	—	—	—	2,349
Federal funds sold	4,833	—	—	—	4,833
Trading securities:					
U.S. Treasury obligations	1,396	8,231	—	—	9,627
GSE obligations	—	137	943	908	1,988
MBS[(1)]:					
U.S. obligation single-family MBS	—	1	—	—	1
Total trading securities	1,396	8,369	943	908	11,616
Yield on trading securities	1.82%	2.21%	2.67%	2.53%	
Available-for-sale securities:					
Certificates of deposit	$ 1,410	$ —	$ —	$ —	$ 1,410
GSE obligations	—	—	120	12	132
Total available-for-sale securities	1,410	—	120	12	1,542
Yield on available-for sale securities	1.99%	—%	3.03%	3.10%	
Held-to-maturity securities:					
U.S. Treasury obligations	$ 35	$ —	$ —	$ —	$ 35
MBS[(1)]:					
U.S. obligation single-family MBS	266	—	—	1,405	1,671
GSE single-family MBS	—	14	16	4,470	4,500
GSE multi-family MBS	—	480	6,636	177	7,293
Total held-to-maturity securities	301	494	6,652	6,052	13,499
Yield on held-to-maturity securities	2.15%	2.08%	2.13%	2.41%	
Total securities	$ 3,107	$ 8,863	$ 7,715	$ 6,972	$ 26,657
Total investments	$ 10,839	$ 8,863	$ 7,715	$ 6,972	$ 34,389

(1) MBS allocated based on contractual principal maturities assuming no prepayments.

As of December 31, 2019, the FHLB held securities of the following issuers with a carrying value greater than 10 percent of FHLB capital. The table includes GSEs, securities of the U.S. government, government agencies and corporations, and privately issued certificates of deposit.

(In millions) Name of Issuer	Total Carrying Value	Total Fair Value
United States Treasury	$ 9,662	$ 9,662
Fannie Mae	7,710	7,710
Freddie Mac	5,504	5,493
Government National Mortgage Association	1,405	1,418
Federal Farm Credit Banks	610	610
The Toronto-Dominion Bank	500	500
Other [(1)]	1,266	1,266
Total investment securities	$ 26,657	$ 26,659

(1) Includes issuers of securities that have a carrying value that is less than 10 percent of FHLB capital.

Loan Portfolio Analysis

The FHLB's outstanding loans, loans 90 days or more past due and accruing interest, and allowance for credit loss information for the five years ended December 31 are shown below. The FHLB's interest and related shortfall on non-accrual loans and loans modified in troubled debt restructurings was not material during the years presented below.

(Dollars in millions)	2019	2018	2017	2016	2015
Domestic:					
Advances	$ 47,370	$ 54,822	$ 69,918	$ 69,882	$ 73,292
Real estate mortgages	$ 11,236	$ 10,502	$ 9,682	$ 9,150	$ 7,954
Real estate mortgages past due 90 days or more (including those in process of foreclosure) and still accruing interest, unpaid principal balance	$ 17	$ 19	$ 26	$ 33	$ 42
Non-accrual loans, unpaid principal balance (1)	$ 2	$ 3	$ 3	$ 4	$ 7
Troubled debt restructurings, unpaid principal balance (not included above)	$ 12	$ 9	$ 9	$ 8	$ 8
Allowance for credit losses on mortgage loans, beginning of year	$ 1	$ 1	$ 1	$ 2	$ 5
Net charge-offs	—	—	—	(1)	(3)
Provision (reversal) for credit losses	—	—	—	—	—
Allowance for credit losses on mortgage loans, end of year	$ 1	$ 1	$ 1	$ 1	$ 2
Ratio of net charge-offs during the period to average loans outstanding during the period	—%	—%	—%	0.01%	0.04%

(1) See Note 1 of the Notes to Financial Statements for an explanation of the FHLB's non-accrual policy.

Other Borrowings

Borrowings with original maturities of one year or less are classified as short-term. The following is a summary of short-term borrowings exceeding 30 percent of total capital for the years ended December 31:

(Dollars in millions)	2019	2018	2017
Discount Notes			
Outstanding at year-end (book value)	$ 49,084	$ 46,944	$ 46,211
Weighted average rate at year-end (1) (2)	1.56%	2.35%	1.23%
Daily average outstanding for the year (book value)	$ 44,482	$ 49,185	$ 43,124
Weighted average rate for the year (2)	2.22%	1.86%	0.89%
Highest outstanding at any month-end (book value)	$ 62,567	$ 64,045	$ 51,762
Bonds (short-term)			
Outstanding at year-end (principal amount)	$ 11,101	$ 14,728	$ 14,405
Weighted average rate at year-end (2) (3)	1.60%	2.38%	1.35%
Daily average outstanding for the year (principal amount)	$ 15,595	$ 14,937	$ 10,359
Weighted average rate for the year (2) (3)	2.27%	1.87%	0.93%
Highest outstanding at any month-end (principal amount)	$ 21,270	$ 19,438	$ 14,405

(1) Represents an implied rate without consideration of concessions.
(2) Amounts used to calculate weighted average rates for the year are based on dollars in thousands. Accordingly, recalculations based upon amounts in millions may not produce the same results.
(3) Represents the effective coupon rate.

Term Deposits

At December 31, 2019, term deposits in denominations of $100,000 or more totaled $27,800,000. The table below presents the maturities for term deposits in denominations of $100,000 or more:

(In millions) By remaining maturity at December 31, 2019	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
Time certificates of deposit	$ 13	$ 1	$ 2	$ 12	$ 28

Ratios

	2019	2018	2017
Return on average assets	0.28%	0.32%	0.31%
Return on average equity	5.65	6.29	6.15
Average equity to average assets	5.04	5.11	5.00
Dividend payout ratio	74.06%	75.60%	66.31%

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 filing.

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, 2019 and 2018, and the related statements of income, comprehensive income, capital and cash flows for each of the three years in the period ended December 31, 2019, 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, 2019, 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, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 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, 2019, 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.

PricewaterhouseCoopers LLP

Cincinnati, Ohio
March 19, 2020

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, 2019	December 31, 2018
ASSETS		
Cash and due from banks (Note 3)	$ 20,608	$ 10,037
Interest-bearing deposits	550,160	122
Securities purchased under agreements to resell	2,348,584	4,402,208
Federal funds sold	4,833,000	10,793,000
Investment securities:		
Trading securities (Note 4)	11,615,693	223,980
Available-for-sale securities (Note 5)	1,542,185	2,402,897
Held-to-maturity securities (includes $0 and $0 pledged as collateral at December 31, 2019 and 2018, respectively, that may be repledged) [(a)] (Note 6)	13,499,319	15,791,222
Total investment securities	26,657,197	18,418,099
Advances (includes $5,238 and $10,008 at fair value under fair value option at December 31, 2019 and 2018, respectively) (Note 8)	47,369,573	54,822,252
Mortgage loans held for portfolio, net of allowance for credit losses of $711 and $840 at December 31, 2019 and 2018, respectively (Note 9 and Note 10)	11,235,353	10,500,917
Accrued interest receivable	182,252	169,982
Derivative assets (Note 11)	267,165	65,765
Other assets	27,667	20,191
TOTAL ASSETS	$ 93,491,559	$ 99,202,573
LIABILITIES		
Deposits (Note 12)	$ 951,296	$ 669,016
Consolidated Obligations: (Note 13)		
Discount Notes (includes $12,386,974 and $0 at fair value under fair value option at December 31, 2019 and 2018, respectively)	49,084,219	46,943,632
Bonds (includes $4,757,177 and $3,906,610 at fair value under fair value option at December 31, 2019 and 2018, respectively)	38,439,724	45,659,138
Total Consolidated Obligations	87,523,943	92,602,770
Mandatorily redeemable capital stock (Note 15)	21,669	23,184
Accrued interest payable	126,091	147,337
Affordable Housing Program payable (Note 14)	115,295	117,336
Derivative liabilities (Note 11)	1,310	4,586
Other liabilities	307,499	308,128
Total liabilities	89,047,103	93,872,357
Commitments and contingencies (Note 20)		
CAPITAL (Note 15)		
Capital stock Class B putable ($100 par value); issued and outstanding shares: 33,664 shares at December 31, 2019 and 43,205 shares at December 31, 2018	3,366,428	4,320,459
Retained earnings:		
Unrestricted	648,374	631,971
Restricted	446,048	390,829
Total retained earnings	1,094,422	1,022,800
Accumulated other comprehensive loss (Note 16)	(16,394)	(13,043)
Total capital	4,444,456	5,330,216
TOTAL LIABILITIES AND CAPITAL	$ 93,491,559	$ 99,202,573

(a) Fair values: $13,501,207 and $15,575,368 at December 31, 2019 and 2018, respectively.

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, 2019	2018	2017
INTEREST INCOME:			
Advances	$ 1,195,128	$ 1,407,702	$ 903,620
Prepayment fees on Advances, net	8,421	679	1,351
Interest-bearing deposits	13,453	704	181
Securities purchased under agreements to resell	64,336	48,454	23,340
Federal funds sold	228,761	179,552	70,287
Investment securities:			
Trading securities	180,506	1,535	19
Available-for-sale securities	27,691	40,444	6,228
Held-to-maturity securities	386,526	380,304	306,204
Total investment securities	594,723	422,283	312,451
Mortgage loans held for portfolio	340,025	321,328	297,075
Loans to other FHLBanks	70	20	—
Total interest income	2,444,917	2,380,722	1,608,305
INTEREST EXPENSE:			
Consolidated Obligations:			
Discount Notes	988,600	915,032	384,976
Bonds	1,033,508	951,298	786,922
Total Consolidated Obligations	2,022,108	1,866,330	1,171,898
Deposits	15,861	14,009	4,738
Loans from other FHLBanks	3	5	10
Mandatorily redeemable capital stock	1,113	1,806	2,514
Other borrowings	—	—	2
Total interest expense	2,039,085	1,882,150	1,179,162
NET INTEREST INCOME	405,832	498,572	429,143
Provision for credit losses	—	—	500
NET INTEREST INCOME AFTER PROVISION FOR CREDIT LOSSES	405,832	498,572	428,643
NON-INTEREST INCOME (LOSS):			
Net gains (losses) on investment securities	210,207	7,086	(6)
Net gains (losses) on financial instruments held under fair value option	(53,852)	(14,184)	10,409
Net gains (losses) on derivatives and hedging activities	(177,912)	(40,398)	(24,464)
Other, net	11,338	10,678	12,824
Total non-interest income (loss)	(10,219)	(36,818)	(1,237)
NON-INTEREST EXPENSE:			
Compensation and benefits	46,077	46,317	42,272
Other operating expenses	21,629	20,019	18,880
Finance Agency	6,715	6,389	6,598
Office of Finance	4,930	4,984	4,484
Other	9,367	7,010	6,484
Total non-interest expense	88,718	84,719	78,718
INCOME BEFORE ASSESSMENTS	306,895	377,035	348,688
Affordable Housing Program assessments	30,801	37,884	35,120
NET INCOME	$ 276,094	$ 339,151	$ 313,568

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,		
	2019	2018	2017
Net income	$ 276,094	$ 339,151	$ 313,568
Other comprehensive income adjustments:			
Net unrealized gains (losses) on available-for-sale securities	480	14	(147)
Pension and postretirement benefits	(3,831)	3,603	(3,257)
Total other comprehensive income (loss) adjustments	(3,351)	3,617	(3,404)
Comprehensive income	$ 272,743	$ 342,768	$ 310,164

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	Total
	Shares	Par Value	Unrestricted	Restricted	Total	Loss	Capital
BALANCE, DECEMBER 31, 2016	41,569	$ 4,156,944	$ 574,122	$ 260,285	$ 834,407	$ (13,256)	$ 4,978,095
Comprehensive income (loss)			250,854	62,714	313,568	(3,404)	310,164
Proceeds from sale of capital stock	3,547	354,654					354,654
Net shares reclassified to mandatorily redeemable capital stock	(2,705)	(270,458)					(270,458)
Cash dividends on capital stock			(207,942)		(207,942)		(207,942)
BALANCE, DECEMBER 31, 2017	42,411	4,241,140	617,034	322,999	940,033	(16,660)	5,164,513
Comprehensive income (loss)			271,321	67,830	339,151	3,617	342,768
Proceeds from sale of capital stock	4,392	439,157					439,157
Repurchase of capital stock	(2,972)	(297,252)					(297,252)
Net shares reclassified to mandatorily redeemable capital stock	(626)	(62,586)					(62,586)
Cash dividends on capital stock			(256,384)		(256,384)		(256,384)
BALANCE, DECEMBER 31, 2018	43,205	4,320,459	631,971	390,829	1,022,800	(13,043)	5,330,216
Comprehensive income (loss)			220,875	55,219	276,094	(3,351)	272,743
Proceeds from sale of capital stock	5,918	591,762					591,762
Repurchase of capital stock	(15,386)	(1,538,544)					(1,538,544)
Net shares reclassified to mandatorily redeemable capital stock	(73)	(7,249)					(7,249)
Cash dividends on capital stock			(204,472)		(204,472)		(204,472)
BALANCE, DECEMBER 31, 2019	33,664	$ 3,366,428	$ 648,374	$ 446,048	$1,094,422	$ (16,394)	$ 4,444,456

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,		
	2019	2018	2017
OPERATING ACTIVITIES:			
Net income	$ 276,094	$ 339,151	$ 313,568
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Depreciation and amortization	4,914	59,577	57,973
Net change in derivative and hedging activities	(147,582)	(4,706)	6,927
Net change in fair value adjustments on trading securities	(210,207)	(7,086)	6
Net change in fair value adjustments on financial instruments held under fair value option	53,852	14,184	(10,409)
Other adjustments	757	(10)	489
Net change in:			
Accrued interest receivable	(12,408)	(41,482)	(18,701)
Other assets	(1,517)	1,651	23,686
Accrued interest payable	(21,224)	18,077	4,743
Other liabilities	19,520	25,792	15,456
Total adjustments	(313,895)	65,997	80,170
Net cash provided by (used in) operating activities	(37,801)	405,148	393,738
INVESTING ACTIVITIES:			
Net change in:			
Interest-bearing deposits	(771,791)	(7,089)	46,981
Securities purchased under agreements to resell	2,053,624	3,299,721	(2,472,442)
Federal funds sold	5,960,000	(7,143,000)	607,000
Premises, software, and equipment	(2,460)	(2,173)	(2,647)
Trading securities:			
Proceeds from maturities	139	164	182
Purchases	(11,181,646)	(216,277)	—
Available-for-sale securities:			
Proceeds from maturities	6,525,000	6,850,000	2,350,000
Purchases	(5,673,500)	(8,336,000)	(1,950,000)
Held-to-maturity securities:			
Proceeds from maturities	3,561,188	2,917,912	2,484,142
Purchases	(1,290,195)	(4,065,023)	(3,058,634)
Advances:			
Repaid	1,343,898,413	2,889,037,056	2,366,633,884
Originated	(1,336,290,080)	(2,873,930,828)	(2,366,705,248)
Mortgage loans held for portfolio:			
Principal collected	1,922,162	1,117,727	1,218,035
Purchases	(2,691,654)	(1,978,111)	(1,788,156)
Net cash provided by (used in) investing activities	6,019,200	7,544,079	(2,636,903)

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,		
	2019	2018	2017
FINANCING ACTIVITIES:			
Net change in deposits and pass-through reserves	$ 274,910	$ 28,225	$ (99,633)
Net proceeds (payments) on derivative contracts with financing elements	(619)	(1,107)	(4,210)
Net proceeds from issuance of Consolidated Obligations:			
Discount Notes	823,242,543	552,603,900	449,775,543
Bonds	27,927,333	29,071,856	27,080,080
Bonds transferred from other FHLBanks	12,697	—	—
Payments for maturing and retiring Consolidated Obligations:			
Discount Notes	(821,075,874)	(551,919,437)	(448,296,555)
Bonds	(35,191,800)	(37,565,265)	(26,065,750)
Proceeds from issuance of capital stock	591,762	439,157	354,654
Payments for repurchase of capital stock	(1,538,544)	(297,252)	—
Payments for repurchase/redemption of mandatorily redeemable capital stock	(8,764)	(69,433)	(275,209)
Cash dividends paid	(204,472)	(256,384)	(207,942)
Net cash provided by (used in) financing activities	(5,970,828)	(7,965,740)	2,260,978
Net increase (decrease) in cash and due from banks	10,571	(16,513)	17,813
Cash and due from banks at beginning of the period	10,037	26,550	8,737
Cash and due from banks at end of the period	$ 20,608	$ 10,037	$ 26,550
Supplemental Disclosures:			
Interest paid	$ 2,116,628	$ 1,851,838	$ 1,157,662
Affordable Housing Program payments, net	$ 32,842	$ 30,425	$ 30,126

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 22 for more information relating to transactions with stockholders.

The Federal Housing Finance Agency (Finance Agency) is the independent Federal regulator of the FHLBanks, Federal Home Loan Mortgage Corporation (Freddie Mac) and Federal National Mortgage Association (Fannie Mae). The Finance Agency's stated mission is to ensure that the housing government-sponsored enterprises operate in a safe and sound manner so that they serve as a reliable source of liquidity and funding for housing finance and community investment.

Each FHLBank operates as a separate entity with its own management, employees, and board of directors. The FHLB does not have 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.

Reclassifications. Certain amounts in the 2018 and 2017 financial statements have been reclassified to conform to the presentation as of December 31, 2019. Specifically, certain cash flow amounts in the prior period Statement of Cash Flows have been reclassified to reflect short-term investment securities purchases and proceeds on a gross, rather than net, basis.

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 19 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 cost. Interest-bearing deposits include certificates of deposits (CDs) not meeting the definition of an investment security. The FHLB treats securities purchased under agreements to resell as short-term collateralized loans, which are classified as assets on the Statements of Condition. If the market value of the underlying securities decrease below the market value required as collateral, the counterparty has the option to (1) place an equivalent amount of additional securities in safekeeping in the name of the FHLB or (2) remit an equivalent amount of cash. Federal funds sold consist of short-term, unsecured loans generally transacted with counterparties that are considered by the FHLB to be of investment quality.

Investment 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 carried at fair value. The FHLB records changes in the fair value of these securities through other income as a net gain or loss on trading securities. However, the FHLB does not participate in speculative trading practices and holds these investments indefinitely as management periodically evaluates its liquidity needs.

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. Generally, 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. Beginning January 1, 2019, the FHLB adopted new hedge accounting guidance, which, among other things, impacts the income statement presentation of gains (losses) on derivatives and hedging activities for qualifying hedges, including hedges on available-for-sale securities. For available-for-sale securities that have been hedged and qualify as a fair value hedge, 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.

Prior to January 1, 2019, for available-for-sale securities that had been hedged and qualified as a fair value hedge, the FHLB recorded the portion of the change in the fair value of the investment related to the risk being hedged in non-interest income (loss) as net gains (losses) on derivatives and hedging activities together with the related change in the fair value of the derivative, and recorded 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.

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, representing the amount at which an investment is acquired adjusted for periodic principal repayments, amortization of premiums and accretion of discounts.

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.

Premiums and Discounts. The FHLB amortizes purchased premiums and accretes purchased discounts on mortgage-backed securities (MBS) 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. 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 other income.

Investment Securities - Other-than-Temporary Impairment. The FHLB evaluates its individual available-for-sale and held-to-maturity securities in an unrealized loss position for other-than-temporary impairment on a quarterly basis. A security is considered impaired when its fair value is less than its amortized cost. The FHLB considers an other-than-temporary impairment to have occurred under any of the following conditions:

- if the FHLB has an intent to sell the impaired debt security;
- if, based on available evidence, the FHLB believes it is more likely than not that it will be required to sell the impaired debt security before the recovery of its amortized cost basis; or
- if the FHLB does not expect to recover the entire amortized cost basis of the debt security.

Recognition of Other-than-Temporary Impairment. If either of the first two conditions above is met, the FHLB recognizes an other-than-temporary impairment charge in earnings equal to the entire difference between the security's amortized cost basis and its fair value as of the Statement of Condition date. For securities in an unrealized loss position that do not meet either of the first two conditions, the entire loss position, or total other-than-temporary impairment, is evaluated to determine the extent and amount of credit loss.

Advances. The FHLB reports Advances (loans to members, former members or housing associates) either at amortized cost or at fair value when the fair value option is elected. Advances carried at amortized cost are reported net of premiums, discounts (including discounts on Advances related to the Affordable Housing Program (AHP), as discussed below), unearned commitment fees and hedging adjustments. The FHLB amortizes or accretes premiums and discounts, and recognizes unearned commitment fees and hedging adjustments on Advances to interest income using a level-yield methodology. Refundable fees are deferred until the commitment expires or until the Advance is made. The FHLB records interest on Advances to income as earned. For Advances carried at fair value, interest income is recognized based on the contractual interest rate.

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 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. The FHLB classifies mortgage loans as held for portfolio and, accordingly, reports them at their principal amount outstanding net of unamortized premiums and discounts and hedging basis adjustments on loans initially classified as mortgage loan commitments. The FHLB has the intent and ability to hold these mortgage loans to maturity.

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 other income. 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.

Allowance for Credit Losses. An allowance for credit losses is separately established for each identified portfolio segment, if it is probable that a loss triggering event has occurred in the FHLB's portfolio as of the Statements of Condition date and the amount of loss can be reasonably estimated. A loan is considered impaired when, based on current information and events, it is probable that the FHLB will be unable to collect all amounts due according to the contractual terms of the loan agreement. To the extent necessary, an allowance for credit losses for off-balance sheet credit exposures is recorded as a liability. See Note 10 for details on each allowance methodology.

Portfolio Segments. A portfolio segment is defined as the level at which an entity develops and documents a systematic methodology for determining its allowance for credit losses. The FHLB has developed and documented a systematic methodology for determining an allowance for credit losses, where applicable, for (1) credit products (Advances, Letters of Credit and other extensions of credit to members) (2) Federal Housing Administration (FHA) mortgage loans held for portfolio; and (3) conventional mortgage loans held for portfolio.

Classes of Financing Receivables. Classes of financing receivables generally are a disaggregation of a portfolio segment to the extent needed to understand the exposure to credit risk arising from these financing receivables. The FHLB determined that no further disaggregation of the portfolio segments identified above is needed as the credit risk arising from these financing receivables is assessed and measured by the FHLB at the portfolio segment level.

Collateral-dependent Loans. An impaired loan is considered collateral-dependent if repayment is expected to be provided solely by the sale of the underlying property; that is, there is no other available and reliable source of repayment. 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 allowance for credit losses is recorded on a loan considered to be a troubled debt restructuring as a result of the individual evaluation for impairment), 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). 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 loan 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 recorded investment 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 that 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 $8,399,000 and $8,190,000, which was net of accumulated depreciation and amortization of $31,106,000 and $29,007,000 as of December 31, 2019 and 2018, respectively. For the years ended December 31, 2019, 2018, and 2017, the depreciation and amortization expense for premises, software and equipment was $2,257,000, $2,889,000, and $2,949,000, respectively.

Leases. The FHLB leases office space and office equipment to run its business operations. Beginning January 1, 2019, the FHLB adopted new lease accounting guidance. At December 31, 2019, the FHLB included in the Statement of Condition $5,816,000 of operating lease right-of-use assets in other assets as well as $6,417,000 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 $1,842,000 for the year ended December 31, 2019.

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 derivatives 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:

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

2. 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 hedge 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.

Beginning January 1, 2019, the FHLB adopted new hedge accounting guidance, which, among other things, impacts the presentation of gains (losses) on derivatives and hedging activities for qualifying hedges. 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.

Prior to January 1, 2019, changes in the fair value of a derivative that was designated and qualified as a fair value hedge, along with changes in the fair value of the hedged asset or liability that were attributable to the hedged risk, were recorded in non-interest income (loss) as "Net gains (losses) on derivatives and hedging activities."

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. As a result, 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 and hedging activities" with no offsetting fair value adjustments for the assets, liabilities, or firm commitments.

The difference between accruals of interest receivables and payables on derivatives that are designated as fair value hedge 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 and hedging activities."

Discontinuance of Hedge Accounting. The FHLB discontinues hedge accounting prospectively when: (1) it determines that the derivative is no longer 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." Upon execution of these transactions, 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 Advance, debt, 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 that are selected for the fair value option), 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 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.

Mandatorily Redeemable Capital Stock. The FHLB reclassifies stock subject to redemption from equity to 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 equity. After the reclassification, dividends on the capital stock are no longer classified as interest expense.

Restricted Retained Earnings. Under the Joint Capital Enhancement Agreement, as amended (Capital Agreement), the FHLB contributes 20 percent of its quarterly net income to a separate restricted retained earnings account until the account balance equals at least one percent of the FHLB's average balance of outstanding Consolidated Obligations for the previous quarter. These restricted retained earnings are not available to pay dividends and are presented separately on the Statements of Condition.

Standby Letters of Credit. The FHLB records commitment fees for Standby Letters of Credit as deferred income when it receives the fees and accretes them using a straight-line methodology over the term of the Standby Letter of Credit. Based upon past experience, the FHLB's management believes that the likelihood of Standby 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). 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. The FHLB also issues AHP Advances at interest rates below the customary interest rate for non-subsidized Advances. When the FHLB makes 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. As an alternative, the FHLB also has the authority to make the AHP subsidy available to members as a grant. 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 Accounting Standards and Interpretations

Facilitation of the Effects of Reference Rate Reform on Financial Reporting. On March 12, 2020, the Financial Accounting Standards Board (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 or transfer of debt securities classified as held-to-maturity. This guidance is effective immediately for the FHLB, and the amendments may be applied prospectively through December 31, 2022. The FHLB is in the process of evaluating the guidance, and its effect on the FHLB's financial condition, results of operations and cash flows has not yet been determined.

Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. On August 29, 2018, the FASB issued amended guidance that aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). This guidance became effective for the FHLB for the interim and annual periods beginning on January 1, 2020. The guidance did not have a material impact on the FHLB's financial condition, results of operations, and cash flows.

Changes to the Disclosure Requirements for Defined Benefit Plans. On August 28, 2018, the FASB issued amended guidance that modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans to improve disclosure effectiveness. This guidance becomes effective for annual periods ending after December 15, 2020 (December 31, 2020 for the FHLB) and will be applied retrospectively for all comparative periods presented. Early adoption is permitted. The FHLB does not intend to adopt this guidance early. The adoption of this guidance will affect the FHLB's disclosures, but will not have any effect on the FHLB's financial condition, results of operations, or cash flows.

Changes to the Disclosure Requirements for Fair Value Measurement. On August 28, 2018, the FASB issued amended guidance that modifies the disclosure requirements for fair value measurements to improve disclosure effectiveness. This guidance became effective for the FHLB for the interim and annual periods beginning on January 1, 2020. The adoption of this guidance will affect the FHLB's disclosures, but will not have any effect on the FHLB's financial condition, results of operations, or cash flows.

Measurement of Credit Losses on Financial Instruments. On June 16, 2016, the FASB issued amended guidance for the accounting of credit losses on financial instruments. The amendments require entities to immediately record the full amount of expected credit losses in their loan portfolios. The measurement of expected credit losses is based on relevant information about past events, including historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the reported amount. The guidance also requires, among other things, credit losses relating to available-for-sale debt securities to be recorded through an allowance for credit losses and expanded disclosure requirements. The guidance became effective for the FHLB for the interim and annual periods beginning on January 1, 2020. The guidance was applied using a modified-retrospective approach, through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance was effective. The adoption of this guidance did not result in an allowance for credit losses for certain financial instruments including Advances, U.S. obligation/GSE investments, securities purchased under agreement to resell and other short-term investments given the specific terms, issuer guarantees, and/or collateralized/secured nature of the instruments. For mortgage loans held for portfolio, the adoption of this guidance did not have a material impact on the FHLB's financial condition, results of operations, or cash flows.

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, 2019 and 2018 were approximately $133,000 and $118,000.

Pass-through Deposit Reserves. The FHLB acts as a pass-through correspondent for member institutions required to deposit reserves with the Federal Reserve Banks. The amount shown as “Cash and due from banks” includes pass-through reserves deposited with Federal Reserve Banks of approximately $10,239,000 and $6,478,000 as of December 31, 2019 and 2018.

Note 4 - Trading Securities

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

Fair Value	December 31, 2019	December 31, 2018
Non-MBS:		
U.S. Treasury obligations	$ 9,626,964	$ —
GSE obligations	1,988,259	223,368
Total non-MBS	11,615,223	223,368
MBS:		
U.S. obligation single-family MBS	470	612
Total	$ 11,615,693	$ 223,980

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

	For the Years Ended December 31,		
	2019	2018	2017
Net gains (losses) on trading securities held at period end	$ 210,207	$ 7,086	$ (6)
Net gains (losses) on trading securities	$ 210,207	$ 7,086	$ (6)

Note 5 - Available-for-Sale Securities

Table 5.1 - Available-for-Sale Securities by Major Security Types (in thousands)

	December 31, 2019			
	Amortized Cost [(1)]	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	$ 1,410,000	$ 111	$ —	$ 1,410,111
GSE obligations	131,815	601	(342)	132,074
Total	$ 1,541,815	$ 712	$ (342)	$ 1,542,185

	December 31, 2018			
	Amortized Cost [(1)]	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	$ 2,350,000	$ 71	$ (69)	$ 2,350,002
GSE obligations	53,007	16	(128)	52,895
Total	$ 2,403,007	$ 87	$ (197)	$ 2,402,897

(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.

Table 5.2 - Available-for-Sale Securities in a Continuous Unrealized Loss Position (in thousands)

	December 31, 2019					
	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 obligations	$ 17,071	$ (126)	$ 21,574	$ (216)	$ 38,645	$ (342)
Total	$ 17,071	$ (126)	$ 21,574	$ (216)	$ 38,645	$ (342)

All securities outstanding with gross unrealized losses at December 31, 2018 were in a continuous unrealized loss position for less than 12 months.

Table 5.3 - Available-for-Sale Securities by Contractual Maturity (in thousands)

	December 31, 2019		December 31, 2018	
Year of Maturity	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Due in 1 year or less	$ 1,410,000	$ 1,410,111	$ 2,350,000	$ 2,350,002
Due after 1 year through 5 years	—	—	—	—
Due after 5 years through 10 years	119,771	119,870	48,999	48,904
Due after 10 years	12,044	12,204	4,008	3,991
Total	$ 1,541,815	$ 1,542,185	$ 2,403,007	$ 2,402,897

Table 5.4 - Interest Rate Payment Terms of Available-for-Sale Securities (in thousands)

	December 31, 2019	December 31, 2018
Amortized cost of available-for-sale securities:		
Fixed-rate	$ 1,541,815	$ 2,403,007

Realized Gains and Losses. The FHLB had no sales of securities out of its available-for-sale portfolio for the years ended December 31, 2019, 2018, or 2017.

Note 6 - Held-to-Maturity Securities

Table 6.1 - Held-to-Maturity Securities by Major Security Types (in thousands)

	December 31, 2019			
	Amortized Cost (1)	Gross Unrecognized Holding Gains	Gross Unrecognized Holding Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 35,171	$ 5	$ —	$ 35,176
Total non-MBS	35,171	5	—	35,176
MBS:				
U.S. obligation single-family MBS	1,670,783	13,499	(239)	1,684,043
GSE single-family MBS	4,500,471	40,386	(24,072)	4,516,785
GSE multi-family MBS	7,292,894	54	(27,745)	7,265,203
Total MBS	13,464,148	53,939	(52,056)	13,466,031
Total	$ 13,499,319	$ 53,944	$ (52,056)	$ 13,501,207

	December 31, 2018			
	Amortized Cost (1)	Gross Unrecognized Holding Gains	Gross Unrecognized Holding Losses	Fair Value
Non-MBS:				
U.S. Treasury obligations	$ 35,667	$ —	$ (6)	$ 35,661
Total non-MBS	35,667	—	(6)	35,661
MBS:				
U.S. obligation single-family MBS	2,040,642	540	(47,463)	1,993,719
GSE single-family MBS	5,543,524	9,891	(162,097)	5,391,318
GSE multi-family MBS	8,171,389	1,739	(18,458)	8,154,670
Total MBS	15,755,555	12,170	(228,018)	15,539,707
Total	$ 15,791,222	$ 12,170	$ (228,024)	$ 15,575,368

(1) Carrying value equals amortized cost.

Table 6.2 - Net Purchased Premiums Included in the Amortized Cost of MBS Classified as Held-to-Maturity (in thousands)

	December 31, 2019	December 31, 2018
Premiums	$ 32,071	$ 42,299
Discounts	(13,996)	(19,730)
Net purchased premiums	$ 18,075	$ 22,569

Table 6.3 summarizes the held-to-maturity securities with unrealized losses, which are aggregated by major security type and length of time that individual securities have been in a continuous unrealized loss position.

Table 6.3 - Held-to-Maturity Securities in a Continuous Unrealized Loss Position (in thousands)

	December 31, 2019					
	Less than 12 Months		12 Months or more		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
MBS:						
U.S. obligation single-family MBS	$ 148,586	$ (239)	$ —	$ —	$ 148,586	$ (239)
GSE single-family MBS	702,730	(2,682)	1,921,576	(21,390)	2,624,306	(24,072)
GSE multi-family MBS	3,385,731	(7,704)	3,735,950	(20,041)	7,121,681	(27,745)
Total	$ 4,237,047	$ (10,625)	$ 5,657,526	$ (41,431)	$ 9,894,573	$ (52,056)

	December 31, 2018					
	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	$ 35,661	$ (6)	$ —	$ —	$ 35,661	$ (6)
Total non-MBS	35,661	(6)	—	—	35,661	(6)
MBS:						
U.S. obligation single-family MBS	175,663	(1,571)	1,526,835	(45,892)	1,702,498	(47,463)
GSE single-family MBS	401,509	(1,581)	3,859,608	(160,516)	4,261,117	(162,097)
GSE multi-family MBS	5,976,323	(18,185)	229,739	(273)	6,206,062	(18,458)
Total MBS	6,553,495	(21,337)	5,616,182	(206,681)	12,169,677	(228,018)
Total	$ 6,589,156	$ (21,343)	$ 5,616,182	$ (206,681)	$ 12,205,338	$ (228,024)

Table 6.4 - Held-to-Maturity Securities by Contractual Maturity (in thousands)

	December 31, 2019		December 31, 2018	
Year of Maturity	Amortized Cost [(1)]	Fair Value	Amortized Cost [(1)]	Fair Value
Non-MBS:				
Due in 1 year or less	$ 35,171	$ 35,176	$ 35,667	$ 35,661
Due after 1 year through 5 years	—	—	—	—
Due after 5 years through 10 years	—	—	—	—
Due after 10 years	—	—	—	—
Total non-MBS	35,171	35,176	35,667	35,661
MBS [(2)]	13,464,148	13,466,031	15,755,555	15,539,707
Total	$ 13,499,319	$ 13,501,207	$ 15,791,222	$ 15,575,368

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

	December 31, 2019	December 31, 2018
Amortized cost of non-MBS:		
Fixed-rate	$ 35,171	$ 35,667
Total amortized cost of non-MBS	35,171	35,667
Amortized cost of MBS:		
Fixed-rate	5,438,532	6,652,055
Variable-rate	8,025,616	9,103,500
Total amortized cost of MBS	13,464,148	15,755,555
Total	$ 13,499,319	$ 15,791,222

Realized Gains and Losses. 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, 2019, 2018, or 2017, the FHLB did not sell any held-to-maturity securities.

Note 7 - Other-than-Temporary Impairment Analysis

The FHLB evaluates any of its individual available-for-sale and held-to-maturity investment securities holdings in an unrealized loss position for other-than-temporary impairment on a quarterly basis.

U.S. Obligations and GSE Investments

For its U.S. obligations and GSE investments (MBS and non-MBS), the FHLB has determined that the strength of the issuers' guarantees through direct obligations or support from the U.S. government is sufficient to protect the FHLB from losses based on current expectations. As a result, the FHLB determined that, as of December 31, 2019, all of the gross unrealized losses on these investments were temporary as the declines in market value of these securities were not attributable to credit quality. Furthermore, the FHLB does not intend to sell the investments, and it is not more likely than not that the FHLB will be required to sell the investments before recovery of their amortized cost bases. As a result, the FHLB did not consider any of these investments to be other-than-temporarily impaired at December 31, 2019.

The FHLB did not consider any of its investments to be other-than-temporarily impaired at December 31, 2018.

Note 8 - 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 8.1 - Advances by Redemption Term (dollars in thousands)

Redemption Term	December 31, 2019 Amount	December 31, 2019 Weighted Average Interest Rate	December 31, 2018 Amount	December 31, 2018 Weighted Average Interest Rate
Due in 1 year or less	$ 32,342,198	1.78%	$ 38,592,494	2.56%
Due after 1 year through 2 years	4,477,497	2.19	6,461,276	2.39
Due after 2 years through 3 years	1,996,647	2.30	3,146,830	2.30
Due after 3 years through 4 years	1,408,948	2.50	1,145,118	2.56
Due after 4 years through 5 years	1,765,323	2.08	935,439	2.76
Thereafter	5,273,531	2.35	4,591,015	2.98
Total principal amount	47,264,144	1.94	54,872,172	2.56
Commitment fees	(281)		(456)	
Discount on Affordable Housing Program (AHP) Advances	(3,148)		(4,386)	
Premiums	1,221		1,510	
Discounts	(2,530)		(3,090)	
Hedging adjustments	109,929		(43,506)	
Fair value option valuation adjustments and accrued interest	238		8	
Total	$ 47,369,573		$ 54,822,252	

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

Redemption Term or Next Call Date	December 31, 2019	December 31, 2018
Due in 1 year or less	$ 35,366,608	$ 43,793,555
Due after 1 year through 2 years	4,982,222	4,338,117
Due after 2 years through 3 years	1,724,647	3,490,580
Due after 3 years through 4 years	1,381,718	753,716
Due after 4 years through 5 years	1,535,418	905,189
Thereafter	2,273,531	1,591,015
Total principal amount	$ 47,264,144	$ 54,872,172

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

Redemption Term or Next Put Date	December 31, 2019	December 31, 2018
Due in 1 year or less	$ 33,451,448	$ 38,827,494
Due after 1 year through 2 years	4,777,497	6,611,276
Due after 2 years through 3 years	2,129,647	3,221,830
Due after 3 years through 4 years	1,238,948	1,145,118
Due after 4 years through 5 years	1,611,073	835,439
Thereafter	4,055,531	4,231,015
Total principal amount	$ 47,264,144	$ 54,872,172

Table 8.4 - Advances by Interest Rate Payment Terms (in thousands)

	December 31, 2019	December 31, 2018
Fixed-rate (1)		
Due in one year or less	$ 25,918,472	$ 14,965,711
Due after one year	10,194,636	9,022,587
Total fixed-rate (1)	36,113,108	23,988,298
Variable-rate (1)		
Due in one year or less	6,423,726	23,626,783
Due after one year	4,727,310	7,257,091
Total variable-rate (1)	11,151,036	30,883,874
Total principal amount	$ 47,264,144	$ 54,872,172

(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.

Advance Concentrations. Advances outstanding that were greater than or equal to $1.0 billion per borrower were $35.1 billion (74.2%) and $41.3 billion (75.3%) at December 31, 2019 and 2018, respectively. These Advances were made to 11 and 10 borrowers (members and former members) at December 31, 2019 and 2018, respectively. See Note 10 for information related to the FHLB's credit risk on Advances and allowance methodology for credit losses.

Table 8.5 - Borrowers Holding Five Percent or more of Total Advances, Including Any Known Affiliates that are Members of the FHLB (dollars in millions)

December 31, 2019			December 31, 2018		
	Principal	% of Total Principal Amount of Advances		Principal	% of Total Principal Amount of Advances
U.S. Bank, N.A.	$ 13,874	29%	JPMorgan Chase Bank, N.A.	$ 23,400	43%
JPMorgan Chase Bank, N.A.	4,500	10	U.S. Bank, N.A.	4,574	8
Third Federal Savings and Loan Association	3,883	8	Third Federal Savings and Loan Association	3,727	7
Total	$ 22,257	47%	Total	$ 31,701	58%

Note 9 - Mortgage Loans Held for Portfolio

Total mortgage loans held for portfolio represent residential mortgage loans under the 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 9.1 - Mortgage Loans Held for Portfolio (in thousands)

	December 31, 2019	December 31, 2018
Unpaid principal balance:		
Fixed rate medium-term single-family mortgage loans (1)	$ 773,575	$ 933,340
Fixed rate long-term single-family mortgage loans	10,207,367	9,338,814
Total unpaid principal balance	10,980,942	10,272,154
Premiums	241,356	227,161
Discounts	(2,166)	(2,603)
Hedging basis adjustments (2)	15,932	5,045
Total mortgage loans held for portfolio	$ 11,236,064	$ 10,501,757

(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.

Table 9.2 - Mortgage Loans Held for Portfolio by Collateral/Guarantee Type (in thousands)

	December 31, 2019	December 31, 2018
Unpaid principal balance:		
Conventional mortgage loans	$ 10,750,526	$ 9,999,307
FHA mortgage loans	230,416	272,847
Total unpaid principal balance	$ 10,980,942	$ 10,272,154

Table 9.3 - 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, 2019			December 31, 2018	
	Principal	% of Total		Principal	% of Total
Union Savings Bank	$ 3,574	33%	Union Savings Bank	$ 3,449	34%
Guardian Savings Bank FSB	1,004	9	Guardian Savings Bank FSB	987	10
FirstBank	714	7			

Note 10 - Allowance for Credit Losses

The FHLB has established an allowance methodology for each of the FHLB's portfolio segments: credit products (Advances, Letters of Credit and other extensions of credit to members); FHA mortgage loans held for portfolio; and conventional mortgage loans held for portfolio.

Credit Products

The FHLB manages its credit exposure to credit products 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. 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. The FHLB accepts certain investment securities, residential mortgage loans, deposits and other real estate related assets as 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.

Members experiencing financial difficulties are subject to FHLB-performed “stress tests” of 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, 2019 and 2018, the FHLB had rights to collateral on a member-by-member basis with an estimated value in excess of its outstanding extensions of credit.

The FHLB evaluates and makes changes to its collateral guidelines, as necessary, based on current market conditions. At December 31, 2019 and 2018, the FHLB did not have any Advances that were past due, in non-accrual status or impaired. In addition, there were no troubled debt restructurings related to credit products of the FHLB during 2019 or 2018.

The FHLB has not experienced any credit losses on Advances since it was founded in 1932. Based upon the collateral held as security, its credit extension and collateral policies and the repayment history on credit products, the FHLB did not record any credit losses on credit products as of December 31, 2019 or 2018. Accordingly, the FHLB did not record any allowance for credit losses on Advances.

At December 31, 2019 and 2018, the FHLB did not record any liability to reflect an allowance for credit losses for off-balance sheet credit exposures. See Note 20 for additional information on the FHLB's off-balance sheet credit exposure.

Mortgage Loans Held for Portfolio - 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 due to 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. As a result, the FHLB did not establish 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 Held for Portfolio - Conventional Mortgage Purchase Program (MPP)

The FHLB determines the allowance for conventional loans through analyses that include consideration of various data observations such as past performance, current performance, loan portfolio characteristics, collateral-related characteristics, industry data, and prevailing economic conditions. The measurement of the allowance for credit losses consists of: (1) collectively evaluating homogeneous pools of residential mortgage loans; (2) reviewing specifically identified loans for impairment; and (3) considering other relevant qualitative factors.

Collectively Evaluated Mortgage Loans. The credit risk analysis of conventional loans evaluated collectively for impairment considers historical delinquency migration, applies estimated loss severities, and incorporates the associated credit enhancements in order to determine the FHLB's best estimate of probable incurred losses at the reporting date. Migration analysis is a methodology for determining, through the FHLB's experience over a historical period, the rate of default on loans. The FHLB applies migration analysis to loans based on payment status categories such as current, 30, 60, and 90 days past due. The FHLB then estimates how many loans in these categories may migrate to a loss realization event and applies a current loss severity to estimate losses. The estimated losses are then reduced by the probable cash flows resulting from available credit enhancements. To properly determine the credit enhancements available to recover estimated losses, the FHLB performs the credit risk analysis of all conventional mortgage loans at the individual Master Commitment Contract level. The Master Commitment Contract is an agreement with a member in which the member agrees to make a best efforts attempt to sell a specific dollar amount of loans to the FHLB, generally over a one-year period. Any credit enhancement cash flows that are projected and assessed as not probable of receipt do not reduce estimated losses.

Individually Evaluated Mortgage Loans. Conventional mortgage loans that are considered troubled debt restructurings are specifically identified for purposes of calculating the allowance for credit losses. The FHLB measures impairment of these specifically identified loans by either estimating the present value of expected cash flows, estimating the loan's observable market price, or estimating the fair value of the collateral if the loan is collateral dependent. The FHLB removes specifically identified loans evaluated for impairment from the collectively evaluated mortgage loan population.

Qualitative Factors. 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 incurred losses that may not otherwise be captured in the methodology described above.

Allowance for Credit Losses on Mortgage Loans. The following tables present a rollforward of the allowance for credit losses on conventional mortgage loans as well as the recorded investment in mortgage loans by impairment methodology. The recorded investment in a loan is the unpaid principal balance of the loan adjusted for accrued interest, unamortized premiums or discounts, hedging basis adjustments and direct write-downs. The recorded investment is not net of any allowance.

Table 10.1 - Rollforward of Allowance for Credit Losses on Conventional Mortgage Loans (in thousands)

	For the Years Ended December 31,		
	2019	2018	2017
Balance, beginning of period	$ 840	$ 1,190	$ 1,142
Net charge offs	(129)	(350)	(452)
Provision for credit losses	—	—	500
Balance, end of period	$ 711	$ 840	$ 1,190

Table 10.2 - Allowance for Credit Losses and Recorded Investment on Conventional Mortgage Loans by Impairment Methodology (in thousands)

	December 31, 2019	December 31, 2018
Allowance for credit losses:		
Collectively evaluated for impairment	$ 711	$ 840
Individually evaluated for impairment	—	—
Total allowance for credit losses	$ 711	$ 840
Recorded investment:		
Collectively evaluated for impairment	$ 11,025,713	$ 10,249,169
Individually evaluated for impairment	13,514	10,554
Total recorded investment	$ 11,039,227	$ 10,259,723

Credit Enhancements. The conventional mortgage loans under the MPP are supported by some combination of credit enhancements (primary mortgage insurance (PMI), supplemental mortgage insurance (SMI) and the Lender Risk Account (LRA), including pooled LRA for those members participating in an aggregated MPP pool). The amount of credit enhancements needed to protect the FHLB against credit losses is determined through use of a third-party default model. These credit enhancements apply after a homeowner's equity is exhausted. Beginning in February 2011, the FHLB discontinued the use of SMI for all new loan purchases and replaced it with expanded use of the LRA. The LRA is funded by the FHLB as a portion of the purchase proceeds to cover expected losses. The LRA is recorded in other liabilities in the Statements of Condition. Excess funds over required balances are returned to the member in accordance with a step-down schedule that is established upon execution of a Master Commitment Contract, 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.

Table 10.3 - Changes in the LRA (in thousands)

	For the Years Ended December 31,		
	2019	2018	2017
LRA at beginning of year	$ 213,260	$ 200,745	$ 187,684
Additions	29,558	24,784	20,677
Claims	(113)	(492)	(506)
Scheduled distributions	(9,229)	(11,777)	(7,110)
LRA at end of period	$ 233,476	$ 213,260	$ 200,745

Credit Quality Indicator and Other Delinquency Statistics. The key credit quality indicator for mortgage loans is payment status. Table 10.4 presents the recorded investment of mortgage loans based on payment status as well as other delinquency statistics.

Table 10.4 - Credit Quality Indicator and Other Delinquency Statistics of Mortgage Loans (dollars in thousands)

	December 31, 2019		
Payment status:	**Conventional MPP Loans**	**FHA Loans**	**Total**
Past due 30-59 days delinquent	$ 35,416	$ 13,903	$ 49,319
Past due 60-89 days delinquent	5,572	3,052	8,624
Past due 90 days or more delinquent	12,421	5,805	18,226
Total past due	53,409	22,760	76,169
Total current mortgage loans	10,985,818	210,732	11,196,550
Total mortgage loans	$ 11,039,227	$ 233,492	$ 11,272,719
Other delinquency statistics:			
In process of foreclosure, included above (1)	$ 8,311	$ 2,515	$ 10,826
Serious delinquency rate (2)	0.11%	2.49%	0.16%
Past due 90 days or more still accruing interest (3)	$ 11,935	$ 5,805	$ 17,740
Loans on non-accrual status, included above	$ 1,902	$ —	$ 1,902

	December 31, 2018		
Payment status:	**Conventional MPP Loans**	**FHA Loans**	**Total**
Past due 30-59 days delinquent	$ 29,596	$ 14,845	$ 44,441
Past due 60-89 days delinquent	7,175	4,238	11,413
Past due 90 days or more delinquent	12,807	7,210	20,017
Total past due	49,578	26,293	75,871
Total current mortgage loans	10,210,145	250,308	10,460,453
Total mortgage loans	$ 10,259,723	$ 276,601	$ 10,536,324
Other delinquency statistics:			
In process of foreclosure, included above (1)	$ 7,557	$ 4,635	$ 12,192
Serious delinquency rate (2)	0.13%	2.65%	0.19%
Past due 90 days or more still accruing interest (3)	$ 11,773	$ 7,210	$ 18,983
Loans on non-accrual status, included above	$ 2,535	$ —	$ 2,535

(1) Includes loans where the decision of foreclosure or a similar alternative such as pursuit of deed-in-lieu has been reported. Loans in process of foreclosure are included in past due or current loans dependent on their delinquency status.

(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 recorded investment amount.

(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.

The FHLB did not have any real estate owned at December 31, 2019 or 2018.

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. A loan considered a troubled debt restructuring is individually evaluated for impairment when determining its related allowance for credit losses. Credit losses are measured by estimating expected cash shortfalls incurred as of the reporting date.

The FHLB's recorded investment in modified loans considered troubled debt restructurings was (in thousands) $13,514 and $10,554 at December 31, 2019 and 2018, respectively. The amount of troubled debt restructurings is not considered material to the FHLB's financial condition, results of operations, or cash flows.

Note 11 - Derivatives and Hedging Activities

Nature of Business Activity

The FHLB is exposed to interest rate risk primarily from the effect of interest rate changes on its interest-earning assets and on the interest-bearing liabilities that finance these assets. 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 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 (uncleared derivatives) or cleared through a Futures Commission Merchant (i.e., clearing agent) with a Derivative Clearing Organization (cleared derivatives). Once a derivative transaction has been accepted for clearing by a Derivative Clearing Organization (Clearinghouse), the executing counterparty is replaced with the Clearinghouse. 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, 2019, the variable-rate transacted by the FHLB in its derivatives is either OIS, SOFR, or 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 purchase 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 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 11.1 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 11.1 - Fair Value of Derivative Instruments (in thousands)

	December 31, 2019		
	Notional Amount of Derivatives	Derivative Assets	Derivative Liabilities
Derivatives designated as fair value hedging instruments:			
Interest rate swaps	$ 9,310,089	$ 7,227	$ 53,641
Derivatives not designated as hedging instruments:			
Interest rate swaps	28,501,469	9,685	363
Interest rate swaptions	6,000,000	12,464	—
Forward rate agreements	849,000	21	782
Mortgage delivery commitments	936,269	2,798	64
Total derivatives not designated as hedging instruments	36,286,738	24,968	1,209
Total derivatives before adjustments	$ 45,596,827	32,195	54,850
Netting adjustments and cash collateral (1)		234,970	(53,540)
Total derivative assets and total derivative liabilities		$ 267,165	$ 1,310

	December 31, 2018		
	Notional Amount of Derivatives	Derivative Assets	Derivative Liabilities
Derivatives designated as fair value hedging instruments:			
Interest rate swaps	$ 6,207,278	$ 2,393	$ 16,810
Derivatives not designated as hedging instruments:			
Interest rate swaps	4,322,480	3,311	1,904
Interest rate swaptions	3,000,000	15,911	—
Forward rate agreements	131,000	—	2,664
Mortgage delivery commitments	146,009	1,726	1
Total derivatives not designated as hedging instruments	7,599,489	20,948	4,569
Total derivatives before adjustments	$ 13,806,767	23,341	21,379
Netting adjustments and cash collateral (1)		42,424	(16,793)
Total derivative assets and total derivative liabilities		$ 65,765	$ 4,586

(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 clearing agent and/or counterparty. Cash collateral posted and related accrued interest was (in thousands) $293,148 and $71,246 at December 31, 2019 and 2018. Cash collateral received and related accrued interest was (in thousands) $4,638 and $12,029 at December 31, 2019 and 2018.

In connection with the adoption of new accounting guidance, changes in fair value of the derivative hedging instrument and the hedged item attributable to the hedged risk for designated fair value hedges are recorded in net interest income in the same line as the earnings effect of the hedged item beginning on January 1, 2019. Prior to January 1, 2019, for designated fair value hedges, any hedge ineffectiveness (which represented the amount by which the change in the fair value of the derivative differed from the change in the fair value of the hedge item) was recorded in non-interest income (loss) as net gains (losses) on derivatives and hedging activities.

Table 11.2 presents the impact of qualifying fair value hedging relationships on the Statements of Income as well as the total interest income (expense) by product.

Table 11.2 - Impact of Fair Value Hedging Relationships on the Statements of Income (in thousands)

	For the Year Ended December 31, 2019		
	Advances	Available-for-sale Securities	Consolidated Bonds
Total interest income (expense) recorded in the Statements of Income	$ 1,195,128	$ 27,691	$ (1,033,508)
Impact of Fair Value Hedging Relationships on the Statements of Income [1]			
Interest income/expense:			
Net interest settlements	$ 36,052	$ (311)	$ 1,637
Gain (loss) on derivatives	(160,006)	(6,402)	945
Gain (loss) on hedged items	153,435	6,307	(905)
Effect on net interest income	$ 29,481	$ (406)	$ 1,677

	For the Year Ended December 31, 2018 [2]		
	Advances	Available-for-sale securities	Consolidated Bonds
Impact of Fair Value Hedging Relationships on the Statements of Income [1]			
Interest income/expense:			
Net interest settlements [3]	$ 24,006	$ (44)	$ (3,215)
Effect on net interest income	$ 24,006	$ (44)	$ (3,215)
Non-interest income (loss):			
Gain (loss) on derivatives	$ (6,443)	$ (1,015)	$ 2,758
Gain (loss) on hedged items	8,517	1,008	(2,950)
Effect on non-interest income (loss)	$ 2,074	$ (7)	$ (192)

	For the Year Ended December 31, 2017 [2]	
	Advances	Consolidated Bonds
Impact of Fair Value Hedging Relationships on the Statements of Income [1]		
Interest income/expense:		
Net interest settlements [3]	$ (17,907)	$ (1,101)
Effect on net interest income	$ (17,907)	$ (1,101)
Non-interest income (loss):		
Gain (loss) on derivatives	$ 35,570	$ 240
Gain (loss) on hedged items	(36,152)	282
Effect on non-interest income (loss)	$ (582)	$ 522

(1) Includes interest rate swaps.
(2) Prior period amounts were not conformed to new hedge accounting guidance adopted January 1, 2019.
(3) Excludes (amortization)/accretion on closed fair value hedge relationships of (in thousands) $(602) and $(2,131) for the years ended December 31, 2018 and 2017.

Table 11.3 presents the cumulative basis adjustments on hedged items designated as fair value hedges and the related amortized cost of the hedged items.

Table 11.3 - Cumulative Basis Adjustments for Fair Value Hedges (in thousands)

	December 31, 2019			
Hedged Item	Amortized Cost of Hedged Asset/ Liability (1)	Basis Adjustment for Active Hedging Relationships Included in Amortized Cost	Basis Adjustments for Discontinued Hedging Relationships Included in Amortized Cost	Cumulative Amount of Fair Value Hedging Basis Adjustments
Advances	$ 9,160,841	$ 109,078	$ 851	$ 109,929
Available-for-sale securities	131,814	7,314	—	7,314
Consolidated Bonds	210,696	708	—	708

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

Table 11.4 presents net gains (losses) related to derivatives and hedging activities recorded in non-interest income (loss). For fair value hedging relationships, the portion of net gains (losses) representing hedge ineffectiveness were recorded in non-interest income (loss) for periods prior to January 1, 2019.

Table 11.4 - Net Gains (Losses) on Derivatives and Hedging Activities Recorded in Non-interest Income (Loss) (in thousands)

	For the Years Ended December 31,		
	2019	2018	2017
Derivatives designated as fair value hedging relationships:			
Interest rate swaps	N/A	$ 1,875	$ (60)
Derivatives not designated as hedging instruments:			
Economic hedges:			
Interest rate swaps	$ (142,193)	10,722	(4,067)
Interest rate swaptions	(19,019)	(5,725)	(17,016)
Forward rate agreements	(10,619)	4,446	(6,054)
Net interest settlements	(24,363)	(46,093)	(8,298)
Mortgage delivery commitments	14,904	(5,349)	10,424
Total net gains (losses) related to derivatives not designated as hedging instruments	(181,290)	(41,999)	(25,011)
Price alignment amount (1)	3,378	(274)	607
Net gains (losses) on derivatives and hedging activities	$ (177,912)	$ (40,398)	$ (24,464)

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

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, 2019, 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 11.5 presents separately the fair value of derivative instruments meeting or not meeting netting requirements, including the related collateral. At December 31, 2019 and 2018, 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 11.5 - Offsetting of Derivative Assets and Derivative Liabilities (in thousands)

	December 31, 2019			
	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	$ 16,637	$ (13,903)	$ 2,819	$ 5,553
Cleared	12,739	248,873	—	261,612
Total				$ 267,165
Derivative Liabilities:				
Uncleared	$ 53,533	$ (53,069)	$ 846	$ 1,310
Cleared	471	(471)	—	—
Total				$ 1,310

	December 31, 2018			
	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	$ 20,284	$ (20,250)	$ 1,726	$ 1,760
Cleared	1,331	62,674	—	64,005
Total				$ 65,765
Derivative Liabilities:				
Uncleared	$ 13,745	$ (11,824)	$ 2,665	$ 4,586
Cleared	4,969	(4,969)	—	—
Total				$ 4,586

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

Note 12 - 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.

Certain financial institutions have agreed to maintain compensating balances in consideration for correspondent and other non-credit services. These balances are included in interest-bearing deposits on the accompanying financial statements. The compensating balances required to be held by the FHLB averaged (in thousands) $6,178 and $8,343 during 2019 and 2018.

Non-interest bearing deposits represent funds for which the FHLB acts as a pass-through correspondent for member institutions required to deposit reserves with the Federal Reserve Banks.

Table 12.1 - Deposits (in thousands)

	December 31, 2019	December 31, 2018
Interest-bearing:		
Demand and overnight	$ 906,028	$ 605,979
Term	27,850	51,600
Other	7,179	4,959
Total interest-bearing	941,057	662,538
Non-interest bearing:		
Other	10,239	6,478
Total non-interest bearing	10,239	6,478
Total deposits	$ 951,296	$ 669,016

Note 13 - 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 $1,025.9 billion and $1,031.6 billion at December 31, 2019 and 2018. 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; obligations, participations, or other instruments of or issued by Fannie Mae or Ginnie Mae; mortgages, obligations, or other securities which are or ever have been sold by Freddie Mac under the FHLBank Act; 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 13.1 - Consolidated Discount Notes Outstanding (dollars in thousands)

	Book Value	Principal Amount	Weighted Average Interest Rate (1)
December 31, 2019	$ 49,084,219	$ 49,176,985	1.56%
December 31, 2018	$ 46,943,632	$ 47,071,113	2.35%

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

Table 13.2 - Consolidated Bonds Outstanding by Original Contractual Maturity (dollars in thousands)

	December 31, 2019		December 31, 2018	
Year of Original Contractual Maturity	Amount	Weighted Average Interest Rate	Amount	Weighted Average Interest Rate
Due in 1 year or less	$ 18,259,565	1.77%	$ 21,085,800	2.20%
Due after 1 year through 2 years	8,293,595	1.96	6,998,565	2.13
Due after 2 years through 3 years	3,024,885	2.41	6,829,595	2.05
Due after 3 years through 4 years	3,123,120	2.62	2,958,620	2.39
Due after 4 years through 5 years	1,540,405	2.73	3,248,975	2.63
Thereafter	4,139,000	2.97	4,525,635	2.94
Total principal amount	38,380,570	2.10	45,647,190	2.29
Premiums	64,604		75,809	
Discounts	(24,335)		(29,275)	
Hedging adjustments	708		(196)	
Fair value option valuation adjustment and accrued interest	18,177		(34,390)	
Total	$ 38,439,724		$ 45,659,138	

Consolidated Bonds outstanding were issued with either fixed-rate coupon payment terms or variable-rate coupon payment terms that are indexed to either LIBOR or the Secured Overnight Financing Rate. To meet the expected specific needs of certain investors in Consolidated Obligations, both fixed-rate Bonds 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 13.3 - Consolidated Bonds Outstanding by Call Features (in thousands)

	December 31, 2019	December 31, 2018
Principal Amount of Consolidated Bonds:		
Non-callable	$ 32,953,570	$ 38,539,190
Callable	5,427,000	7,108,000
Total principal amount	$ 38,380,570	$ 45,647,190

Table 13.4 - Consolidated Bonds Outstanding by Original Contractual Maturity or Next Call Date (in thousands)

Year of Original Contractual Maturity or Next Call Date	December 31, 2019	December 31, 2018
Due in 1 year or less	$ 22,631,565	$ 27,173,800
Due after 1 year through 2 years	7,130,595	5,773,565
Due after 2 years through 3 years	2,662,885	5,060,595
Due after 3 years through 4 years	2,343,120	2,470,620
Due after 4 years through 5 years	1,253,405	2,231,975
Thereafter	2,359,000	2,936,635
Total principal amount	$ 38,380,570	$ 45,647,190

Consolidated Bonds, beyond having fixed-rate or variable-rate interest-rate payment terms, may also have a step-up interest-rate payment type. Step-up bonds pay interest at increasing fixed rates for specified intervals over the life of the Consolidated Bond. These Consolidated Bonds generally contain provisions enabling the FHLB to call the Consolidated Bonds at its option on the step-up dates.

Table 13.5 - Consolidated Bonds by Interest-rate Payment Type (in thousands)

	December 31, 2019	December 31, 2018
Principal Amount of Consolidated Bonds:		
Fixed-rate	$ 27,368,570	$ 29,837,190
Variable-rate	11,012,000	15,470,000
Step-up	—	340,000
Total principal amount	$ 38,380,570	$ 45,647,190

Note 14 - Affordable Housing Program (AHP)

The FHLBank Act requires each FHLBank to establish an AHP. Each FHLBank provides subsidies in the form of direct grants and below-market interest rate AHP Advances to members who use the funds to assist in the purchase, construction, or rehabilitation of housing for very low-, low-, and moderate-income households. Each FHLBank is required to contribute to its AHP the greater of 10 percent of its previous year's 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 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.

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 2019, 2018, or 2017. 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. The FHLB has never made such an application.

Table 14.1 - Analysis of AHP Liability (in thousands)

	2019	2018
Balance at beginning of year	$ 117,336	$ 109,877
Assessments (current year additions)	30,801	37,884
Subsidy uses, net	(32,842)	(30,425)
Balance at end of year	$ 115,295	$ 117,336

Note 15 - 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 operations 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, 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 capital without a weighting factor.

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, 2019 and 2018, the FHLB was in compliance with each of these capital requirements.

Table 15.1 - Capital Requirements (dollars in thousands)

	December 31, 2019		December 31, 2018	
	Minimum Requirement	Actual	Minimum Requirement	Actual
Risk-based capital	$ 820,635	$ 4,482,519	$ 837,666	$ 5,366,443
Capital-to-assets ratio (regulatory)	4.00%	4.79%	4.00%	5.41%
Regulatory capital	$ 3,739,662	$ 4,482,519	$ 3,968,103	$ 5,366,443
Leverage capital-to-assets ratio (regulatory)	5.00%	7.19%	5.00%	8.11%
Leverage capital	$ 4,674,578	$ 6,723,779	$ 4,960,129	$ 8,049,665

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, 2019, the membership stock requirement was determined within a declining range from 0.16 percent to 0.05 percent of each member's total assets, with a minimum of $1 thousand and a maximum of $30 million for each member. In addition to membership stock, a member may be required to hold activity stock to capitalize its Mission Asset Activity with the FHLB.

Mission Asset Activity includes Advances, certain funds and rate Advance commitments, and MPP activity that occurred after implementation of the Capital Plan on December 30, 2002. Members must maintain an activity stock balance at least equal to the minimum activity allocation percentage, which currently is zero percent for the MPP and two percent for all other Mission

Asset Activity. If a member owns more than the maximum activity allocation percentage, which currently is four percent of all Mission Asset Activity, the additional stock is that member's excess stock. The FHLB's unrestricted excess stock is defined as total Class B stock minus membership stock, activity stock calculated at the maximum allocation percentage, shares reserved for exclusive use after a stock dividend, and shares subject to redemption and withdrawal notices. The FHLB's excess stock may normally be used by members to support a portion of their activity stock requirement as long as those members maintain at least their minimum activity stock allocation percentage.

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 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 contributes 20 percent of its net income each quarter to a separate restricted retained earnings account until the balance of that account equals at least one percent of that FHLBank's average balance of outstanding Consolidated Obligations for the previous 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, 2019 and 2018 the FHLB had (in thousands) $446,048 and $390,829 in 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, 2019, 2018, and 2017 dividends on mandatorily redeemable capital stock (in thousands) of $1,113, $1,806 and $2,514 were recorded as interest expense.

Table 15.2 - Mandatorily Redeemable Capital Stock Rollforward (in thousands)

	2019	2018	2017
Balance, beginning of year	$ 23,184	$ 30,031	$ 34,782
Capital stock subject to mandatory redemption reclassified from equity	8,269	68,185	270,458
Capital stock previously subject to mandatory redemption reclassified to capital	(1,020)	(5,599)	—
Repurchase/redemption of mandatorily redeemable capital stock	(8,764)	(69,433)	(275,209)
Balance, end of year	$ 21,669	$ 23,184	$ 30,031

The number of stockholders holding the mandatorily redeemable capital stock was 28, 25 and 26 at December 31, 2019, 2018, and 2017.

As of December 31, 2019 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 15.3 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 15.3 - Mandatorily Redeemable Capital Stock by Contractual Year of Redemption (in thousands)

Contractual Year of Redemption	December 31, 2019	December 31, 2018
Year 1	$ 371	$ 1,633
Year 2	298	371
Year 3	1,129	357
Year 4	2,955	1,209
Year 5	1,931	3,553
Thereafter (1)	650	624
Past contractual redemption date due to remaining activity (2)	14,335	15,437
Total	$ 21,669	$ 23,184

(1) Represents mandatorily redeemable capital stock resulting from a Finance Agency rule effective February 19, 2016, that made captive insurance companies ineligible for FHLB membership. Captive insurance companies that were admitted as FHLB members prior to September 12, 2014, will have their membership terminated no later than February 19, 2021. Captive insurance companies that were admitted as FHLB members on or after September 12, 2014, had their membership terminated no later than February 19, 2017. The related mandatorily redeemable capital stock is not required to be redeemed until five years after the member's termination.
(2) 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. Finance Agency regulations 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, 2019, the FHLB had excess capital stock outstanding totaling less than one percent of its total assets. At December 31, 2019, the FHLB was in compliance with the Finance Agency's excess stock rules.

Note 16 - Accumulated Other Comprehensive Income (Loss)

The following tables summarize the changes in accumulated other comprehensive income (loss) for the years ended December 31, 2019, 2018 and 2017.

Table 16.1 - 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, 2016	$ 23	$ (13,279)	$ (13,256)
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	(147)	—	(147)
Net actuarial gains (losses)	—	(4,964)	(4,964)
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits	—	1,707	1,707
Net current period other comprehensive income (loss)	(147)	(3,257)	(3,404)
BALANCE, DECEMBER 31, 2017	(124)	(16,536)	(16,660)
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	14	—	14
Net actuarial gains (losses)	—	1,403	1,403
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits	—	2,200	2,200
Net current period other comprehensive income (loss)	14	3,603	3,617
BALANCE, DECEMBER 31, 2018	(110)	(12,933)	(13,043)
Other comprehensive income before reclassification:			
Net unrealized gains (losses)	480	—	480
Net actuarial gains (losses)	—	(5,665)	(5,665)
Reclassifications from other comprehensive income (loss) to net income:			
Amortization - pension and postretirement benefits	—	1,834	1,834
Net current period other comprehensive income (loss)	480	(3,831)	(3,351)
BALANCE, DECEMBER 31, 2019	$ 370	$ (16,764)	$ (16,394)

Note 17 - 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, 2018. 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, 2018 and 2017. The FHLB contributed more than five percent of the total contributions to the Pentegra Defined Benefit Plan for the plan year ended June 30, 2016.

Table 17.1 - Pentegra Defined Benefit Plan Net Pension Cost and Funded Status (dollars in thousands)

	2019	2018	2017
Net pension cost charged to compensation and benefit expense for the year ended December 31	$ 6,973	$ 8,988	$ 8,340
Pentegra Defined Benefit Plan funded status as of July 1	108.59% [(a)]	110.96% [(b)]	111.75%
FHLB's funded status as of July 1	125.76%	124.65%	124.35%

(a) The Pentegra Defined Benefit Plan's funded status as of July 1, 2019 is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2019 through March 15, 2020. Contributions made on or before March 15, 2020, and designated for the plan year ended June 30, 2019, will be included in the final valuation as of July 1, 2019. The final funded status as of July 1, 2019 will not be available until the Form 5500 for the plan year July 1, 2019 through June 30, 2020 is filed (this Form 5500 is due to be filed no later than April 2021).

(b) The Pentegra Defined Benefit Plan's funded status as of July 1, 2018 is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2018 through March 15, 2019. Contributions made on or before March 15, 2019, and designated for the plan year ended June 30, 2018, will be included in the final valuation as of July 1, 2018. The final funded status as of July 1, 2018 will not be available until the Form 5500 for the plan year July 1, 2018 through June 30, 2019 is filed (this Form 5500 is due to be filed no later than April 2020).

Qualified Defined Contribution Plan. The FHLB also participates in the Pentegra Defined Contribution Plan for Financial Institutions, a tax-qualified, defined contribution pension plan. The FHLB contributes a percentage of the participants' compensation by making a matching contribution equal to a percentage of voluntary employee contributions, subject to certain limitations. The FHLB contributed $1,333,000, $1,249,000, and $1,191,000 in the years ended December 31, 2019, 2018, and 2017, respectively. The FHLB's contributions are recorded as compensation and benefits expense in the Statements of Income.

Nonqualified Supplemental Defined Benefit Retirement Plan (Defined Benefit Retirement Plan). The FHLB maintains a nonqualified, unfunded defined benefit plan. 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.

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 17.2 presents the obligations and funding status of the FHLB's Defined Benefit Retirement Plan and Postretirement Benefits Plan. The benefit obligation represents projected benefit obligation for the nonqualified supplemental Defined Benefit Retirement Plan and accumulated postretirement benefit obligation for the Postretirement Benefits Plan.

Table 17.2 - Benefit Obligation, Fair Value of Plan Assets and Funded Status (in thousands)

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
Change in benefit obligation:	2019	2018	2019	2018
Benefit obligation at beginning of year	$ 38,687	$ 39,545	$ 4,481	$ 4,795
Service cost	902	1,129	14	19
Interest cost	1,550	1,353	181	166
Actuarial loss (gain)	5,496	(1,127)	169	(276)
Benefits paid	(2,389)	(2,213)	(207)	(223)
Benefit obligation at end of year	44,246	38,687	4,638	4,481
Change in plan assets:				
Fair value of plan assets at beginning of year	—	—	—	—
Employer contribution	2,389	2,213	207	223
Benefits paid	(2,389)	(2,213)	(207)	(223)
Fair value of plan assets at end of year	—	—	—	—
Funded status at end of year	$ (44,246)	$ (38,687)	$ (4,638)	$ (4,481)

Amounts recognized in “Other liabilities” on the Statements of Condition for the FHLB's nonqualified supplemental Defined Benefit Retirement Plan and Postretirement Benefits Plan as of December 31, 2019 and 2018 were (in thousands) $48,884 and $43,168.

Table 17.3 - Amounts Recognized in Accumulated Other Comprehensive Income (in thousands)

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
	2019	2018	2019	2018
Net actuarial loss	$ 16,440	$ 12,779	$ 324	$ 154

Table 17.4 - 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		
	2019	2018	2017	2019	2018	2017
Net Periodic Benefit Cost						
Service cost	$ 902	$ 1,129	$ 882	$ 14	$ 19	$ 28
Interest cost	1,550	1,353	1,367	181	166	197
Amortization of net loss	1,834	2,200	1,702	—	—	5
Net periodic benefit cost	$ 4,286	$ 4,682	$ 3,951	$ 195	$ 185	$ 230
Other Changes in Benefit Obligations Recognized in Other Comprehensive Income						
Net loss (gain)	$ 5,496	$ (1,127)	$ 5,060	$ 169	$ (276)	$ (96)
Amortization of net loss	(1,834)	(2,200)	(1,702)	—	—	(5)
Total recognized in other comprehensive income	3,662	(3,327)	3,358	169	(276)	(101)
Total recognized in net periodic benefit cost and other comprehensive income	$ 7,948	$ 1,355	$ 7,309	$ 364	$ (91)	$ 129

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 and amortization of net loss are recorded as Non-Interest Expense - Other in the Statements of Income.

Table 17.5 presents the estimated net actuarial loss that will be amortized from accumulated other comprehensive income into net periodic benefit cost over the next fiscal year.

Table 17.5 - Amortization for Next Fiscal Year (in thousands)

	Defined Benefit Retirement Plan	Postretirement Benefits Plan
Net actuarial loss	$ 2,254	$ —

Table 17.6 presents the key assumptions used for the actuarial calculations to determine benefit obligations for the nonqualified supplemental Defined Benefit Retirement Plan and Postretirement Benefits Plan.

Table 17.6 - Benefit Obligation Key Assumptions

	Defined Benefit Retirement Plan		Postretirement Benefits Plan	
	2019	2018	2019	2018
Discount rate	3.06%	4.10%	3.12%	4.15%
Salary increases	5.00%	5.00%	N/A	N/A

Table 17.7 presents the key assumptions used for the actuarial calculations to determine net periodic benefit cost for the FHLB's Defined Benefit Retirement Plan and Postretirement Benefit Plan.

Table 17.7 - Net Periodic Benefit Cost Key Assumptions

	Defined Benefit Retirement Plan			Postretirement Benefits Plan		
	2019	2018	2017	2019	2018	2017
Discount rate	4.10%	3.45%	3.91%	4.15%	3.53%	4.10%
Salary increases	5.00%	5.00%	4.50%	N/A	N/A	N/A

Table 17.8 - Postretirement Benefits Plan Assumed Health Care Cost Trend Rates

	2019	2018
Assumed for next year	6.00%	6.50%
Ultimate rate	5.00%	5.00%
Year that ultimate rate is reached	2021	2021

The effect of a percentage point increase in the assumed health care trend rates would be an increase in net periodic postretirement benefit expense of $34,000 and in accumulated postretirement benefit obligation (APBO) of $775,000. The effect of a percentage point decrease in the assumed health care trend rates would be a decrease in net periodic postretirement benefit expense of $27,000 and in APBO of $627,000.

The discount rates for the disclosures as of December 31, 2019 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, 2019, and solving for the single discount rate that produces the same present value.

Table 17.9 presents the estimated future benefits payments reflecting expected future services for the years ended after December 31, 2019.

Table 17.9 - Estimated Future Benefit Payments (in thousands)

Years	Defined Benefit Retirement Plan	Postretirement Benefit Plan
2020	$ 2,128	$ 218
2021	2,260	232
2022	2,389	233
2023	1,882	234
2024	1,874	231
2025 - 2029	11,651	1,213

Note 18 - 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 18.1 - Financial Performance by Operating Segment (in thousands)

	For the Years Ended December 31,		
	Traditional Member Finance	MPP	Total
2019			
Net interest income after provision for credit losses	$ 308,585	$ 97,247	$ 405,832
Non-interest income (loss)	(2,252)	(7,967)	(10,219)
Non-interest expense	77,751	10,967	88,718
Income before assessments	228,582	78,313	306,895
Affordable Housing Program assessments	22,969	7,832	30,801
Net income	$ 205,613	$ 70,481	$ 276,094
2018			
Net interest income after provision for credit losses	$ 389,615	$ 108,957	$ 498,572
Non-interest income (loss)	(32,415)	(4,403)	(36,818)
Non-interest expense	73,441	11,278	84,719
Income before assessments	283,759	93,276	377,035
Affordable Housing Program assessments	28,556	9,328	37,884
Net income	$ 255,203	$ 83,948	$ 339,151
2017			
Net interest income	$ 334,383	$ 94,760	$ 429,143
Provision for credit losses	—	500	500
Net interest income after provision for credit losses	334,383	94,260	428,643
Non-interest income (loss)	2,979	(4,216)	(1,237)
Non-interest expense	67,571	11,147	78,718
Income before assessments	269,791	78,897	348,688
Affordable Housing Program assessments	27,230	7,890	35,120
Net income	$ 242,561	$ 71,007	$ 313,568

Table 18.2 - Asset Balances by Operating Segment (in thousands)

	Assets		
	Traditional Member Finance	MPP	Total
December 31, 2019	$ 81,064,206	$ 12,427,353	$ 93,491,559
December 31, 2018	86,042,150	13,160,423	99,202,573

Note 19 - 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. An entity must disclose the level within the fair value hierarchy in which the measurements are classified.

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.

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. Such reclassifications would be reported as transfers in/out at fair value as of the beginning of the quarter in which the changes occur. The FHLB did not have any transfers of assets or liabilities between fair value levels during the years ended December 31, 2019 or 2018.

Table 19.1 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 19.2 for further details about the financial assets and liabilities held at fair value on either a recurring or nonrecurring basis.

Table 19.1 - Fair Value Summary (in thousands)

	December 31, 2019					
		Fair Value				
Financial Instruments	Carrying Value	Total	Level 1	Level 2	Level 3	Netting Adjustments and Cash Collateral (1)
Assets:						
Cash and due from banks	$ 20,608	$ 20,608	$ 20,608	$ —	$ —	$ —
Interest-bearing deposits	550,160	550,160	—	550,160	—	—
Securities purchased under agreements to resell	2,348,584	2,348,607	—	2,348,607	—	—
Federal funds sold	4,833,000	4,833,000	—	4,833,000	—	—
Trading securities	11,615,693	11,615,693	—	11,615,693	—	—
Available-for-sale securities	1,542,185	1,542,185	—	1,542,185	—	—
Held-to-maturity securities	13,499,319	13,501,207	—	13,501,207	—	—
Advances (2)	47,369,573	47,458,028	—	47,458,028	—	—
Mortgage loans held for portfolio, net	11,235,353	11,437,180	—	11,424,857	12,323	—
Accrued interest receivable	182,252	182,252	—	182,252	—	—
Derivative assets	267,165	267,165	—	32,195	—	234,970
Liabilities:						
Deposits	951,296	951,343	—	951,343	—	—
Consolidated Obligations:						
Discount Notes (3)	49,084,219	49,086,723	—	49,086,723	—	—
Bonds (4)	38,439,724	38,832,230	—	38,832,230	—	—
Mandatorily redeemable capital stock	21,669	21,669	21,669	—	—	—
Accrued interest payable	126,091	126,091	—	126,091	—	—
Derivative liabilities	1,310	1,310	—	54,850	—	(53,540)
Other:						
Standby bond purchase agreements	—	407	—	407	—	—

(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.

(2) Includes (in thousands) $5,238 of Advances recorded under the fair value option at December 31, 2019.

(3) Includes (in thousands) $12,386,974 of Consolidated Obligation Discount Notes recorded under the fair value option at December 31, 2019.

(4) Includes (in thousands) $4,757,177 of Consolidated Obligation Bonds recorded under the fair value option at December 31, 2019.

Financial Instruments	December 31, 2018 Carrying Value	Fair Value Total	Level 1	Level 2	Level 3	Netting Adjustments and Cash Collateral (1)
Assets:						
Cash and due from banks	$ 10,037	$ 10,037	$ 10,037	$ —	$ —	$ —
Interest-bearing deposits	122	122	—	122	—	—
Securities purchased under agreements to resell	4,402,208	4,402,237	—	4,402,237	—	—
Federal funds sold	10,793,000	10,793,000	—	10,793,000	—	—
Trading securities	223,980	223,980	—	223,980	—	—
Available-for-sale securities	2,402,897	2,402,897	—	2,402,897	—	—
Held-to-maturity securities	15,791,222	15,575,368	—	15,575,368	—	—
Advances (2)	54,822,252	54,736,645	—	54,736,645	—	—
Mortgage loans held for portfolio, net	10,500,917	10,329,982	—	10,317,010	12,972	—
Accrued interest receivable	169,982	169,982	—	169,982	—	—
Derivative assets	65,765	65,765	—	23,341	—	42,424
Liabilities:						
Deposits	669,016	668,947	—	668,947	—	—
Consolidated Obligations:						
Discount Notes	46,943,632	46,944,523	—	46,944,523	—	—
Bonds (3)	45,659,138	45,385,615	—	45,385,615	—	—
Mandatorily redeemable capital stock	23,184	23,184	23,184	—	—	—
Accrued interest payable	147,337	147,337	—	147,337	—	—
Derivative liabilities	4,586	4,586	—	21,379	—	(16,793)
Other:						
Standby bond purchase agreements	—	443	—	443	—	—

(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.

(2) Includes (in thousands) $10,008 of Advances recorded under the fair value option at December 31, 2018.

(3) Includes (in thousands) $3,906,610 of Consolidated Obligation Bonds recorded under the fair value option at December 31, 2018.

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 19.2.

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 and certificates of deposit, the fair value is determined using prices received from third-party pricing vendors. For GSE obligations, the FHLB uses prices from multiple third-party pricing vendors. The pricing vendors' methodology and the FHLB's validation process is consistent with the MBS process described above. For certificates of deposit, the fair value is determined based on each security’s indicative fair value obtained from a third-party vendor. The FHLB performs several validation steps in order to verify the accuracy and reasonableness of the fair values obtained for certificates of deposit. These steps may include, but are not limited to, a detailed review of instruments with significant periodic price changes and a derived fair value from an option-adjusted discounted cash flow methodology using market-observed inputs for the interest rate environment and similar instruments.

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 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.

Impaired mortgage loans held for portfolio: The estimated fair values of impaired mortgage loans held for portfolio on a non-recurring basis are based on property values obtained from a third-party pricing vendor.

Derivative assets/liabilities: The FHLB's derivative assets/liabilities generally consist of interest rate swaps, interest rate swaptions, TBA MBS (forward rate agreements), 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 fair value of TBA MBS is based on independent indicative and/or quoted prices generated by market transactions involving comparable instruments. 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.

TBA MBS:

- Market-based prices by coupon class and expected term until settlement.

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 by a constructed 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, 2019 or 2018.

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 19.2 presents the fair value of financial assets and liabilities that are recorded on a recurring or nonrecurring basis at December 31, 2019 and 2018, by level within the fair value hierarchy. The FHLB records nonrecurring fair value adjustments to reflect partial write-downs on certain mortgage loans.

Table 19.2 - Fair Value Measurements (in thousands)

	Fair Value Measurements at December 31, 2019				
	Total	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustments and Cash Collateral (1)**
Recurring fair value measurements - Assets					
Trading securities:					
U.S. Treasury obligations	$ 9,626,964	$ —	$ 9,626,964	$ —	$ —
GSE obligations	1,988,259	—	1,988,259	—	—
U.S. obligation single-family MBS	470	—	470	—	—
Total trading securities	11,615,693	—	11,615,693	—	—
Available-for-sale securities:					
Certificates of deposit	1,410,111	—	1,410,111	—	—
GSE obligations	132,074	—	132,074	—	—
Total available-for-sale securities	1,542,185	—	1,542,185	—	—
Advances	5,238	—	5,238	—	—
Derivative assets:					
Interest rate related	264,346	—	29,376	—	234,970
Forward rate agreements	21	—	21	—	—
Mortgage delivery commitments	2,798	—	2,798	—	—
Total derivative assets	267,165	—	32,195	—	234,970
Total assets at fair value	$ 13,430,281	$ —	$ 13,195,311	$ —	$ 234,970
Recurring fair value measurements - Liabilities					
Consolidated Obligations:					
Discount Notes	$ 12,386,974	$ —	$ 12,386,974	$ —	$ —
Bonds	4,757,177	—	4,757,177	—	—
Total Consolidated Obligations	17,144,151	—	17,144,151	—	—
Derivative liabilities:					
Interest rate related	464	—	54,004	—	(53,540)
Forward rate agreements	782	—	782	—	—
Mortgage delivery commitments	64	—	64	—	—
Total derivative liabilities	1,310	—	54,850	—	(53,540)
Total liabilities at fair value	$ 17,145,461	$ —	$ 17,199,001	$ —	$ (53,540)

(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, 2018				
	Total	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustments and Cash Collateral (1)**
Recurring fair value measurements - Assets					
Trading securities:					
GSE obligations	$ 223,368	$ —	$ 223,368	$ —	$ —
U.S. obligation single-family MBS	612	—	612	—	—
Total trading securities	223,980	—	223,980	—	—
Available-for-sale securities:					
Certificates of deposit	2,350,002	—	2,350,002	—	—
GSE obligations	52,895	—	52,895	—	—
Total available-for-sale securities	2,402,897	—	2,402,897	—	—
Advances	10,008	—	10,008	—	—
Derivative assets:					
Interest rate related	64,039	—	21,615	—	42,424
Mortgage delivery commitments	1,726	—	1,726	—	—
Total derivative assets	65,765	—	23,341	—	42,424
Total assets at fair value	$ 2,702,650	$ —	$ 2,660,226	$ —	$ 42,424
Recurring fair value measurements - Liabilities					
Consolidated Obligation Bonds	$ 3,906,610	$ —	$ 3,906,610	$ —	$ —
Derivative liabilities:					
Interest rate related	1,921	—	18,714	—	(16,793)
Forward rate agreements	2,664	—	2,664	—	—
Mortgage delivery commitments	1	—	1	—	—
Total derivative liabilities	4,586	—	21,379	—	(16,793)
Total liabilities at fair value	$ 3,911,196	$ —	$ 3,927,989	$ —	$ (16,793)
Nonrecurring fair value measurements - Assets (2)					
Mortgage loans held for portfolio	$ 311	$ —	$ —	$ 311	

(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.

(2) The fair value information presented is as of the date the fair value adjustment was recorded during the year ended December 31, 2018.

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 19.3 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, 2019, 2018 and 2017.

Table 19.3 – 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, 2019	2018	2017
Advances	$ 238	$ (4)	$ (81)
Consolidated Discount Notes	(1,060)	—	—
Consolidated Bonds	(53,030)	(14,180)	10,490
Total net gains (losses)	$ (53,852)	$ (14,184)	$ 10,409

For instruments recorded under the fair value option, the related contractual interest income and contractual interest expense 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, 2019 or 2018. 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 19.4 – Aggregate Unpaid Balance and Aggregate Fair Value (in thousands)

	December 31, 2019			December 31, 2018		
	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 (1)	$ 5,000	$ 5,238	$ 238	$ 10,000	$ 10,008	$ 8
Consolidated Discount Notes	12,400,865	12,386,974	(13,891)	—	—	—
Consolidated Bonds	4,739,000	4,757,177	18,177	3,941,000	3,906,610	(34,390)

(1) At December 31, 2019 and 2018, none of the Advances were 90 days or more past due or had been placed on non-accrual status.

Note 20 - Commitments and Contingencies

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, 2019, 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, 2019, 2018, or 2017. 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.

Table 20.1 - Off-Balance Sheet Commitments (in thousands)

	December 31, 2019			December 31, 2018		
Notional Amount	**Expire within one year**	**Expire after one year**	**Total**	**Expire within one year**	**Expire after one year**	**Total**
Standby Letters of Credit	$ 15,143,075	$1,062,105	$ 16,205,180	$ 14,578,925	$ 268,395	$ 14,847,320
Commitments for standby bond purchases	20,360	55,150	75,510	23,215	54,820	78,035
Commitments to purchase mortgage loans	936,269	—	936,269	146,009	—	146,009
Unsettled Consolidated Bonds, principal amount (1)	—	—	—	92,000	—	92,000
Unsettled Consolidated Discount Notes, principal amount (1)	—	—	—	525,000	—	525,000

(1) Expiration is based on settlement period rather than underlying contractual maturity of Consolidated Obligations.

Standby Letters of Credit. The FHLB issues Standby Letters of Credit on behalf of its members to support certain obligations of the members (or member's customer) to third-party beneficiaries. These Standby Letters of Credit are subject to the same collateralization and borrowing limits that are applicable to Advances. Standby Letters of Credit may be offered to assist members in facilitating residential housing finance, community lending, and asset-liability management, and to provide liquidity. In particular, members often use Standby Letters of Credit as collateral for deposits from federal and state government agencies. Standby 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, Standby Letters of Credit usually expire without being drawn upon. Standby Letters of Credit have original expiration periods of up to 18 years, currently expiring no later than 2034. Unearned fees and the value of guarantees related to Standby Letters of Credit are recorded in other liabilities and amounted to (in thousands) $5,170 and $3,331 at December 31, 2019 and 2018.

The FHLB monitors the creditworthiness of its members that have Standby Letters of Credit. In addition, Standby 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. As a result, the FHLB has deemed it unnecessary to record any additional liability on these commitments.

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. The bond purchase commitments entered into by the FHLB have original expiration periods up to 6 years, currently no later than 2022, although some are renewable at the option of the FHLB. During 2019 and 2018, 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.

Pledged Collateral. The FHLB may pledge securities, as collateral, related to derivatives. See Note 11 - 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 ultimate liability, if any, arising out of any matters will have a material effect on the FHLB's financial condition or results of operations.

Note 21 - 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, 2019, 2018, or 2017. 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 21.1 - Lending and Borrowing Between the FHLB and Other FHLBanks (in thousands)

	Average Daily Balances for the Years Ended December 31,		
	2019	2018	2017
Loans to other FHLBanks	$ 2,877	$ 1,370	$ 14
Borrowings from other FHLBanks	137	274	959

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.

During the year ended December 31, 2019 the par amount of the liability on Consolidated Obligations transferred to the FHLB totaled (in thousands) $10,000. All such transfers were from the FHLBank of Boston. The net premiums associated with these transactions were (in thousands) $2,697 in 2019. There were no Consolidated Obligations transferred to the FHLB during the years ended December 31, 2018, or 2017. The FHLB had no Consolidated Obligations transferred to other FHLBanks during these periods.

Note 22 - 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, 2019 or 2018.

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, 2019 or 2018.

Table 22.1 - Transactions with Directors' Financial Institutions (dollars in millions)

	December 31, 2019		December 31, 2018	
	Balance	% of Total (1)	Balance	% of Total (1)
Advances	$ 3,428	7.3%	$ 3,424	6.2%
MPP	122	1.1	585	5.7
Regulatory capital stock	176	5.2	419	9.6

(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 22.2 - Stockholders Holding Five Percent or more of Regulatory Capital Stock (dollars in millions)

	Regulatory Capital Stock		Advance	MPP Unpaid
December 31, 2019	Balance	% of Total	Principal	Principal Balance
JPMorgan Chase Bank, N.A.	$ 675	20%	$ 4,500	$ —
U.S. Bank, N.A.	485	14	13,874	17

	Regulatory Capital Stock		Advance	MPP Unpaid
December 31, 2018	Balance	% of Total	Principal	Principal Balance
JPMorgan Chase Bank, N.A.	$ 1,085	25%	$ 23,400	$ —
U.S. Bank, N.A.	796	18	4,574	19
The Huntington National Bank	248	6	6	486

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, 2019 or 2018. The FHLB has 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, 2019 and 2018, 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, 2019, 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, 2019, 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.

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, 2019. 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, 2019, 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, 2019 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, 2019 that materially affected, or are reasonably likely to materially affect, the FHLB's internal control over financial reporting.

Item 9B. Other Information.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

NOMINATION AND ELECTION OF DIRECTORS

The Finance Agency has authorized us to have a total of 18 directors: 10 Member directors and eight Independent directors. Two of our Independent directors are designated as Public Interest directors and all 18 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 by mail. 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, 2020) regarding each of our current directors.

Name	Age	Director Since	Expiration of Term as a Director	Independent or Member (State)
J. Lynn Anderson	56	2017 (1)	12/31/20	Independent (OH)
Grady P. Appleton	72	2007	12/31/21	Independent (OH)
April Miller Boise	51	2019	12/31/22	Independent (OH)
Brady T. Burt	47	2017	12/31/20	Member (OH)
Greg W. Caudill	61	2014	12/31/21	Member (KY)
Leslie D. Dunn	74	2007	12/31/20	Independent (OH)
James A. England, Vice Chair	68	2011	12/31/22	Member (TN)
Robert T. Lameier	67	2016	12/31/23	Member (OH)
Donald J. Mullineaux, Chair	74	2010	12/31/23	Independent (KY)
Alvin J. Nance	62	2009	12/31/20	Independent (TN)
Michael P. Pell	56	2019	12/31/22	Member (OH)
Kathleen A. Rogers (2)	54	2020	12/31/21	Member (OH)
Charles J. Ruma	78	(2002-2004) 2007	12/31/23	Independent (OH)
David E. Sartore	59	2014	12/31/21	Member (KY)
William S. Stuard, Jr.	65	2011	12/31/22	Member (TN)
Nancy E. Uridil	68	2015	12/31/22	Independent (OH)
James J. Vance	58	2017	12/31/20	Member (OH)
Jonathan D. Welty	50	2020	12/31/23	Member (OH)

(1) Ms. Anderson, an Independent director beginning in 2017, also served as a Member director from 2011-2016.

(2) Ms. Rogers was elected by the Board on November 21, 2019 to fill the Ohio Member director vacancy that resulted from the retirement of Director DuHamel. Ms. Rogers' term commenced on January 1, 2020 and will end on December 31, 2021 (what would have been the end of Director DuHamel's 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. 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 been Chief Executive Officer of Farmers National Bank, Danville, Kentucky since December 2002. He also served as President of Farmers National Bank from December 2002 until April 2016.

Mr. England has been Chairman of Decatur County Bank, Decaturville, Tennessee since 1990. He also served as Chief Executive Officer of Decatur County Bank from 1990 to 2013.

Mr. Lameier has been President, Chief Executive Officer, and a director of Miami Savings Bank, Miamitown, Ohio since 1993.

Mr. Pell has been President and Chief Executive Officer of First State Bank, Winchester, Ohio since March 2006.

Ms. Rogers has been Executive Vice President, Director of Capital Stress Testing and Financial Systems of U.S. Bancorp and U.S. Bank, N.A., Cincinnati, Ohio since August 2016. She also served as Vice Chairman and Chief Financial Officer of U.S. Bancorp from January 2015 to August 2016.

Mr. Sartore became Executive Vice President and Chief Financial Officer of Field & Main Bank, Henderson, Kentucky in January 2015 when Ohio Valley Financial Group and BankTrust Financial merged to form Field & Main Bank. Previously, Mr. Sartore was Senior Vice President and Chief Financial Officer of Ohio Valley Financial Group since 1992.

Mr. Stuard has been Chairman of F&M Bank, Clarksville, Tennessee, since January 2016 and President and Chief Executive Officer of F&M Bank since January 1991.

Mr. Vance has been Senior Vice President and Treasurer of Western-Southern Life Assurance Company and related subsidiaries (Cincinnati, Ohio) since March 2016. Previously, he served as Vice President and Treasurer of Western-Southern Life Assurance Company and related subsidiaries from 1999 to March 2016.

Mr. Welty has been President of Ohio Capital Finance Corporation (OCFC), Columbus, Ohio since August 2019 and Vice President of Ohio Capital Corporation for Housing, an affiliate of OCFC, since May 2000. Prior to serving as President of OCFC, Mr. Welty served as Executive Director from January 2010 to August 2019.

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 President of Nationwide Bank from November 2009 to March 2016. Prior to retiring, she served as 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 has 10 years of experience serving on the board of National Church Residences, a leading national non-profit provider of senior housing. 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 non-profit housing experience provides public interest viewpoints that connect to the FHLB's mission.

Mr. Appleton was the President and Chief Executive Officer of East Akron Neighborhood Development Corporation (EANDC) from January 2014 to January 2018. He also served as Executive Director of EANDC for more than 30 years. EANDC improves communities by providing quality and affordable housing, comprehensive homeownership services and economic development opportunities. Mr. Appleton's years of experience with EANDC bring insight to the Board that contributes to the FHLB's corporate objective of maximizing the effectiveness of contributions to Housing and Community Investment programs. Mr. Appleton also served as a member of the FHLB's Advisory Council from 1997 until 2006.

Ms. Boise has been Executive Vice President and General Counsel of Eaton Corporation since January 2020. She was formerly the Senior Vice President, Chief Legal Officer, and Corporate Secretary of Meritor Incorporated from August 2016 to

December 2019. Previously, Ms. Boise served as Senior Vice President, General Counsel, Head of Global Mergers and Acquisitions and Corporate Secretary of Avintiv Incorporated from March 2015 to December 2015. She also served as Vice President, General Counsel, Corporate Secretary and Chief Privacy Officer of Veyance Technologies Incorporated from January 2011 to January 2015. Ms. Boise has 26 years of legal experience and expertise leading corporate development and implementing strategic growth plans, while mitigating related risks. Her knowledge and background offers the Board valuable insight on the FHLB’s governance and risk management corporate objectives.

Ms. Dunn was Senior Vice President of Business Development, General Counsel and Secretary of Cole National Corporation, a New York Stock Exchange listed retailer now owned by EssilorLuxottica, from September 1997 until October 2004. Prior to joining Cole, she had been a partner since 1985 in the Business Practice of the Jones Day law firm. She currently is engaged in various public and private company board activities and serves in leadership positions with a number of civic and philanthropic organizations. Ms. Dunn has served as a director of New York Community Bancorp, Inc. since September 2015 and serves on its Audit, Risk Assessment, Compensation, and Nominating and Corporate Governance Committees. Ms. Dunn's experience as a director and senior officer of publicly held companies and as a law firm partner representing numerous publicly held companies brings perspective to the Board regarding the FHLB's status as an SEC registrant, corporate governance matters, and the Board's responsibility to oversee the FHLB's operations.

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 held 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. Nance has been Chief Executive Officer of LHP Development LLC and LHP Management LLC since April 2015. Previously, he was Executive Director and the Chief Executive Officer of Knoxville's Community Development Corporation (KCDC) from 2000 to 2015. The KCDC is the public housing and redevelopment authority for the City of Knoxville and Knox County, which strives to improve Knoxville's neighborhoods and communities, including through providing quality affordable housing. Mr. Nance also served as Chairman of the Legislative Committee for the Tennessee Association of Housing and Redevelopment Authorities, which provides assistance and support to the state's public and affordable housing agencies. In addition, Mr. Nance served an eight-year term where he held the office of Vice Chairman on the Tennessee Housing Development Agency, the state's housing finance agency, which promotes the production of affordable housing for very low, low, and moderate, income individuals and families in the state. Mr. Nance also serves on the Board of Knoxville Habitat for Humanity. Mr. Nance's depth of experience with these organizations brings insight to the Board that contributes to the FHLB's corporate objective of maximizing the effectiveness of its contributions to Housing and Community Investment programs.

Mr. Ruma has been President and Chief Executive Officer of Virginia Homes Ltd., a homebuilder, since 1975. He served on the board of the Ohio Housing Finance Agency (OHFA), the state's housing agency, from 2004 to 2009. OHFA helps Ohio's first-time homebuyers, renters, senior citizens, and others find quality, affordable housing that meets their needs. OHFA's programs also support developers and property managers of affordable housing throughout the state. Mr. Ruma's years of experience in the home building industry and with the OHFA bring insight to the Board that contributes to the FHLB's mission and corporate objectives.

Ms. Uridil was the Senior Vice President of Global Operation for Moen Incorporated from September 2005 until March 2014. Ms. Uridil served on the Board of Directors of Flexsteel Industries, Inc. (Nasdaq: FLXS) from December 2010 to December 2019, where she served on the Compensation Committee and chaired the Nominations and Governance Committee. Ms. Uridil also served as a Senior Vice President of Estée Lauder Companies, from 2000 to 2005. In addition, Ms. Uridil served as a Senior Vice President of Mary Kay, Incorporated, from 1996 to 2000. Serving on executive teams for global businesses for more than 18 years, 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, 2020) regarding our executive officers.

Name	Age	Position	Employee of the FHLB Since
Andrew S. Howell	58	President and Chief Executive Officer	1989
Stephen J. Sponaugle	57	Executive Vice President-Chief Financial Officer	1992
R. Kyle Lawler	62	Executive Vice President-Chief Business Officer	2000
Roger B. Batsel	48	Executive Vice President-Chief Operating Officer	2014
J. Gregory Dooley, Sr.	66	Executive Vice President-Chief Risk and Compliance Officer	2006
Damon v. Allen	49	Senior Vice President-Housing and Community Investment Officer	1999
J. Christopher Bates	44	Senior Vice President-Chief Accounting Officer	2005
David C. Eastland	62	Senior Vice President-Chief Credit Officer	1999
Tami L. Hendrickson	59	Senior Vice President-Treasurer	2006
Bridget C. Hoffman	43	Senior Vice President-General Counsel	2018
Reema Singh	43	Senior Vice President-Chief Audit Executive	2018
Daniel A. Tully	42	Senior Vice President-Assistant Chief Risk and Compliance Officer	2006

Mr. Howell became President and Chief Executive Officer in June 2012. Previously, he served as the Executive Vice President-Chief Operating Officer since January 2008.

Mr. Sponaugle became 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. Sponaugle also served as the FHLB's Senior Vice President-Chief Risk and Compliance Officer from November 2015 to December 2016, and as Senior Vice President-Chief Risk Officer from January 2007 to October 2015.

Mr. Lawler became Executive Vice President-Chief Business Officer in August 2012. Previously, he served as the Senior Vice President-Chief Credit Officer since May 2007.

Mr. Batsel became 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. Mr. Batsel also served as the FHLB's Senior Vice President-Chief Information Officer since January 2014.

Mr. Dooley became the Executive Vice President-Chief Risk and Compliance Officer in January 2018. Previously, he served as the FHLB's Senior Vice President-Internal Audit since January 2013.

Mr. Allen became Senior Vice President-Housing and Community Investment Officer in January 2012. Previously, he served as the FHLB's Vice President and Community Investment Officer since July 2011.

Mr. Bates became Senior Vice President-Chief Accounting Officer in January 2015. Previously, he served as the FHLB's Vice President-Controller since January 2013.

Mr. Eastland became the Senior Vice President-Chief Credit Officer in January 2015. Prior to that, he served as the FHLB's Vice President-Credit Risk Management since January 2002.

Ms. Hendrickson became Senior Vice President-Treasurer in January 2015. Previously, she served as the FHLB's Vice President-Treasurer since January 2010.

Ms. Hoffman became 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. Singh became Senior Vice President-Chief Audit Executive in July 2019. Previously, she served as the FHLB's First Vice President-Internal Audit since January 2018. Prior to that, she served as Managing Director, Internal Audit at Protiviti, Inc. from October 2015 to January 2018. Ms. Singh also worked at Deloitte & Touche LLP from January 2001 to September 2015, with her last position being Senior Manager, Advisory and Risk Services.

Mr. Tully became Senior Vice President-Assistant Chief Risk and Compliance Officer in January 2020. Previously, 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 and as Vice President-Financial and Market Risk Analysis since 2014.

All officers are appointed annually by our Board of Directors.

AUDIT COMMITTEE FINANCIAL EXPERT

The Board of Directors has determined (1) that Ms. J. Lynn Anderson, Chair of the Audit Committee, and Committee member Mr. David E. Sartore, 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). Ms. Anderson has experience in the internal audit disciplines within the financial industry and is a Certified Public Accountant. Mr. Sartore's experience has principally been in the accounting and finance disciplines within the financial industry and is a Certified Public Accountant. 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.

2019 COMPENSATION DISCUSSION AND ANALYSIS

The following provides discussion and analysis regarding our compensation program for executive officers for 2019, and in particular our Named Executive Officers. Named Executive Officers for 2019 were: Andrew S. Howell, President and Chief Executive Officer (CEO); Stephen J. Sponaugle, Executive Vice President, Chief Financial Officer; R. Kyle Lawler, Executive Vice President, Chief Business Officer; J. Gregory Dooley, Sr., Executive Vice President, Chief Risk and Compliance Officer and Roger B. Batsel, Senior Vice President, Chief Information and Operations Officer. Effective January 1, 2020, Mr. Batsel was promoted to Executive Vice President, Chief Operating Officer. Mr. Dooley has announced his retirement effective April 3, 2020.

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 November 2019 and January 2020 meetings, we submitted the 2020 base salaries as well as incentive payments earned for 2019 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, 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 2020 compensation, we primarily relied upon information from the McLagan Custom Survey. It encompasses information relating to 2019 compensation from mortgage banks, commercial financial institutions that typically had 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 provided to certain officers, including the Named Executive Officers, for maintaining the value of our members' capital stock above a minimum threshold over a three-year 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, 2019, 2018 and 2017. 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	2019	$939,615	$ 779,698	$ 3,457,000	$ 37,044	$5,213,357
President and CEO	2018	901,538	722,867	192,000	34,233	1,850,638
	2017	854,808	650,066	2,149,000	32,837	3,686,711
Stephen J. Sponaugle	2019	419,250	259,314	1,377,000	16,800	2,072,364
Executive Vice President-	2018	405,231	245,058	193,000	16,500	859,789
Chief Financial Officer	2017	368,750	215,949	777,000	16,200	1,377,899
R. Kyle Lawler	2019	440,577	303,275	994,000	16,800	1,754,652
Executive Vice President-	2018	424,250	284,925	170,000	16,500	895,675
Chief Business Officer	2017	404,654	255,349	661,000	16,200	1,337,203
J. Gregory Dooley, Sr.	2019	315,923	208,325	177,000	16,754	718,002
Executive Vice President-	2018	307,518	194,570	103,000	16,382	621,470
Chief Risk and Compliance Officer	2017	262,014	176,729	99,000	16,200	553,943
Roger B. Batsel	2019	341,000	205,659	88,000	16,406	651,065
Executive Vice President-	2018	316,635	190,309	26,000	12,375	545,319
Chief Operating Officer	2017	295,000	168,365	38,000	11,980	513,345

(1) Includes excess accrued vacation benefits automatically paid in accordance with established policy (applicable to all employees), which for 2019 were as follows: Mr. Howell, $64,615; Mr. Sponaugle $9,750; Mr. Lawler, $15,577 and Mr. Dooley, $6,923.

(2) Amounts shown for 2019 reflect total payments pursuant to the current portion of the 2019 Incentive Plan and the deferred portion of the 2016 Incentive Plan (2017 - 2019 performance period), as follows.

Name	2019 Incentive Plan (current incentive)	2016 Incentive Plan (three-year deferred incentive)	Total
Andrew S. Howell	$ 375,896	$ 403,802	$ 779,698
Stephen J. Sponaugle	140,735	118,579	259,314
R. Kyle Lawler	146,062	157,213	303,275
J. Gregory Dooley, Sr.	108,616	99,709	208,325
Roger B. Batsel	102,544	103,115	205,659

(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. See "Retirement Benefits" and "2019 Pension Benefits" for additional information.

(4) Amounts represent matching contributions to the qualified defined contribution pension plan in 2019. For Mr. Howell, 2019 also includes perquisites totaling $20,244, 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.

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 2019. For each of the current Named Executive Officers other than the CEO, total salary increases, including merit, market, and promotional adjustments, ranged from 3.00 percent to 5.00 percent. These increases were based on the CEO's recommendation for each executive, which took into consideration market data, and an evaluation of each executive's annual performance. For Mr. Howell, directors provided feedback to the Chair, and the Committee recommended, and the Board subsequently approved a salary increase of 4.17 percent. In recommending and approving Mr. Howell's 2019 increase, the Committee and Board took into consideration competitive market analysis and the directors' appraisals of his performance during the year.

In October 2019, the Committee recommended and the Board approved a 4.70 percent salary increase pool for 2020 for all employees, comprised of 3.20 percent for merit increases and 1.50 percent for market and promotional adjustments. Using the same process as described above, in November 2019, the Committee recommended, and the Board approved, the following 2020 base salaries and percent increases for the Named Executive Officers: Mr. Howell, $900,000 (2.86 percent); Mr. Sponaugle, $422,000 (3.05 percent); Mr. Lawler, $438,000 (3.06 percent); Mr. Dooley, $315,000 (1.94 percent); and Mr. Batsel, $368,000 (7.92 percent). In January 2020, 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 2020.

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 generally 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. However, the Chief Risk and Compliance Officer's award opportunity is weighted 75 percent on bank-wide goals and 25 percent on Enterprise Risk Management (ERM) specific goals, which are developed with the Risk Committee in order to provide incentive and maintain a level of independence for risk management initiatives.

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 2019 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
R. Kyle Lawler	40.0	60.0	80.0
J. Gregory Dooley, Sr.	40.0	60.0	80.0
Roger B. Batsel	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 2017 - 2019 were calculated based on the actual performance or achievement level for each deferred plan goal at the end of the three-year performance period, with interpolations made for results between achievement levels. The achievement level for each goal was then multiplied by the corresponding incentive weight assigned to that goal. The final value of the deferred award was adjusted based on the goal achievement level determined using separate performance measures over the 2017 - 2019 deferral period. For all Named Executive Officers, the final value of the deferred award was 75 percent for a Threshold level of achievement, 100 percent for a Target level of achievement, or 125 percent for a Maximum level of achievement. If a goal achievement level over the three-year deferral period was below the threshold, no payment would be made for that deferred goal.

In 2018, the Board established a new safety and soundness metric to determine if the deferred portion of the 2018 Incentive Plan and future plans will be awarded rather than using the calculation described above. The safety and soundness metric 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.

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.

2019 Incentive Plan. For calendar year 2019, the Board approved a total of six performance measures in the functional areas of Franchise Value Promotion, Mission Asset Activity 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 2020 meeting, following certification of the 2019 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 2019 plan year, we cumulatively achieved approximately 86 percent of the available maximum incentive opportunity. This was lower than the 88 percent overall performance achieved for 2018 primarily due to not meeting the target performance level for two of the six goals in 2019.

The following table presents the incentive weights, threshold, target and maximum performance levels, and the actual results achieved for the 2019 Incentive Plan performance measures for all Named Executive Officers.

2019 Incentive Plan Performance Levels and Results

(Dollars in thousands)

	Incentive Weight	Threshold Performance	Target Performance	Maximum Performance	Results Achieved
Franchise Value Promotion					
1) Mission Outreach	10.0%	90	100	118	121
2) Mission Asset Participation	10.0	65%	72%	80%	80%
Mission Asset Activity					
3) Average Advance Balances for Members with Assets of $50 billion or Less	15.0	$ 20,000,000	$ 22,000,000	$24,000,000	$ 21,601,334
4) Mortgage Purchase Program New Mandatory Delivery Commitments	15.0	1,500,000	1,800,000	2,200,000	3,550,647
Stockholder Risk/Return					
5) Decline in Market Value of Equity	25.0	< 7%	< 5%	3% or less	3.0%
6) Profitability-Available Earnings vs. Average 3-month LIBOR Rate	25.0	275 bps	350 bps	400 bps	310

During 2019, 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.

The 2019 incentive program for the Chief Risk and Compliance Officer was weighted 75 percent on bank-wide goals, shown above, and 25 percent on the ERM department goal, as follows:

Implement specific initiatives of the ERM program within the ERM Department.

Weight of Goal: 100 percent

Threshold: 3 initiatives satisfactorily completed*
Target: 4 initiatives satisfactorily completed*
Maximum: 5 initiatives satisfactorily completed*

2019 Results Achieved: 4.75 initiatives satisfactorily completed*

* Specific initiatives include efforts in: 1) leading a data integrity project; 2) credit and collateral model migration; 3) leveraging technology to improve efficiency and effectiveness of risk management; 4) MPP credit modeling initiative; and 5) enhancing certain risk management practices.

2020 Incentive Plan. At its November 2019 meeting, the Board established the 2020 Incentive Plan goals, the incentive weights and the performance measures corresponding to each Incentive Plan goal and award opportunity for the 2020 Incentive Plan. After that meeting, the 2020 Incentive Plan was sent to the Finance Agency and we received notification of the completion of their review and non-objection in January 2020. The 2020 Incentive Plan goals for our executives are set forth below.

2020 Incentive Plan Goals

Franchise Value Promotion		
Mission Outreach	*Weight:*	*10.0%*
Mission Asset Participation	*Weight:*	*15.0%*
Mission Asset Activity		
Average Advances Balances for Members with Assets of $50 billion or Less	*Weight:*	*15.0%*
Mortgage Purchase Program New Mandatory Delivery Commitments	*Weight:*	*15.0%*
Stockholder Risk/Return		
Decline in Market Value of Equity	*Weight:*	*20.0%*
Profitability - Available Earnings vs. Average Short-term Rates (3-month LIBOR and Federal funds effective)	*Weight:*	*25.0%*

As reflected above, the Board decided to keep all of the 2020 goals the same as those in 2019 although the performance metrics and the weighting of two goals have been adjusted. In setting the performance measures for the 2020 Incentive Plan, the Board reviewed the results against target for 2019 and considered relevant aspects of our financial outlook for 2020 including the impact of the anticipated interest rate environment, market volatility and changes in member funding needs and the mortgage market that continue to affect Mission Asset Activity and profitability. The Board also considered opportunities to increase mission asset participation by members that are a focus for strategic initiatives. Additionally, in light of the planned LIBOR replacement at the end of 2021, the Board added a Federal funds component to the average interest rates used to benchmark profitability.

The Board also approved a separate ERM department goal for the Chief Risk and Compliance Officer, whose annual incentive is weighted 75 percent on bank-wide goals and 25 percent on the ERM goal.

2020 ERM Goal

Implement specific initiatives of the ERM program within the ERM Department.

<u>Weight of Goal:</u>	100 percent
Threshold:	3 initiatives satisfactorily completed*
Target:	4 initiatives satisfactorily completed*
Maximum:	5 initiatives satisfactorily completed*

* Specific initiatives include efforts in: 1) implementing a data management project; 2) credit and collateral model development; 3) improving the risk dashboard reporting; 4) enhancing market risk measures; and 5) governance risk compliance initiatives.

Three-Year Deferred Incentive Awards. During 2019, the Board, the Committee and the CEO periodically reviewed progress toward the deferred plan goals for each ongoing performance period. At its January 2020 meeting, following certification of the performance results for the deferred portion of the 2016 Incentive Plan (2017 - 2019 performance period) and in accordance with those results, the Board authorized the distribution of payments to eligible officers including the Named Executive Officers. Cumulatively, we achieved approximately 89 percent of the available maximum incentive opportunity. The deferred payments for the 2017 - 2019 performance period are shown in Note 2 to the Summary Compensation Table.

The following table presents, for all Named Executive Officers, the incentive weights, threshold, target and maximum performance levels, and the actual results achieved for each of the goals in the deferred portion of the 2016 Incentive Plan (2017 - 2019 performance period):

	Incentive Weight	Threshold Performance	Target Performance	Maximum Performance	Results Achieved
Operating Efficiency:					
Ranking of Operating Efficiency Ratio in comparison to other FHLBanks	20%	6th	4th	1st	1st
Earnings Volatility Adjusted Profitability:					
Ranking of monthly volatility adjusted return on average equity (ROE) spread to average 3-month LIBOR in comparison to other FHLBanks	20%	9th	6th	1st	6th
Market Capitalization Ratio:					
Ratio of Market Value of Equity to Par Value of Regulatory Capital Stock	20%	95%	100%	110%	117%
Advance Utilization Ratio:					
Ranking of average of each member's Advances-to-assets ratio multiplied by the average member borrower penetration ratio in comparison to other FHLBanks	20%	7th	4th	1st	5th
Strategic Business Plan Achievement:					
Percentage of Strategic Business Plan strategies achieved	20%	70%	80%	100%	93%

As described above, the deferred portion of the 2019 Incentive Plan (2020 - 2022 performance period) is based on a safety and soundness metric tied to the market capitalization ratio as defined in the 2020 Incentive Plan. If our market capitalization ratio is greater than 100 percent during the 2020 - 2022 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 Plans.

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 21, 2019	$ 450,000	$ 675,000	$ 900,000
Stephen J. Sponaugle	November 21, 2019	168,800	253,200	337,600
R. Kyle Lawler	November 21, 2019	175,200	262,800	350,400
J. Gregory Dooley, Sr.	November 21, 2019	126,000	189,000	252,000
Roger B. Batsel	November 21, 2019	147,200	220,800	294,400

(1) Awards granted on this date are for the 2020 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 the Pentegra Defined Contribution Plan for Financial Institutions.

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 plans.

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.

The benefit formula for employees hired prior to January 1, 2006, which includes Messrs. Howell, Sponaugle, and Lawler, is 2.50 percent for each year of benefit service multiplied by the highest three-year average compensation. Compensation is 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 is payable under the plan, with payments commencing as early as age 45.

For employees who were hired after January 1, 2006, which includes Messrs. Dooley and Batsel, the current benefit formula is 1.25 percent for each year of benefit service multiplied by the highest five-year average compensation. Beginning in 2006 through the end of 2017, compensation was defined as base salary only and excluded all other forms of compensation. Beginning January 1, 2018, compensation is defined as base salary, excess accrued vacation benefits and annual incentive compensation, and excludes any deferred incentive payments. In addition, the current plan provides 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 has 10 years or more of service.

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 to employees hired prior to February 1, 2006.

Non-Qualified Defined Benefit Pension Plan. Executive officers and other employees whose pay 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.

2019 Pension Benefits

Name	Plan Name	Number of Years Credited Service (1)	Present Value (2) of Accumulated Benefits
Andrew S. Howell	Pentegra DB	29.50	$ 2,630,000
	DB/BEP	29.50	10,907,000
Stephen J. Sponaugle	Pentegra DB	26.33	2,485,000
	DB/BEP	26.33	2,297,000
R. Kyle Lawler	Pentegra DB	18.50	2,027,000
	DB/BEP	18.50	2,161,000
J. Gregory Dooley, Sr.	Pentegra DB	12.33	589,000
	DB/BEP	12.33	123,000
Roger B. Batsel	Pentegra DB	4.92	156,000
	DB/BEP	4.92	39,000

(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 17 of the Notes to Financial Statements for details regarding valuation assumptions.

Qualified Defined Contribution Plan. The Pentegra Defined Contribution Plan for Financial Institutions (Pentegra 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. Eligible compensation in the Pentegra DC plan is defined as base salary and annual bonus (current incentive award) and excludes any deferred incentive awards.

Under the Pentegra 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 annual leave (i.e., vacation) and sick leave policies. 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 2019, 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 2019, perquisites totaled $20,244 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 vacation benefits. 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 vacation benefits 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, 2019.

Total Potential Payment Upon Termination (1)

Separation Event	Andrew S. Howell	Stephen J. Sponaugle	R. Kyle Lawler	J. Gregory Dooley, Sr.	Roger B. Batsel
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)	80,769	36,225	45,769	16,638	3,758
Involuntary termination without Cause not due to a Change in Control (3)	518,269	240,975	258,269	171,138	174,258
Involuntary termination without Cause due to a Change in Control or resignation for Good Reason due to a Change in Control (4)	4,594,238	1,449,221	1,511,465	1,087,934	982,058

(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 vacation.
(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 vacation.
(4) Named Executive Officers would receive payment as follows:

Component	Andrew S. Howell	Stephen J. Sponaugle	R. Kyle Lawler	J. Gregory Dooley, Sr.	Roger B. Batsel
Salary	$ 2,187,500	$ 716,625	$ 743,750	$ 540,750	$ 511,500
Incentive compensation	1,640,625	429,975	446,250	324,450	268,538
Other (a)	766,113	302,621	321,465	222,734	202,020
Total	$ 4,594,238	$ 1,449,221	$ 1,511,465	$ 1,087,934	$ 982,058

(a) Includes accrued annual incentive compensation from the current year, accrued vacation benefits, 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 2019 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.

Donald J. Mullineaux (Chair)
Grady P. Appleton
Leslie D. Dunn
James A. England
Robert T. Lameier
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 did not change from 2019 to 2020. The following table sets forth the maximum base fees for 2019 and 2020:

	2019	2020
	Maximum Base Fees	Maximum Base Fees
Chair	$ 145,000	$ 145,000
Vice Chair	125,500	125,500
Other members	110,000	110,000

In addition to the base fees, annual fees are paid to the Audit Committee Chair and Other Committee Chairs of $15,500 and $12,500, respectively. These fees are subject to certain attendance requirements.

During 2019, total directors' fees and travel expenses incurred were $2,064,575 and $284,690, 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 2019, there were 13 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.

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The following table sets forth the fees earned by each director for the year ended December 31, 2019.

2019 Directors Compensation Table

Name	Fees Earned or Paid in Cash
J. Lynn Anderson	$ 125,500
Grady P. Appleton	110,000
April Miller Boise	110,000
Brady T. Burt	110,000
Greg W. Caudill	110,000
Mark N. DuHamel [(1)]	78,575
Leslie D. Dunn	122,500
James A. England, Vice Chair	125,500
Robert T. Lameier	110,000
Michael R. Melvin	110,000
Donald J. Mullineaux, Chair	145,000
Alvin J. Nance	110,000
Michael P. Pell	110,000
Charles J. Ruma	122,500
David E. Sartore	122,500
William S. Stuard, Jr.	122,500
Nancy E. Uridil	110,000
James J. Vance	110,000
Total	$ 2,064,575

(1) Mr. DuHamel resigned as a Member Director effective July 22, 2019.

The following table summarizes the total number of board meetings and meetings of its designated committees held in 2018 and 2019.

Meeting Type	Number of Meetings Held 2018	Number of Meetings Held 2019
Board Meeting	10	9
Audit Committee	11	10
Risk Committee	7	8
Business and Operations Committee	5	5
Governance	7	6
Housing and Community Development Committee	6	3
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 2019 or 2020 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:

2019	2020
Donald J. Mullineaux (Chair)	Donald J. Mullineaux (Chair)
Grady P. Appleton	Grady P. Appleton
Leslie D. Dunn	Leslie D. Dunn
James A. England	James A. England
Michael R. Melvin	Robert T. Lameier
Nancy E. Uridil	Nancy E. Uridil

PAY RATIO

As required by the Dodd-Frank Act, information about the 2019 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 $127,256; and
- the annual total compensation of the CEO, as reported in the Summary Compensation Table, was $5,213,357.

Based on this information, for 2019, the ratio of the annual total compensation of the CEO to the median of the annual total compensation of all employees was 41 to 1.

The median employee was identified in 2017. To identify the median employee, we compared the compensation of all full-time and part-time employees who were employed as of November 3, 2017. We annualized the compensation of employees who were hired in 2017 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.

We have updated the median employee's compensation for 2019, which includes base salary, excess accrued vacation benefits, incentive compensation, matching contributions to the qualified defined contribution pension plan, and the value of such employee’s pension benefits. The value of the median employee's 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 2019 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 29, 2020 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
JPMorgan Chase Bank, N.A.	1111 Polaris Parkway Columbus, OH 43240	$ 583,490	18%	5,834,898
U.S. Bank, N.A.	425 Walnut Street Cincinnati, OH 45202	454,581	14	4,545,811

The following table lists capital stock outstanding as of February 29, 2020 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	$ 454,581	14.0%
Western & Southern Financial Group (1)	400 Broadway Street Cincinnati, OH 45202	132,076	4.1
The Park National Bank	50 North Third Street Newark, OH 43058	28,844	0.9
F&M Bank	50 Franklin Street Clarksville, TN 37040	4,998	0.2
Farmers National Bank	304 West Main Street Danville, KY 40422	2,274	0.1
Field & Main Bank	140 North Main Street Henderson, KY 42420	2,030	0.1
First State Bank	19230 State Route 136 Winchester, OH 45697	1,281	0.0
Miami Savings Bank	8008 Ferry Street Miamitown, OH 45041	789	0.0
Decatur County Bank	56 North Pleasant Street Decaturville, TN 38329	646	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. Appleton, Mullineaux, Nance and Ruma and Mses. Anderson, Boise, Dunn and Uridil, our eight 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 22 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, 2019 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, 2019 and 2018 by its independent registered public accounting firm, PwC:

(In thousands)	For the Years Ended December 31, 2019	For the Years Ended December 31, 2018
Audit fees	$ 733	$ 721
Audit-related fees	89	70
Tax fees	—	—
All other fees	2	3
Total fees	$ 824	$ 794

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 accounting research software and 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 $48,000 and $49,000 in 2019 and 2018, 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
Statements of Condition as of December 31, 2019 and 2018
Statements of Income for the years ended December 31, 2019, 2018 and 2017
Statements of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017
Statements of Capital for the years ended December 31, 2019, 2018 and 2017
Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017
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, as of April 5, 2019	Form 10-Q, filed August 8, 2019
4.2	Description of Capital Stock	Filed Herewith
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, 2019	Form 10-K, filed March 21, 2019
10.7 [2]	Incentive Compensation Plan as of January 1, 2020	Filed Herewith
10.8 [2]	Federal Home Loan Bank of Cincinnati Benefit Equalization Plan (December 2008 Restatement)	Form 10-K, filed March 18, 2010
10.9 [2]	First Amendment to the Federal Home Loan Bank of Cincinnati Benefit Equalization Plan (December 2008 Restatement)	Form 10-K, filed March 18, 2010

10.10	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
10.11	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
10.12	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
10.13	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 19th day of March 2020.

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, 2019, 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 19th day of March 2020.

Signatures	Title
/s/ Andrew S. Howell	President and Chief Executive Officer
Andrew S. Howell	(principal executive officer)
/s/ Stephen J. Sponaugle	Executive Vice President-Chief Financial Officer
Stephen J. Sponaugle	(principal financial officer)
/s/ J. Christopher Bates	Senior Vice President-Chief Accounting Officer
J. Christopher Bates	(principal accounting officer)
/s/ J. Lynn Anderson	Director
J. Lynn Anderson	
/s/ Grady P. Appleton	Director
Grady P. Appleton	
/s/ April Miller Boise	Director
April Miller Boise	
/s/ Brady T. Burt	Director
Brady T. Burt	
/s/ Greg W. Caudill	Director
Greg W. Caudill	

/s/ Leslie D. Dunn Leslie D. Dunn	Director
/s/ James A. England James A. England	Director (Vice Chair)
/s/ Robert T. Lameier Robert T. Lameier	Director
/s/ Donald J. Mullineaux Donald J. Mullineaux	Director (Chair)
/s/ Alvin J. Nance Alvin J. Nance	Director
/s/ Michael P. Pell Michael P. Pell	Director
/s/ Kathleen A. Rogers Kathleen A. Rogers	Director
/s/ Charles J. Ruma Charles J. Ruma	Director
/s/ David E. Sartore David E. Sartore	Director
/s/ William S. Stuard, Jr. William S. Stuard, Jr.	Director
/s/ Nancy E. Uridil Nancy E. Uridil	Director
/s/ James J. Vance James J. Vance	Director
/s/ Jonathan D. Welty Jonathan D. Welty	Director