FEDERAL HOME LOAN BANKS

Combined Financial Report
for the Year Ended December 31, 2016

This Combined Financial Report provides financial information on the Federal Home Loan Banks. Investors should use this Combined Financial Report with other information provided by the Federal Home Loan Banks when considering whether or not to purchase Federal Home Loan Bank consolidated bonds and consolidated discount notes (collectively referred to as consolidated obligations).

Consolidated obligations are the joint and several obligations of all Federal Home Loan Banks, even though each Federal Home Loan Bank is a separately chartered entity with its own board of directors and management. This means that each individual Federal Home Loan Bank is responsible for the payment of principal and interest on all consolidated obligations issued by the Federal Home Loan Banks. There is no centralized, system-wide management or oversight by a single board of directors of the Federal Home Loan Banks.

Federal Home Loan Bank consolidated obligations are not obligations of the United States and are not guaranteed by either the United States or any government agency.

The Securities Act of 1933, as amended, does not require the registration of consolidated obligations; therefore, no registration statement has been filed with the U.S. Securities and Exchange Commission. Neither the U.S. Securities and Exchange Commission, nor the Federal Housing Finance Agency, nor any state securities commission has approved or disapproved of these securities or determined if this report is truthful or complete.

Carefully consider the risk factors provided in this Combined Financial Report. Neither the Combined Financial Report nor any offering materials provided on behalf of the Federal Home Loan Banks describe all the risks of investing in Federal Home Loan Bank consolidated obligations. Investors should consult with their financial and legal advisors about the risks of investing in these consolidated obligations.

This Combined Financial Report is available on the Federal Home Loan Banks Office of Finance web site at www.fhlb-of.com. This web site address is provided as a matter of convenience only, and its contents are not made part of this report and are not intended to be incorporated by reference into this report.

Investors should direct questions about Federal Home Loan Bank consolidated obligations or the Combined Financial Report to the Federal Home Loan Banks Office of Finance at (703) 467-3600.

This Combined Financial Report was issued on March 28, 2017.

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Consolidated obligations issued under the Federal Home Loan Banks' Global Debt Program may be listed on the Euro MTF market of the Luxembourg Stock Exchange. The Luxembourg Stock Exchange has allocated the number 2306 to the Federal Home Loan Banks' Global Debt Program for listing purposes. Under the Federal Home Loan Banks' agreement with the underwriter(s) of a particular series of consolidated obligations, any series of consolidated obligations listed on the Luxembourg Stock Exchange may be delisted if the continuation of the listing has become unduly onerous in the opinion of the issuer, and the issuer has agreed with the underwriter(s) that it will use reasonable efforts to list the consolidated obligations on another stock exchange.

EXPLANATORY STATEMENT ABOUT FEDERAL HOME LOAN BANKS COMBINED FINANCIAL REPORT

The Federal Home Loan Banks (FHLBanks) are government-sponsored enterprises (GSEs), federally-chartered but privately capitalized and independently managed. The FHLBanks together with the Federal Home Loan Banks Office of Finance (Office of Finance), the fiscal agent of the FHLBanks, comprise the FHLBank System.

The Office of Finance is responsible for preparing the Combined Financial Report of the FHLBanks. Each FHLBank is responsible for the financial information and underlying data it provides to the Office of Finance for inclusion in the Combined Financial Report. The Office of Finance is responsible for combining the financial information it receives from each of the FHLBanks.

The FHLBanks Combined Financial Report is intended to be used by investors in consolidated obligations (consolidated bonds and consolidated discount notes) of the FHLBanks as these are the joint and several obligations of all FHLBanks. This Combined Financial Report is provided using combination accounting principles generally accepted in the United States of America. This combined presentation in no way indicates that these assets and liabilities are under joint management and control as each individual FHLBank manages its operations independently.

Because of the FHLBank System's structure, the Office of Finance does not prepare consolidated financial statements. Consolidated financial statements are generally considered to be appropriate when a controlling financial interest rests directly or indirectly in one of the enterprises included in the consolidation. This is the case in the typical holding company structure, where there is a parent corporation that owns, directly or indirectly, one or more subsidiaries. However, the FHLBanks do not have a parent company that controls each of the FHLBanks. Instead, each of the FHLBanks is owned by its respective members and former members.

Each FHLBank is a separately chartered cooperative with its own board of directors and management and is responsible for establishing its own accounting and financial reporting policies in accordance with accounting principles generally accepted in the United States of America (GAAP). Although the FHLBanks work together in an effort to achieve consistency on significant accounting policies, the FHLBanks' accounting and financial reporting policies and practices are not necessarily identical because alternative policies and presentations are permitted under GAAP in certain circumstances. Statements in this report may be qualified by a term such as "generally," "primarily," "typically," or words of similar meaning to indicate that the statement is generally applicable, but may not be applicable to all FHLBanks or transactions as a result of their different business practices and accounting and financial reporting policies under GAAP.

An investor may not be able to obtain easily a system-wide view of the FHLBanks' business, risk profile, and financial information because there is no centralized, system-wide management or centralized board of director oversight of the individual FHLBanks. This decentralized structure is not conducive to preparing disclosures from a system-wide view in the same manner that is generally expected of U.S. Securities and Exchange Commission (SEC) registrants. For example, a conventional Management's Discussion and Analysis is not provided in this Combined Financial Report; instead, this report includes a "Financial Discussion and Analysis" prepared by the Office of Finance using information provided by each FHLBank.

Each FHLBank is subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, and must file periodic reports and other information with the SEC. Each FHLBank prepares an annual financial report, filed on SEC Form 10-K, and quarterly financial reports, filed on SEC Form 10-Q. Those reports contain additional information that is not contained in this Combined Financial Report. An investor should review available information on individual FHLBanks to obtain additional detail on each FHLBank's business, risk profile, financial condition, results of operations, and accounting and financial reporting policies. FHLBank financial reports are made available on the web site of each FHLBank and on the SEC's web site at www.sec.gov. This web site address is provided as a matter of convenience only, and its contents are not made part of this report and are not intended to be incorporated by reference into this report.

BUSINESS

General Information

The 11 FHLBanks are GSEs, organized under the authority of the Federal Home Loan Bank Act of 1932, as amended (FHLBank Act). The Office of Finance is a joint office of the FHLBanks established to facilitate the issuance and servicing of debt instruments for the FHLBanks, known as consolidated obligations, and to prepare the quarterly and annual combined financial reports of the FHLBanks. The FHLBanks and the Office of Finance are regulated by the Federal Housing Finance Agency (FHFA). (See *Audits and Examinations - FHLBanks' Regulator* for more information regarding the FHFA.)

The mission of the FHLBanks is to provide financial products and services to their members and housing associates, including, but not limited to, secured loans known as advances, that assist and enhance their financing of: (1) housing, including single-family and multi-family housing serving consumers at all income levels; and (2) community lending. (See *Business - Other Mission-Related Activities* for additional information.) FHFA regulations require each FHLBank's board of directors to have in effect, at all times, a strategic business plan that describes how the business activities of that FHLBank will achieve its mission and meet the FHFA's regulatory guidance related to core mission achievement. (See *Supplemental Information - Individual FHLBanks Selected Financial Data and Financial Ratios* for more information on each FHLBank's core mission asset ratio at December 31, 2016).

The FHLBanks serve the public by providing a readily available, low-cost source of funds to FHLBank members through advances. These funds may be used for residential mortgages, community investments, and other services for housing and community development. In addition, the FHLBanks may provide members and housing associates with a means of enhancing liquidity by purchasing home mortgages through mortgage programs developed for their members. Under these programs, the FHLBanks purchase mortgage loans from members and housing associates. Members can also borrow from an FHLBank to fund low-income housing, helping the members satisfy their regulatory requirements under the Community Reinvestment Act. Finally, the FHLBanks may offer their members a variety of services, such as:

- correspondent banking, which includes security safekeeping, wire transfers, and settlements;
- cash management;
- letters of credit; and
- derivative intermediation.

Table 1 - FHLBanks' Asset Composition
(dollars in millions)

	December 31, 2016		December 31, 2015	
Cash and due from banks	$ 7,441	0.7%	$ 14,289	1.5%
Investments(1)	292,017	27.6%	273,684	28.2%
Advances	705,225	66.7%	634,022	65.4%
Mortgage loans held for portfolio, net	48,476	4.6%	44,557	4.6%
Other	3,553	0.4%	2,687	0.3%
Combined total assets	$ 1,056,712	100.0%	$ 969,239	100.0%

(1) Investments consist of interest-bearing deposits, securities purchased under agreements to resell, federal funds sold, trading securities, available-for-sale securities, and held-to-maturity securities.

Each FHLBank's funding is principally obtained from consolidated obligations, which are debt instruments issued through the Office of Finance on behalf of the FHLBanks. Each FHLBank is jointly and severally liable with the other FHLBanks for all consolidated obligations issued. Consolidated obligations are not obligations of the United States and are not guaranteed by either the United States or any government agency. Additional funds are provided by member deposits and the issuance of capital stock.

Table 2 - FHLBanks' Liability and Capital Composition
(dollars in millions)

	December 31, 2016		December 31, 2015	
Deposits	$ 8,089	0.8%	$ 8,533	0.9%
Consolidated obligations				
Discount notes	409,815	38.8%	494,045	51.0%
Bonds	578,927	54.8%	411,851	42.5%
Total consolidated obligations	988,742	93.6%	905,896	93.5%
Mandatorily redeemable capital stock	1,704	0.2%	745	0.1%
Other	5,718	0.4%	6,023	0.5%
Total liabilities	1,004,253	95.0%	921,197	95.0%
Total GAAP capital(1)	52,459	5.0%	48,042	5.0%
Combined total liabilities and capital	$ 1,056,712	100.0%	$ 969,239	100.0%

(1) The FHLBanks' combined regulatory capital-to-assets ratio was 5.14% at December 31, 2016, and 5.10% at December 31, 2015. (See *Note 16 - Capital* to the accompanying combined financial statements for details on regulatory capital requirements.)

The FHLBanks are cooperatives that are privately and wholly owned by their members and former members. Each FHLBank operates as a separate entity within a defined geographic region of the country, known as its district, with its own board of directors, management, and employees. As a condition of membership, each member must purchase and maintain capital stock. To the extent declared by an FHLBank's board of directors, a stockholder may receive dividends on its investment in its FHLBank's capital stock.

Membership in an FHLBank is voluntary and is generally limited to federally-insured depository institutions, insurance companies, and community development financial institutions. A community development financial institution is eligible to become a member if it has been certified by the U.S. Department of the Treasury (U.S. Treasury). Eligible institutions include community development loan funds, community development venture capital funds, and state-chartered credit unions without federal insurance. (See *Market for Capital Stock and Related Stockholder Matters - Table 6 - Membership by Type of Member,* which presents FHLBank membership.) Eligible institutions may generally only become a member of the FHLBank whose district includes the location of the institution's principal place of business. Some financial institution holding companies may have one or more subsidiaries, each of which may be a member of the same or a different FHLBank.

The FHLBanks are cooperative institutions, and each FHLBank conducts its credit and mortgage program businesses almost exclusively with its members and housing associates. An FHLBank may also have investments in interest-bearing deposits, securities purchased under agreements to resell, federal funds sold, and certificates of deposit, and may also execute mortgage-backed securities and derivative transactions, with members, former members, or their affiliates. All investments are transacted at then-current market prices without preference to the status of the counterparty or the issuer of the investment as a member, former member, or affiliate. The FHLBanks manage their primary objective of fulfilling their public purpose by enhancing the value of membership for member institutions. The value of membership may be derived from access to readily available credit and other services from the FHLBanks and the value of the cost differential between an FHLBank's advances and other potential sources of funds, as well as the potential for dividends received on a member's investment in an FHLBank's capital stock.

Due to the FHLBanks' cooperative structures, the FHLBanks generally earn a narrow net interest spread and historically have returned a portion of their net income to their stockholders in the form of dividends. Accordingly, the FHLBanks' net income and balance of retained earnings are relatively small as compared to total assets and total liabilities. (See *Selected Financial Data* for additional information.)

The primary source of revenue for the FHLBanks is interest income earned on advances, mortgage loans held for portfolio, and investments. The primary items of expense for the FHLBanks are interest paid on consolidated obligations; operating expenses, including employee compensation and benefits; and Affordable Housing Program assessments. The FHLBanks may also recognize non-interest gains and losses, such as gains and losses on trading securities, and gains and losses on derivatives and hedging activities.

Advances

The FHLBanks provide liquidity to members and housing associates through secured loans known as advances. Each FHLBank makes advances based on the security of mortgage loans and other types of eligible collateral pledged by the borrowing institutions. It also makes advances based on the creditworthiness and financial condition of these institutions. (See *Financial Discussion and Analysis - Risk Management - Credit Risk - Advances* for additional information on advances collateral.) Access to FHLBank advances can reduce the amount of low-yielding liquid assets a member would otherwise hold to ensure the same amount of liquidity. Advances are the FHLBanks' largest asset category on a combined basis, representing 66.7% and 65.4% of combined total assets at December 31, 2016 and 2015. Because members may originate loans that are not sold in the secondary mortgage market, FHLBank advances can serve as a funding source for a variety of mortgages, including those focused on very low-, low-, and moderate-income households. In addition, FHLBank advances can provide interim funding for those members that choose to sell or securitize their mortgages. FHLBank advances can also be a source of funding to smaller lenders that may not have access to all of the funding options available to large financial institutions.

FHLBank credit products also aid members in asset and liability management. The FHLBanks can offer advances that have amortization schedules that are structured to match the maturity and payment characteristics of mortgage loans. These advances can reduce a member's interest-rate risk associated with holding long-term, fixed-rate mortgages. In addition, an FHLBank may make commitments for advances to a member covering a predefined period. This program aids members and the FHLBanks in cash flow planning and enables members to reduce funding risk.

The FHLBanks offer specialized programs that provide members with access to below-market interest rate advances to create affordable homeownership and rental opportunities, and for commercial and economic development activities. (See *Business - Other Mission-Related Activities* for more information.)

Each FHLBank develops its advance programs to meet the particular needs of its borrowers and offers a wide range of fixed- and variable-rate advance products, with different maturities, interest rates, payment characteristics, and optionality.

Advance Products

- Fixed-Rate Advances. These advances are available over a variety of terms and are used to fund both the short- and long-term liquidity needs of borrowers. Typically, interest is paid monthly or quarterly and the principal is paid at maturity.

- Variable-Rate Advances. These advances are used to fund both short- and long-term liquidity needs of borrowers. Variable-rate advances have interest rates that reset periodically based on the London Interbank Offered Rate (LIBOR) or other standard indices, or consolidated discount note rates. Typically, interest is paid monthly or quarterly and the principal is paid at maturity.

- Hybrid Advances. These advances contain a one-time option to embed either a floor or cap at any time during the life of the advance and may be either fixed- or variable-rate at the time of issuance.

- Convertible Advances. These advances allow an FHLBank to convert an advance from one interest-payment term structure to another. When issuing convertible advances, an FHLBank may purchase put options from a member that allow that FHLBank to convert the fixed-rate advance to a variable-rate advance at the current market rate or another structure after an agreed-upon lockout period. A convertible advance carries a lower interest rate than a comparable-maturity fixed-rate advance without the conversion feature. Variable- to fixed-rate convertible advances have a defined lockout period during which the interest rates adjust based on a spread to LIBOR or other specified index. At the end of the lockout period, these advances may convert to fixed-rate advances.

- Amortizing Advances. These advances are medium- or long-term loans with amortization schedules. In addition, certain amortizing advances have amortization schedules that are structured to match the payment characteristics of a mortgage loan or portfolio of mortgage loans. The principal and interest are repaid monthly, quarterly, semi-annually, or annually over the term of the advances. Amortizing advances may be fully amortizing to the maturity date, or may have a balloon payment due at maturity.

- Overnight Advances. These advances are used primarily to fund the short-term liquidity needs of borrowers. An overnight advance may automatically renew until the member pays down the advance, or it may mature on the next business day. Interest rates are set daily.

In addition to these advance products, the FHLBanks' advance programs may include products with embedded option features, such as interest-rate caps and floors and call and put options, advances with non-standard interest-rate indices, forward starting advances, and advances with a combination of these features.

Advances to Housing Associates

The FHLBanks are permitted to provide advances to housing associates (including state and local housing authorities) that are approved mortgagees under Title II of the National Housing Act and that meet the following requirements:

- is a chartered institution having succession;
- is subject to the inspection and supervision of some governmental agency;
- its principal activity in the mortgage field consists of lending its own funds;
- its financial condition is such that advances may be safely made to the housing associate; and
- if the non-member is a state housing financing agency (as defined by FHFA regulation), it shall provide satisfactory evidence that it functions as a source of mortgage loan financing in that state or for the Indian or Alaskan Native community.

Housing associates are not subject to certain provisions applicable to members under the FHLBank Act. For example, they are not required or permitted to purchase capital stock in an FHLBank. However, the regulatory lending requirements that apply to members generally also apply to housing associates. Advances to housing associates represented approximately 0.1% of total advances outstanding at par value at both December 31, 2016 and 2015.

Standby Letters of Credit

An FHLBank issues standby letters of credit on behalf of its members to support certain obligations of the members 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 an FHLBank is required to make a payment for a beneficiary's draw, the payment amount is converted into a collateralized advance to the member.

Investments

The FHLBanks maintain investment portfolios for liquidity purposes and to generate additional earnings. This investment income bolsters the FHLBanks' capacity to meet their commitments to affordable housing and community investment. Investments represented 27.6% and 28.2% of the FHLBanks' combined total assets at December 31, 2016 and 2015.

The FHLBanks maintain short-term investment portfolios, which may provide funds to meet the credit needs of their members and to maintain liquidity. Within the portfolio of short-term investments, the FHLBanks have unsecured credit exposure on certain investments. These portfolios may include:

- interest-bearing deposits;
- securities purchased under agreements to resell;
- federal funds sold;
- U.S. Treasury obligations;
- certificates of deposit; and
- GSE obligations.

The FHLBanks maintain long-term investment portfolios primarily to provide additional liquidity and to earn interest income. These investments generally provide the FHLBanks with higher returns than those available on short-term investments.

FHFA regulations prohibit the FHLBanks from investing in certain types of securities and limit the FHLBanks' investment in mortgage-backed securities (MBS) and asset-backed securities (ABS). (See *Financial Discussion and Analysis - Risk Management - Credit Risk - Investments* and *Financial Discussion and Analysis - Combined Financial Condition - Investments* for information on these restrictions and limitations.)

Mortgage Loans

An FHLBank may have programs to purchase mortgage loans from members or housing associates called participating financial institutions (PFIs). The primary programs are the Mortgage Purchase Program (MPP) and the Mortgage Partnership Finance® (MPF®) Program ("Mortgage Partnership Finance," "MPF," and "MPF Xtra" are registered trademarks of the FHLBank of Chicago). Through the MPP and MPF Program, an FHLBank invests principally in qualifying 5-year to 30-year conventional and government-guaranteed or -insured fixed-rate mortgage loans and participations in pools of these mortgage loans, secured by one-to-four family residential properties. Government-guaranteed or -insured mortgage loans are guaranteed or insured by the Federal Housing Administration, the Department of Veterans Affairs, the Rural Housing Service of the Department of Agriculture, or the U.S. Department of Housing and Urban Development (HUD). At both December 31, 2016 and 2015, mortgage loans held for portfolio represented 4.6% of the FHLBanks' combined total assets.

An FHLBank may purchase mortgage loans to support the FHLBank's housing mission, provide an additional source of liquidity to its members, diversify its investments, and generate additional earnings. As such, these programs serve as a secondary mortgage structure for those FHLBank members originating mortgage loans that they choose to sell into the secondary mortgage market rather than hold in their own loan portfolios. At December 31, 2016, the FHLBank of Atlanta was not accepting additional master commitments to acquire loans for its own portfolio. However, during 2016, the FHLBank of Atlanta and the FHLBank of Indianapolis began participating in the funding of an MPP master commitment with a member of the FHLBank of Indianapolis. The FHLBank of Des Moines was not accepting additional master commitments to purchase mortgage loans under the MPP at December 31, 2016, and expects the balance of existing loans, acquired through the merger with the FHLBank of Seattle, to decrease as they are paid off. The remaining FHLBanks participating in the MPP and MPF Program continue to have the ability to purchase both conventional and government-guaranteed or -insured fixed-rate mortgage loans.

Under the MPP and MPF Program, each FHLBank manages the interest-rate risk, prepayment option risk, and liquidity risk of the fixed-rate mortgage loans in which it holds an interest, while the PFI manages the origination and servicing activities. For conventional mortgage loans held in an FHLBank's portfolio, the FHLBank and the PFI share in the credit risk pursuant to a master commitment because the PFI is required to provide a measure of credit-loss protection to the FHLBank(s) holding interests in loans generated by the PFI. For government-guaranteed or -insured mortgage loans, the servicer provides and maintains a guarantee or insurance from the applicable government agency. The servicer is responsible for compliance with all government agency requirements and for obtaining the benefit of the applicable guarantee or insurance with respect to defaulted government-guaranteed or -insured mortgage loans. Any losses incurred on these government-guaranteed or -insured mortgage loans that are not recovered from the issuer or the guarantor are absorbed by the servicer. (See *Note 10 - Allowance for Credit Losses - Credit Enhancements* to the accompanying combined financial statements and *Financial Discussion and Analysis - Risk Management - Credit Risk - Mortgage Loans Held for Portfolio* for a detailed discussion of the credit enhancement and risk sharing arrangements and loan product information for these programs.)

MPP

Each participating FHLBank may acquire mortgage loans from its approved PFIs, which can also be third-party servicers for the FHLBank's MPP. Each MPP FHLBank is responsible for operating its own program, including the marketing and funding of MPP loans, and establishing the loan origination, underwriting, and servicing criteria of the loans acquired through its MPP. An MPP FHLBank neither services the acquired loans, nor owns any servicing rights. However, an MPP FHLBank must approve any servicer, including a member-servicer, and any transfers of servicing to third parties. Each MPP FHLBank has engaged BNY Mellon as the MPP master servicer.

MPF Program

One or more MPF FHLBanks may acquire or participate in all or a portion of the acquired mortgage loans from a PFI of another MPF FHLBank. The FHLBank of Chicago acts as master servicer ("MPF Provider") for the MPF Program and provides programmatic and operational support to the MPF FHLBanks and each of their PFIs. In this regard, the FHLBank of Chicago has engaged a vendor for master servicing, Wells Fargo Bank, National Association, which monitors the PFIs' compliance with the MPF Program requirements and issues periodic reports to the FHLBank of Chicago. As of December 31, 2016, there were five MPF Program portfolio products (MPF Original, MPF 125, MPF Plus, MPF 35, and MPF Government) in which an MPF FHLBank purchases loans that have been acquired or have already been closed by the PFI with its own funds. The MPF 100 loan product is no longer offered by the MPF FHLBanks for new loan originations. MPF 100 loans were acquired as table-funded loans whereby the MPF FHLBank funded and originated the loans because the PFI acted as the agent for the MPF FHLBank.

The FHLBank of Chicago purchases eligible MPF loans from PFIs located in its district, and in other MPF FHLBank districts, under the MPF Xtra, the MPF Direct, and the MPF Government MBS products. PFIs are not required to provide credit enhancement and do not receive credit enhancement fees in connection with these three off-balance sheet mortgage loan products. Upon purchase from PFIs, the FHLBank of Chicago concurrently sells mortgage loans to Fannie Mae under the MPF Xtra product and to third-party investors under the MPF Direct product. Under the MPF Government MBS product, the FHLBank of Chicago aggregates government-guaranteed or -insured mortgage loans, which are classified as mortgage loans held for sale, and issues securities guaranteed by Ginnie Mae.

Consolidated Obligations

Consolidated obligations consist of consolidated bonds and consolidated discount notes, which are debt instruments issued through the Office of Finance. Consolidated obligations are the principal funding source used by the FHLBanks to make advances and to purchase mortgage loans and investments. Consolidated obligations outstanding represented 93.6% and 93.5% of the FHLBanks' combined total liabilities and capital at December 31, 2016 and 2015.

The FHLBanks’ decision whether to use consolidated bonds or consolidated discount notes is generally driven by market conditions, cost of specific debt issuance, or desired maturity terms. All consolidated obligations are issued through the Office of Finance on behalf of the FHLBanks. The Office of Finance can issue consolidated obligations only when an FHLBank provides a request for and agrees to accept the funds. An FHLBank is generally prohibited by regulation from purchasing, directly or indirectly, securities from the initial issuance of consolidated obligations. The FHFA and the Secretary of the Treasury have oversight over the issuance of FHLBank debt.

The capital markets have generally considered the FHLBanks' consolidated obligations to be agency debt. As a result, although the U.S. government does not guarantee the FHLBanks' debt, the FHLBanks have traditionally had ready access to funding at relatively favorable rates. The FHLBanks' ability to access the capital markets through the issuance of consolidated obligations, using a variety of debt structures and maturities, allows the FHLBanks to manage their balance sheets effectively and efficiently.

Credit Ratings. Consolidated obligations are currently rated Aaa/P-1 by Moody's Investors Service (Moody's) and AA+/A-1+ by S&P Global Ratings (S&P). These ratings reflect the FHLBanks' status as GSEs and indicate that these rating agencies believe the FHLBanks have the capacity to meet their commitments to pay principal and interest on consolidated obligations. The FHLBanks' consolidated obligations have historically received the same credit rating as the government bond credit rating of the United States, even though the consolidated obligations are not obligations of the United States. These ratings have not been affected by rating actions taken with respect to individual FHLBanks. Investors should note that a rating issued by a nationally recognized statistical rating organization is not a recommendation to buy, sell, or hold securities, and that the ratings may be revised or withdrawn by a nationally recognized statistical rating organization at any time. Investors should evaluate the rating of each nationally recognized statistical rating organization independently.

Interest Rate. Consolidated obligations can be issued with either fixed-rate coupon payment terms or variable-rate coupon payment terms that use a variety of indices for interest-rate resets, such as LIBOR. The FHLBanks may issue variable-rate consolidated bonds and simultaneously execute interest-rate swaps to hedge the basis risk of the variable-rate debt. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements.)

Derivative Transactions. To meet the specific needs of certain investors in consolidated obligations, both fixed-rate and variable-rate consolidated bonds may contain features that result in complex coupon payment terms and call options. When these consolidated obligations are issued, the FHLBanks typically enter into derivatives containing offsetting features that effectively convert the terms of the consolidated bond to better match the interest-rate risk management objectives of the issuing FHLBank(s). Each FHLBank transacts most of its derivatives with large banks and major broker-dealers. Some of these banks and broker-dealers, or their affiliates, buy, sell, and distribute consolidated obligations.

Other Transactions and Services. Certain securities dealers and banks or their affiliates enter into other transactions with, and perform other services for, the FHLBanks. These services include the purchase and sale of investment securities. In some cases, some or all of the net proceeds from an issue of consolidated obligations may be loaned to a member that is affiliated with the securities dealer involved in underwriting that issue.

Joint and Several Liability. Although each FHLBank is primarily liable for its portion of consolidated obligations (i.e., those issued on its behalf), each FHLBank is also jointly and severally liable with the other FHLBanks for the payment of principal and

interest on all consolidated obligations of each of the FHLBanks. The FHFA, 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 that FHLBank. Although it has never occurred, to the extent that an FHLBank makes any payment on a consolidated obligation on behalf of another FHLBank that is primarily liable for that consolidated obligation, FHFA regulations provide that the paying FHLBank is entitled to reimbursement from the non-complying FHLBank for any payments made on its behalf and other associated costs (including interest to be determined by the FHFA). However, if the FHFA determines that the non-complying FHLBank is unable to satisfy its repayment obligations, then the FHFA may allocate the outstanding liabilities of the non-complying FHLBank among the remaining FHLBanks on a pro-rata basis in proportion to each FHLBank's participation in all consolidated obligations outstanding. The FHFA reserves the right to allocate the outstanding liabilities for the consolidated obligations between the FHLBanks in any other manner it may determine to ensure that the FHLBanks operate in a safe and sound manner.

Regulatory Requirements. FHFA regulations require that each FHLBank maintain the following types of assets, free from any lien or pledge, in an amount at least equal to that FHLBank's participation in all consolidated obligations outstanding:

- cash;
- obligations of, or fully guaranteed by, the United States;
- secured advances;
- mortgages, which have any guaranty, insurance, or commitment from the United States or any agency of the United States; and
- investments described in Section 16(a) of the FHLBank Act (e.g., securities that a fiduciary or trust fund may purchase under the laws of the state in which the FHLBank is located).

Any assets subject to a lien or pledge for the benefit of the 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. In addition, each FHLBank must adhere to the leverage limits set by the FHLBank Act and regulatory limits set by the FHFA. At December 31, 2016, each FHLBank was in compliance with these requirements.

Consolidated Discount Notes

Investor demand for short-term securities (one year or less) may be met through FHLBank discount note programs. Discount notes may be offered to the market through the window or through regularly scheduled competitive auctions. Discount notes issued through the window are generally available with same day, next business day, and two or more business day settlement. Discount notes issued through the auction are available with next business day settlement. Rates and maturity categories for the window are set frequently and announced publicly on Reuters and through other major wire services. Auction rates and maturity categories are announced publicly during the auction process on Reuters and other major wire services.

On a daily basis, through the discount note window, FHLBanks may request that specific amounts of consolidated discount notes with specific maturity dates be offered by the Office of Finance for sale through certain securities dealers. These consolidated discount notes have a maturity range of one day to one year, are generally issued at or below par, and mature at par. The Office of Finance commits to issue consolidated discount notes on behalf of the requesting FHLBanks after dealers submit orders for the specific consolidated discount notes offered for sale. The FHLBanks receive funding based on the time of their request, the rate requested for issuance, the trade date, the settlement date, and the maturity date. However, an FHLBank may receive less than requested (or may not receive any funding) because of investor demand and competing FHLBank requests for the particular funding that the FHLBank is requesting.

Twice weekly, one or more of the FHLBanks may also request that specific amounts of consolidated discount notes with fixed maturities of 4, 8, 13, and 26 weeks be offered by the Office of Finance through single-price (Dutch) auctions conducted with securities dealers in the consolidated discount note selling group. Issuance is contingent on FHLBank demand for funding with these terms. The FHLBanks may decide not to offer one or more of these maturities, or skip an auction entirely, if there is no need for these funds. The consolidated discount notes offered for sale through Dutch auction are not subject to a limit on the maximum costs the FHLBanks are willing to pay. Bids will be accepted from the lowest bid rate until the auction size is met, and all winning bids will be awarded at the highest bid rate accepted. The FHLBanks receive funding based on their requests at the highest bid rate accepted. If the bids submitted are less than the total of the FHLBanks' requests, an FHLBank receives funding based on that FHLBank's regulatory capital relative to the regulatory capital of other FHLBanks offering consolidated discount notes.

Consolidated Bonds

Consolidated bonds may be issued to raise short-, intermediate-, or long-term funds for the FHLBanks. Consolidated bonds generally carry fixed- or variable-rate payment terms and have maturities ranging from one month to 30 years. They can be issued and distributed through negotiated or competitive bidding (auction) transactions with approved underwriters or bidding group members.

Negotiated Transactions.

Reverse Inquiry. The FHLBanks issue fixed-rate noncallable (bullet), floating rate, callable, step-up/step-down, and other types of bonds through negotiated bond transactions. These transactions are flexible and can be investor-customized with different interest-rate characteristics, terms, and currencies (for bonds issued under the Global Debt Program). Underwriters contact the Office of Finance or the FHLBanks directly if there is a bond structure they need to meet investor demand.

Mandated Global. The FHLBanks issue large, liquid bullet bonds through the Global Debt Program (mandated global bullets) to expand their pool of investors, while diversifying their funding sources. Mandated global bullets are issued through a formal dealer syndicate following pre-announced calendar issuance dates. The FHLBanks and the Office of Finance maintain a debt issuance process for scheduled issuance of mandated global bullets. As part of this process, management from each FHLBank will determine and communicate a firm commitment to the Office of Finance for an amount of scheduled mandated global bullet debt to be issued on its behalf. If the FHLBanks' orders do not meet the minimum debt issue size, each FHLBank receives an allocation of proceeds equal to either the larger of the FHLBank's commitment or the ratio of the individual FHLBank's regulatory capital to total regulatory capital of all of the FHLBanks. If the FHLBanks' commitments exceed the minimum debt issue size, then the proceeds are allocated based on relative regulatory capital of the FHLBanks, with the allocation limited to either the lesser of the allocation amount or the actual commitment amount. The FHLBanks can, however, pass on any scheduled calendar slot and decline to issue any mandated global bullet consolidated bonds upon agreement of at least eight of the FHLBanks.

Competitive Bidding (Auction) Transactions.

TAP Issue Program. The FHLBanks use the TAP Issue Program to issue fixed-rate, noncallable bonds. This program uses specific maturities that may be reopened daily through a single-price (Dutch) award method through a designated TAP bidding group. The goal of the TAP Issue Program is to aggregate frequent smaller fixed-rate funding needs into a larger bond issue that may have greater market liquidity.

Callables. American-style callable bonds are auctioned daily through the callable bidding group members.

Mandated Global Reopenings. Individual mandated global bullet bonds may be reopened on any pre-announced calendar issuance date through a single-price (Dutch) award method through a designated bidding group.

Deposits

The FHLBanks offer demand and overnight deposit programs to members and qualifying non-members. In addition, certain FHLBanks offer short-term interest-bearing deposit programs to members, and in certain cases, qualifying non-members. The FHLBank Act allows each FHLBank to accept deposits from:

- its members;
- any institution for which it is providing correspondent services;
- other FHLBanks; and
- other U.S. government instrumentalities.

Deposit programs, although not as significant as other funding sources, provide some of the funding resources for the FHLBanks. To a much lesser extent than consolidated obligations, deposits also provide funding for advances, mortgage loans, and investments. At the same time, they offer members a low-risk earning asset that satisfies their regulatory liquidity requirements. Deposits represented 0.8% and 0.9% of the FHLBanks' combined total liabilities and capital at December 31, 2016 and 2015.

Capital, Capital Rules, and Dividends

Capital Structure

Each FHLBank is permitted to issue one or two classes of capital stock, each with sub-classes. Class A capital stock (Class A stock) is redeemable on six-months written notice from a member and Class B capital stock (Class B stock) is redeemable on five-years written notice from a member. If a member withdraws its membership from an FHLBank, it may not acquire shares of any FHLBank for five years after the date on which its divestiture of capital stock is completed. This restriction does not apply if the member is transferring its membership from one FHLBank to another FHLBank on an uninterrupted basis. The FHFA's regulation that implemented a capital structure for the FHLBanks also established risk-based and leverage capital requirements for the FHLBanks. (See *Note 16 - Capital* to the accompanying combined financial statements.)

Capital Adequacy

Each FHLBank is required to ensure that it operates in a safe and sound manner, with sufficient permanent capital and reserves to manage risks that arise in the operations and management of that FHLBank. Each FHLBank is subject to these three regulatory capital requirements: risk-based capital, total regulatory capital, and leverage capital. The FHFA may require an FHLBank to maintain greater minimum capital levels than are required based on FHFA rules and regulations. Each FHLBank was in compliance with FHFA regulatory capital requirements at December 31, 2016.

Risk-Based Capital. Permanent capital for each FHLBank is defined as the amount paid-in for Class B stock, plus the amount of an FHLBank's retained earnings, as determined in accordance with GAAP. Mandatorily redeemable capital stock is considered capital for regulatory purposes. Each FHLBank must maintain at all times permanent capital 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 FHFA.

Credit Risk. Each FHLBank's credit risk capital requirement shall equal the sum of its credit risk capital charges for all assets, off-balance sheet items, and derivative contracts. These computations are based on, among other requirements, the credit risk percentages assigned to each item as required by the FHFA.

Market Risk. Each FHLBank's market risk capital requirement shall equal the sum of the market value of its portfolio at risk from market movements, primarily interest rates, that could occur during times of market stress plus the amount, if any, by which the current market value of its total capital is less than 85% of its book value of total capital. Each FHLBank must calculate the market value of its portfolio at risk and the current market value of its total capital by using either an internal market risk model or internal cash flow model approved by the FHFA. Although each FHLBank models its own market risk, the FHFA has reviewed and approved the modeling approach and underlying assumptions used by each FHLBank and reviews these modeling approaches on an ongoing basis.

Operations Risk. Each FHLBank's operations risk capital requirement shall at all times equal 30% of the sum of its credit risk and market risk capital requirements. The FHFA can approve a reduction in this percentage if an FHLBank meets alternative requirements.

Total Regulatory Capital. Each FHLBank is required to maintain at all times a total regulatory capital-to-assets ratio of at least four percent. Capital for regulatory capital adequacy purposes is defined as the sum of each FHLBank's:

- permanent capital;
- amounts paid-in for Class A stock;
- general loss allowance, if consistent with GAAP and not established for specific assets; and
- other amounts from sources determined by the FHFA as available to absorb losses.

Leverage Capital. Each FHLBank is required to 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.

Summary of Individual FHLBank's Capital Plan Structure

Single Class of Class B Stock. Each of the FHLBanks of Cincinnati and San Francisco offers a single class of Class B stock. Each of these FHLBanks requires its members to maintain a membership and/or activity-based stock balance based on the terms of the respective FHLBank's capital plan.

Sub-Classes of Class B Stock. Each of the FHLBanks of New York, Pittsburgh, Atlanta, Indianapolis, Chicago, Des Moines, and Dallas offers two sub-classes of Class B stock, which represent either membership or activity-based stock requirements based on the terms of the respective FHLBank's capital plan. The two sub-class Class B stockholders may or may not have the same voting rights and dividend rates, which are based on the terms of the respective FHLBank's capital plan.

Class A and Class B Stock. Each of the FHLBanks of Boston and Topeka may offer a single series of Class A stock and a single series of Class B stock, although the FHLBank of Boston has not issued, and does not intend to issue, any Class A stock at this time. Usage of Class A stock and Class B stock to meet membership and activity-based requirements, as well as dividend rates and voting rights for each class of stock, are determined based on the terms of the respective FHLBank's capital plan.

Capital Classification Determination

The FHFA has implemented the prompt corrective action provisions of the Housing and Economic Recovery Act of 2008, as amended. The FHFA regulation defines four capital classifications for the FHLBanks: adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized. It also defines the prompt corrective action provisions that apply to an FHLBank that is deemed to be not adequately capitalized. The FHFA determines each FHLBank's capital classification on at least a quarterly basis. If an FHLBank is determined to be other than adequately capitalized, that FHLBank becomes subject to additional supervisory authority by the FHFA. Before implementing a reclassification, the Director of the FHFA is required to provide that FHLBank with written notice of the proposed action and an opportunity to submit a response. Each FHLBank is classified by the FHFA as adequately capitalized as of the date of the FHFA's most recent notification to each FHLBank. For a discussion of an individual FHLBank's capital classification, see that FHLBank's periodic report filed with the SEC.

Mandatorily Redeemable Capital Stock

An FHLBank generally reclassifies capital stock subject to redemption from capital to a mandatorily redeemable capital stock liability upon expiration of a grace period, if applicable, after a member exercises a written redemption right, or gives notice of intent to withdraw from membership, or attains non-member status by merger or acquisition, relocation, charter termination, or involuntary termination of membership. Shares of capital stock meeting these conditions are reclassified to mandatorily redeemable capital stock at fair value. The fair value of capital stock subject to mandatory redemption is generally equal to its par value as indicated by contemporaneous member purchases and sales at par value. Fair value also includes an estimated dividend earned at the time of reclassification from capital to a liability, until such amount is paid, and any subsequently declared dividend. Dividends related to capital stock classified as mandatorily redeemable capital stock are accrued at the expected dividend rate and reported as interest expense on the Combined Statement of Income.

Statutory and Regulatory Restrictions on Capital Stock Redemptions and Repurchases

In accordance with the FHLBank Act, each class of FHLBank stock is considered putable by the member, and an FHLBank may repurchase, at 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 an FHLBank repurchased (at an FHLBank'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 FHLBank is in compliance with the following restrictions.

- An FHLBank may not redeem or repurchase any capital stock if, following such redemption or repurchase, the FHLBank would fail to satisfy any of its minimum capital requirements. By law, no FHLBank stock may be redeemed or repurchased if the FHLBank becomes undercapitalized.

- An FHLBank may not redeem or repurchase any capital stock without approval of the FHFA if either its board of directors or the FHFA determines that it has incurred, or is likely to incur, losses resulting, or expected to result, in a charge against capital while such charges are continuing or expected to continue.

- An FHLBank's board of directors can suspend redemptions of stock if it finds that redemptions would result in the FHLBank failing to maintain adequate capital considering risks faced by the FHLBank or would otherwise prevent the FHLBank from operating in a safe and sound manner.

These restrictions apply even if an FHLBank is in compliance with its minimum capital requirements. As a result, repurchases or redemptions of a member's capital stock in an FHLBank will depend on whether the FHLBank is in compliance with its three regulatory capital requirements (risk-based capital, total regulatory capital, and leverage capital). In addition, an individual FHLBank may institute a higher capital requirement to meet internally-established thresholds or to address supervisory matters, limit dividend payments, or restrict excess capital stock repurchases as part of its retained earnings policies.

Additionally, an FHLBank may not redeem or repurchase shares of capital stock from any of its members if:

- the principal or interest due on any consolidated obligation has not been paid in full when due;
- the FHLBank fails to certify in writing to the FHFA that it will remain in compliance with its liquidity requirements and will remain capable of making full and timely payment of all of its current obligations;
- the FHLBank notifies the FHFA that it cannot provide the foregoing certification, projects it will fail to comply with statutory or regulatory liquidity requirements, or will be unable to timely and fully meet all of its obligations; or
- the FHLBank actually fails to comply with statutory or regulatory liquidity requirements, or to timely and fully meet all of its current obligations, or enters or negotiates to enter into an agreement with one or more FHLBanks to obtain financial assistance to meet its current obligations.

If an FHLBank is liquidated, after payment in full to the FHLBank's creditors, the FHLBank's stockholders will be entitled to receive the par value of their capital stock. The rights of the Class A and Class B stockholders in connection with a liquidation, merger, or other consolidation with another FHLBank shall be determined in accordance with the capital plan of the affected FHLBank, subject to any terms and conditions imposed by the FHFA.

In addition to possessing the authority to suspend stock redemptions, in certain situations, an FHLBank's board of directors has the right to call for the FHLBank's members, as a condition of membership, to make additional capital stock purchases as needed to satisfy statutory and regulatory capital requirements.

Each FHLBank's board of directors has a statutory obligation to review and adjust member capital stock requirements in order to comply with the FHLBank's minimum capital requirements, and each member must comply promptly with any such requirement. However, a member could reduce its outstanding business with the FHLBank as an alternative to purchasing stock.

If, during the period between receipt of a stock redemption notification from a member and the actual redemption (which may last indefinitely if an FHLBank is undercapitalized), an FHLBank is either liquidated or forced to merge with another FHLBank, the redemption value of the stock will be established after the settlement of all senior claims. Generally, no claims would be subordinated to the rights of FHLBank stockholders.

Dividends and Retained Earnings

According to FHFA regulations and the terms of the Joint Capital Enhancement Agreement, as amended (Capital Agreement), an FHLBank's board of directors may declare and pay dividends, in either cash or capital stock, from unrestricted retained earnings or from additional capital from merger. An FHLBank is prohibited from paying a dividend if it has failed to meet any capital requirements or would fail to meet such a requirement after paying the dividend. FHFA regulations also limit the ability of an FHLBank to create excess capital stock under certain circumstances. Excess capital stock is defined as the amount of stock held by a member (or former member) in excess of that institution's minimum stock ownership requirement. An FHLBank may not pay dividends in the form of capital stock or issue new excess capital stock to members if that FHLBank's excess capital stock exceeds one percent of its total assets, or if the issuance of excess capital stock would cause that FHLBank's excess capital stock to exceed one percent of its total assets.

The Capital Agreement is intended to enhance the capital position of each FHLBank. The Capital Agreement provides that each FHLBank allocates 20% of its net income each quarter to a separate restricted retained earnings account. (See *Note 16 - Capital* - *Restricted Retained Earnings* to the accompanying combined financial statements.)

Use of Derivatives

The use of derivatives is an integral part of each FHLBank's financial management strategy to reduce identified risks inherent in its lending, investing, and funding activities. The FHLBanks are exposed to interest-rate risk primarily from the effect of interest rate changes on their interest-earning assets and their interest-bearing liabilities that finance these assets. To mitigate the risk of loss, each FHLBank has established policies and procedures, which include guidelines on the amount of exposure to interest rate changes it is willing to accept. In addition, each FHLBank monitors the risk to its interest income, net interest margin, and average maturity of interest-earning assets and interest-bearing liabilities. FHFA regulation and each FHLBank's risk management policy prohibit trading in, or the speculative use of, these derivative instruments and limit credit risk arising from these instruments. The types of derivatives an FHLBank may use include: interest-rate swaps, options, swaptions, interest-rate cap and floor agreements, and futures and forward contracts. The most common ways in which an FHLBank uses derivatives are to:

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

Each FHLBank transacts most of its derivatives with large banks and major broker-dealers. Some of these banks and broker-dealers, or their affiliates, buy, sell, and distribute consolidated obligations. An FHLBank may enter into derivative transactions concurrently with the issuance of consolidated obligations. This strategy of issuing consolidated obligations while simultaneously entering into derivative transactions enables an FHLBank to offer a wider range of attractively priced advances to its members and may allow an FHLBank to reduce its funding costs. The continued attractiveness of this strategy depends on yield relationships between the FHLBanks' consolidated obligations and the derivatives markets. If conditions change, an FHLBank may alter the types or terms of the consolidated obligations that it issues. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements and *Financial Discussion and Analysis - Risk Management - Credit Risk - Derivative Counterparties* for information on credit exposure on derivatives.)

Audits and Examinations

FHLBanks' Regulator

The Federal Housing Finance Agency (FHFA), an independent agency in the executive branch of the U.S. government, supervises and regulates the FHLBanks and the Office of Finance. The Housing and Economic Recovery Act of 2008, as amended (Housing Act), created the FHFA with regulatory authority over FHLBank matters such as: board of director composition, executive compensation, risk-based capital standards and prompt corrective action enforcement provisions, membership eligibility, and low-income housing goals. The FHFA's mission, with respect to the FHLBanks, is to ensure that the FHLBanks operate in a safe and sound manner so that the FHLBanks serve as a reliable source of liquidity and funding for housing finance and community investment. (See *Note 16 - Capital* to the accompanying combined financial statements for more information on the FHFA's regulatory requirements.)

The FHFA is headed by a Director appointed by the President of the United States, by and with the advice and consent of the U.S. Senate, to serve a five-year term. The Director of the FHFA must have a demonstrated understanding of financial management or oversight, and have a demonstrated understanding of capital markets, including the mortgage securities markets and housing finance.

The Federal Housing Finance Oversight Board advises the Director of the FHFA about overall strategies and policies for executing the duties of the Director of the FHFA. The Federal Housing Finance Oversight Board is comprised of four board

members: the Secretary of the Treasury, the Secretary of HUD, the Chairman of the SEC, and the Director of the FHFA, who serves as the chairman of the board.

The FHFA is financed by assessments from the regulated entities, including the FHLBanks. No tax dollars or other appropriations are directed to support the operations of the FHFA or the FHLBanks. To assess the safety and soundness of the FHLBanks, the FHFA conducts annual on-site examinations, interim on-site visits, and off-site analyses of each FHLBank and the Office of Finance. In accordance with the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended by the Housing Act, the FHFA is required to present the findings of the agency's annual examinations of the FHLBanks and the Office of Finance to the U.S. Congress. In addition, each FHLBank is required to submit monthly financial information on its financial condition and results of operations to the FHFA.

The principal duties of the Director of the FHFA, with respect to the FHLBanks, are the following:

- to oversee the prudential operations of the FHLBanks;
- to ensure that each FHLBank operates in a safe and sound manner, including maintenance of adequate capital and internal controls;
- to ensure that the operations and activities of each FHLBank foster liquid, efficient, competitive, and resilient national housing finance markets (including activities relating to mortgages on housing for low- and moderate-income families involving a reasonable economic return that may be less than the return earned on other activities);
- to ensure that each FHLBank complies with the FHLBank Act and the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended by the Housing Act, and the applicable rules, regulations, guidelines, and orders issued under those Acts;
- to ensure that each FHLBank carries out its statutory mission only through activities that are authorized under and consistent with the FHLBank Act and the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended by the Housing Act; and
- to ensure that the activities of each FHLBank and the manner in which each FHLBank is operated are consistent with the public interest.

The FHFA is located at 400 7th Street, SW, Washington, D.C. 20219, and its web site is www.fhfa.gov. This web site is provided as a matter of convenience only, and its contents are not made part of this report and are not intended to be incorporated by reference into this report.

Government Corporation Control Act

The Government Corporation Control Act provides that, before a government corporation issues and offers obligations to the public, the Secretary of the Treasury shall prescribe the form, denomination, maturity, interest rate, and conditions to which the obligations will be subject; the method and time issued; and the selling price. The FHLBanks meet the definition of government corporations under the Government Corporation Control Act.

Each FHLBank and the Office of Finance has an internal audit department and an audit committee of its board of directors. An independent registered public accounting firm audits the annual financial statements of each FHLBank and the annual combined financial statements of the FHLBanks prepared by the Office of Finance. The accounting firm conducts the audit of each FHLBank in accordance with the standards of the Public Company Accounting Oversight Board and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. The accounting firm conducts the audit of the annual combined financial statements in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States.

Each FHLBank is required to submit an annual management report to the U.S. Congress, which includes the financial statements, the report of the accounting firm on the financial statements, a statement on internal accounting and administrative control systems, and other comments and information necessary to inform the U.S. Congress about the operations and financial conditions of the FHLBanks. In addition, each FHLBank is required to provide a copy of that report to the President of the United States, the Director of the Office of Management and Budget, and the Comptroller General of the United States.

The Government Corporation Control Act provides that the Comptroller General of the United States may review any audit of the financial statements conducted by an independent registered public accounting firm and shall report to the U.S. Congress, the Director of the Office of Management and Budget, and the FHLBank under review regarding the results of the review and make any recommendation the Comptroller General of the United States considers appropriate. The Comptroller General of the United States may also audit the financial statements of an FHLBank at the discretion of the Comptroller General or at the request of a committee of the U.S. Congress. In addition, the Comptroller General of the United States has the authority under the FHLBank Act to audit or examine the FHFA and the FHLBanks to determine the extent to which they fairly and effectively fulfill the purposes of the FHLBank Act.

Other Mission-Related Activities

In addition to supporting residential mortgage lending, one of the FHLBanks' core missions is to support community development through affordable housing and community investment. A number of programs administered by the FHLBanks are targeted to fulfill that mission. These programs have provided affordable homeownership and rental opportunities for hundreds of thousands of very low- to moderate-income families and have provided community lending, which has strengthened communities across the United States and its territories.

Community Investment Cash Advance Programs

The FHLBanks offer funding to members, often at below-market interest rates and for long terms, through Community Investment Cash Advance programs. Under these programs, in general, each FHLBank:

- shall offer an Affordable Housing Program;
- shall offer a Community Investment Program;
- may offer a Rural Development Funding Program;
- may offer an Urban Development Funding Program; and
- may offer other programs, that have been approved by the FHFA, for targeted community lending.

Community Investment Cash Advance programs provide financing for projects that target affordable housing and certain economic development activities. Economic development projects include commercial, industrial, manufacturing, social service, infrastructure, and public facility projects and activities. Lending targets specific beneficiaries, which are determined by the geographical area in which a project is located, by the individuals who benefit from a project as employees or service recipients, or by projects that qualify as small businesses. Members may use the proceeds of Community Investment Cash Advance funding to finance targeted affordable housing and economic development projects through loan originations and participations, through lending to other lenders for eligible purposes, or by purchasing eligible mortgage-backed securities, mortgage revenue bonds, and low-income housing tax credits. Approved housing associates may also use certain Community Investment Cash Advance programs.

Affordable Housing Program (AHP). An AHP subsidizes the cost of owner-occupied housing provided that the household's income does not exceed 80% of the area median income, and in the case of rental housing, the household's income in at least 20% of the units does not exceed 50% of the area median income. The subsidy may be in the form of a grant or an advance with a reduced interest rate. AHP funds are primarily available through a competitive application program at each of the FHLBanks.

In an AHP competitive application program, members submit applications on behalf of one or more sponsors of eligible housing projects. Proposed AHP projects must meet certain eligibility requirements and are approved based on scoring guidelines established by each FHLBank in order to obtain funding under an AHP competitive application program. AHP funds are also awarded through a homeownership set-aside program. Under this type of program, an FHLBank may set aside annually up to the greater of $4.5 million or 35% of its annual required AHP funds to assist low- and moderate-income households to purchase homes, provided that at least one-third of the FHLBank's set-aside allocation is made available to assist first-time home buyers. Members obtain AHP homeownership set-aside funds from the FHLBank and then use those funds as grants to eligible households. Set-aside funds may be used for down payment, closing costs, counseling, or rehabilitation assistance in connection with a household's purchase or rehabilitation of an owner-occupied unit. Each FHLBank sets its own maximum grant amount, which may not exceed $15,000 per household. All of the FHLBanks have AHP homeownership set-aside programs.

If an FHLBank fails to use or commit the full amount it is required to contribute to an AHP in any year, then 90% of the unused or uncommitted amount shall be deposited by the FHLBank in an Affordable Housing Reserve Fund established and administered by the FHFA. The remaining 10% of the unused and uncommitted amount retained by that FHLBank should be fully used or committed by that FHLBank during the following year, and any remaining portion must be deposited in the Affordable Housing Reserve Fund. The Affordable Housing Reserve Fund has never been activated.

Community Investment Program. The Community Investment Program for housing is a lending program that allows members to borrow at a discounted rate of interest, or to obtain letters of credit, from an FHLBank. An advance under the Community Investment Program for housing is offered to a member at an FHLBank's cost of funds plus reasonable administrative costs. An FHLBank discounts the interest rates on these advances and may require the member to pass through this discount to its own borrowers.

Members use the Community Investment Program for housing advances to fund the purchase, construction, rehabilitation, refinancing, or pre-development financing of owner-occupied and rental housing for households whose income does not exceed 115% of the area median income. At December 31, 2016 and 2015, the FHLBanks had $11.1 billion and $10.3 billion of Community Investment Program housing advances outstanding.

In addition to housing, this program can be used for commercial and economic development activities that benefit low- or moderate-income households with incomes at 80% or less of area median income and in neighborhoods where at least 51% of households are low- or moderate-income. At December 31, 2016 and 2015, the FHLBanks had $185 million and $159 million of Community Investment Program commercial and economic development advances outstanding.

Rural Development Funding Program. The Rural Development Funding Program provides advances or grants for targeted community lending in rural areas for targeted beneficiaries with incomes at or below 115% of the area median income.

Urban Development Funding Program. The Urban Development Funding Program provides advances or grants for targeted community lending in urban areas for targeted beneficiaries with incomes at or below 100% of the area median income.

Community Investment Cash Advance Program Status and Funding. Currently, each FHLBank offers an AHP and a Community Investment Program and may offer either a Rural Development Funding Program, an Urban Development Funding Program, or both. Some FHLBanks also have additional community lending programs designed to retain or create jobs, or to otherwise improve the economic status of communities. Each FHLBank has a Community Lending Plan that describes its program objectives for economic development.

For the year ended December 31, 2016, the FHLBanks have contributed $392 million to the AHP and have disbursed $295 million through the AHP. (See *Note 14 - Affordable Housing Program (AHP)* to the accompanying combined financial statements.)

For the year ended December 31, 2016, the FHLBanks have funded $3.2 billion in Community Investment Program advances, including housing advances and economic development advances. For the year ended December 31, 2016, the FHLBanks have also funded $2.7 billion in Community Investment Cash Advance economic development advances.

Community Support Program

To retain access to long-term credit from an FHLBank, each member that is subject to community support review is required to meet standards of community support activities, which it documents by submitting a Community Support Statement to the FHFA every two years. These standards take into account each member's performance under the Community Reinvestment Act of 1977, as amended, and the member's record of lending to first-time home buyers.

Competition

Advances

Demand for FHLBank advances is affected by, among other things, the cost of other sources of liquidity available to FHLBank members, including deposits. Each FHLBank individually competes with its members' depositors as well as suppliers of secured and unsecured wholesale funding. These competitors may include investment banks, commercial banks, Federal Reserve Banks, and, in certain circumstances, one or more other FHLBanks, when affiliates of their members are members of other

FHLBanks. Both small and large FHLBank members typically have access to brokered deposits and repurchase agreements, each of which presents a competitive alternative to advances. Larger members also have greater access to other competitive sources of funding and asset and liability management facilitated by the domestic and global credit markets. These sources may include subordinated debt, interbank loans, interest-rate swaps, options, bank notes, and commercial paper. In addition, the FHLBanks' competitive environment may be impacted by various legislative and regulatory initiatives. (See *Risk Factors - Business Risk-Legislative and Regulatory* for more information.)

The availability of alternative funding sources to members can significantly influence the demand for FHLBank advances and this availability can vary as a result of:

- market conditions;
- products and structures available in the marketplace;
- member creditworthiness;
- availability of collateral; and
- new government programs and regulations or changes to existing ones.

Mortgage Loans

The activities of the FHLBanks' mortgage loan programs are subject to significant competition in purchasing conventional fixed-rate mortgage and government-guaranteed or -insured loans. The FHLBanks face competition in customer service, the prices paid for these assets, and ancillary services, such as automated underwriting. The most direct competition for mortgages comes from other housing GSEs that also purchase conventional fixed-rate mortgage loans, specifically Fannie Mae and Freddie Mac, which are the dominant purchasers of residential fixed-rate conventional mortgages. The FHLBanks primarily compete on the basis of transaction structure, price, products, and services offered. The FHLBanks regularly reassess their potential for success in attracting and retaining customers for their mortgage products and services.

Debt Issuance

Each FHLBank competes primarily with the U.S. Treasury, Fannie Mae, Freddie Mac, and other GSEs, as well as corporate, state and local, sovereign, sub-sovereign, and supranational entities, for funds raised through the issuance of unsecured debt in the domestic and global debt markets. If the supply of competing debt products increases without a corresponding increase in demand, or if certain investors change their view of investing in FHLBank debt, debt costs may rise, or less debt may be issued at the same cost. In addition, certain regulatory initiatives may adversely affect the availability and cost of funds raised through the issuance of certain types of unsecured debt. Although the available supply of funds has kept pace with the funding needs of the FHLBanks' members (as expressed through FHLBank debt issuance), investors should not rely on the belief that this will necessarily continue to be the case in the future.

The issuance of callable debt and the simultaneous execution of callable derivative transactions that mirror the debt issued has been an important source of competitive funding for the FHLBanks. As such, the availability of markets for callable debt and derivative transactions may be an important factor in determining the FHLBanks' relative cost of funds. There is considerable competition in the markets for callable debt and for derivative transactions with high credit quality entities. Investors should not rely on the belief that these markets will necessarily be sustained in the future. (See *Risk Factors - Business Risk-Legislative and Regulatory* for more information.)

Tax Status and Assessments

The FHLBanks are exempt from all corporate federal, state, and local taxation, except for local real estate tax. However, by regulation, the FHLBanks must annually set aside for the Affordable Housing Program the greater of the aggregate of $100 million or 10% of each individual FHLBank's income subject to assessment. In addition to the required Affordable Housing Program assessment, an FHLBank's board of directors may elect to make voluntary contributions to the Affordable Housing Program. Affordable Housing Program assessments were $392 million, $332 million, and $269 million for the years ended December 31, 2016, 2015, and 2014. (See *Note 14 - Affordable Housing Program (AHP)* to the accompanying combined financial statements.)

Cash dividends received by FHLBank members from the FHLBanks are taxable and do not benefit from the exclusion for corporate dividends received.

Office of Finance

The Office of Finance is a joint office of the FHLBanks established to function as the fiscal agent of the FHLBanks. In this capacity the Office of Finance:

- facilitates the issuance and servicing of all FHLBank consolidated obligations;
- prepares the quarterly and annual combined financial reports of the FHLBanks; and
- administers the Resolution Funding Corporation and the Financing Corporation, two tax-exempt government corporations created during the savings and loan crisis of the 1980s.

In addition, the Office of Finance performs research and serves as a source of information for the FHLBanks on capital markets developments; manages relationships with the rating agencies and the U.S. Treasury as they relate to the consolidated obligations; and performs various debt marketing activities, including investor presentations and conferences.

Pursuant to FHFA regulations, the Office of Finance, often in conjunction with the FHLBanks, has adopted policies and procedures for consolidated obligations. These policies and procedures relate to the frequency and timing of consolidated obligations issuance, issue size, minimum denomination, selling concessions, underwriter qualifications and selection, issuance currency, coupon features, call or put features, principal amortization features, and selection and retention of outside counsel. The Office of Finance has responsibility for facilitating and approving the issuance of the consolidated obligations in accordance with these policies and procedures. In addition, the Office of Finance has the authority to redirect, limit, or prohibit the FHLBanks' requests to issue consolidated obligations if it determines that the action is inconsistent with FHFA regulations. The FHFA requires consolidated obligations to be issued efficiently and at the lowest all-in funding costs over time, consistent with:

- prudent risk-management practices, prudential debt parameters, short- and long-term market conditions, and the FHLBanks' role as GSEs;
- maintaining reliable access to the short- and long-term capital markets; and
- positioning the issuance of debt to take advantage of current and future capital market opportunities.

Employees

Table 3 - Employees

	December 31, 2016			December 31, 2015			Full-time Employees
FHLBank	Full-time	Part-time	Total	Full-time	Part-time	Total	Change
Boston	203	1	204	204	1	205	(1)
New York	280	—	280	273	—	273	7
Pittsburgh	212	3	215	213	2	215	(1)
Atlanta	316	4	320	314	4	318	2
Cincinnati	209	2	211	203	—	203	6
Indianapolis	216	2	218	214	2	216	2
Chicago	426	14	440	410	12	422	16
Des Moines	300	7	307	269	6	275	31
Dallas	218	—	218	207	—	207	11
Topeka	229	6	235	213	5	218	16
San Francisco	268	6	274	256	7	263	12
Office of Finance	104	—	104	106	—	106	(2)
Total	2,981	45	3,026	2,882	39	2,921	99

RISK FACTORS

The following discussion summarizes certain risks and uncertainties facing the FHLBanks as they potentially affect investors in the FHLBanks' consolidated obligations. There may be other risks and uncertainties that are not described in these risk factors. If any of these risks or uncertainties is realized, it could negatively affect an FHLBank's, and possibly the entire FHLBank System's, financial condition or results of operations. As a result, there could be a reduction in the value of FHLBank membership or an adverse effect on an FHLBank's, or the entire FHLBank System's, ability to pay its obligations when due. Additional discussion and analysis of other risks and uncertainties are set forth throughout this Combined Financial Report. (See each FHLBank's 2016 SEC Form 10-K under *Part I. Item 1A-Risk Factors* for a discussion regarding its risk factors.)

Business Risk-General

A prolonged downturn in the U.S. housing market and other economic conditions, and related U.S. government policies, could adversely affect the FHLBanks' business activities and earnings.

The FHLBanks' businesses and results of operations are sensitive to the condition of the U.S. housing and mortgage markets, as well as general business and economic conditions. During 2016, U.S. economic activity continued to expand at a moderate pace and the conditions in the U.S. housing market have continued to improve, as evidenced by the level of home price appreciation and lower delinquency rates. However, if adverse trends reappear in the mortgage lending sector, including declines in home prices or a decrease in loan performance, the value of collateral securing member credit to each FHLBank and the fair value of its mortgage-backed security investments could decline. Any of these changes could increase the possibility of under-collateralization, increasing the risk of loss in case of a member's failure, or could increase the risk of loss on the FHLBanks' mortgage-backed security investments resulting in additional credit impairment charges. Also, deterioration in the residential mortgage markets could negatively affect the value of the FHLBanks' mortgage loan portfolios, resulting in an increase in the allowance for credit losses on mortgage loans and possible additional realized losses if the FHLBanks are forced to liquidate their mortgage portfolios.

In addition, the FHLBanks' businesses and results of operations are affected significantly by the fiscal and monetary policies of the U.S. government and its agencies. For example, the Federal Reserve Board's policies either directly or indirectly influence the yield on interest-earning assets and the yield on interest-bearing liabilities and the demand for FHLBank debt. These policies and other systemic events could adversely affect the FHLBanks through lower yields on their investments, higher yields on their debt, or both. Additionally, the FHLBanks may be adversely affected by negative trends in the global economy and political climate as they can influence, among other business activities, member borrowing activity and FHLBank investment patterns. Furthermore, investors' negative perceptions of the state of the U.S. economy could lead to a decline in investors' demand for FHLBanks' consolidated obligations.

Business Risk-Legislative and Regulatory

Changes in the legislative and regulatory environment could restrict the FHLBanks' business operations and negatively affect their earnings and the value of FHLBank membership.

As GSEs, the FHLBanks are organized under the authority of the FHLBank Act and are governed by U.S. federal laws and regulations of the FHFA, an independent agency within the executive branch of the U.S. government. The FHFA has issued and continues to issue regulations that change how the FHLBanks conduct business activities as part of carrying out their housing finance and community investment mission.

The legislative and regulatory environment for FHLBanks and their members also continues to change as regulators continue to implement the Housing and Economic Recovery Act of 2008, as amended, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act), and the reforms of the Basel Committee on Bank Supervision. There are several provisions in the Dodd-Frank Act that could affect the FHLBanks or their members, depending on how the various regulators decide to implement this federal law through the issuance of regulations and their enforcement activities. Because the Dodd-Frank Act requires several regulatory bodies to carry out its provisions, the full effect of this law on the FHLBanks and their members remains uncertain until after the required regulations and reports to Congress are issued and implemented.

In addition, changes in the regulatory environment relating to FHLBank members, investors, and debt underwriters have affected, and will continue to affect, the FHLBanks. For example, the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency, and the FDIC previously adopted revised capital and liquidity requirements to incorporate the Basel III standards from the Basel Committee on Banking Supervision. While the FHLBanks are not required to meet these new requirements, they are applicable to certain FHLBank members, investors, and debt underwriters, among other banking organizations. There continues to be uncertainty about the extent to which implementation of these requirements by FHLBank members, investors, and debt underwriters may affect the FHLBanks.

Furthermore, political events, including the results of the 2016 U.S. elections, could cause legislative and regulatory uncertainties. Potential legislative and regulatory changes that affect FHLBanks, FHLBank members, investors, and debt underwriters could adversely affect the FHLBanks' business activities, financial condition, and results of operations.

(See *Financial Discussion and Analysis - Legislative and Regulatory Developments* for more information about recent legislative and regulatory developments.)

Changes in the regulation or status of GSEs and the related effect on debt issuance could reduce demand or increase the cost of the FHLBanks' debt issuance and adversely affect their earnings.

The FHLBanks are GSEs organized under the authority of the FHLBank Act and are authorized to issue debt securities to fund their operations and to finance housing and community investments in the United States. During the financial crisis of 2008, the FHLBank System's debt pricing came under pressure as investors perceived GSE debt securities, including those securities issued by Fannie Mae and Freddie Mac, as bearing increased risk. This increased perception of risk resulted from the negative financial performance of Fannie Mae and Freddie Mac and the FHFA's action to place them into conservatorship in September 2008. In response, several GSE reform bills have been proposed, specifically targeting Fannie Mae and Freddie Mac. Given the recent changes as a result of the 2016 U.S. government elections, the regulatory environment for the housing GSEs has become less predictable.

Due to the current uncertainty surrounding the nature, timing, and pace of reforms, as well as the recent changes in the U.S. government, the FHLBanks' funding costs and access to funds could be adversely affected by changes in investors' perceptions of the risks associated with the housing GSEs. Additionally, investor concerns about U.S. agency debt and the U.S. agency debt market may also adversely affect the FHLBanks' competitive position and result in higher funding costs, which could negatively affect the FHLBanks' earnings.

A failure to meet minimum regulatory capital requirements could affect the FHLBanks' ability to conduct business and could adversely affect their earnings.

Each FHLBank is subject to certain minimum capital requirements under the FHLBank Act, as amended, and FHFA rules and regulations that include total capital, leverage capital, and risk-based capital requirements. If an FHLBank is unable to satisfy its minimum capital requirements, that FHLBank would be subject to certain capital restoration requirements and prohibited from paying dividends and redeeming or repurchasing capital stock without the prior approval of the FHFA, which could adversely affect a member's investment in FHLBank capital stock. Any capital shortfall could be perceived by investors as an increased level of risk or deterioration in the performance of an FHLBank, which could result in a downgrade in that FHLBank's outlook or its short- or long-term credit ratings. This, in turn, could negatively affect investors' perception of the FHLBank system and potentially increase the FHLBanks' cost of funding. (See *Note 16 - Capital* to the accompanying combined financial statements and *Business - Capital, Capital Rules, and Dividends* for additional information on the FHLBanks' capital requirements.)

A failure to pay dividends or repurchase or redeem FHLBank members' capital stock consistent with past practices may cause a decrease in members' demand for advances or difficulties in retaining existing members and attracting new members.

The payment of dividends and repurchase or redemption of capital stock are subject to certain statutory and regulatory restrictions (including that an FHLBank is in compliance with all minimum capital requirements) and is highly dependent on an FHLBank's ability to continue to generate future net income and maintain adequate retained earnings and capital levels. Furthermore, events such as changes in an FHLBank's market risk profile, quality of assets held, and increased volatility of net

income may affect the adequacy of an FHLBank's retained earnings. These changes may require an FHLBank to increase its target level of retained earnings and correspondingly reduce its dividends or limit capital stock repurchases or redemptions in order to achieve and maintain the targeted amounts of retained earnings. These actions may be a factor in causing a decline in the value of FHLBank membership or a reduction in members' demand for advances, or a factor in making it difficult for an FHLBank to retain existing members or to attract new members. (See *Note 16 - Capital* to the accompanying combined financial statements for additional information on the FHLBanks' excess stock limitations.)

Compliance with regulatory contingency liquidity guidance could restrict investment activities and adversely affect the FHLBanks' net interest income.

The FHFA requires the FHLBanks to maintain sufficient liquidity through short-term investments in an amount at least equal to an FHLBank's cash outflows under two hypothetical scenarios for the treatment of maturing advances. (See *Financial Discussion and Analysis - Liquidity and Capital Resources* for a description of these scenarios.) This regulatory guidance is designed to provide sufficient liquidity to protect against temporary disruptions in the capital markets that affect the FHLBanks' access to funding. To satisfy these two scenarios, the FHLBanks maintain balances in shorter-term investments, which may earn lower interest rates than alternate investment options. In certain circumstances the FHLBanks may also need to fund shorter-term advances with short-term consolidated obligations that have maturities beyond those of the related advances, thus increasing the FHLBanks' short-term advance pricing or reducing net income through lower net interest spreads. To the extent these increased prices make FHLBank advances less competitive, advance levels and net interest income may be negatively affected. Issuance of additional regulatory liquidity requirements in the future could also adversely affect the FHLBanks' business activities and operations. (See *Financial Discussion and Analysis - Liquidity and Capital Resources* for more discussion regarding the FHLBanks' liquidity requirements.)

The FHLBanks' Affordable Housing Programs could become a larger proportional burden if the FHLBanks' annual net income is reduced or eliminated.

Each FHLBank is required to establish an Affordable Housing Program (AHP). Each FHLBank provides subsidies in the form of direct grants or below-market interest rate loans to members who use the funds to assist in the purchase, construction, or rehabilitation of housing for low- to moderate-income households. Annually, the FHLBanks must set aside an aggregate of the greater of $100 million or 10% of net earnings for the AHP. As an FHLBank's net income is reduced, the amount of funding available through the AHP is also reduced, limiting the FHLBanks' ability to satisfy its mission. As a result, the FHLBanks could be required to set aside a minimum of $100 million per year in the aggregate, even if one or more FHLBanks are unprofitable for that year. (See *Note 14 - Affordable Housing Program (AHP)* to the accompanying combined financial statements for more information about this funding requirement.)

Business Risk-Strategic

Increased competition or reduced demand could adversely affect the FHLBanks' primary business activity to provide funding at attractive prices while maintaining sufficient net interest margins.

The FHLBanks' primary business is making advances to their members. Each FHLBank competes with other suppliers of wholesale funding, including investment banks, commercial banks, Federal Reserve Banks, and, in certain circumstances, other FHLBanks. While the FHLBanks' advances to their members have increased in recent years to levels prior to the financial crisis of 2008, the availability of alternative funding sources to the FHLBank members, such as deposits from members' banking customers, could significantly decrease the demand for the FHLBanks' advances and negatively affect the FHLBanks' combined financial condition and results of operations.

The FHLBanks may be required to change policies, programs, and agreements affecting members' access to advances, mortgage purchase programs, affordable housing programs, and other credit programs that could cause members to obtain financing from alternative sources. Furthermore, adoption of new legislation or regulations could create alternative funding sources for FHLBank members. Some competitors may not be subject to the same regulations, which may enable those competitors to offer products and terms that the FHLBanks are not able to offer. Additionally, some of the FHLBanks compete with Fannie Mae and Freddie Mac, as well as other FHLBanks, to purchase mortgage loans from members or affiliates of members. This increased competition may reduce the amount of available mortgage loans that FHLBanks can purchase, resulting in lower income from this part of their businesses.

Each FHLBank also competes with the U.S. Treasury, Fannie Mae, Freddie Mac, and other GSEs, as well as corporate, state, and local, sovereign, sub-sovereign, and supranational entities, for funds raised through the issuance of unsecured debt in the U.S. and global capital markets. Increases in the supply of competing debt products could result in higher debt costs or lower amounts of debt issued at the same cost. Increased competition could adversely affect the amount of funding available to the FHLBanks or increase the cost of funding available to the FHLBanks. Any of these factors could adversely affect the FHLBanks' combined financial condition and results of operations, and the value of FHLBank membership.

A loss or change of business activities with large members, consolidation of membership, and/or regulatory changes in membership rules could adversely affect the FHLBanks' combined financial condition or results of operations.

Some FHLBanks have a high concentration of advances and capital with large members, and certain large members have affiliates that are members of other FHLBanks. A loss of some of these members due to withdrawal from membership, acquisition by a non-member, or failure could result in a reduction of the FHLBanks' total combined assets, capital, and net income. Withdrawal of members could occur as a result of increased consolidation in the financial services industry. As the financial industry continues to consolidate to a smaller number of institutions, it could lead to the concentration of large members in some FHLBank districts and a related decrease in membership and significant loss of business for certain other FHLBanks. If advances are concentrated in a smaller number of members, an FHLBank's risk of loss resulting from a single event could become greater. Industry consolidation could also cause an FHLBank to lose members whose business and stock investments are so substantial that their loss could threaten the viability of that FHLBank.

In addition, regulatory changes in membership rules could affect some FHLBanks' business activities. For example, the FHFA issued a final rule on FHLBank membership in January 2016, which, among other things, made captive insurance companies ineligible for FHLBank membership. The magnitude of the impact from this rule will depend primarily on the financial condition and results of operations of the FHLBanks with large captive insurance members at the time of membership termination or maturity of related advances. (See *Financial Discussion and Analysis - Combined Financial Condition - Advances* and *Note 16 - Capital* to the accompanying combined financial statements for more information regarding captive insurance members.) The FHLBanks' combined financial condition or results of operations could be adversely affected by a continued loss or change of business activities with large members, consolidation in the financial services industry, and/or regulatory changes in membership rules. (See *Financial Discussion and Analysis - Risk Management - Business Risk* for more discussion regarding the FHLBanks' exposure to member concentration risk.)

Credit Risk

Increased loan delinquency and default rates or loan modifications could result in additional credit losses on mortgage loans that back mortgage-backed security investments and adversely affect the yield or value of these FHLBank investments.

FHLBanks have invested in both U.S. agency and private-label mortgage-backed securities that are backed by prime, subprime, and Alt-A mortgage loans. Although the FHLBanks only invested in senior tranches of these private-label mortgage-backed securities having the highest long-term debt rating at the time of purchase, many of those securities were subsequently downgraded and sustained realized or projected credit losses due to economic conditions and housing market trends. The depth and duration of these previous trends, and the uncertainty regarding future trends, continue to affect the market for these private-label mortgage-backed securities even though improvement in the combined fair value of these securities has been experienced in recent years.

Due to continued improvements in the housing markets, the FHLBanks continued to recognize minimal credit losses in their combined results of operations during 2016. If positive trends in the housing markets and housing prices reverse or are less than projected, there could be additional credit losses relating to other-than-temporary impairments. For example, a slower economic expansion, in either the United States as a whole or in specific regions of the country, or delays in foreclosures could result in higher delinquencies, increasing the risk of credit losses that adversely affect the yield or value of these securities.

Federal and state government authorities, as well as other entities that include financial institutions and residential mortgage loan servicers, have proposed, commenced, or promoted programs designed to provide homeowners with assistance in avoiding residential mortgage loan foreclosures. For example, the U.S. Treasury is continuing its efforts relating to refinancing and modification programs for homeowners whose mortgages are greater than their home value to include mortgages underlying private-label mortgage-backed securities. However, future increases in loan delinquency and default

rates or loan modifications may adversely affect the yield or value of FHLBanks' private-label mortgage-backed securities and U.S. agency mortgage-backed securities. (See *Financial Discussion and Analysis - Risk Management - Credit Risk - Investments* for more discussion and analysis about the FHLBanks' credit risk exposure to investments and their management of this risk.)

Increased credit risk exposure resulting from increased defaults on mortgage loans or FHLBank member failures could adversely affect the FHLBanks' combined financial condition and results of operations.

The FHLBanks have exposure to credit risk as part of their normal business operations through:

- funding advances;
- purchasing mortgage loans; and
- extending open lines of credit, standby letters of credit and other commitments.

The FHLBanks require advances and other extensions of credit to be fully secured with collateral and require borrowers to pledge additional collateral, when deemed necessary. Typically, an FHLBank would take physical possession or control of collateral if the financial condition of the borrower deteriorates or if the borrower exceeds certain product usage triggers. To ensure its position as a first-priority secured creditor, an FHLBank will generally require insurance company borrowers to place physical possession of all pledged eligible collateral with the FHLBank or deposit it with a control agent. If borrowers are unable to pledge additional collateral to fully secure their obligations with an FHLBank, that FHLBank's advance levels could decrease or result in an increase in credit risk, negatively affecting its financial condition, results of operations, and value of FHLBank membership. Additionally, inability to liquidate the collateral in the event of a default could cause an FHLBank to incur a credit loss and adversely affect that FHLBank and the FHLBanks' combined financial condition and results of operations. (See *Financial Discussion and Analysis - Risk Management - Credit Risk - Advances* for more discussion and analysis about the FHLBanks' credit risk exposure to advances and their management of this risk.)

Mortgage loans held in the FHLBanks' portfolios are collateralized by the underlying real estate and may also be credit enhanced to further mitigate credit risk. Certain FHLBanks may have a greater credit risk exposure in geographical areas with suppressed real estate values.

The U.S. housing market is exposed to credit risk. Some financial institutions are under financial stress exposing the FHLBanks to member and counterparty credit risk. If an FHLBank's member defaults on its obligations, or the FDIC fails either to promptly repay all of that failed institution's obligations or to assume the outstanding advances, then that FHLBank may be required to liquidate the collateral pledged by the failed institution. The volatility of market prices and interest rates could affect the value of the collateral held by the FHLBank as security for the obligations of its members. The proceeds realized from the liquidation of pledged collateral may not be sufficient to fully satisfy the amount of the failed institution's obligations or the operational cost of liquidating the collateral. Default by a member with significant unsecured obligations to an FHLBank could result in significant losses, which would adversely affect the FHLBanks' combined financial condition and results of operations. (See *Financial Discussion and Analysis - Risk Management - Credit Risk* for more discussion and analysis about the FHLBanks' exposure to credit risk and their management of this risk.)

Defaults by one or more institutional counterparties on its obligations to the FHLBanks could adversely affect combined financial condition and results of operations.

The FHLBanks face the risk that their institutional counterparties may fail to fulfill their contractual obligations. The primary exposures to institutional counterparty risk are with:

- unsecured money market transactions or short-term investments with domestic and foreign counterparties;
- derivative counterparties;
- mortgage servicers that service the loans purchased under the MPP and MPF Program; and
- third-party providers of credit enhancements on private-label MBS investments, including mortgage insurers, bond insurers, and financial guarantors.

A counterparty default could result in losses if an FHLBank's credit exposure to that counterparty was unsecured or under-collateralized, or if an FHLBank's credit obligations associated with derivative positions were over-collateralized. The insolvency or other inability of a significant counterparty to perform its obligations under these transactions or other agreements could have an adverse effect on the FHLBanks' combined financial condition and results of operations.

The FHLBanks have both direct and indirect exposure to foreign credit risk through their various counterparties. Adverse economic, political, or other trends that may occur within, across, or among various regions or countries could have direct adverse effects on an FHLBank's institutional counterparties and on the U.S. economy. In turn, the FHLBanks could also experience adverse effects on their credit performance given their relationship with these counterparties and the possibility of negative consequences for the U.S. economy.

In addition, the FHLBanks' ability to engage in routine derivatives, funding, and other transactions could be adversely affected by the actions and commercial soundness of other financial institutions. Financial services institutions are inter-related as a result of trading, clearing, counterparty, and other relationships. As a result, actual and potential defaults of one or more financial services institutions could lead to market-wide disruptions, making it difficult for the FHLBanks to find counterparties for transactions. (See *Financial Discussion and Analysis - Risk Management* - *Credit Risk* for more discussion and analysis about the FHLBanks' exposure to credit risk and their management of this risk.)

Market Risk

Changes in interest rates or an inability to successfully manage interest-rate risk could have a material adverse effect on the FHLBanks' net interest income.

The FHLBanks realize net interest income primarily from the spread between interest earned on their outstanding advances and investments less the interest paid on their consolidated obligations and other liabilities. The FHLBanks' businesses and results of operations are significantly affected by the fiscal and monetary policies of the U.S. government and its agencies. Therefore, an FHLBank's ability to prepare for changes regarding the direction and speed of interest rate changes, or to use derivatives to hedge related exposures such as basis risk arising from a shift in the relationship of interest rates in different financial markets or on different financial instruments, significantly affects the success of its asset and liability management activities and its level of net interest income. If the FHLBanks are unable to enter into derivative instruments on acceptable terms, the FHLBanks may be unable to effectively manage their interest rate and other risks, which could adversely affect the FHLBanks' combined financial condition or results of operations.

An FHLBank may use a number of measures to monitor and manage interest rate risk, including income simulations and duration/market value sensitivity analyses. Given the unpredictability of the financial markets, capturing all potential outcomes in these analyses is extremely difficult. Key assumptions include, but are not limited to, loan volumes and pricing, market conditions for an FHLBank's consolidated obligations, interest rate spreads and prepayment speeds, implied volatility of options contracts, and cash flows on mortgage-related assets. These assumptions are inherently uncertain and they cannot precisely estimate net interest income and the market value of equity. Actual results may differ from simulated results due to the timing, magnitude, and frequency of interest rate changes and changes in market conditions and management strategies, among other factors. Volatility and disruption in the credit markets may result in a higher level of volatility in an FHLBank's interest-rate risk profile and could negatively affect that FHLBank's ability to manage interest-rate risk effectively.

Interest rate changes can exacerbate prepayment and extension risks. Decreases in interest rates typically cause mortgage prepayments to increase and may result in lower interest income and substandard performance in an FHLBank's mortgage portfolio as there are generally limited reinvestment opportunities at similar interest rates. In addition, while these prepayments would reduce the asset balance, the associated debt may remain outstanding and at above-market rates. Conversely, when interest rates increase, an FHLBank may experience extension risk, which is the risk that the mortgage-related investments will remain outstanding longer than expected at below-market yields. Therefore, any changes in interest rates could adversely affect the FHLBanks' net interest income. (See *Quantitative and Qualitative Disclosures about Market Risk* for additional discussion and analysis regarding the FHLBanks' sensitivity to interest rate changes and the use of derivatives to manage their exposure to interest-rate risk.)

Changes to the credit ratings of FHLBanks' consolidated obligations could adversely affect the FHLBanks' ability to access the capital markets, their primary source of funding, on acceptable terms.

The FHLBanks' consolidated obligations are rated Aaa/P-1 with a stable outlook by Moody's and AA+/A-1+ with a stable outlook by S&P. Rating agencies may from time to time change a rating or issue negative reports. Because all of the FHLBanks have joint and several liability for all FHLBank consolidated obligations, negative developments at any FHLBank may affect these credit ratings or result in the issuance of a negative report regardless of an individual FHLBank's financial condition and results of operations. In addition, because of the FHLBanks' GSE status, the credit ratings of the FHLBank System and the

FHLBanks are directly influenced by the sovereign credit rating of the United States. For example, downgrades to the U.S. sovereign credit rating and outlook may occur if the U.S. government fails to adequately address, based on the credit rating agencies' criteria, its fiscal budget process or statutory debt limits. As a result, similar downgrades in the credit ratings and outlook on the FHLBanks and the FHLBanks' consolidated obligations would most likely occur even though the consolidated obligations are not obligations of the United States.

Future downgrades in credit ratings and outlook may result in higher funding costs or disruptions in the FHLBanks' access to capital markets, including additional collateral posting requirements under certain derivative instrument arrangements. (See *Note 11 - Derivatives and Hedging Activities* - *Managing Credit Risk on Derivatives* to the accompanying combined financial statements for more information about the FHLBanks' additional collateral requirements.) Furthermore, member demand for certain FHLBank products could weaken. To the extent that the FHLBanks cannot access funding when needed on acceptable terms to effectively manage their cost of funds, their financial condition and results of operations and the value of FHLBank membership could be negatively affected.

Liquidity Risk

Disruptions in the short-term capital markets could have an adverse effect on the FHLBanks' ability to refinance their consolidated obligations or to manage their liquidity positions to meet members' needs on acceptable terms.

The FHLBanks' primary source of funds is the sale of consolidated obligations in the capital markets through the Office of Finance. The FHLBanks' ability to obtain funds through the sale of consolidated obligations depends generally on prevailing conditions in the capital markets, and in particular the short-term capital markets due to their reliance on short-term funding. Each FHLBank's ability to operate its business, meet its obligations, and generate net interest income depends primarily on the ability to issue debt continuously to meet member demand and to refinance existing outstanding consolidated obligations at attractive rates, maturities, and call features when needed.

The severe financial and economic disruptions during the financial crisis of 2008, and the U.S. government's dramatic measures enacted to mitigate their effects, have affected the FHLBanks' funding costs and practices. Changes to the regulatory environment that affect FHLBank debt underwriters and investors, particularly recent changes related to capital and liquidity requirements and money market fund reform, have also affected, and will continue to affect, the FHLBanks' ability to access the capital markets. For example, money market fund reform resulted in a significant increase in demand for government funds, agency debt, and FHLBanks' short-term consolidated obligations. While this increased demand benefited the FHLBanks' ability to raise short-term liquidity at attractive costs, such demand may be short-term in nature as money market investor risk and return preferences and money market regulatory requirements could change over time.

The FHLBanks are exposed to liquidity risk if there is any significant disruption in the short-term debt markets. If this disruption is prolonged, the FHLBanks may not be able to obtain funding on acceptable terms. Without access to the short-term debt markets, the alternative longer-term funding, if available, would increase funding costs and likely cause the FHLBanks to increase advance rates, adversely affecting demand for advances. If the FHLBanks cannot access funding when needed on acceptable terms, their ability to support and continue their operations would be adversely affected. As a result, an FHLBank's inability to manage its liquidity position or its contingency liquidity plan to meet its obligations, as well as the credit and liquidity needs of its members, could adversely affect that FHLBank's financial condition and results of operations, and the value of FHLBank membership. (See *Financial Discussion and Analysis - Liquidity and Capital Resources* for more discussion regarding the FHLBanks' liquidity requirements.)

Operational Risk

A failure of FHLBanks' business and financial models to produce reliable results could adversely affect FHLBanks' business, financial condition, results of operations, and risk management.

Each FHLBank makes significant use of business and financial models for managing different risks. Each FHLBank uses models to measure and monitor exposures to various risks, including interest rate, prepayment, and other market risks, as well as credit risk. Each FHLBank also uses models in determining the fair value of financial instruments when independent price quotations are not available or reliable. The information provided by these models is also used in making business decisions relating to strategies, initiatives, risk management, transactions, and products, and for financial reporting. Because models use assumptions to project future trends and performance, they are inherently imperfect predictors of actual results.

Changes in models or in their underlying assumptions, judgments, or estimates may cause the results generated by the models to be materially different. If the models are not reliable, an FHLBank could make poor business decisions, including poor asset and liability management decisions, that could result in an adverse financial effect on that FHLBank's business. Furthermore, strategies that an FHLBank employs to attempt to manage the risks associated with the use of models may not be effective. The models used by each FHLBank to determine the fair values of its assets and liabilities, including derivatives, may differ from the models used by the other FHLBanks. The use of different models or assumptions by individual FHLBanks, as well as changes in market conditions, could result in materially different valuation estimates or other estimates even when similar or identical assets and liabilities are being measured, and could have materially different effects on the net income and retained earnings of each of the FHLBanks.

For example, uncertainty in the housing and mortgage markets may increase the FHLBanks' exposure to the inherent risks associated with the reliance on internal models that use key assumptions to project future trends and performance. Although each FHLBank adjusts its internal models when necessary to reflect changes in economic conditions, housing markets, and other key factors, the risk remains that an FHLBank's internal models could produce unreliable results or estimates that vary materially from actual results. (See *Financial Discussion and Analysis - Critical Accounting Estimates* for more discussion about the FHLBanks' use of financial models in determining critical accounting estimates.)

A failure or breach, including as a result of cyber attacks, of the information systems of the FHLBanks and the Office of Finance, and those of critical vendors and third parties, could disrupt the FHLBanks' businesses or result in significant losses or reputational damage.

Each of the FHLBanks and the Office of Finance relies heavily on its information systems and other technology to conduct and manage its business. A failure or breach of these systems or other technologies, including events caused by cyber attacks, could disrupt and prevent the FHLBanks and the Office of Finance from conducting and managing their businesses effectively, including the FHLBanks' access to funds through the Office of Finance. Additionally, such failure or breach could result in significant losses, including a loss of data, intellectual property, or confidential information, reputational damages, or other harm.

Additionally, each of the FHLBanks and the Office of Finance relies on vendors and other third parties to perform certain critical services that may be sources of cyber security or other technological risks. Compromised security at those vendors and third parties could expose the FHLBanks and/or Office of Finance to risks, including cyber attacks, data loss, or other breaches.

Although each of the FHLBanks and the Office of Finance takes measures to protect the security of its information systems, these actions may not be able to prevent or mitigate the negative effects of certain failures or breaches. As such, a failure or breach of information systems could disrupt and adversely affect an FHLBank's or the Office of Finance's ability to conduct and manage its business effectively and could also result in significant losses, reputational damage, or other harm.

Failures of critical vendors and other third parties could disrupt the FHLBanks' and Office of Finance's ability to conduct and manage their businesses.

Each of the FHLBanks and the Office of Finance relies on vendors and other third parties to perform certain critical services. A failure in, or an interruption to, one of more of those services provided could negatively affect the business operations of the FHLBanks and the Office of Finance. If one or more of these key external parties were not able to perform their functions for a period of time, at an acceptable service level, or for increased volumes, the FHLBanks' and the Office of Finance's business operations could be constrained, disrupted, or otherwise negatively affected. Additionally, the use of vendors and other third parties also exposes the FHLBanks and the Office of Finance to the risk of a loss of data, intellectual property, or confidential information, or other harm. To the extent that vendors do not conduct their activities under appropriate standards, the FHLBanks and the Office of Finance could also be exposed to reputational risk.

FHLBanks rely on the Office of Finance for, among other services, the issuance and servicing of consolidated obligations, which represent their primary source of funds. A failure or an interruption in these services could disrupt the FHLBanks' access to these funds.

While each of the FHLBanks and the Office of Finance has a business continuity plan in place, the FHLBanks' and the Office of Finance's ability to conduct and manage their businesses may be constrained by a critical vendor or a third-party failure.

Failures or circumventions of the financial reporting controls and procedures that each of the FHLBanks and the Office of Finance maintain, and that the Office of Finance relies upon to prepare the FHLBanks Combined Financial Report, could adversely affect the accuracy and meaningfulness of the information contained in this Combined Financial Report.

Each FHLBank is responsible for establishing and maintaining disclosure controls and procedures and internal control over financial reporting with respect to the information and financial data provided to the Office of Finance. The Office of Finance is not required to establish and maintain disclosure controls and procedures and internal control over financial reporting in the same manner as those maintained by each FHLBank. Instead, the Office of Finance relies on each FHLBank management's certification and representation regarding the accuracy and completeness, in all material respects, of its data submitted to the Office of Finance and has established controls and procedures concerning: (1) each FHLBank's submission of information and financial data to the Office of Finance, (2) the process of combining the financial statements of the individual FHLBanks, and (3) the review of such information. However, an FHLBank's or the Office of Finance's failure to detect material weaknesses or circumventions of its respective key controls could have an adverse effect on the accuracy and meaningfulness of the FHLBanks Combined Financial Report. (See *Controls and Procedures* for more information regarding each FHLBank's management assessment of its individual internal control over financial reporting and evaluation of its disclosure controls and procedures, and the Office of Finance's controls and procedures over the combined financial reporting combining process.)

PROPERTIES AND GEOGRAPHIC DISTRIBUTION

The FHLBanks operate in all 50 states, the District of Columbia, and U.S. territories. Each FHLBank serves members whose principal place of business is located in its specifically-defined geographic district. In addition to their principal business location, each of the FHLBanks and the Office of Finance also maintain leased, off-site, back-up facilities, and may also maintain additional office space.

Table 4 - Properties and Geographic Distribution

FHLBank	Principal Business Address	Owned/ Leased	States and Territories	Number of Members
Boston	800 Boylston Street 9th Floor Boston, MA 02199	Leased	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	447
New York	101 Park Avenue New York, NY 10178-0599	Leased	New Jersey, New York, Puerto Rico, U.S. Virgin Islands	325
Pittsburgh	601 Grant Street Pittsburgh, PA 15219	Leased	Delaware, Pennsylvania, West Virginia	304
Atlanta	1475 Peachtree St., N.E. Atlanta, GA 30309	Owned	Alabama, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia	901
Cincinnati	221 East Fourth St. Suite 600 Cincinnati, OH 45202	Leased	Kentucky, Ohio, Tennessee	687
Indianapolis	8250 Woodfield Crossing Blvd. Indianapolis, IN 46240	Owned	Indiana, Michigan	394
Chicago	200 E. Randolph Dr. Chicago, IL 60601	Leased	Illinois, Wisconsin	728
Des Moines	801 Walnut Street Suite 200 (Skywalk Level) Des Moines, IA 50309	Leased	Alaska, American Samoa, Guam, Hawaii, Idaho, Iowa, Minnesota, Missouri, Montana, North Dakota, Commonwealth of the Northern Mariana Islands, Oregon, South Dakota, Utah, Washington, Wyoming	1,422
Dallas	8500 Freeport Parkway South Irving, TX 75063	Owned	Arkansas, Louisiana, Mississippi, New Mexico, Texas	831
Topeka	One Security Benefit Place Suite 100 Topeka, KS 66606-2444	Leased	Colorado, Kansas, Nebraska, Oklahoma	755
San Francisco	600 California Street Suite 300 San Francisco, CA 94108	Leased	Arizona, California, Nevada	331
Office of Finance	1818 Library Street Suite 200 Reston, VA 20190	Leased		

See *Market for Capital Stock and Related Stockholder Matters* for more information on FHLBank members.

LEGAL PROCEEDINGS

The FHLBanks are subject to various pending legal proceedings arising in the normal course of business. The FHLBanks and the Office of Finance are not a party to, nor are they subject to, any pending legal proceedings, except the following identified proceedings, where the ultimate liability of the FHLBanks, if any, arising out of these proceedings is likely to have a material effect on the results of operations, financial condition, or liquidity of the FHLBanks or that are otherwise material to the FHLBanks. (See each FHLBank's 2016 SEC Form 10-K under *Part I. Item 3-Legal Proceedings* for additional information, including updates, to its legal proceedings.)

Legal Proceedings Relating to the Purchase of Certain Private-label MBS

As of December 31, 2016, each of the FHLBanks of Boston, Chicago, Des Moines, and San Francisco is a plaintiff in continued legal proceedings that relate to the purchases of certain private-label MBS. Defendants in these lawsuits include entities and their affiliates that buy, sell, or distribute the FHLBanks' consolidated obligations or are derivative counterparties. These defendants and their affiliates may be members or former members of the plaintiff FHLBanks or other FHLBanks. As a result of its merger with the FHLBank of Seattle, the FHLBank of Des Moines became involved in a number of legal proceedings initiated by the FHLBank of Seattle against various entities relating to its purchases and subsequent impairment of certain private-label MBS. Although the FHLBank of Seattle sold all private-label MBS during the three months ended March 31, 2015, the FHLBank of Des Moines continues to be involved in these legal proceedings. (See *Note 21 - Subsequent Events* to the accompanying combined financial statements for additional information relating to certain FHLBanks' private-label MBS settlements.)

Legal Proceedings Relating to the Lehman Bankruptcy

See *Note 20 - Commitments and Contingencies* - *Lehman Bankruptcy* to the accompanying combined financial statements for information on legal proceedings relating to bankruptcy proceedings involving Lehman Brothers Holdings, Inc.

MARKET FOR CAPITAL STOCK AND RELATED STOCKHOLDER MATTERS

As a cooperative, each FHLBank conducts its advances business and mortgage loan programs almost exclusively with its members. Members and former members own all of the FHLBanks' capital stock. There is no established marketplace for the FHLBanks' stock and it is not publicly traded. FHLBank stock is purchased by members at the stated par value of $100 per share and may be redeemed/repurchased at its stated par value of $100 per share, subject to applicable redemption periods and certain conditions and limitations. (See *Note 16 - Capital* to the accompanying combined financial statements and *Business - Capital, Capital Rules, and Dividends* for more information.)

At December 31, 2016, the FHLBanks had 379 million shares of capital stock outstanding, including mandatorily redeemable capital stock. The FHLBanks are not required to register their securities under the Securities Act of 1933, as amended; however, each FHLBank is required to register a class of its stock under the Securities Exchange Act of 1934, as amended.

Table 5 presents combined regulatory capital stock, which includes mandatorily redeemable capital stock, held by type of member and Table 6 presents FHLBank membership by type of member.

Table 5 - Regulatory Capital Stock Held by Type of Member
(dollars in millions)

	December 31, 2016		December 31, 2015	
	Amount	Percentage of Regulatory Capital Stock	Amount	Percentage of Regulatory Capital Stock
Commercial banks	$ 23,650	62.3%	$ 21,070	60.4%
Thrifts	4,961	13.1%	4,892	14.0%
Insurance companies	4,009	10.6%	4,821	13.8%
Credit unions	3,605	9.5%	3,394	9.7%
Community development financial institutions	9	—	8	—
Total GAAP capital stock	36,234	95.5%	34,185	97.9%
Mandatorily redeemable capital stock	1,704	4.5%	745	2.1%
Total combined regulatory capital stock	$ 37,938	100.0%	$ 34,930	100.0%

Table 6 - Membership by Type of Member

	December 31, 2016		December 31, 2015	
	Number	Percentage of Total Members	Number	Percentage of Total Members
Commercial banks	4,520	63.5%	4,688	64.8%
Credit unions	1,389	19.5%	1,319	18.2%
Thrifts	778	10.9%	818	11.3%
Insurance companies	393	5.5%	372	5.1%
Community development financial institutions	45	0.6%	41	0.6%
Total	7,125	100.0%	7,238	100.0%

The information on regulatory capital stock presented in Table 7 is accumulated at the holding-company level. The percentage of total regulatory capital stock identified in Table 7 for each holding company was computed by dividing all regulatory capital stock owned by subsidiaries of that holding company by total combined regulatory capital stock. These percentage concentrations do not represent ownership concentrations in an individual FHLBank.

Table 7 - Top 10 Regulatory Capital Stockholders by Holding Company at December 31, 2016
(dollars in millions)

Holding Company Name(1)	FHLBank Districts(2)	Regulatory Capital Stock(3)	Percentage of Total Regulatory Capital Stock	Mandatorily Redeemable Capital Stock
Wells Fargo & Company	Des Moines, Dallas, Topeka, San Francisco	$ 3,132	8.3%	$ 32
JPMorgan Chase & Co.	Pittsburgh, Cincinnati, Chicago, Des Moines, San Francisco	2,852	7.5%	661
Citigroup Inc.	New York, Dallas, San Francisco	1,821	4.8%	54
The PNC Financial Services Group, Inc.	New York, Pittsburgh, Atlanta, Cincinnati	883	2.3%	24
MetLife, Inc.	Boston, New York, Pittsburgh, Des Moines	869	2.3%	31
Capital One Financial Corporation	Atlanta, Dallas	760	2.0%	—
New York Community Bancorp, Inc.	New York	591	1.6%	—
Navy Federal Credit Union	Atlanta	589	1.6%	—
Ally Financial Inc.	Pittsburgh	577	1.5%	—
Bank of America Corporation	Boston, Atlanta, Des Moines, San Francisco	528	1.4%	7
		$ 12,602	33.3%	$ 809

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(1) Holding company information was obtained from the Federal Reserve System's web site, the National Information Center (NIC), and SEC filings. The NIC is a central repository of data about banks and other institutions for which the Federal Reserve System has a supervisory, regulatory, or research interest, including both domestic and foreign banking organizations operating in the United States.
(2) At December 31, 2016, each holding company had subsidiaries with regulatory capital stock holdings in these FHLBank districts.
(3) Includes FHLBank capital stock that is considered to be mandatorily redeemable, which is classified as a liability under GAAP.

Table 8 presents information on the five largest regulatory capital stockholders by FHLBank at December 31, 2016. The information presented on capital stock in Table 8 is for individual FHLBank regulatory capital stockholders. The data is not aggregated to the holding-company level. Some of the institutions listed may be affiliates of the same holding company, and some of the institutions listed may have affiliates that are regulatory capital stockholders that are not listed in the table. Each FHLBank describes its risk management policies, including disclosures about its concentration risk, if any, in its periodic reports filed with the SEC. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report*.)

Table 8 - Top 5 Regulatory Capital Stockholders by FHLBank at December 31, 2016
(dollars in millions)

District	Name	Holding Company Name(1)	Regulatory Capital Stock	Percentage of FHLBank Regulatory Capital Stock(2)	Mandatorily Redeemable Capital Stock
Boston	Citizens Bank, National Association		$ 358	14.6 %	$ —
	People's United Bank, National Association		155	6.3 %	—
	Webster Bank, National Association		144	5.9 %	—
	Massachusetts Mutual Life Insurance Company		74	3.1 %	—
	Berkshire Bank		57	2.4 %	—
			$ 788	32.3 %	$ —
New York	Citibank, N.A.	Citigroup Inc.	$ 1,767	27.9 %	$ —
	Metropolitan Life Insurance Company	MetLife, Inc.	748	11.8 %	—
	New York Community Bank	New York Community Bancorp, Inc.	574	9.1 %	—
	HSBC Bank USA, National Association		338	5.3 %	—
	Investors Bank(3)		238	3.7 %	—
			$ 3,665	57.8 %	$ —

District	Name	Holding Company Name(1)	Regulatory Capital Stock	Percentage of FHLBank Regulatory Capital Stock(2)	Mandatorily Redeemable Capital Stock
Pittsburgh	Chase Bank USA, National Association	JPMorgan Chase & Co.	$ 874	23.2 %	$ —
	PNC Bank, National Association(3)	The PNC Financial Services Group, Inc.	860	22.9 %	—
	Ally Bank	Ally Financial Inc.	577	15.4 %	—
	Santander Bank, N.A.(3)		280	7.4 %	—
	Citizens Bank of Pennsylvania		121	3.2 %	—
			$ 2,712	72.1 %	$ —
Atlanta	Capital One, National Association	Capital One Financial Corporation	$ 745	15.0 %	$ —
	Navy Federal Credit Union	Navy Federal Credit Union	588	11.9 %	—
	Bank of America, National Association	Bank of America Corporation	504	10.2 %	—
	EverBank		249	5.0 %	—
	BankUnited, National Association		238	4.8 %	—
			$ 2,324	46.9 %	$ —
Cincinnati	JPMorgan Chase Bank, National Association	JPMorgan Chase & Co.	$ 1,317	31.4 %	$ —
	U.S. Bank National Association		475	11.4 %	—
	Fifth Third Bank		248	5.9 %	—
	The Huntington National Bank		244	5.8 %	—
	KeyBank National Association		122	2.9 %	—
			$ 2,406	57.4 %	$ —
Indianapolis	Flagstar Bank, FSB		$ 180	10.8 %	$ —
	Jackson National Life Insurance Company		125	7.5 %	—
	The Lincoln National Life Insurance Company		120	7.2 %	—
	Tuebor Captive Insurance Company LLC		78	4.7 %	—
	IAS Services LLC		74	4.5 %	—
			$ 577	34.7 %	$ —
Chicago	One Mortgage Partners Corp.	JPMorgan Chase & Co.	$ 245	12.2 %	$ 245
	BMO Harris Bank, National Association		197	9.8 %	—
	The Northern Trust Company		150	7.5 %	—
	State Farm Bank, FSB		148	7.4 %	—
	MB Financial Bank, National Association		68	3.4 %	—
			$ 808	40.3 %	$ 245
Des Moines	Wells Fargo Bank, National Association	Wells Fargo & Company	$ 3,093	47.0 %	$ —
	Transamerica Life Insurance Company		177	2.7 %	—
	TH Insurance Holdings Company LLC		168	2.6 %	—
	Truman Insurance Company, LLC		146	2.2 %	146
	HICA Education Loan Corporation		140	2.1 %	140
			$ 3,724	56.6 %	$ 286

District	Name	Holding Company Name(1)	Regulatory Capital Stock	Percentage of FHLBank Regulatory Capital Stock(2)	Mandatorily Redeemable Capital Stock
Dallas	Comerica Bank		$ 122	6.3 %	$ —
	Texas Capital Bank, National Association		72	3.7 %	—
	Centennial Bank		68	3.5 %	—
	Southside Bank(3)		61	3.2 %	—
	Prosperity Bank		55	2.9 %	—
			$ 378	19.6 %	$ —
Topeka	BOKF, National Association		$ 220	17.9 %	$ —
	MidFirst Bank		198	16.1 %	—
	Capitol Federal Savings Bank		105	8.6 %	—
	United of Omaha Life Insurance Company		31	2.5 %	—
	Mutual of Omaha Bank		27	2.2 %	—
			$ 581	47.3 %	$ —
San Francisco	JPMorgan Chase Bank, National Association(4)	JPMorgan Chase & Co.	$ 400	14.1 %	$ 400
	Bank of the West		197	7.0 %	—
	First Republic Bank		161	5.7 %	—
	Charles Schwab Bank		81	2.8 %	—
	CIT Bank, National Association		75	2.7 %	—
			$ 914	32.3 %	$ 400

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(1) The holding company name is only shown for each Top 5 regulatory capital stockholder that has its holding company listed in Table 7 - Top 10 Regulatory Capital Stockholders by Holding Company at December 31, 2016.

(2) For consistency with the individual FHLBank's presentation of its Top 5 regulatory capital stockholders at December 31, 2016, amounts used to calculate percentages of FHLBank regulatory capital stock may be based on numbers in thousands. Accordingly, recalculations using the amounts in millions as presented in Table 8 may not produce the same results.

(3) Indicates that an officer or director of the stockholder was an FHLBank director at December 31, 2016.

(4) Non-member stockholder that is holding legacy capital stock due to out-of-district acquisition, merger, or relocation.

SELECTED FINANCIAL DATA

(dollars in millions)	2016	2015	2014	2013	2012
Selected Statement of Condition Data at December 31,					
Investments(1)	$ 292,017	$ 273,684	$ 270,217	$ 242,863	$ 265,825
Advances	705,225	634,022	570,726	498,599	425,750
Mortgage loans held for portfolio	48,494	44,575	43,582	44,465	49,526
Allowance for credit losses on mortgage loans	(18)	(18)	(52)	(88)	(132)
Total assets	1,056,712	969,239	913,310	834,135	762,423
Consolidated obligations					
Discount notes	409,815	494,045	362,303	293,296	216,282
Bonds	578,927	411,851	486,031	473,845	475,856
Total consolidated obligations	988,742	905,896	848,334	767,141	692,138
Mandatorily redeemable capital stock	1,704	745	2,631	4,998	6,929
Subordinated notes(2)	—	944	944	944	1,000
Capital					
Total capital stock(3)	36,234	34,185	33,705	33,375	33,535
Additional capital from merger(4)	52	194	—	—	—
Retained earnings	16,330	14,297	13,211	12,141	10,493
Accumulated other comprehensive income (loss)	(157)	(634)	54	(511)	(1,510)
Total capital	52,459	48,042	46,970	45,005	42,518
Selected Statement of Income Data for the year ended December 31,					
Net interest income	$ 3,835	$ 3,553	$ 3,532	$ 3,379	$ 4,029
Provision (reversal) for credit losses	6	4	(21)	(19)	21
Net interest income after provision (reversal) for credit losses	3,829	3,549	3,553	3,398	4,008
Non-interest income (loss)	1,154	843	17	329	(154)
Non-interest expense	1,183	1,199	1,046	943	975
Affordable Housing Program Assessments	392	332	269	293	296
Net income	$ 3,408	$ 2,861	$ 2,255	$ 2,491	$ 2,583
Selected Other Data for the year ended December 31,					
Cash and stock dividends	$ 1,517	$ 1,514	$ 1,185	$ 843	$ 659
Dividend payout ratio(5)	44.51%	52.92%	52.55%	33.84%	25.51%
Return on average equity(6)	6.90%	6.12%	4.95%	5.80%	6.42%
Return on average assets	0.34%	0.31%	0.26%	0.32%	0.34%
Average equity to average assets	4.88%	5.08%	5.26%	5.50%	5.27%
Net interest margin(7)	0.38%	0.39%	0.41%	0.44%	0.53%
Selected Other Data at December 31,					
GAAP capital-to-asset ratio	4.96%	4.96%	5.14%	5.40%	5.58%
Regulatory capital-to-assets ratio(8)	5.14%	5.10%	5.42%	6.06%	6.68%

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(1) Investments consist of interest-bearing deposits, securities purchased under agreements to resell, federal funds sold, trading securities, available-for-sale securities, and held-to-maturity securities.
(2) The subordinated notes outstanding, issued by the FHLBank of Chicago, matured and were paid in full on June 13, 2016. (See *Note 15 - Subordinated Notes* to the accompanying combined financial statements for additional information on subordinated notes.)
(3) FHLBank capital stock is redeemable at the request of a member subject to the statutory redemption periods and other conditions and limitations. (See *Note 16 - Capital* to the accompanying combined financial statements for additional information on the statutory redemption periods and other conditions and limitations.)
(4) Additional capital from merger primarily represents the amount of the FHLBank of Seattle's closing retained earnings balance as of the merger date, adjusted for fair value and other purchase accounting adjustments, and identified intangible assets, and is net of dividends paid by the FHLBank of Des Moines subsequent to the merger date. (See *Note 16 - Capital* to the accompanying combined financial statements for additional information.)
(5) Dividend payout ratio is equal to dividends declared in the period expressed as a percentage of net income in the period. This ratio may not be as relevant to the combined balances because there are no shareholders at the FHLBank System-wide level.
(6) Return on average equity is equal to net income expressed as a percentage of average total capital.
(7) Net interest margin is equal to net interest income represented as a percentage of average interest-earning assets.
(8) The regulatory capital-to-assets ratio is calculated based on the FHLBanks' regulatory capital as a percentage of total assets. (See *Note 16 - Capital* to the accompanying combined financial statements for a definition and discussion of regulatory capital.)

FINANCIAL DISCUSSION AND ANALYSIS OF
COMBINED FINANCIAL CONDITION AND COMBINED RESULTS OF OPERATIONS

Investors should read this financial discussion and analysis of combined financial condition and combined results of operations together with the combined financial statements and the accompanying notes in this Combined Financial Report of the FHLBanks. Each FHLBank discusses its financial condition and results of operations in its periodic reports filed with the SEC. Each FHLBank's Annual Report on SEC Form 10-K and Quarterly Report on SEC Form 10-Q contains, as required by applicable SEC rules, a "Management's Discussion and Analysis of Financial Condition and Results of Operations," commonly called MD&A. The SEC notes that one of the principal objectives of MD&A is "to provide a narrative explanation of a registrant's financial statements that enables investors to see the registrant through the eyes of management." Because there is no centralized management of the FHLBanks that can provide a system-wide "eyes of management" view of the FHLBanks as a whole, this Combined Financial Report does not contain a conventional MD&A. Instead, a "Financial Discussion and Analysis of Combined Financial Condition and Combined Results of Operations" is prepared by the Office of Finance using information provided by the individual FHLBanks. This Financial Discussion and Analysis does not generally include a separate description of how each FHLBank's operations affect the combined financial condition and combined results of operations. That level of information about each of the FHLBanks is addressed in each respective FHLBank's periodic reports filed with the SEC. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report* and *Supplemental Information - Individual Federal Home Loan Bank Selected Financial Data and Financial Ratios*.)

The combined financial statements include the financial records of the FHLBanks. (See *Condensed Combining Schedules* for information regarding each individual FHLBank's results.) Transactions among the FHLBanks have been eliminated in accordance with combination accounting principles related to consolidation under GAAP. (See *Note 1 - Summary of Significant Accounting Policies* to the accompanying combined financial statements and *Interbank Transfers of Consolidated Bonds and Their Effect on Combined Net Income* for more information.)

Unless otherwise stated, dollar amounts disclosed in this Combined Financial Report represent values rounded to the nearest million. Dollar amounts rounding to less than one million are not reflected in this Combined Financial Report.

Forward-Looking Information

Statements contained in this report, including statements describing the objectives, projections, estimates, or future predictions of the FHLBanks and Office of Finance, may be "forward-looking statements." These statements may use forward-looking terminology, such as "anticipates," "believes," "could," "estimates," "may," "should," "will," "would," or their negatives or other variations on these terms. Investors should note that forward-looking statements, by their nature, involve risks or uncertainties, including those set forth in the *Risk Factors* section of this report. Therefore, the actual results could differ materially from those expressed or implied in these forward-looking statements or could affect the extent to which a particular objective, projection, estimate, or prediction is realized.

These forward-looking statements involve risks and uncertainties including, but not limited to, the following:

- changes in the general economy, money and capital markets, the rate of inflation (or deflation), employment rates, housing market activity and housing prices, the size and volatility of the residential mortgage market, and uncertainty regarding the global economy;
- volatility of market prices, interest rates, and indices or other factors that could affect the value of investments or collateral held by the FHLBanks resulting from the effects of, and changes in, various monetary or fiscal policies and regulations, including those determined by the Federal Reserve Board and the Federal Deposit Insurance Corporation (FDIC), or a decline in liquidity in the financial markets;
- political events, including legislative, regulatory, judicial, or other developments that affect the FHLBanks, their members, counterparties, underwriters, or investors in the consolidated obligations of the FHLBanks, including changes in the Federal Home Loan Bank Act of 1932, as amended (FHLBank Act), housing finance and government-sponsored enterprise (GSE) reform, Federal Housing Finance Agency (FHFA) actions, or regulations that affect FHLBank operations, and regulatory oversight;

- competitive forces, including other sources of funding available to FHLBank members and other entities borrowing funds in the capital markets;
- disruptions in the credit and debt markets and the effect on future funding costs, sources, and availability;
- demand for FHLBank advances resulting from changes in FHLBank members' deposit flows and credit demands;
- loss of members and repayment of advances made to those members due to institutional failures, consolidations, voluntary withdrawals, or involuntary terminations from FHLBank membership, and changes in the financial health of members;
- changes in domestic and foreign investor demand for consolidated obligations, including short-term funding, or the terms of derivative transactions and similar transactions, including changes in the relative attractiveness of consolidated obligations as compared to other investment opportunities, changes in support from FHLBank debt underwriters, and changes resulting from any modification of credit ratings;
- the availability of acceptable institutional counterparties for business transactions, including derivative transactions used to manage interest-rate risk;
- the ability to introduce new products and services and successfully manage the risks associated with those products and services, including new types of collateral used to secure advances;
- the pace of technological change and the ability to develop, secure, and support technology and information systems to effectively manage the risks; and
- the effect of new accounting guidance, including the development of supporting systems and related internal controls.

Neither the FHLBanks nor the Office of Finance undertakes any obligation to publicly update or revise any forward-looking statements contained in this Combined Financial Report, whether as a result of new information, future events, changed circumstances, or any other reason.

Executive Summary

This overview highlights selected information and may not contain all of the information that is important to readers of this Combined Financial Report. For a more complete understanding of events, trends, and uncertainties, this executive summary should be read together with the Financial Discussion and Analysis section in its entirety and the FHLBanks' combined financial statements and related notes.

Overview

The FHLBanks are GSEs, federally-chartered, but privately capitalized and independently managed. The FHLBanks together with the Office of Finance, the fiscal agent of the FHLBanks, comprise the FHLBank System. All FHLBanks and the Office of Finance operate under the supervisory and regulatory framework of the FHFA.

The FHLBanks are cooperative institutions, meaning that their stockholders are also the FHLBanks' primary customers. FHLBank capital stock is not publicly traded; it is purchased by members from, and redeemed or repurchased by, an FHLBank at the stated par value of $100 per share. The FHLBanks are generally designed to expand and contract in asset size as the needs of member financial institutions and their communities change over time.

Each FHLBank's primary business is to serve as a financial intermediary between the capital markets and its members. This intermediation process involves raising funds by issuing debt, known as consolidated obligations, in the capital markets and lending those proceeds to member institutions in the form of secured loans, known as advances. Each FHLBank's funding is principally obtained from consolidated obligations issued through the Office of Finance on behalf of the FHLBanks. Consolidated obligations are the joint and several obligation of each FHLBank. FHLBank debt issuance is generally driven by members' needs for advances.

The FHLBanks seek to maintain a balance between their public policy mission and their goal of providing adequate returns on member capital. The FHLBanks strive to achieve this balance by providing value to their members through advances, other services, and dividend payments. The FHLBanks' primary sources of earnings are the net interest spread between the yield on interest-earning assets and the yield on interest-bearing liabilities, combined with earnings on invested capital. However, due to the FHLBanks' cooperative structures, the FHLBanks generally earn a narrow net interest spread.

External Credit Ratings

The FHLBank System's ability to raise funds in the capital markets at narrow spreads to the U.S. Treasury yield curve is due largely to the FHLBanks' status as GSEs, which is reflected in its consolidated obligations receiving the same credit rating as the government bond credit rating of the United States, even though the consolidated obligations are not obligations of the United States and are not guaranteed by either the United States or any government agency. In addition to ratings on the FHLBanks' consolidated obligations, each FHLBank is rated individually by Moody's Investors Service (Moody's) and S&P Global Ratings (S&P). (See *External Credit Ratings* for more information.) Investors should note that a rating issued by a rating agency is not a recommendation to buy, sell, or hold securities, and that the ratings may be revised or withdrawn by the rating agency at any time. Investors should evaluate the rating of each rating agency independently. Moody's, S&P, or other rating organizations could downgrade or upgrade the credit rating of the U.S. government and, in turn, GSEs, including the FHLBanks and their consolidated obligations.

Business Environment

The primary external factors that affect the FHLBanks' combined financial condition and results of operations include (1) the general state of the economy and financial markets; (2) the conditions in the housing markets; (3) interest rate levels and volatility; and (4) the legislative and regulatory environment.

Economy and Financial Markets. The FHLBanks' members typically use wholesale funding in the form of advances along with other sources of funding, such as retail deposits, as sources of liquidity to make residential mortgage loans. The FHLBanks' overall results of operations are influenced by the economy and financial markets, and, in particular, by the FHLBanks' member demand for wholesale funding and the FHLBanks' ability to maintain sufficient access to diverse sources of funding at relatively favorable rates.

The FHLBanks' flexibility in utilizing various funding tools, in combination with a diverse investor base and their unique status as GSEs, have helped ensure reliable market access and demand for FHLBank consolidated obligations, despite market uncertainty and regulations affecting debt underwriters. Regulatory changes to institutional money market funds during 2016 resulted in increased investor demand for short-term FHLBank debt. The FHLBank System continued to meet its funding needs in response to growth in advances during the year ended December 31, 2016.

Economic and market data received prior to the Federal Open Market Committee meeting in December 2016, indicated that the labor market continued to strengthen and that economic activity expanded at a moderate pace since mid-2016. Inflation continued to run below the Federal Open Market Committee's longer-run objective of two percent; however, inflation is expected to rise to two percent over the medium term. The Federal Open Market Committee also stated that it is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities (MBS) back into agency MBS, and of rolling over maturing Treasury securities at auction.

The unemployment rate declined to 4.7% in December 2016, compared to 5.0% in December 2015. U.S. real gross domestic product increased 1.6% in 2016 according to the second estimate released by the Bureau of Economic Analysis, compared to an increase of 2.6% in 2015.

Conditions in Housing Markets. Conditions in the U.S. housing markets primarily affect the FHLBanks through the creation of demand for, and yield on, advances and mortgage loans, as well as the yield on investments in mortgage-backed securities. Total existing home sale transactions were 5.45 million in 2016, an increase of 3.8% on a year-over-year basis, driven by low mortgage rates and a stronger labor market. For the year ended December 31, 2016, the share of first-time homebuyers represented 32% of existing home sales, compared to 30% in 2015. Limited housing inventory and strong demand have continued to push home prices higher. The increased equity gained from rising home prices reduced the number of homeowners whose mortgage loan balances exceed the fair market value of their homes and also reduced the number of distressed sales of homes to 7% of existing-home sales in December 2016, compared to 8% in December 2015.

Interest Rate Levels and Volatility. The level and volatility of interest rates affect FHLBank member demand for wholesale funding. In addition, credit spreads and the shape of the yield curve affect investor demand for consolidated obligations. These factors also impact the FHLBanks' combined results of operations, primarily affecting net interest income and the valuation of certain assets and liabilities.

Interest rate levels, volatility, and spreads were affected by several factors during the year ended December 31, 2016. There was uncertainty in the global markets driven by the United Kingdom's vote to leave the European Union, China's economic slowdown, and the negative interest-rate policies of several European central banks, including the European Central Bank (ECB), as well as the Bank of Japan. In the United States, monetary policy, financial regulation, heavy issuance of corporate debt, and the results of the 2016 U.S. elections were influencing factors.

Table 9 presents key interest rate data that illustrates the flattening of the yield curve, as average short-term interest rates were higher and average long-term interest rates were lower, during the year ended December 31, 2016, compared to the same periods in 2015.

Table 9 - Key Interest Rates

	Three-Month Average		Twelve-Month Average		Ending Rate	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Federal Funds Effective	0.45%	0.16%	0.39%	0.13%	0.55%	0.20%
3-month LIBOR	0.92%	0.41%	0.74%	0.32%	1.00%	0.61%
2-year swap rate	1.24%	0.93%	1.00%	0.88%	1.45%	1.18%
10-year swap rate	1.99%	2.10%	1.70%	2.18%	2.34%	2.19%
3-month U.S. Treasury yield	0.42%	0.11%	0.31%	0.04%	0.50%	0.17%
2-year U.S. Treasury yield	1.00%	0.82%	0.83%	0.68%	1.19%	1.05%
30-year residential mortgage note rate	4.03%	4.09%	3.87%	4.04%	4.39%	4.19%

Source: Bloomberg

The Federal Reserve Board, acting through its Federal Open Market Committee, decided in December 2016, to raise the target range for the federal funds rate to 0.50% to 0.75%, based on labor market conditions and inflation. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Federal Open Market Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and two percent inflation.

During the year ended December 31, 2016, the cost of FHLBank consolidated obligations, as measured by the spread to comparative U.S. Treasury rates, has remained relatively stable. Funding spreads to three-month LIBOR, especially short-term funding spreads, generally improved for the year ended December 31, 2016, resulting primarily from increased investor demand for FHLBank consolidated obligations and rising LIBOR. Table 10 presents the FHLBanks' funding spreads to three-month LIBOR.

Table 10 - Funding Spreads to Three-Month LIBOR
(in basis points)

	Three-Month Average		Twelve-Month Average		Ending Spread	
Borrowing Term	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
3-months	(44.6)	(13.2)	(33.5)	(14.4)	(42.7)	(20.2)
2-years	(12.4)	0.7	(4.7)	(7.8)	(16.5)	(0.2)
5-years	12.8	17.5	17.3	6.8	9.0	16.2
10-years	51.6	61.4	57.2	49.1	57.7	59.5

Legislative and Regulatory Environment. The legislative and regulatory environment in which each FHLBank and its members and underwriters operate continues to evolve as regulators continue to implement the Housing and Economic Recovery Act of 2008, as amended (Housing Act), and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act). Potential legislative and regulatory changes, as well as other rules and regulations issued by the FHFA, could adversely affect the FHLBanks, FHLBank members, investors, and debt underwriters. The FHLBanks' business operations, funding costs, rights, obligations, and/or the environment in which the FHLBanks carry out their mission could be significantly affected by these changes. (See *Legislative and Regulatory Developments* for more information.)

FHLBanks' Financial Highlights

Combined Financial Condition. Total assets were $1.057 trillion at December 31, 2016, an increase of 9.0% from $969.2 billion at December 31, 2015. Advances were $705.2 billion at December 31, 2016, an increase of 11.2% from $634.0 billion at December 31, 2015, driven primarily by higher member demand, particularly by large members. Investments were $292.0 billion at December 31, 2016, an increase of 6.7% from $273.7 billion at December 31, 2015, resulting from increases in federal funds sold, mortgage-backed securities, and securities purchased under agreements to resell. Mortgage loans held for portfolio, net were $48.5 billion at December 31, 2016, an increase of 8.8% from $44.6 billion at December 31, 2015, driven by higher mortgage loan purchases from members.

Total liabilities were $1.004 trillion at December 31, 2016, an increase of 9.0% from $921.2 billion at December 31, 2015. This increase was primarily the result of increases in consolidated obligations and mandatorily redeemable capital stock. Total consolidated obligations were $988.7 billion at December 31, 2016, an increase of 9.1% from $905.9 billion at December 31, 2015, due primarily to increased funding needs related to the growth in advances, and consisted of a 40.6% increase in consolidated bonds, partially offset by a 17.0% decrease in consolidated discount notes. Mandatorily redeemable capital stock was $1.7 billion at December 31, 2016, an increase of $1.0 billion from $0.7 billion at December 31, 2015, driven primarily by the FHFA rule on FHLBank membership that, among other things, requires the FHLBanks to terminate the membership of captive insurance companies by specified dates, resulting in a reclassification of capital stock held by these members to mandatorily redeemable capital stock.

Total GAAP capital was $52.5 billion at December 31, 2016, an increase of 9.2% from $48.0 billion at December 31, 2015. This increase was due primarily to an increase in capital stock and growth in retained earnings. Capital stock was $36.2 billion at December 31, 2016, an increase of 6.0% from $34.2 billion at December 31, 2015. Retained earnings were $16.3 billion at December 31, 2016, an increase of 14.2% from $14.3 billion at December 31, 2015, resulting from net income of $3,408 million, offset by dividends of $1,375 million.

Combined Results of Operations. Net income was $3,408 million for the year ended December 31, 2016, an increase of $547 million, or 19.1%, compared to the same period in 2015. This increase was driven by higher net interest income and higher non-interest income.

Net interest income after provision (reversal) for credit losses was $3,829 million for the year ended December 31, 2016, an increase of $280 million, or 7.9%, compared to the same period in 2015. Net interest margin was 0.38% for the year ended December 31, 2016, a decrease of 1 basis point compared to the same period in 2015.

Interest income was $10,930 million for the year ended December 31, 2016, an increase of $2,769 million, or 33.9%, compared to the same period in 2015. This increase was due primarily to higher yields on advances and investments, and increases in the average balances of advances. Interest expense was $7,095 million for the year ended December 31, 2016, an increase of $2,487 million, or 54.0%, compared to the same period in 2015. This increase was due primarily to higher yields on, and increases in the average balances of, consolidated obligations.

Non-interest income was $1,154 million for the year ended December 31, 2016, an increase of $311 million, or 36.9%, compared to the same period in 2015, due primarily to higher gains on litigation settlements, and lower losses on trading securities, partially offset by lower gains on derivatives and hedging activities. Non-interest expense was $1,183 million for the year ended December 31, 2016, a decrease of $16 million, or 1.3%, compared to the same period in 2015.

Affordable Housing Program assessments were $392 million for the year ended December 31, 2016, an increase of $60 million, or 18.1%, compared to the same period in 2015. Affordable Housing Program assessments result from individual FHLBank income subject to assessments.

See *Combined Financial Condition* and *Combined Results of Operations* for further information.

Combined Financial Condition

Total assets were $1.057 trillion at December 31, 2016, an increase of 9.0% from $969.2 billion at December 31, 2015, consisting of increases in advances and investments, partially offset by a decrease in cash. Total liabilities were $1.004 trillion at December 31, 2016, an increase of 9.0% from $921.2 billion at December 31, 2015. This increase was primarily the result of increases in consolidated obligations and mandatorily redeemable capital stock. The following discussion contains information on the major categories of the Combined Statement of Condition: advances, investments, mortgage loans, consolidated obligations, deposits, and capital.

Advances

The FHLBanks provide liquidity to members and housing associates through secured loans (advances), which may be used for residential mortgages, community investments, and other services for housing and community development. Each FHLBank makes advances based on the security of mortgage loans and other types of eligible collateral pledged by, and the creditworthiness and financial condition of, the borrowing institutions.

Table 11 presents advances outstanding by product type and contractual maturity, some of which include advances that contain embedded put or call options. A member either can sell an embedded option to an FHLBank or it can purchase an embedded option from an FHLBank. (See *Note 8 - Advances* to the accompanying combined financial statements for additional information on putable and callable advances and their potential effects on advance maturities.)

Table 11 - Types of Advances by Contractual Maturity
(dollars in millions)

	December 31, 2016		December 31, 2015		
	Amount	Percentage of Total Par Value of Advances	Amount	Percentage of Total Par Value of Advances	Change
Fixed-rate					
Due in 1 year or less	$ 181,631	25.8%	$ 168,290	26.7%	$ 13,341
Due after 1 year through 3 years	73,782	10.5%	73,733	11.7%	49
Due after 3 years through 5 years	33,368	4.7%	33,093	5.2%	275
Thereafter	18,152	2.6%	21,350	3.4%	(3,198)
Total par value	306,933	43.6%	296,466	47.0%	10,467
Fixed-rate, callable or prepayable(1)					
Due in 1 year or less	22	—	690	0.1%	(668)
Due after 1 year through 3 years	60	—	543	0.1%	(483)
Due after 3 years through 5 years	224	—	158	—	66
Thereafter	234	—	939	0.1%	(705)
Total par value	540	—	2,330	0.3%	(1,790)
Fixed-rate, putable					
Due in 1 year or less	3,670	0.5%	1,837	0.3%	1,833
Due after 1 year through 3 years	3,042	0.4%	8,112	1.3%	(5,070)
Due after 3 years through 5 years	1,806	0.3%	1,166	0.2%	640
Thereafter	2,619	0.4%	1,104	0.2%	1,515
Total par value	11,137	1.6%	12,219	2.0%	(1,082)
Variable-rate					
Due in 1 year or less	68,119	9.7%	60,542	9.6%	7,577
Due after 1 year through 3 years	72,278	10.3%	59,562	9.4%	12,716
Due after 3 years through 5 years	18,936	2.7%	18,285	2.9%	651
Thereafter	2,870	0.4%	4,653	0.7%	(1,783)
Total par value	162,203	23.1%	143,042	22.6%	19,161
Variable-rate, callable or prepayable(1)					
Due in 1 year or less	31,644	4.5%	18,367	2.9%	13,277
Due after 1 year through 3 years	76,406	10.9%	53,206	8.4%	23,200
Due after 3 years through 5 years	51,139	7.3%	52,808	8.4%	(1,669)
Thereafter	53,134	7.5%	40,125	6.4%	13,009
Total par value	212,323	30.2%	164,506	26.1%	47,817
Other(2)					
Due in 1 year or less	1,529	0.2%	1,732	0.3%	(203)
Due after 1 year through 3 years	2,296	0.3%	3,730	0.6%	(1,434)
Due after 3 years through 5 years	2,109	0.3%	1,982	0.3%	127
Thereafter	3,785	0.5%	3,719	0.6%	66
Total par value	9,719	1.3%	11,163	1.8%	(1,444)
Index-amortizing(3)	1,448	0.2%	1,481	0.2%	(33)
Overdrawn and overnight deposit accounts	6	—	26	—	(20)
Total par value advances	$ 704,309	100.0%	$ 631,233	100.0%	$ 73,076
Other adjustments(4)	916		2,789		
Total advances	$ 705,225		$ 634,022		

(1) Prepayable advances are those advances that may be contractually prepaid by the borrower on specified dates without incurring prepayment or termination fees.
(2) Includes hybrid, fixed-rate amortizing/mortgage matched, convertible, and other advances.
(3) Index-amortizing advances requires repayment according to predetermined amortization schedules linked to the level of various indices. Generally, as market interest rates rise (fall), the maturity of an index-amortizing advance extends (contracts).
(4) Consists of hedging and fair value option valuation adjustments, unamortized premiums, discounts, and commitment fees.

The outstanding carrying value of advances was $705.2 billion at December 31, 2016, an increase of $71.2 billion or 11.2%, from $634.0 billion at December 31, 2015. This increase was driven primarily by higher member demand, particularly by large members. The percentage of members with outstanding advances was 57.1% at December 31, 2016, compared to 58.7% at December 31, 2015.

Table 12 presents cash flows related to advance originations and advance repayments. During the years ended December 31, 2016, 2015, and 2014, advance originations exceeded repayments, driven primarily by growth in short-term advances.

Table 12 - Advance Originations and Repayments
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Advances originated	$ 6,686,143	$ 5,425,265	$ 4,675,304	$ 1,260,878	$ 749,961
Advances repaid	6,613,082	5,359,730	4,602,200	1,253,352	757,530
Net change	$ 73,061	$ 65,535	$ 73,104		

The FHLBanks make advances primarily to their members. Table 13 presents advances at par value by type of borrower and Table 14 presents member borrowers by type of member.

Table 13 - Advances at Par Value by Type of Borrower
(dollars in millions)

	December 31, 2016		December 31, 2015	
	Par Value	Percentage of Total Par Value of Advances	Par Value	Percentage of Total Par Value of Advances
Commercial bank members	$ 452,712	64.3%	$ 381,983	60.5%
Insurance company members(1)	101,739	14.5%	98,410	15.6%
Thrift members	86,188	12.2%	84,138	13.3%
Credit union members	46,666	6.6%	44,650	7.1%
Community development financial institution members	121	—	115	—
Total member advances	687,426	97.6%	609,296	96.5%
Non-member borrowers	16,173	2.3%	21,295	3.4%
Housing associates	710	0.1%	642	0.1%
Total par value	$ 704,309	100.0%	$ 631,233	100.0%

(1) Includes $31.1 billion and $38.7 billion of advances outstanding at par value to captive insurance members at December 31, 2016 and 2015. At December 31, 2016, $3.8 billion of advances outstanding at par value were related to captive insurance members that had their memberships terminated no later than February 19, 2017.

Table 14 - Member Borrowers by Type of Member

	December 31, 2016		December 31, 2015	
	Number	Percentage of Total Member Borrowers	Number	Percentage of Total Member Borrowers
Commercial banks	2,799	68.8%	2,978	70.1%
Thrifts	549	13.5%	570	13.4%
Credit unions	532	13.1%	521	12.3%
Insurance companies	168	4.1%	163	3.9%
Community development financial institutions	19	0.5%	14	0.3%
Total member borrowers	4,067	100.0%	4,246	100.0%
Total members	7,125		7,238	

Table 15 presents the FHLBanks' top 10 advance holding borrowers at the holding-company level on a combined basis based on advances outstanding at par at December 31, 2016. The percentage of total advances for each holding company was computed by dividing the par value of advances by subsidiaries of that holding company by the total combined par value of advances. These percentage concentrations do not represent borrowing concentrations in an individual FHLBank.

Table 15 - Top 10 Advance Holding Borrowers by Holding Company at December 31, 2016
(dollars in millions)

Holding Company Name(1)	FHLBank Districts(2)	Par Value	Percentage of Total Par Value of Advances
JPMorgan Chase & Co.	Pittsburgh, Cincinnati, Chicago, Des Moines, San Francisco	$ 79,483	11.3%
Wells Fargo & Company	Des Moines, San Francisco	77,146	11.0%
Citigroup Inc.	New York, Dallas, San Francisco	33,552	4.8%
The PNC Financial Services Group, Inc.	New York, Pittsburgh, Atlanta, Cincinnati	17,549	2.5%
Capital One Financial Corporation	Atlanta, Dallas	17,178	2.4%
MetLife, Inc.	Boston, New York, Pittsburgh, Des Moines	15,965	2.3%
Ally Financial Inc.	Pittsburgh	13,995	2.0%
Navy Federal Credit Union	Atlanta	13,495	1.9%
Bank of America Corporation	Boston, Atlanta, Des Moines, San Francisco	12,162	1.7%
New York Community Bancorp, Inc.	New York	11,665	1.7%
		$ 292,190	41.6%

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(1) Holding company information was obtained from the Federal Reserve System's web site, the National Information Center (NIC), and SEC filings. The NIC is a central repository of data about banks and other institutions for which the Federal Reserve System has a supervisory, regulatory, or research interest, including both domestic and foreign banking organizations operating in the United States.

(2) At December 31, 2016, each holding company had subsidiaries with advance borrowings in these FHLBank districts.

Table 16 presents information on the five largest borrowers from each FHLBank at December 31, 2016. The information presented on borrowings in Table 16 is for individual FHLBank advance holding borrowers. The data is not aggregated to the holding-company level. Some of the institutions listed may be affiliates of the same holding company, and some of the institutions listed may have affiliates that are advance holding borrowers that are not listed in the table. Each FHLBank describes its risk management policies, including disclosures about its concentration risk, if any, in its periodic reports filed with the SEC. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report*.)

Table 16 - Top 5 Advance Holding Borrowers by FHLBank at December 31, 2016
(dollars in millions)

District	Name	Holding Company Name(1)	Par Value	Percentage of FHLBank Total Par Value of Advances(2)
Boston	Citizens Bank, National Association		$ 7,260	18.5%
	Webster Bank, National Association		2,843	7.3%
	People's United Bank, National Association		2,805	7.2%
	Berkshire Bank		1,168	3.0%
	Massachusetts Mutual Life Insurance Company		1,100	2.8%
			$ 15,176	38.8%
New York	Citibank, N.A.	Citigroup Inc.	$ 33,551	30.7%
	Metropolitan Life Insurance Company	MetLife, Inc.	14,445	13.2%
	New York Community Bank	New York Community Bancorp, Inc.	11,381	10.5%
	HSBC Bank USA, National Association		5,700	5.2%
	Investors Bank(3)		4,409	4.0%
			$ 69,486	63.6%

District	Name	Holding Company Name(1)	Par Value	Percentage of FHLBank Total Par Value of Advances(2)
Pittsburgh	Chase Bank USA, National Association	JPMorgan Chase & Co.	$ 21,300	27.7%
	PNC Bank, National Association(3)	The PNC Financial Services Group, Inc.	17,535	22.8%
	Ally Bank	Ally Financial Inc.	13,995	18.2%
	Santander Bank, N.A.(3)		5,950	7.8%
	Citizens Bank of Pennsylvania		2,450	3.2%
			$ 61,230	79.7%
Atlanta	Capital One, National Association	Capital One Financial Corporation	$ 17,176	17.5%
	Navy Federal Credit Union	Navy Federal Credit Union	13,495	13.7%
	Bank of America, National Association	Bank of America Corporation	11,511	11.7%
	EverBank		5,506	5.6%
	BankUnited, National Association		5,240	5.3%
			$ 52,928	53.8%
Cincinnati	JPMorgan Chase Bank, National Association	JPMorgan Chase & Co.	$ 32,300	46.2%
	U.S. Bank National Association		8,563	12.2%
	Third Federal Savings and Loan Association of Cleveland		3,049	4.4%
	Fifth Third Bank		2,517	3.6%
	The Huntington National Bank		2,433	3.5%
			$ 48,862	69.9%
Indianapolis	The Lincoln National Life Insurance Company		$ 3,350	11.9%
	Flagstar Bank, FSB		2,980	10.6%
	Jackson National Life Insurance Company		2,376	8.4%
	Tuebor Captive Insurance Company LLC		1,660	5.9%
	IAS Services LLC		1,650	5.8%
			$ 12,016	42.6%
Chicago	One Mortgage Partners Corp.	JPMorgan Chase & Co.	$ 11,000	24.5%
	The Northern Trust Company		5,000	11.1%
	BMO Harris Bank, National Association		4,375	9.7%
	State Farm Bank, FSB		3,620	8.1%
	Associated Bank, National Association		2,747	6.1%
			$ 26,742	59.5%
Des Moines	Wells Fargo Bank, National Association	Wells Fargo & Company	$ 77,075	58.6%
	Transamerica Life Insurance Company		4,170	3.2%
	TH Insurance Holdings Company LLC		4,000	3.0%
	Truman Insurance Company, LLC		3,588	2.7%
	HICA Education Loan Corporation		3,396	2.6%
			$ 92,229	70.1%
Dallas	Comerica Bank		$ 2,800	8.6%
	Texas Capital Bank, National Association		2,000	6.2%
	Southside Bank(3)		1,310	4.0%
	Centennial Bank		1,305	4.0%
	Life Insurance Company of the Southwest		1,166	3.6%
			$ 8,581	26.4%

District	Name	Holding Company Name(1)	Par Value	Percentage of FHLBank Total Par Value of Advances(2)
Topeka	BOKF, National Association		$ 4,800	20.0%
	MidFirst Bank		4,340	18.1%
	Capitol Federal Savings Bank		2,275	9.5%
	United of Omaha Life Insurance Company		670	2.8%
	Mutual of Omaha Bank		556	2.4%
			$ 12,641	52.8%
San Francisco	JPMorgan Chase Bank, National Association(4)	JPMorgan Chase & Co.	$ 14,807	29.7%
	Bank of the West		7,306	14.7%
	First Republic Bank		5,900	11.8%
	CIT Bank, National Association		2,410	4.8%
	Star One Credit Union(3)		2,024	4.1%
			$ 32,447	65.1%

(1) The holding company name is only shown for each Top 5 advance holding borrower that has its holding company listed in Table 15 - Top 10 Advance Holding Borrowers by Holding Company at December 31, 2016.
(2) For consistency with the individual FHLBank's presentation of its Top 5 advance holders at December 31, 2016, amounts used to calculate percentages of FHLBank advances may be based on numbers in thousands. Accordingly, recalculations using the amounts in millions as presented in Table 16 may not produce the same results.
(3) Indicates that an officer or director of the member was an FHLBank director at December 31, 2016.
(4) Non-member advance holding borrower that is holding legacy advances due to out-of-district acquisition or merger.

Investments

The FHLBanks maintain investment portfolios for liquidity purposes and to generate additional earnings. This investment income bolsters the FHLBanks' capacity to meet their commitments to affordable housing and community investment. Within the investment portfolio, the FHLBanks invest in investment-quality securities to reduce their credit risk. Total investments were $292.0 billion at December 31, 2016, an increase of $18.3 billion or 6.7% from $273.7 billion at December 31, 2015, driven by increases in federal funds sold, mortgage-backed securities, and securities purchased under agreements to resell. FHFA regulations prohibit the FHLBanks from investing in certain types of securities and limit the FHLBanks' investment in mortgage-backed securities (MBS) and asset-backed securities (ABS). (See *Financial Discussion and Analysis - Risk Management - Credit Risk - Investments* for additional information.)

The FHLBanks maintain short-term investment portfolios, which may provide funds to meet the credit needs of their members and to maintain liquidity. These portfolios may include:

- interest-bearing deposits;
- securities purchased under agreements to resell;
- federal funds sold;
- U.S. Treasury obligations;
- certificates of deposit; and
- GSE obligations.

The yield earned on these short-term investments is tied directly to short-term market interest rates. At December 31, 2016, the FHLBanks continued to maintain significant short-term investment balances as part of their ongoing strategy and to satisfy liquidity needs. (See *Liquidity and Capital Resources* for further discussion related to liquidity management.)

The FHLBanks maintain long-term investment portfolios primarily to provide additional liquidity and to earn interest income. These investments generally provide the FHLBanks with higher returns than those available on short-term investments.

Table 17 presents the composition of investments and investment securities at December 31, 2016, 2015, and 2014. For disclosures related to an individual FHLBank's investment holdings that exceed 10% of its respective total capital, see that FHLBank's 2016 SEC Form 10-K.

Table 17 - Total Investments
(dollars in millions)

	December 31,						
	2016					2015	2014
	Due in 1 year or less	Due after 1 year through 5 years	Due after 5 years through 10 years	Due after 10 years	Carrying Value	Carrying Value	Carrying Value
Interest-bearing deposits	$ 2,878	$ —	$ —	$ —	$ 2,878	$ 1,836	$ 1,569
Securities purchased under agreements to resell	52,771	—	—	—	52,771	47,827	25,419
Federal funds sold	48,633	—	—	—	48,633	42,380	52,773
Trading Securities							
Trading non-mortgage-backed securities							
U.S. Treasury obligations	1,504	—	102	—	1,606	1,310	526
Other U.S. obligations	—	—	111	105	216	237	256
GSE and Tennessee Valley Authority obligations	2,592	2,302	623	176	5,693	7,216	7,601
State or local housing agency obligations	—	—	—	—	—	1	1
Other	17	74	93	106	290	290	294
Total trading non-mortgage-backed securities	4,113	2,376	929	387	7,805	9,054	8,678
Trading mortgage-backed securities							
Other U.S. obligations single-family MBS	—	—	17	3	20	24	28
GSE single-family MBS	—	1	—	126	127	159	201
GSE multifamily MBS	—	204	1,067	238	1,509	1,523	693
Total trading mortgage-backed securities	—	205	1,084	367	1,656	1,706	922
Total trading securities	4,113	2,581	2,013	754	9,461	10,760	9,600
Available-for-Sale Securities							
Available-for-sale non-mortgage-backed securities							
Certificates of deposit	1,300	—	—	—	1,300	700	1,350
Other U.S. obligations	23	205	3,842	212	4,282	4,829	4,995
GSE and Tennessee Valley Authority obligations	2,334	5,450	6,515	1,944	16,243	14,863	15,093
State or local housing agency obligations	3	112	308	850	1,273	1,199	139
Federal Family Education Loan Program ABS	—	3	—	4,569	4,572	5,299	6,221
Other	183	141	387	353	1,064	1,124	1,063
Total available-for-sale non-mortgage-backed securities	3,843	5,911	11,052	7,928	28,734	28,014	28,861
Available-for-sale mortgage-backed securities							
Other U.S. obligations single-family MBS	—	32	—	5,545	5,577	4,587	4,889
Other U.S. obligations multifamily MBS	—	—	—	563	563	744	871
GSE single-family MBS	—	—	207	9,369	9,576	9,586	9,714
GSE multifamily MBS	47	9,487	19,606	1,250	30,390	24,693	19,625
Private-label residential MBS	—	1	2	6,830	6,833	8,282	11,036
Home equity loan ABS	—	—	—	—	—	10	12
Total available-for-sale mortgage-backed securities	47	9,520	19,815	23,557	52,939	47,902	46,147
Total available-for-sale securities	3,890	15,431	30,867	31,485	81,673	75,916	75,008

	December 31,						
	2016					2015	2014
	Due in 1 year or less	Due after 1 year through 5 years	Due after 5 years through 10 years	Due after 10 years	Carrying Value	Carrying Value	Carrying Value
Held-to-Maturity Securities							
Held-to-maturity non-mortgage-backed securities							
Certificates of deposit	$ 1,750	$ —	$ —	$ —	$ 1,750	$ —	$ 356
Other U.S. obligations	671	282	101	697	1,751	1,957	2,271
GSE and Tennessee Valley Authority obligations	2,411	3,487	443	129	6,470	6,226	7,280
State or local housing agency obligations	85	110	255	2,125	2,575	2,710	3,830
Total held-to-maturity non-mortgage-backed securities	4,917	3,879	799	2,951	12,546	10,893	13,737
Held-to-maturity mortgage-backed securities							
Other U.S. obligations single-family MBS	128	875	13	7,477	8,493	10,223	9,401
Other U.S. obligations multifamily MBS	—	3	1	1	5	23	117
GSE single-family MBS	4	427	748	39,937	41,116	48,258	58,499
GSE multifamily MBS	346	8,311	20,694	732	30,083	19,951	16,755
Private-label residential MBS	1	55	8	4,054	4,118	5,332	7,004
Manufactured housing loan ABS	—	—	—	69	69	86	105
Home equity loan ABS	—	—	—	171	171	199	230
Total held-to-maturity mortgage-backed securities	479	9,671	21,464	52,441	84,055	84,072	92,111
Total held-to-maturity securities	5,396	13,550	22,263	55,392	96,601	94,965	105,848
Total investment securities	13,399	31,562	55,143	87,631	187,735	181,641	190,456
Total investments	$ 117,681	$ 31,562	$ 55,143	$ 87,631	$ 292,017	$ 273,684	$ 270,217
Interest-bearing deposits	$ 2,878	$ —	$ —	$ —	$ 2,878	$ 1,836	$ 1,569
Securities purchased under agreements to resell	52,771	—	—	—	52,771	47,827	25,419
Federal funds sold	48,633	—	—	—	48,633	42,380	52,773
Total Investment Securities by Major Security Type							
Investment securities non-mortgage-backed securities							
U.S. Treasury obligations	1,504	—	102	—	1,606	1,310	526
Certificates of deposit	3,050	—	—	—	3,050	700	1,706
Other U.S. obligations	694	487	4,054	1,014	6,249	7,023	7,522
GSE and Tennessee Valley Authority obligations	7,337	11,239	7,581	2,249	28,406	28,305	29,974
State or local housing agency obligations	88	222	563	2,975	3,848	3,910	3,970
Federal Family Education Loan Program ABS	—	3	—	4,569	4,572	5,299	6,221
Other	200	215	480	459	1,354	1,414	1,357
Total investment securities non-mortgage-backed securities	12,873	12,166	12,780	11,266	49,085	47,961	51,276
Investment securities mortgage-backed securities							
Other U.S. obligations single-family MBS	128	907	30	13,025	14,090	14,834	14,318
Other U.S. obligations multifamily MBS	—	3	1	564	568	767	988
GSE single-family MBS	4	428	955	49,432	50,819	58,003	68,414
GSE multifamily MBS	393	18,002	41,367	2,220	61,982	46,167	37,073
Private-label residential MBS	1	56	10	10,884	10,951	13,614	18,040
Manufactured housing loan ABS	—	—	—	69	69	86	105
Home equity loan ABS	—	—	—	171	171	209	242
Total investment securities mortgage-backed securities	526	19,396	42,363	76,365	138,650	133,680	139,180
Total investment securities	13,399	31,562	55,143	87,631	187,735	181,641	190,456
Total investments	$ 117,681	$ 31,562	$ 55,143	$ 87,631	$ 292,017	$ 273,684	$ 270,217

	December 31,						
	2016					2015	2014
	Due in 1 year or less	Due after 1 year through 5 years	Due after 5 years through 10 years	Due after 10 years	Carrying Value	Carrying Value	Carrying Value
Yield on trading securities	1.15%	1.20%	2.71%	3.63%			
Yield on available-for-sale securities	2.03%	3.29%	2.13%	3.17%			
Yield on held-to-maturity securities	1.09%	2.16%	1.44%	2.05%			
Yield on total investment securities	1.38%	2.64%	1.87%	2.46%			

The FHLBanks classify investment securities as held-to-maturity (HTM), available-for-sale (AFS), or trading securities. The interest-rate and prepayment risks associated with these investment securities are managed through a combination of debt issuance and derivatives. An FHLBank may manage the prepayment and interest-rate risks by funding investment securities with consolidated obligations that have call features or by hedging the prepayment risk with caps or floors, callable swaps or swaptions. An FHLBank may manage prepayment and duration risk by funding investment securities with consolidated obligations that contain call features. An FHLBank may also manage the risk arising from changing market prices and volatility of investment securities by matching the cash outflow on the derivatives with the cash inflow on the investment securities. Derivatives held by an FHLBank that are associated with trading and HTM securities are designated as economic hedges, and derivatives held by an FHLBank associated with AFS securities may qualify as either a fair value hedge, an economic hedge, or a cash flow hedge. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements and *Quantitative and Qualitative Disclosure About Market Risk - Use of Derivatives to Manage Interest-Rate Risk* for additional information.)

Table 18 presents the interest-rate payment terms of investment securities at December 31, 2016 and 2015.

Table 18 - Interest-Rate Payment Terms of Investment Securities
(dollars in millions)

	December 31, 2016	December 31, 2015
Trading Securities at Fair Value		
Trading non-mortgage-backed securities		
Fixed-rate	$ 3,241	$ 4,554
Variable-rate	4,564	4,500
Total trading non-mortgage-backed securities	7,805	9,054
Trading mortgage-backed securities		
Fixed-rate	1,509	1,525
Variable-rate	147	181
Total trading mortgage-backed securities	1,656	1,706
Total trading securities	$ 9,461	$ 10,760
Available-for-Sale Securities at Amortized Cost		
Available-for-sale non-mortgage-backed securities		
Fixed-rate	$ 21,136	$ 19,462
Variable-rate	7,456	8,446
Total available-for-sale non-mortgage-backed securities	28,592	27,908
Available-for-sale mortgage-backed securities		
Fixed-rate	28,105	26,830
Variable-rate	24,214	20,571
Total available-for-sale mortgage-backed securities	52,319	47,401
Total available-for-sale securities	$ 80,911	$ 75,309
Held-to-Maturity Securities at Amortized Cost		
Held-to-maturity non-mortgage-backed securities		
Fixed-rate	$ 6,483	$ 4,425
Variable-rate	6,063	6,468
Total held-to-maturity non-mortgage-backed securities	12,546	10,893
Held-to-maturity mortgage-backed securities		
Fixed-rate	31,076	37,952
Variable-rate	53,411	46,647
Total held-to-maturity mortgage-backed securities	84,487	84,599
Total held-to-maturity securities	$ 97,033	$ 95,492

Net Unrealized Gains (Losses) on AFS and HTM Investment Securities. The FHLBanks held AFS and HTM securities in net unrealized gain(loss) positions. These net unrealized gains(losses) are due primarily to changes in interest rates, credit spreads, rate volatility, and/or illiquidity.

Net unrealized gains, including the net effect of non-credit related other-than-temporary impairment (OTTI) recognized in accumulated other comprehensive income (loss) (AOCI), on AFS securities were $762 million at December 31, 2016, an increase of $155 million from December 31, 2015. This increase was due primarily to higher net unrealized gains on private-label residential MBS, as well as GSE and Tennessee Valley Authority obligations, partially offset by lower net unrealized gains on Federal Family Education Loan Program ABS. (See *Note 5 - Available-for-Sale Securities* to the accompanying combined financial statements for additional information regarding AFS securities.)

Net unrealized gains, including the net effect of non-credit-related OTTI recognized in AOCI, on HTM securities were $324 million, a decrease of $307 million from December 31, 2015. This decrease was due primarily to lower net unrealized gains on GSE single-family MBS and GSE multifamily MBS, partially offset by higher net unrealized gains on private-label residential MBS. (See *Note 6 - Held-to-Maturity Securities* to the accompanying combined financial statements for additional information regarding HTM securities).

OTTI on Investment Securities. Each FHLBank evaluates its individual AFS and HTM investment securities holdings for OTTI on a quarterly basis. Private-label residential MBS, manufactured housing loan ABS, and home equity loan ABS (collectively referred to as private-label mortgage-backed securities) are those investment securities that generally carry the greatest risk of loss. (See *Note 7 - Other-than-Temporary Impairment Analysis* to the accompanying combined financial statements, *Critical Accounting Estimates - OTTI for Investment Securities*, and *Risk Management - Credit Risk - Investments* for additional information.)

Mortgage-Backed Securities to Total Regulatory Capital Limit. Current regulatory policy prohibits an FHLBank from purchasing MBS if its investment in MBS exceeds 300% of that FHLBank's previous month-end regulatory capital on the day it intends to purchase the securities. At December 31, 2016, each of the FHLBanks of Chicago and Topeka was precluded from purchasing additional MBS investments until its respective MBS to total regulatory capital percentage declines below 300%. Each of these FHLBanks was not required to sell any previously purchased MBS. Each of the FHLBanks was in compliance with the regulatory limit at the time of its respective MBS purchases. On a combined basis, at December 31, 2016, the FHLBanks' percentage of MBS (net of regulatory excluded MBS) was 255% of total combined regulatory capital.

Mortgage Loans Held for Portfolio, Net

An FHLBank may purchase mortgage loans to support the FHLBank's housing mission, provide an additional source of liquidity to FHLBank members, diversify its investments, and generate additional earnings. The two primary programs are the Mortgage Purchase Program (MPP) and the Mortgage Partnership Finance® (MPF) Program. (See *Business - Mortgage Loans* and *Risk Management - Credit Risk - Mortgage Loans Held for Portfolio* for more information.)

Table 19 - Mortgage Loans Held for Portfolio, Net
(dollars in millions)

	December 31, 2016	December 31, 2015	Change
Mortgage loans held for portfolio	$ 48,494	$ 44,575	$ 3,919
Allowance for credit losses on mortgage loans	(18)	(18)	—
Total mortgage loans held for portfolio, net	$ 48,476	$ 44,557	$ 3,919

Mortgage Loans Held for Portfolio. Mortgage loans were $48.5 billion at December 31, 2016, an increase of 8.8% from $44.6 billion at December 31, 2015, driven by higher mortgage loan purchases from members.

As of December 31, 2016, the FHLBank of Atlanta was not accepting additional master commitments to acquire loans for its own portfolio. However, during 2016, the FHLBank of Atlanta and the FHLBank of Indianapolis began participating in the funding of an MPP master commitment with a member of the FHLBank of Indianapolis. The FHLBank of Des Moines was not accepting additional master commitments to purchase mortgage loans under the MPP at December 31, 2016, and expects the balance of these existing loans, acquired through its merger with the FHLBank of Seattle, to decrease as they are paid off. The remaining FHLBanks participating in the MPP and MPF Program continue to have the ability to purchase both conventional and government-guaranteed or -insured fixed-rate mortgage loans.

Allowance for Credit Losses on Mortgage Loans. Table 20 presents the characteristics and credit losses of mortgage loans held for portfolio. Periodically, each FHLBank evaluates the allowance for credit losses for its mortgage loans based on its policies and procedures to determine if an allowance for credit losses is necessary. The allowance for credit losses on mortgage loans remained unchanged at $18 million as of December 31, 2016, compared to the same period in 2015.

Table 20 - Mortgage Loans Held for Portfolio - Characteristics and Credit Losses
(dollars in millions)

	December 31,				
Unpaid Principal Balance	**2016**	**2015**	**2014**	**2013**	**2012**
Total past due 90 days or more and still accruing interest	$ 126	$ 138	$ 228	$ 410	$ 559
Non-accrual loans	$ 241	$ 335	$ 438	$ 552	$ 650
Troubled debt restructurings (not included above)(1)	$ 103	$ 117	$ 114	$ 78	$ 61

	Year Ended December 31,				
	2016	**2015**	**2014**	**2013**	**2012**
Allowance for credit losses, beginning of period	$ 18	$ 52	$ 88	$ 132	$ 138
Charge-offs, net of recoveries(2)	(6)	(38)	(15)	(25)	(27)
Provision (reversal) for credit losses	6	4	(21)	(19)	21
Allowance for credit losses, end of period	$ 18	$ 18	$ 52	$ 88	$ 132

(1) Represents troubled debt restructured loans that are still performing as of the period-end presented.
(2) Net charge-offs for the year-ended December 31, 2015, includes $21 million of one-time charge-offs due to the adoption of FHFA Advisory Bulletin 2012-02.

Table 21 - Interest Shortfall on Nonaccrual Loans and Loans Modified in Troubled Debt Restructurings
(dollars in millions)

	Year Ended December 31,				
	2016	**2015**	**2014**	**2013**	**2012**
Gross amount of interest that would have been recorded based on original terms	$ 14	$ 20	$ 23	$ 26	$ 30
Interest actually recognized in income during the period	4	5	6	4	12
Shortfall	$ 10	$ 15	$ 17	$ 22	$ 18

See *Note 10 - Allowance for Credit Losses* to the accompanying combined financial statements for more information.

Consolidated Obligations

Consolidated obligations consist of consolidated bonds and consolidated discount notes, which are debt instruments issued through the Office of Finance. Consolidated obligations are the principal funding source used by the FHLBanks to make advances and to purchase mortgage loans and investments. The carrying value of consolidated obligations was $988.7 billion at December 31, 2016, an increase of $82.8 billion or 9.1% from $905.9 billion at December 31, 2015, due primarily to increased funding needs related to the growth in advances and consisted of an increase in consolidated bonds, partially offset by a decrease in consolidated discount notes.

Consolidated bonds may be issued to raise short-, intermediate-, or long-term funds. Consolidated bonds generally carry fixed- or variable-rate payment terms and have maturities ranging from one month to 30 years. The carrying value of consolidated bonds was $578.9 billion at December 31, 2016, an increase of $167.1 billion or 40.6% from $411.9 billion at December 31, 2015. Consolidated bonds represented 58.6% and 45.5% of total consolidated obligations outstanding at December 31, 2016 and 2015.

Consolidated discount notes are issued primarily to provide short-term funding and have a maturity range of one day to one year, are generally issued at or below par, and mature at par. A significant portion of consolidated discount note activity typically results from the refinancing of overnight discount notes. The carrying value of consolidated discount notes was $409.8 billion at December 31, 2016, a decrease of $84.2 billion or 17.0% from $494.0 billion at December 31, 2015. Consolidated discount notes represented 41.4% and 54.5% of total consolidated obligations outstanding at December 31, 2016 and 2015.

Table 22 - Types of Consolidated Obligations by Contractual Maturity
(dollars in millions)

	December 31, 2016		December 31, 2015		
	Amount	Percentage of Total Par Value of Consolidated Obligations	Amount	Percentage of Total Par Value of Consolidated Obligations	Change
Consolidated Discount Notes					
Overnight	$ 5,201	0.5%	$ 5,459	0.6%	$ (258)
Due after 1 day through 30 days	159,352	16.1%	160,694	17.7%	(1,342)
Due after 30 days through 90 days	192,622	19.4%	233,976	25.8%	(41,354)
Due after 90 days through 1 year	52,947	5.4%	94,214	10.4%	(41,267)
Total par value	410,122	41.4%	494,343	54.5%	(84,221)
Consolidated Bonds					
Fixed-rate, non-callable					
Due in 1 year or less	78,335	7.9%	109,710	12.1%	(31,375)
Due after 1 year through 3 years	85,847	8.7%	83,674	9.2%	2,173
Due after 3 years through 5 years	27,663	2.8%	22,635	2.5%	5,028
Thereafter	16,946	1.7%	19,508	2.2%	(2,562)
Total par value	208,791	21.1%	235,527	26.0%	(26,736)
Fixed-rate, callable					
Due in 1 year or less	4,104	0.4%	4,634	0.5%	(530)
Due after 1 year through 3 years	17,566	1.8%	21,923	2.5%	(4,357)
Due after 3 years through 5 years	12,286	1.2%	13,961	1.5%	(1,675)
Thereafter	19,081	1.9%	19,118	2.1%	(37)
Total par value	53,037	5.3%	59,636	6.6%	(6,599)
Variable-rate (non-capped and capped)					
Due in 1 year or less	252,249	25.6%	76,920	8.5%	175,329
Due after 1 year through 3 years	48,091	4.9%	18,202	2.0%	29,889
Due after 3 years through 5 years	375	—%	—	—%	375
Thereafter	—	—%	—	—%	—
Total par value	300,715	30.5%	95,122	10.5%	205,593
Step-up/step-down					
Due in 1 year or less	215	—%	—	—%	215
Due after 1 year through 3 years	2,436	0.2%	2,348	0.3%	88
Due after 3 years through 5 years	6,266	0.7%	5,965	0.7%	301
Thereafter	5,689	0.6%	8,678	1.0%	(2,989)
Total par value	14,606	1.5%	16,991	2.0%	(2,385)
Other(1)					
Due in 1 year or less	667	0.1%	1,420	0.2%	(753)
Due after 1 year through 3 years	138	—%	1,128	0.1%	(990)
Due after 3 years through 5 years	215	—%	25	—%	190
Thereafter	1,019	0.1%	1,010	0.1%	9
Total par value	2,039	0.2%	3,583	0.4%	(1,544)
Total par value consolidated bonds	579,188	58.6%	410,859	45.5%	$ 168,329
Total par value	989,310	100.0%	905,202	100.0%	
Other adjustments(2)	(568)		694		
Total consolidated obligations	$ 988,742		$ 905,896		

(1) Includes index-amortizing notes.
(2) Consists of hedging and fair value option valuation adjustments, unamortized premiums and discounts, and also consists of combining adjustments of $234 million and $307 million at December 31, 2016 and 2015.

Table 23 presents cash flows related to consolidated obligations, which illustrates proceeds exceeding payments for the years ended December 31, 2016, 2015, and 2014, resulting in higher consolidated obligation balances. The increase in issuance of consolidated obligations for the year ended December 31, 2016, as compared to the same period in 2015, was due primarily to increased funding needs driven by higher member demand, particularly by large members, for short-term advances.

Table 23 - Net Proceeds and Payments for Consolidated Obligations
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Net proceeds from issuance of consolidated obligations					
Discount notes	$ 3,863,143	$ 3,553,414	$ 3,969,949	$ 309,729	$ (416,535)
Bonds	524,098	304,426	348,749	219,672	(44,323)
Net proceeds	4,387,241	3,857,840	4,318,698	$ 529,401	$ (460,858)
Payments for maturing and retiring consolidated obligations					
Discount notes	3,947,549	3,421,830	3,900,963	$ 525,719	$ (479,133)
Bonds	355,733	378,287	337,198	(22,554)	41,089
Net payments	4,303,282	3,800,117	4,238,161	$ 503,165	$ (438,044)
Net change	$ 83,959	$ 57,723	$ 80,537		

Table 24 presents short-term consolidated obligations outstanding for the years ended December 31, 2016, 2015, and 2014. The daily average balance outstanding for consolidated discount notes and consolidated bonds with original maturities of one year or less increased during the year ended December 31, 2016, compared to the years ended December 31, 2015 and 2014, due to increased short-term funding needs resulting from market conditions and short-term advance demand that favored the issuance of shorter-term debt.

Table 24 - Short-Term Consolidated Obligations Outstanding
(dollars in millions)

	Consolidated Discount Notes(1)			Consolidated Bonds With Original Maturities of One Year or Less(2)		
	2016	2015	2014	2016	2015	2014
Outstanding at end of the period	$ 409,815	$ 494,045	$ 362,303	$ 194,194	$ 99,151	$ 108,450
Weighted-average interest rate at end of the period	0.48%	0.26%	0.09%	0.65%	0.28%	0.12%
Daily average outstanding for the period	$ 448,448	$ 394,332	$ 309,815	$ 158,048	$ 93,544	$ 127,517
Weighted-average interest rate for the period	0.45%	0.21%	0.17%	0.54%	0.19%	0.13%
Highest outstanding at any month-end	$ 498,898	$ 494,045	$ 362,303	$ 194,194	$ 101,978	$ 140,268

(1) Values are derived using the carrying value of the consolidated discount notes.
(2) Values are derived using the par value of the consolidated bonds.

Consolidated bonds often have investor-determined features. The decision to issue a consolidated bond using a particular structure is based on the desired amount of funding and the ability of the FHLBank(s) receiving the proceeds of the consolidated bonds issued to hedge the risks. This strategy of issuing consolidated obligations while simultaneously entering into derivative transactions enables an FHLBank to offer a wider range of attractively priced advances to its members and may allow an FHLBank to reduce its funding costs. The continued attractiveness of this strategy depends on yield relationships between the FHLBanks' consolidated obligations and the derivatives markets. If conditions change, an FHLBank may alter the types or terms of the consolidated obligations that it issues. The increase in funding alternatives available to the FHLBanks through negotiated debt/swap transactions is beneficial to the FHLBanks because it may diversify the investor base, reduce funding costs, and/or provide additional asset/liability management tools.

The types of consolidated bonds issued can fluctuate based on comparative changes in their cost levels, supply and demand conditions, advance demand, and the FHLBanks' individual balance sheet management strategies. During the year ended December 31, 2016, investors preferred variable-rate consolidated obligations to fixed-rate consolidated obligations as a result of money market fund reform and investor expectations that interest rates may rise. Table 25 presents the bond types the FHLBanks relied on for their bond funding needs.

Table 25 - Percentage of Total Consolidated Bonds Issued by Bond Type

	Year Ended December 31,		
	2016	2015	2014
Single-index, variable-rate	63.4%	29.2%	15.6%
Fixed-rate, noncallable	23.3%	46.0%	51.4%
Fixed-rate, callable	10.3%	18.1%	24.7%
Step-up/step-down(1)	2.7%	5.9%	7.6%
Other	0.3%	0.8%	0.7%
Total	100.0%	100.0%	100.0%

(1) Primarily consists of callable step-up bonds.

The FHLBanks may use callable swaps to hedge against the interest-rate risk associated with callable bonds. The hedged callable bond is generally called if the call feature of the derivative is exercised. These call features could result in the need for FHLBanks to refinance a substantial portion of outstanding liabilities during times of decreasing interest rates. Call options on unhedged callable bonds generally are exercised when the bond can be replaced at a lower cost. Callable bonds enable an FHLBank to meet its funding needs at costs not otherwise directly attainable solely through the issuance of non-callable debt.

The FHLBanks have diversified sources and channels of funding based on the need for funding from the capital markets. Consolidated bonds can be negotiated individually or auctioned competitively through approved underwriters. The FHLBanks issue large, liquid bullet bonds through the Global Debt Program (mandated global bullets) to expand their pool of investors, while diversifying their funding sources. Mandated global bullets are issued through a formal dealer syndicate following pre-announced calendar issuance dates. For other negotiated bond transactions, underwriters contact the Office of Finance or the FHLBanks directly if there is a bond structure they need to meet investor demand. These transactions are flexible and can be investor-customized with different interest-rate characteristics, terms, and currencies (for bonds issued under the Global Debt Program). Competitively-bid transactions are generally initiated when an FHLBank needs funds of a particular structure and size. Consolidated bonds can be offered daily through auction and include fixed-rate, noncallables (through the TAP Issue Program), American-style callables, and mandated global reopenings.

Table 26 - Percentage of Total Consolidated Bonds Issued by Transaction Type

	Year Ended December 31,		
	2016	2015	2014
Negotiated transactions	92.2%	90.8%	87.2%
Competitive bid	7.8%	9.2%	12.8%
Total	100.0%	100.0%	100.0%

Deposits

The FHLBanks offer demand and overnight deposit programs to members and qualifying non-members. In addition, certain FHLBanks offer short-term interest-bearing deposit programs to members, and in certain cases, qualifying non-members. Deposits represent a relatively small portion of the FHLBanks' funding, totaling $8.1 billion at December 31, 2016, a decrease of $0.4 billion or 5.2% from December 31, 2015. Deposit balances vary depending on market factors, such as the attractiveness of the FHLBanks' deposit pricing relative to the rates available on alternative money market instruments, FHLBank members' investment preferences with respect to the maturity of their investments, and FHLBank members' liquidity. Interest-bearing demand and overnight deposits represented 87.8% and 89.5% of deposits at December 31, 2016 and 2015, with the remaining deposits primarily being term deposits and non-interest bearing deposits.

Table 27 presents term deposits issued in amounts of $100 thousand or more at December 31, 2016 and 2015.

Table 27 - Term Deposits Issued in Amounts of $100 Thousand or More
(dollars in millions)

	December 31, 2016	December 31, 2015
3 months or less	$ 406	$ 274
Over 3 months through 6 months	157	183
Over 6 months through 12 months	53	23
Over 12 months	18	9
Total	$ 634	$ 489

Capital

Table 28 - Total Capital and Capital-to-Assets Ratios
(dollars in millions)

	December 31, 2016	December 31, 2015	Change
Capital stock	$ 36,234	$ 34,185	$ 2,049
Additional capital from merger	52	194	(142)
Retained earnings	16,330	14,297	2,033
AOCI	(157)	(634)	477
Total GAAP capital	52,459	48,042	4,417
Exclude: AOCI	157	634	(477)
Add: Mandatorily redeemable capital stock	1,704	745	959
Other(1)	(2)	—	(2)
Total combined regulatory capital(2)	$ 54,318	$ 49,421	$ 4,897
Total assets	$ 1,056,712	$ 969,239	$ 87,473
Combined GAAP capital-to-assets ratio	4.96%	4.96%	
Combined regulatory capital-to-assets ratio(3)	5.14%	5.10%	

(1) Represents rounding adjustments.
(2) Regulatory capital requirements apply to individual FHLBanks, and the combined amounts are for analysis only. The sum of the individual FHLBank regulatory capital amounts does not agree to the total combined regulatory capital due to combining adjustments.
(3) The combined regulatory capital-to-assets ratio is calculated based on the FHLBanks' combined regulatory capital as a percentage of combined total assets. (See *Note 16 - Capital* to the accompanying combined financial statements for a definition and discussion of regulatory capital.)

GAAP Capital. Total GAAP capital was $52.5 billion at December 31, 2016, an increase of 9.2% from $48.0 billion at December 31, 2015. This increase was due primarily to an increase in capital stock and growth in retained earnings. At both December 31, 2016 and 2015, the combined GAAP capital-to-assets ratio was 4.96%.

Capital Stock. Capital stock was $36.2 billion at December 31, 2016, an increase of 6.0% from $34.2 billion at December 31, 2015. This was due primarily to member activity, driven by higher member demand for advances, partially offset by the FHFA rule on FHLBank membership that, among other things, requires the FHLBanks to terminate the membership of captive insurance companies by specified dates, resulting in a reclassification of capital stock held by these members to mandatorily redeemable capital stock.

Retained Earnings. Retained earnings were $16.3 billion at December 31, 2016, an increase of 14.2% from $14.3 billion at December 31, 2015. This increase was due to net income of $3,408 million, offset by dividends of $1,375 million. Unrestricted retained earnings were $11.8 billion at December 31, 2016, an increase of 12.8% from $10.4 billion at December 31, 2015. Restricted retained earnings were $4.5 billion at December 31, 2016, an increase of 17.9% from $3.9 billion at December 31, 2015.

Table 29 - Capital Components as a Percentage of Total GAAP Capital

	December 31, 2016	December 31, 2015
Capital stock	69.1 %	71.1 %
Additional capital from merger	0.1 %	0.4 %
Retained earnings	31.1 %	29.8 %
AOCI	(0.3)%	(1.3)%
Total GAAP capital	100.0 %	100.0 %

Regulatory Capital. Total combined regulatory capital was $54.3 billion at December 31, 2016, an increase of 9.9% from $49.4 billion at December 31, 2015. This increase is the result of growth in retained earnings and an increase in regulatory capital stock outstanding, which consists of capital stock and mandatorily redeemable capital stock.

Mandatorily Redeemable Capital Stock. Mandatorily redeemable capital stock increased $1.0 billion due primarily to the transfer of capital stock to mandatorily redeemable capital stock, resulting from the FHFA rule on FHLBank membership. (See *Note 16 - Capital* to the accompanying combined financial statements for more information on mandatorily redeemable capital stock.)

Combined Results of Operations

Net Income

Net income was $3,408 million for the year ended December 31, 2016, an increase of 19.1% compared to the same period in 2015. This increase was driven by higher net interest income, higher gains on litigation settlements, and lower losses on trading securities, partially offset by lower gains on derivatives and hedging activities. Net income was $2,861 million for the year ended December 31, 2015, an increase of 26.9% compared to the same period in 2014. This increase resulted primarily from higher gains on litigation settlements, and gains on derivatives and hedging activities.

Table 30 - Changes in Net Income
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Net interest income after provision (reversal) for credit losses	$ 3,829	$ 3,549	$ 3,553	$ 280	$ (4)
Non-interest income	1,154	843	17	311	826
Non-interest expense	1,183	1,199	1,046	(16)	153
Affordable Housing Program assessments	392	332	269	60	63
Net income	$ 3,408	$ 2,861	$ 2,255	$ 547	$ 606

Net Interest Income after Provision (Reversal) for Credit Losses

The primary source of each FHLBank's earnings is net interest income, which is the interest income on advances, mortgage loans, and investments, less the interest expense on consolidated obligations and other borrowings. Net interest income after provision (reversal) for credit losses was $3,829 million for the year ended December 31, 2016, an increase of 7.9% compared to the same period in 2015. Net interest margin was 0.38% for the year ended December 31, 2016, a decrease of 1 basis point compared to the same period in 2015. Net interest income after provision (reversal) for credit losses was $3,549 million for the year ended December 31, 2015, a decrease of 0.1% compared to the same period in 2014. Net interest margin for the year ended December 31, 2015, was 0.39% a decrease of 2 basis points compared to the same period in 2014.

Table 31 - Net Interest Income after Provision (Reversal) for Credit Losses
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Interest income					
Advances	$ 5,273	$ 2,794	$ 2,541	$ 2,479	$ 253
Prepayment fees on advances, net	86	179	79	(93)	100
Mortgage loans held for portfolio	1,579	1,636	1,715	(57)	(79)
Investments and other	3,992	3,552	3,707	440	(155)
Total interest income	10,930	8,161	8,042	2,769	119
Interest expense					
Consolidated obligations - Discount notes	2,020	825	536	1,195	289
Consolidated obligations - Bonds	4,931	3,650	3,779	1,281	(129)
Total consolidated obligations	6,951	4,475	4,315	2,476	160
Other borrowings	144	133	195	11	(62)
Total interest expense	7,095	4,608	4,510	2,487	98
Net interest income	3,835	3,553	3,532	282	21
Provision (reversal) for credit losses	6	4	(21)	2	25
Net interest income after provision (reversal) for credit losses	$ 3,829	$ 3,549	$ 3,553	$ 280	$ (4)

Table 32 presents average balances of and yields on the major categories of interest-earning assets and interest-bearing liabilities; net interest spread, which is the difference between the annualized yield on total interest-earning assets and the annualized yield on total interest-bearing liabilities; and net interest margin, which is net interest income expressed as a percentage of the average balance of total interest-earning assets. Due to the FHLBanks' cooperative structures, the FHLBanks generally earn a narrow net interest spread.

Table 32 - Spread and Yield Analysis
(dollars in millions)

	Year Ended December 31,								
	2016			2015			2014		
	Average Balance	Interest	Annualized Yield	Average Balance	Interest	Annualized Yield	Average Balance	Interest	Annualized Yield
Advances(1)	$ 672,737	$ 5,359	0.80%	$ 581,321	$ 2,973	0.51%	$ 520,535	$ 2,620	0.50%
Mortgage loans	45,949	1,579	3.44%	44,393	1,636	3.69%	43,510	1,715	3.94%
Investments									
Interest-bearing deposits and other	8,136	43	0.53%	7,490	11	0.15%	7,908	11	0.14%
Securities purchased under agreements to resell	24,661	92	0.37%	31,205	33	0.11%	28,094	17	0.06%
Federal funds sold	68,092	274	0.40%	66,688	84	0.13%	70,084	60	0.09%
Trading securities	11,110	186	1.67%	9,470	182	1.92%	10,752	187	1.74%
Available-for-sale securities(2)	79,883	1,603	2.01%	75,386	1,439	1.91%	70,337	1,396	1.98%
Held-to-maturity securities(2)	96,705	1,794	1.86%	99,941	1,803	1.80%	109,055	2,036	1.87%
Total investment securities	187,698	3,583	1.91%	184,797	3,424	1.85%	190,144	3,619	1.90%
Total investments	288,587	3,992	1.38%	290,180	3,552	1.22%	296,230	3,707	1.25%
Total interest-earning assets	1,007,273	10,930	1.09%	915,894	8,161	0.89%	860,275	8,042	0.93%
Other non-interest-earning assets	6,215			5,724			4,986		
Fair-value adjustment on investment securities(2)	(398)			(1,466)			687		
Total assets	$ 1,013,090			$ 920,152			$ 865,948		
Consolidated obligations									
Discount notes	$ 448,448	2,020	0.45%	$ 394,332	825	0.21%	$ 309,815	536	0.17%
Bonds	493,927	4,931	1.00%	456,885	3,650	0.80%	484,452	3,779	0.78%
Total consolidated obligations	942,375	6,951	0.74%	851,217	4,475	0.53%	794,267	4,315	0.54%
Mandatorily redeemable capital stock and other borrowings(3)	10,635	144	1.35%	11,547	133	1.15%	14,573	195	1.34%
Total interest-bearing liabilities	953,010	7,095	0.74%	862,764	4,608	0.53%	808,840	4,510	0.56%
Non-interest-bearing liabilities	10,660			10,653			11,572		
Total liabilities	963,670			873,417			820,412		
Capital	49,420			46,735			45,536		
Total liabilities and capital	$ 1,013,090			$ 920,152			$ 865,948		
Net interest income		$ 3,835			$ 3,553			$ 3,532	
Net interest spread			0.35%			0.36%			0.37%
Net interest margin			0.38%			0.39%			0.41%

(1) Interest income for advances includes prepayment fees on advances, net.
(2) The average balances of AFS securities and HTM securities are reflected at amortized cost; therefore, the resulting yields do not give effect to changes in fair value or the non-credit component of previously recognized OTTI reflected in AOCI.
(3) The average balances of other borrowings do not include non-interest-bearing deposits, but do include the average balances and the related interest expense of deposits and subordinated notes.

Changes in both interest rates and average balances of interest-earning assets and interest-bearing liabilities have a direct influence on changes in net interest income, net interest margin, and net interest spread. Table 33 presents changes in interest income and interest expense due to volume-related and rate-related factors. Changes in interest income and interest expense not identifiable as either volume-related or rate-related, but rather attributable to both volume and rate changes, have been allocated to the volume and rate categories based on the proportion of the absolute value of the volume and rate changes.

Table 33 - Rate and Volume Analysis
(dollars in millions)

	2016 vs. 2015			2015 vs. 2014		
	Volume	Rate	Total	Volume	Rate	Total
Interest Income						
Advances(1)	$ 517	$ 1,869	$ 2,386	$ 301	$ 52	$ 353
Mortgage loans	56	(113)	(57)	34	(113)	(79)
Investments	(19)	459	440	(64)	(91)	(155)
Total interest income	554	2,215	2,769	271	(152)	119
Interest Expense						
Consolidated obligations - Discount notes	129	1,066	1,195	155	134	289
Consolidated obligations - Bonds	313	968	1,281	(223)	94	(129)
Total consolidated obligations	442	2,034	2,476	(68)	228	160
Other borrowings(2)	(11)	22	11	(37)	(25)	(62)
Total interest expense	431	2,056	2,487	(105)	203	98
Changes in net interest income	$ 123	$ 159	$ 282	$ 376	$ (355)	$ 21

(1) Includes prepayment fees on advances, net.
(2) The average balances of other borrowings do not include non-interest-bearing deposits, but do include the average balances and the related interest expense of deposits and subordinated notes.

Net interest income was $3,835 million for the year ended December 31, 2016, an increase of 7.9% compared to the same period in 2015. Interest income was $10,930 million for the year ended December 31, 2016, an increase of 33.9% compared to the same period in 2015, due primarily to a 20 basis point increase in the yield on interest-earning assets, and a 10.0% increase in the average balance of interest-earning assets. Interest expense was $7,095 million for the year ended December 31, 2016, an increase of 54.0% compared to the same period in 2015, due primarily to a 21 basis point increase in the yields on interest-bearing liabilities, and a 10.5% increase in the average balance of interest-bearing liabilities.

Net interest income was $3,553 million for the year ended December 31, 2015, an increase of 0.6% compared to the same period in 2014. Interest income was $8,161 million for the year ended December 31, 2015, an increase of 1.5% compared to the same period in 2014, due primarily to a 6.5% increase in the average balance of interest-earning assets, partially offset by a 4 basis point decrease in the yield on interest-earning assets. Interest expense was $4,608 million for the year ended December 31, 2015, an increase of 2.2% compared to the same period in 2014, due primarily to a 6.7% increase in the average balance of interest-bearing liabilities.

Factors Affecting Net Interest Income.

Advances. Interest income on advances was $5,359 million for the year ended December 31, 2016, an increase of 80.3% compared to the same period in 2015, resulting from increases in both the yield on, and average balance of, advances. The yield on advances was 0.80% for the year ended December 31, 2016, an increase of 29 basis points compared to the same period in 2015, and the average balance of advances was $672.7 billion, an increase of 15.7% compared to the same period in 2015. The increase in yield was primarily due to the higher short-term interest rate environment, including the effect of derivatives and hedging activities on advances interest income. (See Table 34 for additional information regarding the effect of derivatives and hedging activities on net interest income.) The increase in the average balance of advances was the result of higher member demand, particularly by large members.

Interest income on advances was $2,973 million for the year ended December 31, 2015, an increase of 13.5% compared to the same period in 2014, resulting from increases in both the average balance of, and yield on, advances. The average balance of advances was $581.3 billion for the year ended December 31, 2015, an increase of 11.7% compared to the same period in 2014, and the yield on advances was 0.51%, an increase of 1 basis point compared to the same period in 2014. The increase in the average balance of advances was due to higher member demand and the increase in the yield on advances was due primarily to higher prepayment fees.

Mortgage Loans. Interest income on mortgage loans was $1,579 million for the year ended December 31, 2016, a decrease of 3.5% compared to the same period in 2015, resulting from a decrease in the yield on mortgage loans, partially offset by an increase in the average balance of mortgage loans. The yield on mortgage loans was 3.44% for the year ended December 31, 2016, a decrease of 25 basis points compared to the same period in 2015, and the average balance of mortgage loans was $45.9 billion, an increase of 3.5% compared to the same period in 2015. The increase in the average balance of mortgage loans was driven by higher mortgage loan purchases from members.

Interest income on mortgage loans was $1,636 million for the year ended December 31, 2015, a decrease of 4.6% compared to the same period in 2014, resulting from a decrease in the yield on mortgage loans, partially offset by an increase in the average balance of mortgage loans. The yield on mortgage loans was 3.69% for the year ended December 31, 2015, a decrease of 25 basis points compared to the same period in 2014, and the average balance of mortgage loans was $44.4 billion, an increase of 2.0% compared to the same period in 2014.

Investments. Interest income on investments was $3,992 million for the year ended December 31, 2016, an increase of 12.4% compared to the same period in 2015, resulting principally from an increase in the yield on investments. The yield on investments was 1.38% for the year ended December 31, 2016, an increase of 16 basis points compared to the same period in 2015, driven primarily by higher yields on short-term investments, resulting from the higher short-term interest rate environment.

Interest income on investments was $3,552 million for the year ended December 31, 2015, a decrease of 4.2% compared to the same period in 2014, resulting from both decreases in the yield on, and average balance of, investments. The yield on investments was 1.22% for the year ended December 31, 2015, a decrease of 3 basis points compared to the same period in 2014, and the average balance of investments was $290.2 billion, a decrease of 2.0% compared to the same period in 2014. The decrease in the yield on investments resulted primarily from the runoff of higher-yield investments and reinvestment in the low interest-rate environment. The decrease in the average balance of investments was primarily driven by decreases in the average balances of investment securities and federal funds sold, partially offset by an increase in securities purchased under agreements to resell.

Consolidated Obligations. Interest expense on consolidated obligations was $6,951 million for the year end December 31, 2016, an increase of 55.3% compared to the same period in 2015, resulting from increases in both the yields on, and the average balances of, consolidated discount notes and consolidated bonds. The yield on consolidated discount notes was 0.45% for the year ended December 31, 2016, an increase of 24 basis points, and the yield on consolidated bonds was 1.00%, an increase of 20 basis points compared to the same period in 2015. The average balance of consolidated discount notes was $448.4 billion for the year ended December 31, 2016, an increase of 13.7%, and the average balance of consolidated bonds was $493.9 billion, an increase of 8.1% compared to the same period in 2015. The increase in the yields on consolidated discount notes and consolidated bonds was due primarily to the higher short-term interest rate environment, including the effect of derivatives and hedging activities on consolidated obligations interest expense. (See Table 34 for additional information regarding the effect of derivatives and hedging activities on net interest income.) The increases in the average balances of consolidated discount notes and consolidated bonds were driven by funding needs related to the growth in the average balance of advances.

Interest expense on consolidated obligations was $4,475 million for the year ended December 31, 2015, an increase of 3.7% compared to the same period in 2014, resulting from an increase in the yields on consolidated discount notes and consolidated bonds and an increase in the average balance of consolidated discount notes, partially offset by a decrease in the average balance of consolidated bonds. The yield on consolidated discount notes was 0.21% for the year ended December 31, 2015, an increase of 4 basis points, and the yield on consolidated bonds was 0.80%, an increase of 2 basis points compared to the same period in 2014. The average balance of consolidated discount notes was $394.3 billion for the year ended December 31, 2015, an increase of 27.3%, and the average balance of consolidated bonds was $456.9 billion, a decrease of

5.7% compared to the same period in 2014. The increases in the yields on consolidated discount notes and consolidated bonds were due primarily to the higher short-term interest rate environment, including the effect of derivatives and hedging activities on consolidated obligations interest expense. However, there was a decrease in the yield on total consolidated obligations, which was due to a shift towards lower-yielding short-term consolidated obligations. (See Table 34 for additional information regarding the effect of derivatives and hedging activities on net interest income.)

Effect of Derivatives and Hedging Activities on Net Interest Income

Net interest income includes components related to the effect of derivatives and hedging activities resulting from the FHLBanks' hedging strategies. The effect of derivatives and hedging activities on net interest income was a net reduction of $1,819 million, $2,213 million, and $2,205 million for the years ended December 31, 2016, 2015, and 2014.

If a hedging relationship is designated and qualifies for hedge accounting treatment, the net interest settlements of interest receivables or payables related to derivatives designated in fair value or cash flow hedge relationships are recognized as adjustments to interest income or expense of the designated hedged item. In addition, when hedge accounting is discontinued, the cumulative basis adjustment on the hedged item is amortized or accreted into net interest income over the remaining life of the hedged item using a level-yield methodology. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements for additional information on the effect of derivatives and hedging activities.)

Table 34 - Effect of Derivatives and Hedging Activities on Net Interest Income
(dollars in millions)

	Year Ended December 31, 2016						
	Advances	Investment Securities	Mortgage Loans	Deposits	Consolidated Bonds	Consolidated Discount Notes	Total
Net interest income							
Amortization and accretion of hedging activities in net interest income	$ (125)	$ 74	$ (29)	$ —	$ (16)	$ (2)	$ (98)
Net interest settlements included in net interest income(1)	(1,716)	(643)	—	—	872	(234)	(1,721)
Total effect on net interest income	$ (1,841)	$ (569)	$ (29)	$ —	$ 856	$ (236)	$ (1,819)

	Year Ended December 31, 2015						
	Advances	Investment Securities	Mortgage Loans	Deposits	Consolidated Bonds	Consolidated Discount Notes	Total
Net interest income							
Amortization and accretion of hedging activities in net interest income	$ (397)	$ 97	$ (29)	$ —	$ 13	$ (3)	$ (319)
Net interest settlements included in net interest income(1)	(2,807)	(691)	—	—	1,870	(266)	(1,894)
Total effect on net interest income	$ (3,204)	$ (594)	$ (29)	$ —	$ 1,883	$ (269)	$ (2,213)

	Year Ended December 31, 2014						
	Advances	Investment Securities	Mortgage Loans	Deposits	Consolidated Bonds	Consolidated Discount Notes	Total
Net interest income							
Amortization and accretion of hedging activities in net interest income	$ (293)	$ 120	$ (27)	$ —	$ 73	$ (2)	$ (129)
Net interest settlements included in net interest income(1)	(3,174)	(658)	—	1	2,036	(281)	(2,076)
Total effect on net interest income	$ (3,467)	$ (538)	$ (27)	$ 1	$ 2,109	$ (283)	$ (2,205)

(1) Represents interest income or expense on derivatives included in net interest income.

Non-Interest Income

Non-interest income was $1,154 million for the year ended December 31, 2016, an increase of $311 million compared to the same period in 2015. This increase was due primarily to higher gains on litigation settlements, and lower losses on trading securities, partially offset by lower gains on derivatives and hedging activities.

Non-interest income was $843 million for the year ended December 31, 2015, an increase of $826 million compared to the same period in 2014. This increase was due primarily to higher gains on litigation settlements, and gains on derivatives and hedging activities, partially offset by higher losses on trading securities.

Table 35 - Changes in Non-Interest Income
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Net other-than-temporary impairment losses	$ (22)	$ (78)	$ (15)	$ 56	$ (63)
Net gains (losses) on trading securities	(41)	(131)	(17)	90	(114)
Net realized gains (losses) from sale of available-for-sale securities	18	60	1	(42)	59
Net realized gains (losses) from sale of held-to-maturity securities	40	15	9	25	6
Net gains (losses) on financial instruments held under fair value option	3	(31)	(76)	34	45
Net gains (losses) on derivatives and hedging activities	47	182	(148)	(135)	330
Gains on litigation settlements, net	952	688	135	264	553
Net gains (losses) on debt extinguishments	(5)	(4)	—	(1)	(4)
Other, net	162	142	128	20	14
Total non-interest income (loss)	$ 1,154	$ 843	$ 17	$ 311	$ 826

Other-than-Temporary Impairment Losses. Each FHLBank updates its own other-than-temporary impairment analysis each quarter to reflect current housing market conditions, changes in anticipated housing market conditions, observed and anticipated borrower behavior, and updated information on the loans supporting private-label mortgage-backed securities. This process includes updating key aspects of the FHLBank's loss projection models.

Net other-than-temporary impairment losses were $22 million, $78 million, and $15 million for the years ended December 31, 2016, 2015, and 2014. The net losses for the year ended December 31, 2015, were due primarily to the FHLBank of Seattle classifying all investment securities as available-for-sale and recording a $52 million OTTI charge based on the FHLBank of Seattle's intent to sell its private-label mortgage backed securities in connection with its merger with the FHLBank of Des Moines. The FHLBank of Seattle subsequently sold these private-label mortgage backed securities and realized a $52 million gain from the sale of available-for-sale securities in March 2015. (See *Note 7 - Other-than-Temporary Impairment Analysis* to the accompanying combined financial statements, *Critical Accounting Estimates - OTTI for Investment Securities*, and *Risk Management-Credit Risk- Investments* for additional information.)

Gains (Losses) on Trading Securities. The FHLBanks classify certain investment securities generally held for liquidity purposes as trading securities under GAAP. Securities classified as trading are recorded at fair value, with changes in fair value reflected in non-interest income. There are a number of factors that affect the fair value of these securities, including changes in interest rates, credit spreads, the passage of time, and volatility. Net losses on trading securities were $41 million, $131 million, and $17 million for the years ended December 31, 2016, 2015, and 2014. Certain trading securities are being economically hedged, and the gains (losses) on these securities are generally offset by the change in fair value of the associated derivatives. (See Table 36 for additional information regarding the effect of derivatives and hedging activities on non-interest income).

Gains (Losses) on Derivatives and Hedging Activities. Fair value estimates for an FHLBank's derivatives and hedging positions fluctuate with changes in market conditions. In general, an FHLBank holds derivatives and associated hedged instruments to the maturity, call, or put date. Therefore, as a matter of timing, nearly all of the cumulative net gains and losses for these financial instruments generally reverse over the remaining contractual terms of the hedged financial instruments.

However, there may be instances when an FHLBank terminates these instruments prior to maturity or prior to the call or put dates. Terminating the financial instrument or hedging relationship may result in a realized gain or loss.

Fair values are based on a wide range of factors, including current and projected levels of interest rates, credit spreads, the passage of time, and volatility. Hedge ineffectiveness occurs when changes in the fair value of the derivative and the associated hedged instrument do not perfectly offset. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements for additional information on the financial effect of derivatives and hedging activities.) Table 36 presents the effect of derivatives and hedging activities on non-interest income.

Table 36 - Effect of Derivatives and Hedging Activities on Non-Interest Income
(dollars in millions)

	Year Ended December 31, 2016							
	Advances	Investment Securities	Mortgage Loans	Consolidated Bonds	Consolidated Discount Notes	Balance Sheet	Intermediary Positions and Other	Total
Net gains (losses) on derivatives and hedging activities								
Gains (losses) related to fair value hedge ineffectiveness	$ 158	$ 35	$ —	$ (31)	$ (3)	$ —	$ —	$ 159
Gains (losses) related to cash flow hedge ineffectiveness	—	—	—	—	5	—	—	5
Gains (losses) related to derivatives not designated as hedging instruments	(5)	(31)	10	(71)	(8)	5	(17)	(117)
Total net gains (losses) on derivatives and hedging activities	153	4	10	(102)	(6)	5	(17)	47
Net gains (losses) on trading securities(1)	—	(50)	—	—	—	—	—	(50)
Net gains (losses) on financial instruments held at fair value	(21)	—	(5)	35	(6)	—	—	3
Total effect on non-interest income	$ 132	$ (46)	$ 5	$ (67)	$ (12)	$ 5	$ (17)	$ —

	Year Ended December 31, 2015							
	Advances	Investment Securities	Mortgage Loans	Consolidated Bonds	Consolidated Discount Notes	Balance Sheet	Intermediary Positions and Other	Total
Net gains (losses) on derivatives and hedging activities								
Gains (losses) related to fair value hedge ineffectiveness	$ 277	$ (21)	$ —	$ (28)	$ 2	$ —	$ —	$ 230
Gains (losses) related to cash flow hedge ineffectiveness	—	—	—	—	2	—	—	2
Gains (losses) related to derivatives not designated as hedging instruments	(59)	(130)	3	157	(15)	(8)	2	(50)
Total net gains (losses) on derivatives and hedging activities	218	(151)	3	129	(11)	(8)	2	182
Net gains (losses) on trading securities(1)	—	(124)	—	—	—	—	—	(124)
Net gains (losses) on financial instruments held at fair value	(34)	—	(2)	(1)	6	—	—	(31)
Total effect on non-interest income	$ 184	$ (275)	$ 1	$ 128	$ (5)	$ (8)	$ 2	$ 27

	Year Ended December 31, 2014							
	Advances	Investment Securities	Mortgage Loans	Consolidated Bonds	Consolidated Discount Notes	Balance Sheet	Intermediary Positions and Other	Total
Net gains (losses) on derivatives and hedging activities								
Gains (losses) related to fair value hedge ineffectiveness	$ 161	$ (59)	$ —	$ (28)	$ —	$ —	$ —	$ 74
Gains (losses) related to cash flow hedge ineffectiveness	—	—	—	—	1	—	—	1
Gains (losses) related to derivatives not designated as hedging instruments	(91)	(257)	(7)	217	(48)	(38)	1	(223)
Total net gains (losses) on derivatives and hedging activities	70	(316)	(7)	189	(47)	(38)	1	(148)
Net gains (losses) on trading securities(1)	—	1	—	—	—	—	—	1
Net gains (losses) on financial instruments held at fair value	(10)	—	—	(68)	2	—	—	(76)
Total effect on non-interest income	$ 60	$ (315)	$ (7)	$ 121	$ (45)	$ (38)	$ 1	$ (223)

(1) Includes only those gains (losses) on trading securities that have an assigned economic derivative; therefore, this line item may not agree to the Combined Statement of Income.

Net gains on derivatives and hedging activities were $47 million for the year ended December 31, 2016, consisting primarily of gains related to fair value hedge ineffectiveness, partially offset by losses related to derivatives not designated as qualifying accounting hedges under GAAP. Net gains on derivatives and hedging activities were $182 million for the year ended December 31, 2015, driven primarily by gains related to fair value hedge ineffectiveness. Net losses on derivatives and hedging activities were $148 million for the year ended December 31, 2014, due primarily to losses related to derivatives not designated as qualifying accounting hedges under GAAP.

Gains on Litigation Settlement, Net. Several of the FHLBanks agreed to settle certain claims arising from investments in private-label mortgage-backed securities. Gains on litigation settlements, net of related legal expenses, were $952 million for the year ended December 31, 2016, driven primarily by the FHLBank of San Francisco's recognition of settlements resulting in a net gain of $510 million and the FHLBank of Des Moines' recognition of settlements resulting in a net gain of $376 million. Gains on litigation settlements, net of related legal expenses, were $688 million and $135 million for the years ended December 31, 2015 and 2014.

Non-Interest Expense

Non-interest expense was $1,183 million for the year ended December 31, 2016, a decrease of 1.3% compared to the same period in 2015, due primarily to a decrease in other operating expenses, partially offset by an increase in other. The decrease in other operating expenses resulted primarily from expenses incurred during the year ended December 31, 2015, related to private-label mortgage-backed securities litigation expenses, and related charges, incurred by the FHLBank of Seattle and expenses incurred in connection with the merger of the FHLBank of Des Moines and the FHLBank of Seattle. The increase in other was primarily the result of a $25 million settlement related to the 2008 Lehman bankruptcy during the fourth quarter of 2016 by an FHLBank. (See *Note 20 - Commitments and Contingencies* to the accompanying combined financial statements for additional information related to the settlement.)

Non-interest expense was $1,199 million for the year ended December 31, 2015, an increase of 14.6% compared to the same period in 2014, due primarily to increases in compensation and benefits and other operating expenses. The increase in compensation and benefits during the year ended December 31, 2015, was due primarily to change in control agreements and severance packages paid to transition employees, as well as a discretionary pension contribution related to the merger of the FHLBanks of Des Moines and Seattle. In addition, there were staffing increases and increased incentive compensation accruals at certain FHLBanks. The increase in other operating expenses during the year ended December 31, 2015, was driven primarily by the FHLBank of Seattle terminating an arrangement to reduce potential future costs, related to the incurrence of certain private-label mortgage-backed securities litigation expenses and related charges, resulting in $58 million recorded in other operating expense during the second quarter of 2015.

Table 37 - Changes in Non-Interest Expense
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Compensation and benefits	$ 640	$ 637	$ 559	$ 3	$ 78
Other operating expenses	385	447	372	(62)	75
Federal Housing Finance Agency	59	59	58	—	1
Office of Finance	47	46	43	1	3
Other	52	10	14	42	(4)
Total non-interest expense	$ 1,183	$ 1,199	$ 1,046	$ (16)	$ 153

Compensation and Benefits. These expenses consist primarily of costs for FHLBank employees, including salaries, incentives, and health and retirement benefits.

Other Operating Expenses. These expenses consist primarily of professional and other contractual services, occupancy costs, depreciation and amortization, and information technology.

FHFA Expenses. The FHLBanks fund the portion of the FHFA's operating costs and working capital fund that relate to the FHLBanks, as determined by the FHFA. These costs are based on the FHFA's annual budget and are under the sole control of the FHFA. Each FHLBank pays its pro-rata share of FHFA expenses based on the ratio of each FHLBank's minimum required regulatory capital to the aggregate minimum required regulatory capital of all FHLBanks.

Office of Finance Expenses. The FHLBanks also fund the operating and capital expenditures of the Office of Finance, a joint office of the FHLBanks that issues and services consolidated obligations, prepares the FHLBanks' quarterly and annual combined financial reports, and fulfills certain other functions.

Affordable Housing Program (AHP) Assessments

AHP assessments were $392 million, $332 million, and $269 million for the years ended December 31, 2016, 2015, and 2014. AHP assessments result from individual FHLBank income subject to assessments.

By regulation, the FHLBanks must annually set aside for the AHP the greater of the aggregate of $100 million or 10% of the individual FHLBank's income subject to assessment. In addition to the required assessment, an FHLBank's board of directors may elect to make voluntary contributions to the AHP. For purposes of the AHP calculation, each FHLBank's income subject to assessment is defined as the individual FHLBank's net income before assessments, plus interest expense related to mandatorily redeemable capital stock. (See *Note 14 - Affordable Housing Program (AHP)* to the accompanying combined financial statements for additional information related to the AHP calculation.)

AHP helps members provide subsidized and other low-cost funding, as well as grants, to create affordable rental and homeownership opportunities. All FHLBank operating costs for the AHP are included in operating expenses, so all AHP assessments go directly to support affordable housing projects.

Interbank Transfers of Consolidated Bonds and Their Effect on Combined Net Income

Combined net income of the FHLBanks is affected by interbank transfers of the liability on outstanding consolidated bonds. These transactions arise when one FHLBank transfers its direct liability on outstanding consolidated bonds to another FHLBank. By engaging in these transactions, two FHLBanks are able to better match their funding needs by transferring funds held by one FHLBank to another FHLBank that needs funds. Because the consolidated bonds are the joint and several obligation of all FHLBanks, these interbank transactions have no effect on the holders of the consolidated bonds.

There were no interbank transfers of consolidated obligations during the year ended December 31, 2016. Total consolidated bonds of $115 million and $59 million at par value were transferred from an FHLBank to another FHLBank during the years ended December 31, 2015 and 2014. The amount of total interbank consolidated bonds transferred during a period depends on a variety of factors, such as (1) whether or not an assuming FHLBank can obtain equal or lower funding costs through interbank transfers as compared to issuing new debt, (2) an FHLBank's overall asset/liability management strategy, and (3) current market conditions.

The transferring FHLBank treats the transfer as a debt extinguishment because that FHLBank has been released from being the primary obligor. The transferring FHLBank records a gain or loss on the debt transferred to the assuming FHLBank based on the difference between the fair value and the carrying value of the consolidated bonds, including any unamortized premiums or discounts. The assuming FHLBank becomes the primary obligor because it now is directly responsible for repaying the debt. The assuming FHLBank records the fair value, including any premium or discount, as the initial carrying amount for the consolidated bond it received from the transferring FHLBank. However, under the principles of combination accounting, interbank eliminations are required to reflect the transaction as if the transferring FHLBank continues to hold the consolidated bond for purposes of the FHLBanks' combined financial statements.

Table 38 presents the effect of interbank eliminations and rounding adjustments (collectively referred to as combining adjustments) on the Combined Statement of Income. Interbank eliminations include:

- transfers of interbank consolidated bond liabilities;
- interest on purchased consolidated bonds, which is eliminated in interest income and interest expense; and
- fees related to the MPF Program that are eliminated in non-interest income and non-interest expense.

Table 38 - Effect of Combining Adjustments on Combined Statement of Income
(dollars in millions)

Effect on	Year Ended December 31, 2016	2015	2014
Interest income	$ (10)	$ (22)	$ (17)
Interest expense	5	9	30
Provision (reversal) for credit losses	—	(2)	(1)
Net interest income after provision (reversal) for credit losses	(15)	(29)	(46)
Non-interest income	(16)	(2)	(4)
Non-interest expense	(17)	(8)	(8)
Affordable Housing Program assessments	—	(1)	(1)
Net income	$ (14)	$ (22)	$ (41)

Comprehensive Income

Comprehensive income is comprised of net income and other comprehensive income. Other comprehensive income is reported on the Combined Statement of Comprehensive Income and presents the net change in the accumulated other comprehensive income (loss) balances.

Other comprehensive income was $477 million, an increase of $1,114 million for the year ended December 31, 2016, compared to the same period in 2015, resulting primarily from fair value gains on AFS securities and higher net unrealized gains relating to cash flow hedging activities.

Other comprehensive loss was $637 million for the year ended December 31, 2015, a decrease of $1,202 million compared to the same period in 2014, due primarily to fair value losses on AFS securities, partially offset by net unrealized gains relating to cash flow hedging activities.

Table 39 - Comprehensive Income
(dollars in millions)

	Year Ended December 31,			Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
Net income	$ 3,408	$ 2,861	$ 2,255	$ 547	$ 606
Other comprehensive income					
Changes in fair value of AFS securities					
Net unrealized gains (losses) on AFS securities	41	(786)	198	827	(984)
Net change in fair value of other-than-temporarily impaired AFS securities	123	(84)	277	207	(361)
Total changes in fair value of AFS securities	164	(870)	475	1,034	(1,345)
Changes in non-credit OTTI losses					
Net amount of AFS and HTM impairment losses reclassified to (from) non-interest income	(8)	42	(2)	(50)	44
Reclassification of (gains) losses of the non-credit portion on AFS securities included in net income	(1)	(52)	—	51	(52)
Accretion of non-credit portion on HTM securities	95	114	133	(19)	(19)
Total changes in non-credit OTTI losses	86	104	131	(18)	(27)
Net unrealized gains (losses) relating to hedging activities	240	123	(1)	117	124
Other	(13)	6	(40)	(19)	46
Total other comprehensive income (loss)	477	(637)	565	1,114	(1,202)
Comprehensive income	$ 3,885	$ 2,224	$ 2,820	$ 1,661	$ (596)

Changes in Fair Value of AFS securities. Changes in the fair value of AFS securities are recorded in other comprehensive income. The net change in unrealized gains (losses) on AFS securities, which have not been other-than-temporarily impaired, was due primarily to changes in interest rates, credit spreads, the passage of time, and volatility. The net change in the fair value of other-than-temporarily impaired AFS securities was driven by housing prices and the economic outlook, as well as changes in interest rates, credit spreads, the passage of time, and volatility. The distinction between the two categories is whether the AFS security has ever incurred an OTTI loss.

Changes in Non-Credit OTTI Losses. Changes in non-credit OTTI losses are comprised of the accretion of the non-credit portion on HTM securities, the reclassification of (gains) losses of the non-credit portion on AFS securities included in net income, and the net amount of AFS and HTM impairment losses reclassified to (from) non-interest income.

Net Unrealized Gains (Losses) Relating to Hedging Activities. Net unrealized gains (losses) relating to hedging activities is comprised of changes in the fair value of a derivative that is designated and qualifies as a cash flow hedge, to the extent that the hedge is effective, until earnings are affected by the variability of the cash flows of the hedged transaction and the amounts are reclassified to non-interest income. The FHLBanks' gains (losses) on hedging activities fluctuate with volatility in the overall interest-rate environment and with the positions taken by the FHLBanks to hedge their risk exposure using cash flow hedges.

Liquidity and Capital Resources

Liquidity

Each FHLBank is required to maintain liquidity in accordance with the FHLBank Act, FHFA regulations, and policies established by its management and board of directors. Each FHLBank seeks to be in a position to meet the credit and liquidity needs of its members and to meet all current and future financial commitments 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 its assets and liabilities.

The FHLBanks may not be able to predict future trends in member credit needs because they are driven by complex interactions among a number of factors, including members' mortgage loan originations, other loan portfolio growth, deposit growth, and the attractiveness of advances compared to other wholesale borrowing alternatives. Each FHLBank regularly monitors current trends and anticipates future debt issuance needs to be prepared to fund its members' credit needs and its investment opportunities. An FHLBank's ability to expand its balance sheet and corresponding liquidity requirements in response to its members' increased credit needs is correlated to its members' requirements for advances and mortgage loans. Alternatively, in response to reduced member credit needs, an FHLBank may allow its consolidated obligations to mature without replacement, or repurchase and retire outstanding consolidated obligations, allowing its balance sheet to shrink.

Sources and Uses of Liquidity. The FHLBanks' primary sources of liquidity are proceeds from the issuance of consolidated obligations and advance repayments, as well as cash and investment holdings that are primarily high-quality, short-, and intermediate-term financial instruments. The FHLBanks' consolidated obligations are not obligations of the United States and are not guaranteed by either the United States or any government agency, but have historically received the same credit rating as the government bond credit rating of the United States. As a result, the FHLBanks generally have comparatively stable access to funding at relatively favorable spreads to U.S. Treasury rates. As of March 15, 2017, the FHLBanks' consolidated obligations were rated AA+/Aaa (with outlook stable) by S&P and Moody's.

During the year ended December 31, 2016, the FHLBanks maintained continual access to funding and adapted their debt issuance to meet the needs of their members. The FHLBanks maintained a preference for short-term funding through the issuance of consolidated discount notes and short-term consolidated bonds during the year ended December 31, 2016. Access to short-term debt markets has been reliable because investors, driven by increased liquidity preferences and risk aversion, including the effects of money market fund reform, have sought the FHLBanks' short-term debt as an asset of choice, which has led to advantageous funding opportunities and increased utilization of debt maturing in one year or less. However, due to the short maturity of the debt, the FHLBanks may be exposed to access to debt markets, refinancing, and investor concentration risks. (See *Combined Financial Condition - Consolidated Obligations* for more information on short-term consolidated obligations.)

Other sources of liquidity include payments collected on mortgage loans, proceeds from the issuance of capital stock, and deposits from members. In addition, by law, the Secretary of the Treasury may acquire up to $4 billion of consolidated

obligations of the FHLBanks. This authority may be exercised only if alternative means cannot be effectively employed to permit the FHLBanks to continue to supply reasonable amounts of funds to the mortgage market, and the ability to supply such funds is substantially impaired because of monetary stringency and a high level of interest rates. Any funds borrowed shall be repaid by the FHLBanks at the earliest practicable date.

The FHLBanks' primary uses of liquidity are advance originations and consolidated obligation payments. Other uses of liquidity are mortgage loan and investment purchases, dividend payments, and other contractual payments. An FHLBank also maintains liquidity to redeem or repurchase excess capital stock, at its discretion, upon the request of a member or under an FHLBank's capital plan.

See *Combined Financial Condition - Advances* for advance originations and repayments and *Combined Financial Condition - Consolidated Obligations* for net proceeds and payments for consolidated obligations.

Each FHLBank is focused on maintaining a liquidity and funding balance between its financial assets and financial liabilities. The FHLBanks work collectively to manage the system-wide liquidity and funding management and the FHLBanks jointly monitor the combined refinancing risk. In managing and monitoring the amounts of assets that require refunding, the FHLBanks may consider contractual maturities of the financial assets, as well as certain assumptions regarding expected cash flows (i.e., estimated prepayments and scheduled amortizations). See the notes to the accompanying combined financial statements for additional information regarding contractual maturities of certain financial assets and financial liabilities.

Regulatory Liquidity Requirements. To protect the FHLBanks against temporary disruptions in access to the debt markets in response to a rise in capital markets volatility, the FHFA requires each FHLBank to:

- maintain contingency liquidity sufficient to meet liquidity needs that shall, at a minimum, cover five calendar days of inability to access consolidated obligations in the debt markets;
- have available at all times an amount greater than or equal to its members' current deposits invested in advances with maturities not to exceed five years, deposits in banks or trust companies, and obligations of the U.S. Treasury;
- maintain, in the aggregate, unpledged qualifying assets in an amount at least equal to the amount of its participation in total consolidated obligations outstanding; and
- maintain, through short-term investments, an amount at least equal to its anticipated cash outflows under these two hypothetical scenarios.
    - One scenario assumes that an FHLBank cannot access the capital markets for a period of between 10 to 20 days, with initial guidance set at 15 days, and that during that time members do not renew any maturing, prepaid, or called advances.
    - The second scenario assumes that an FHLBank cannot access the capital markets for a period of between three to seven days, with initial guidance set at five days, and that during that period an FHLBank will automatically renew maturing and called advances for all members except very large members, provided that the member is well-rated by its primary Federal regulator or its state regulator equivalent for insurance companies and is well-rated by the individual FHLBank's internal credit rating system.

Each FHLBank also maintains a contingency liquidity plan designed to enable it to meet its obligations and the liquidity needs of members in the event of operational disruptions at the FHLBanks and/or the Office of Finance, or short-term capital market disruptions. During the year ended December 31, 2016, each of the FHLBanks was in compliance with the FHFA's regulatory contingency liquidity requirements. As defined by FHFA regulations, contingency liquidity means the sources of cash an FHLBank may use to meet its operational requirements when its access to capital markets is impeded, and includes:

- marketable securities with a maturity of one year or less;
- self-liquidating assets with a maturity of seven days or less;
- assets that are generally accepted as collateral in the repurchase agreement market; and
- irrevocable lines of credit from financial institutions rated not lower than the second highest rating category by a nationally recognized statistical rating organization.

Office of Finance Funding Contingency Plan Policy. The Office of Finance has an allocation methodology for the proceeds from the issuance of consolidated obligations when consolidated obligations cannot be issued in sufficient amounts to satisfy all FHLBank demand for funding during periods of financial distress and when its existing allocation processes are deemed insufficient. The purpose and objective of this allocation methodology is to ensure that guidance is in place to facilitate the ability of the Office of Finance to meet the funding needs of FHLBanks when market conditions threaten to limit or prevent access to funding in periods of financial distress. In general, this methodology provides that the proceeds in these circumstances will be allocated among the FHLBanks based on relative FHLBank regulatory capital unless the Office of Finance determines that there is an overwhelming reason to adopt a different allocation method. As is the case during any instance of a disruption in an FHLBank's ability to access the capital markets, market conditions or this allocation could adversely impact an FHLBank's ability to finance its operations, which could thereby adversely impact that FHLBank's financial condition and results of operations.

Capital Resources

At December 31, 2016, each of the FHLBanks was in compliance with its statutory minimum capital requirements. (See *Note 16 - Capital* to the accompanying combined financial statements for additional information regarding minimum regulatory capital requirements.) Regulatory guidance requires each FHLBank to assess, at least once a year, the adequacy of its retained earnings under various future financial and economic scenarios, including:

- parallel and non-parallel interest-rate shifts;
- changes in the interest-rate relationship between different yield curves; and
- changes in the credit quality of the FHLBank's assets.

Management and the board of directors of each FHLBank review the capital structure of that FHLBank on a periodic basis to ensure the capital structure supports the risk associated with its assets and addresses applicable regulatory and supervisory matters. In addition, an individual FHLBank may institute a higher capital requirement to meet internally-established thresholds or to address supervisory matters, limit dividend payments, or restrict excess capital stock repurchases as part of its retained earnings policies. (See *Note 16 - Capital* to the accompanying combined financial statements and *Business - Capital, Capital Rules, and Dividends* for more information.)

Annual Stress Test. Under the Dodd-Frank Wall Street Reform and Consumer Protection Act, as implemented by the FHFA, each FHLBank is required to perform an annual stress test to assess the potential impact of various financial and economic conditions on capital adequacy. The annual stress tests were completed and published in November 2016, based on each FHLBank’s financial condition as of December 31, 2015, using the methodology prescribed by the FHFA. Each FHLBank's stress test results demonstrated capital adequacy under the severely adverse economic scenario defined by the FHFA.

Joint Capital Enhancement Agreement. The Joint Capital Enhancement Agreement, as amended (Capital Agreement), is intended to enhance the capital position of each FHLBank. The Capital Agreement provides that each FHLBank will allocate 20% 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. (See *Note 16 - Capital* - *Restricted Retained Earnings* to the accompanying combined financial statements for more information.)

Off-Balance Sheet Arrangements and Other Commitments

In the ordinary course of business, the FHLBanks engage in financial transactions that, in accordance with GAAP, are not recorded on the FHLBanks' Combined Statement of Condition or may be recorded on the FHLBanks' Combined Statement of Condition in amounts that are different from the full contract or notional amount of the transactions. (See *Note 20 - Commitments and Contingencies* - *Off-Balance Sheet Commitments* to the accompanying combined financial statements for a discussion and the amounts of the FHLBanks' off-balance sheet arrangements and other commitments.) The FHLBanks do not have any special purpose entities or any other types of off-balance sheet conduits.

Contractual Obligations

In the ordinary course of operations, the FHLBanks enter into certain contractual obligations. Table 40 presents the FHLBanks' significant contractual obligations at December 31, 2016.

Table 40 - Payments Due or Expiration Terms by Type of Contractual Obligation
(dollars in millions)

	Payments Due or Expiration Terms by Period				
	Less than 1 year	1 year to less than 3 years	3 years to less than 5 years	Thereafter	Total
Consolidated bonds(1)	$ 335,499	$ 153,977	$ 46,805	$ 42,687	$ 578,968
Mandatorily redeemable capital stock	52	54	411	1,187	1,704
Commitments to fund/purchase mortgage loans	1,241	—	—	—	1,241
Pension and post-retirement contributions(2)	40	33	34	132	239
Operating leases	20	40	29	83	172
Other unconditional purchase obligations	38	45	—	—	83
Total contractual obligations	$ 336,890	$ 154,149	$ 47,279	$ 44,089	$ 582,407

(1) Does not include consolidated discount notes and contractual interest payments related to consolidated bonds. Payments for consolidated bonds (including index-amortizing notes) are allocated to a period based on contractual maturities. The actual timing of payments could be influenced by factors affecting redemptions. (See *Note 13 - Consolidated Obligations* to the accompanying combined financial statements for additional information.)

(2) Includes future funding contributions for the qualified pension plans and scheduled benefit payments for the nonqualified (unfunded) pension plans.

Critical Accounting Estimates

The preparation of financial statements in accordance with GAAP requires each FHLBank's management to make a number of 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 expense during the reported periods. Although each FHLBank's management believes that its judgments, estimates, and assumptions are reasonable, actual results may differ from these estimates.

Each individual FHLBank manages its operations independently and is responsible for establishing its own accounting and financial reporting policies in accordance with GAAP. An individual FHLBank's accounting and financial reporting policies and practices, including accounting estimates, are not always identical to those used by other FHLBanks because alternative policies and presentations are permitted under GAAP in certain circumstances. For example, the FHLBanks might not use the same models and assumptions in determining the fair values of their respective assets and liabilities. The use of different models or assumptions by individual FHLBanks could result in materially different valuations or other estimates, even when similar or identical assets and liabilities are being measured, and could have materially different effects on the net income and retained earnings of the respective FHLBanks, although each of these methodologies is in compliance with GAAP. However, the FHLBanks and the Office of Finance recognize the importance of transparency and enhanced consistency in financial reporting, and have implemented a uniform framework for completing their OTTI analyses of private-label MBS and a uniform valuation technique for determining the fair value of agency MBS and private-label MBS.

The accounting estimates and assumptions discussed in this section are those generally considered by each FHLBank's management to be the most critical to an understanding of its financial statements and the financial data it provides to the Office of Finance for this Combined Financial Report. These estimates require an FHLBank's management to make subjective or complex judgments about matters that are inherently uncertain. Investors are cautioned that future events rarely develop exactly as forecasted, and the best estimates routinely require adjustments, which could be material. A change in an estimate or assumption could have a material effect on an FHLBank's reported results of operations or its financial condition, and differences between the assumptions and estimates used by individual FHLBanks could result in material differences in the reported results of operations and financial condition of those FHLBanks.

Estimates and assumptions that are significant to the results of operations and financial condition of the FHLBanks include those used in conjunction with (1) OTTI for investment securities; (2) fair value estimates; (3) derivative hedging relationships; (4) amortization of premiums and accretion of discounts on investment securities and purchased mortgage loans; and (5) calculation of allowance for credit losses for each identified portfolio segment of financing receivables. (See *Note 1 - Summary of Significant Accounting Policies* to the accompanying combined financial statements for a description of accounting policies related to these estimates and assumptions.)

OTTI for Investment Securities

Uniform OTTI Framework. The FHLBanks have developed a uniform framework for completing their OTTI analyses in compliance with accounting guidance on the recognition and presentation of OTTI in the financial statements. To ensure consistency in the determination of OTTI for private-label MBS among all FHLBanks, the FHLBanks use a system-wide governance committee and a formal process to ensure consistency in key OTTI modeling assumptions used for purposes of their cash flow analyses for the majority of these securities. To assess whether the entire amortized cost bases of the FHLBanks' private-label MBS will be recovered, the FHLBanks performed a cash flow analysis for each such security that was previously other-than-temporarily impaired or where fair value was less than amortized cost as of the balance sheet date, except for certain private-label MBS where the underlying loan-level collateral data was not available using the OTTI modeling methodology under the FHLBanks' uniform framework.

The FHLBanks evaluate substantially all of their private-label MBS in an unrealized loss position using the FHLBanks' uniform framework and approved assumptions for purposes of OTTI cash flow analysis. For private-label MBS where underlying collateral data is not available, alternative procedures, as determined by each FHLBank, are used to assess these securities for OTTI. (See *Note 7 - Other-than-Temporary Impairment Analysis* to the accompanying combined financial statements for additional discussion regarding the recognition and presentation of OTTI.)

At December 31, 2016, seven FHLBanks owned certain private-label MBS where the underlying loan-level collateral data was not available. For private-label MBS that could not be modeled under the FHLBanks' uniform framework, alternative procedures were determined and approved by the system-wide governance committee. These alternative procedures established a formal process by which the FHLBanks could provide input on and approve key OTTI assumptions. Each affected FHLBank used the approved alternative procedures to assess these securities for OTTI. These securities represented approximately 2% of the FHLBanks' total unpaid principal balance of private-label MBS at December 31, 2016.

Each FHLBank updates its OTTI analysis each quarter to reflect current and anticipated housing market conditions, observed and anticipated borrower behavior, and updated information on the loans supporting the FHLBank's private-label MBS. This process includes updating key aspects of each FHLBank's loss projection models. In doing so, an FHLBank considers many factors including, but not limited to, the following:

- the credit ratings assigned to the securities by the nationally recognized statistical rating organizations;
- other indicators of issuer credit quality;
- the strength of the provider of any guarantees;
- the duration and magnitude of the unrealized loss; and
- whether the FHLBank has the intent to sell the security or more likely than not will be required to sell the security before the recovery of its amortized cost basis.

In the case of its private-label MBS, each FHLBank also considers prepayment speeds, the historical and projected performance of the underlying loans, and the credit support provided by the subordinate securities.

In performing the cash flow analysis for the private-label MBS under the uniform framework, each FHLBank uses two third-party models. The first model forecasts loan-level prepayment, default, and severity behavior. The second model is used to determine the resulting cash flows. The FHLBanks also assess the potential mitigation of projected credit losses through the application of existing monoline bond insurance from third parties by performing an assessment of the respective insurer's ability to cover the security's projected shortfall of contractual principal or interest. (See *Note 7 - Other-than-Temporary Impairment Analysis* to the accompanying combined financial statements for additional information.)

The modeling assumptions, significant inputs, and methodologies are material to an OTTI determination. Any changes to these assumptions, significant inputs, or methodologies could result in materially different outcomes to this determination, including the realization of additional OTTI charges that may be substantial. Each FHLBank is responsible for making its own OTTI determination and assessing the reasonableness of assumptions, significant inputs, and methodologies used, as well as for performing the required present value calculations using appropriate historical cost bases and yields. Two or more FHLBanks that hold the same private-label MBS are required to consult with one another to ensure they reach the same conclusion on any decision that a commonly-held private-label MBS is other-than-temporarily impaired. This includes the determination that the fair value and the credit loss component of the unrealized loss are consistent among those FHLBanks.

Table 41 presents the unpaid principal balances and the significant inputs used to assess private-label residential MBS and home equity loan ABS under the FHLBanks' uniform framework for OTTI, as well as related current credit enhancements as of

December 31, 2016. The calculated averages represent the dollar-weighted averages of all private-label residential MBS and home equity loan ABS in each category shown.

Table 41 - Significant Inputs for Private-Label Residential MBS and Home Equity Loan ABS at December 31, 2016
(dollars in millions)

		Significant Inputs			
	Unpaid Principal Balance	Prepayment Rates	Default Rates	Loss Severities	Current Credit Enhancement
		Weighted-Average	Weighted-Average	Weighted-Average	Weighted-Average
Private-label Residential MBS(1)					
Prime	$ 3,671	13.5%	6.2%	25.1%	8.0%
Alt-A	8,913	11.1%	19.8%	35.8%	7.6%
Subprime	457	2.7%	40.2%	56.9%	19.1%
Total private-label residential MBS	$ 13,041	11.5%	16.7%	33.5%	8.1%
Home Equity Loan ABS(1)					
Subprime	69	5.1%	6.6%	48.7%	38.8%
Total home equity loan ABS	$ 69	5.1%	6.6%	48.7%	38.8%

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(1) The classification (prime, Alt-A, and subprime) is based on the model used to run the estimated cash flows for the individual securities, which may not necessarily be the same as the classification at the time of origination.

Adverse Case Scenario. In addition to evaluating its private-label MBS under a base case (or best estimate) scenario as discussed in *Note 7 - Other-than-Temporary Impairment Analysis* to the accompanying combined financial statements, each FHLBank performed a cash flow analysis for each of these securities under a more stressful scenario, or adverse case scenario. This adverse case scenario was primarily based on a short-term housing price forecast, which was five percentage points lower than the base case, followed by a path with annual rates of housing price growth that included rates which were 33% lower than the base case. The credit losses on all other-than-temporarily impaired private-label MBS under the base case and adverse case scenarios were $3 million and $8 million for the three months ended December 31, 2016. The base case scenario represents actual OTTI-related credit losses recognized in earnings for the three months ended December 31, 2016.

The estimated cash flows of the adverse case scenario were generated to estimate what the OTTI charges would have been under a more stressful scenario for the three months ended December 31, 2016. The adverse case scenario and associated results do not represent each FHLBank's current expectations, and therefore should not be construed as a prediction of each FHLBank's future results, market conditions, or the actual performance of these securities. Rather, the results from this hypothetical adverse case scenario provide a measure of the credit losses that the FHLBanks might incur if home price declines (and subsequent recoveries) are more adverse than those projected in each FHLBank's base case OTTI assessment.

Interest Income Recognition. When a security has been other-than-temporarily impaired, a new accretable yield is calculated for that security at its impairment measurement date. This adjusted yield is used to calculate the interest income recognized over the remaining life of that security, matching the amount and timing of its estimated future collectible cash flows. Subsequent to that security's initial OTTI, an FHLBank re-evaluates estimated future collectible cash flows on a quarterly basis. If the security has no additional OTTI based on this evaluation, the accretable yield is reassessed for possible adjustment on a prospective basis. Depending on an FHLBank's accounting method, the accretable yield is adjusted if there is either: (1) a significant increase in the security's expected cash flows or (2) a favorable or unfavorable change in the timing and amount of the security's expected cash flows. If there continue to be improvements in the estimated cash flows of securities previously identified as other-than-temporarily impaired, the accretion of yield adjustments is likely to continue to be a positive source of net interest income in future periods.

Monoline Bond Insurers. Certain FHLBanks' investment securities are insured by monoline bond insurers. The bond insurance on these investments guarantees the timely payments of principal and interest if these payments cannot be satisfied from the cash flows of the underlying mortgage pool(s). Private-label MBS insured by monoline bond insurers are cash flow tested for credit impairment. For private-label MBS protected by such monoline insurance, an FHLBank's OTTI analysis would look first to the performance of the underlying security, considering its embedded credit enhancements in the form of excess spread, over-collateralization, and credit subordination, to determine the collectability of all amounts due. If these protections are deemed insufficient to make timely payment of all amounts due, then an FHLBank may consider the capacity of the monoline bond insurer to cover any shortfalls. (See *Risk Management - Monoline Bond Insurance* for additional information regarding the FHLBanks' monoline bond insurance coverage on a limited number of private-label MBS.)

Fair Value Estimates

The use of fair value to measure the FHLBanks' financial instruments is fundamental to the FHLBanks' financial statements and is a critical accounting estimate because certain assets and liabilities are carried at fair value, including trading securities, available-for-sale securities, derivative assets and liabilities, certain advances, certain consolidated obligations, and certain other assets and liabilities. In addition, certain assets are measured at fair value on a non-recurring basis at December 31, 2016. These assets are subject to fair value adjustments in certain circumstances (for example, when there is evidence of impairment).

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). In general, the transaction price will equal the exit price, and therefore represents the fair value of the asset or liability at initial recognition. However, in concluding whether a transaction price represents fair value, each reporting entity is required to consider factors specific to the transaction and the asset or liability. In addition, the reporting entity must determine the unit of account, highest and best use, principal market, and market participants. These determinations allow the reporting entity to define the inputs for fair value and level of hierarchy. The three-level fair value hierarchy prioritizes the inputs into the valuation technique used to measure the fair value of the assets and liabilities held at fair value. The fair value hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and lowest priority to unobservable inputs (Level 3 measurements).

Table 42 presents the assets and liabilities measured at fair value and their respective percentages compared to total recurring assets and liabilities measured at fair value and to total assets and total liabilities as reported on the Combined Statement of Condition at December 31, 2016. (See *Note 19 - Fair Value* to the accompanying combined financial statements for details on fair value measurements.)

Table 42 - Assets and Liabilities Measured at Fair Value
(dollars in millions)

	December 31, 2016				
	Total	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustment and Cash Collateral (1)**
Assets measured at fair value					
Recurring					
Fair value option	$ 14,323	$ —	$ 14,323	$ —	$ —
All other	92,648	159	86,825	6,841	(1,177)
Total recurring assets	106,971	159	101,148	6,841	(1,177)
Non-recurring	107	—	3	104	—
Total assets measured at fair value	$ 107,078	$ 159	$ 101,151	$ 6,945	$ (1,177)
Percentage of recurring assets to total recurring assets	100.0%	0.1%	94.6%	6.4%	(1.1)%
Percentage of recurring assets to total assets(2)	10.1%	—	9.6%	0.6%	(0.1)%
Percentage of total assets measured at fair value to total assets(2)	10.2%	—	9.6%	0.7%	(0.1)%
Liabilities measured at fair value					
Recurring					
Fair value option	$ 35,495	$ —	$ 35,495	$ —	$ —
All other	810	—	4,934	—	(4,124)
Total recurring liabilities	36,305	—	40,429	—	(4,124)
Total liabilities measured at fair value	$ 36,305	$ —	$ 40,429	$ —	$ (4,124)
Percentage of recurring liabilities to total recurring liabilities	100.0%	—	111.4%	—	(11.4)%
Percentage of recurring liabilities to total liabilities(2)	3.6%	—	4.0%	—	(0.4)%
Percentage of total liabilities measured at fair value to total liabilities(2)	3.6%	—	4.0%	—	(0.4)%

(1) Amounts represent the application of the netting requirements that allow an FHLBank to settle positive and negative positions and also cash collateral and related accrued interest held or placed by that FHLBank with the same clearing agent and/or counterparty.
(2) The percentage is calculated based on the total assets of $1,056,712 million and total liabilities of $1,004,253 million as reported on the Combined Statement of Condition at December 31, 2016.

Each FHLBank uses valuation techniques that maximize the use of observable market-based inputs, when appropriate, to value the assets and liabilities carried at fair value on a recurring basis or to determine whether a fair value adjustment is needed for assets and liabilities to be carried at fair value on a non-recurring basis. Given the nature of some of the assets and liabilities carried at fair value, whether on a recurring or non-recurring basis, clearly determinable market-based valuation inputs are often not available. Therefore, the fair value measurements of these instruments use unobservable inputs and are classified as Level 3 within the fair value hierarchy. Level 3 assets primarily consist of private-label MBS. Due to unavailability of observable inputs for the Level 3 assets, fair values are determined by valuation models that use the following:

- third-party vendor prices;
- discounted cash flows, using market estimates of interest rates and volatility; or
- dealer prices on similar instruments.

The assumptions used in these models are based on each FHLBank's best estimate with respect to the following:

- discount rates;
- prepayments;
- market volatility; and
- other factors.

These assumptions may have a significant effect on the reported fair value of assets and liabilities. The use of different assumptions, as well as changes in market conditions, could result in materially different net income, other comprehensive income, and retained earnings.

Uniform Valuation Technique for MBS. Using a uniform framework, the FHLBanks' valuation technique first requires the establishment of a median price for each security using a formula based on the number of third-party vendor prices received:

- if four prices are received, the middle two prices are averaged to establish a median price;
- if three prices are received, the middle price is the median price;
- if two prices are received, the prices are averaged to establish a median price; and
- if one price is received, it is the median price (and also the final price), subject to further validation, consistent with the evaluation of outliers as discussed in the next paragraph.

All prices that are within a specified tolerance threshold of the median price are included in the cluster of prices that are averaged to compute a default price. Prices that are outside the threshold (outliers) are subject to further analysis to determine if they are a better estimate of fair value. This analysis includes, but is not limited to, comparison to prices provided by an additional third-party valuation service, prices for similar securities, and non-binding dealer estimates. If the analysis determines an outlier or some other price is a better estimate of fair value, then the outlier or the other price is used as the final price rather than the default price. If the analysis confirms that an outlier is not representative of fair value, 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.

Each individual FHLBank has its set of control processes that are designed to ensure its fair value measurements are appropriate and reliable. These control processes may include, but are not limited to, the following:

- obtaining the third-party pricing service methodologies and control reports;
- challenging a third-party pricing vendor when a price falls outside of the tolerance parameters;
- identifying a stale price, a price that changed significantly from prior valuations, and other anomalies that may indicate that a price may not be accurate; and
- reviewing pricing consistency within the same asset group to identify anomalies.

Prices for MBS CUSIPs held in common with other FHLBanks are reviewed for consistency. In using this common methodology, each FHLBank remains responsible for the selection and application of its fair value methodology and for the reasonableness of assumptions and inputs used.

Derivative Hedging Relationships

Derivatives accounting involves estimating the fair value of the derivatives and assessing the effectiveness of the hedging relationship using regression-based testing, based on simulated valuations derived from historical market data. These estimates include subjective calculations and estimates based on information available as of the date of the financial statements, which could be materially different based on different assumptions, calculations, and estimates. If hedging relationships meet the criteria, two approaches to hedge accounting can be used: short-cut hedge accounting and long-haul hedge accounting.

Short-Cut Hedge Accounting. A short-cut hedging relationship assumes no ineffectiveness and implies that the hedge between an interest-rate swap and an interest-bearing financial instrument is perfectly correlated. Therefore, it is assumed that changes in the fair value of the interest-rate swap and the interest-bearing financial instrument will perfectly offset one another. To qualify for short-cut accounting treatment, a number of restrictive conditions must be met, including but not limited to, the following:

- the notional amount of the interest-rate swap matches the principal amount of the interest-bearing financial instrument being hedged;
- the fair value of the interest-rate swap at the inception of the hedging relationship is zero;
- the formula for computing net settlements under the interest-rate swap is the same for each net settlement; and
- the interest-bearing financial instrument is not prepayable.

Provided that no terms changed, the entire change in the hedging instrument's fair value is considered to be effective at achieving offsetting changes in fair values or cash flows of the hedged asset or liability. If all the criteria are met, an FHLBank may apply the short-cut method to a qualifying hedge when the relationship is designated on the trade date of both the hedging instrument and the hedged items (for example, upon commitment to disburse advances or issue consolidated obligation bonds). In many hedging relationships, the hedged item is not recognized for accounting purposes until its settlement date; however, the FHLBanks record the changes in the hedging instrument and the hedged item's fair value beginning on the trade date, but the derivative relationship has no effect on earnings or capital.

Long-Haul Hedge Accounting. A long-haul hedging relationship implies a highly effective hedging relationship that requires an FHLBank to assess, retrospectively and prospectively, whether the derivative and hedged item has been and will be highly effective in offsetting changes in fair value attributable to the hedged risk. The changes in fair value for the derivative and the hedged item may or may not be perfectly correlated. Any difference in the change of fair value between the two will be recognized as a net gain (loss) on the statement of income. To maintain the highly effective relationship, this effectiveness testing of the hedge is performed at the inception of the hedge and thereafter, on at least a quarterly basis. An FHLBank may perform dollar-offset prospective testing at the inception of the hedge and calculate retrospective regressions after a sufficient number of data points have been accumulated. Alternatively, an FHLBank may employ regression-based testing prospectively based on valuations derived from historical and current market data. If, during this effectiveness testing, the hedge fails to maintain effectiveness at any point, the hedge relationship will be deemed ineffective. As a result, the hedged item's changes in fair value will no longer be evaluated for effectiveness, and will be treated as not highly effective.

If a hedging relationship is not considered highly effective, it does not qualify for hedge accounting treatment. Therefore, the hedged item's changes in fair value are not evaluated, even though an offsetting relationship between fair values or cash flows of the hedge and hedged items may be demonstrated. Changes in the fair value of such economic hedges of assets or liabilities for asset/liability management purposes are recorded in current period earnings.

See *Note 1 - Summary of Significant Accounting Policies* and *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements for additional discussion regarding the FHLBanks' accounting for derivatives and types of hedging transactions.

Amortization of Premiums and Accretion of Discounts on Investment Securities and Purchased Mortgage Loans

When an FHLBank purchases investment securities and mortgage loans, it may not pay the seller the par value or the unpaid principal balance of the asset. If an FHLBank purchases the asset at a premium, the premium reduces the yield that an FHLBank recognizes on the asset below the stated coupon or note rate. Conversely, if an FHLBank purchases the asset at a discount, the discount increases the yield that FHLBank recognizes on the asset above the stated coupon or note rate.

The FHLBanks amortize premiums and accrete discounts in accordance with GAAP and recognize the amounts of amortization or accretion in current period earnings as a decrease or increase to interest income. An offsetting adjustment is made to the asset's net carrying value as the premiums are amortized and the discounts are accreted into interest income.

Contractual Interest Method. The amortization of premiums or accretion of discounts to interest income using the contractual interest method produces a constant level-yield over the contractual life, which represents the stated maturity. The contractual interest method recognizes the income effects of premiums and discounts over the contractual life of the asset based on the actual behavior of the underlying assets, including adjustments for actual prepayment activities, and reflects the contractual terms of the asset without regard to changes in estimated prepayments based on assumptions about future borrower behavior.

Retrospective Interest Method. Except when the contractual interest method is used, the FHLBanks apply the retrospective interest method on their investment securities and purchased mortgage loans for which prepayments reasonably can be expected and estimated. The retrospective interest method requires that an FHLBank estimate prepayments over the estimated life of the securities and make a retrospective adjustment of the effective yield each time that it changes the estimated life as if the new estimate had been known since the original acquisition date of the asset. Use of the retrospective method may increase volatility of reported earnings during periods of changing interest rates, and the use of different estimates or assumptions, as well as changes in external factors, could produce significantly different results. Declining interest rates generally accelerate prepayments, which accelerate the amortization of premiums and reduce current period earnings. Typically, declining interest rates also accelerate the accretion of discounts, which increases current period earnings. Conversely, rising interest rates generally result in slower prepayments, which shift premium amortization and discount accretion to future periods.

Allowance for Credit Losses

Each FHLBank is required to assess potential credit losses and establish an allowance for credit losses, as applicable, for each identified portfolio segment of financing receivables. A portfolio segment is the level at which an FHLBank develops and documents a systematic method for determining its allowance for credit losses. The FHLBanks' allowance for credit losses methodologies are discussed below for the following portfolio segments:

- credit products (advances, letters of credit, and other extensions of credit to borrowers);
- conventional MPF loans held for portfolio and conventional MPP loans held for portfolio; and
- government-guaranteed or -insured mortgage loans held for portfolio.

Furthermore, each FHLBank has established a systematic methodology for assessing other financing receivables for potential credit losses, including term securities purchased under agreements to resell and term federal funds sold. (See *Note 10 - Allowance for Credit Losses* to the accompanying combined financial statements for additional information on the FHLBanks' allowance for credit losses methodologies.)

The allowance for credit losses represents the best estimate by each FHLBank's management of the probable credit losses inherent in its financing receivable portfolios. Determining the amount of the allowance for credit losses is considered a critical accounting estimate because management's evaluation of the adequacy of the allowance for credit losses is subjective and requires significant estimates, such as the amounts and timing of estimated future cash flows, estimated losses based on historical loss experience, and consideration of current economic trends, all of which are susceptible to change. Each FHLBank's assumptions and judgments related to its allowance for credit losses are based on information available as of the date of the corresponding financial statements. Actual losses could differ from these estimates. (See *Risk Management - Credit Risk* for further discussion of how the FHLBanks monitor, limit, and assess credit risk on their financing receivables.)

Credit Products. Each FHLBank expects to collect all amounts due according to the contractual terms of its credit products based on the nature and quality of the collateral held as security for its credit products, its credit extension and collateral policies, its credit analysis, and the repayment history on its credit products. Accordingly, no allowance for losses on credit products was deemed necessary at December 31, 2016 and 2015. Furthermore, no liability to reflect an allowance for credit losses for off-balance sheet exposures was recorded at December 31, 2016 and 2015. No FHLBank has ever experienced a credit loss on any of its credit products.

The FHLBanks are required by FHFA regulation to obtain sufficient collateral on credit products to protect against losses. The FHLBanks are permitted to accept only certain collateral, such as the following:

- residential mortgage loans;
- U.S. government or agency securities;
- FHLBank deposits; and
- other real estate-related assets.

Each FHLBank may require additional collateral (whether or not that additional collateral meets the eligibility criteria previously discussed) or require that the borrower substitute existing collateral at any time. An FHLBank also has a statutory lien on each member's FHLBank stock as additional security for the indebtedness of that member. At December 31, 2016 and 2015, the rights to collateral held by the FHLBanks on a borrower-by-borrower basis had an estimated value that was equal to or exceeded the outstanding extensions of credit. Management of each FHLBank believes that adequate policies and procedures are in place to effectively manage that FHLBank's respective credit risk on its credit products. These policies and procedures may include, but are not limited to the following: (1) monitoring the creditworthiness and financial condition of the institutions to which the FHLBank lends funds; (2) reviewing the quality and value of collateral pledged by members to secure extensions of credit; (3) estimating borrowing capacity based on collateral value and collateral type for each member; and (4) evaluating historical loss experience.

Conventional MPF Mortgage Loans Held for Portfolio. At December 31, 2016 and 2015, each FHLBank that holds mortgage loans under the MPF Program had an allowance for credit losses on mortgage loans held under that program. Each FHLBank bases its allowance on its management's estimate of credit losses inherent in its mortgage loan portfolio at the statement of condition date. The estimate is based on the individual MPF FHLBank's loan portfolio performance history and/or on analysis of industry statistics for similar mortgage loan portfolios. Conventional loans, in addition to having the related real estate as collateral, are also credit enhanced either by the PFI, which is required to pledge qualified collateral to secure its credit enhancement obligation, or by the supplemental mortgage insurance (SMI) purchased by the PFI. If an MPF FHLBank had losses in excess of the estimated liquidation value of collateral held and credit enhancement amount, credit losses would be recognized for financial reporting purposes.

The allowance for credit losses on mortgage loans held under the MPF Program is established at a level that each FHLBank's management believes to be adequate to absorb its estimated credit losses related to specifically identified loans and estimated credit losses inherent in its total MPF loan portfolio.

The estimation of credit losses in the total MPF loan portfolio involves assessing the effect of current economic trends and specific events on the allowance for credit losses on mortgage loans. Furthermore, each FHLBank generally takes into consideration the following factors: (1) management's judgment as to the eligibility of PFIs to continue to service and credit-enhance the loans delivered to an MPF FHLBank; (2) evaluation of credit exposure on portfolio loans; (3) valuation and collectability of credit enhancements provided by PFIs or mortgage insurers; (4) estimation of loss exposure and historical loss experience; (5) loan portfolio characteristics and collateral valuations; and (6) industry data and prevailing economic conditions. Setting the level of reserves requires significant judgment, due to the inability to readily determine the fair value of all underlying properties and the uncertainty in other macroeconomic factors that make estimating defaults and severity imprecise, and regular evaluation by management.

Certain conventional mortgage loans, primarily impaired mortgage loans that are considered collateral-dependent, may be specifically identified for purposes of calculating the allowance for credit losses. These collateral-dependent loans, which may include loans on non-accrual status, are treated separately from the remaining MPF loans because sufficient information exists to make a reasonable estimate of the inherent loss on these MPF loans on an individual loan basis. MPF loans that are not individually evaluated are collectively evaluated for impairment. Migration analysis is a methodology for determining, through an FHLBank's experience over a historical period, the rate of default on pools of similar loans. Certain FHLBanks apply migration analysis to loans based on payment status categories such as current, 30, 60, and 90 days past due, as well as to loans 60 days past due following receipt of notice of filing from the bankruptcy court. Each FHLBank then estimates how many loans in these categories may migrate to a realized loss position, and applies a loss severity factor to estimate losses incurred at the statement of condition date. Primary mortgage insurance (PMI) and the credit enhancement amount provided by the PFI or by SMI are generally factored into the allowance for credit loss determination, provided that collection from the PFI or insurance companies is determined to be probable. The combination of these factors, as well as an additional judgmental amount determined by management due to uncertainties inherent in the estimation process, represents the estimated credit losses from conventional MPF loans. Although this amount is not allocated to any specific economic or credit event, it is

intended to cover other inherent losses that may not be captured in the methodology previously described. Therefore, the total allowance for credit losses represents management's best estimate of probable loan losses. However, the actual loss that may occur on homogeneous pools of mortgage loans may be more or less than the estimated loss. Any potential losses that would be recovered from the credit enhancement amount, as well as PMI, are not generally reserved for as part of the allowance for credit losses on mortgage loans.

Conventional MPP Mortgage Loans Held for Portfolio. At December 31, 2016 and 2015, each MPP FHLBank that holds mortgage loans under the MPP had an allowance for credit losses on mortgage loans held under that program. Each MPP FHLBank that has acquired mortgage loans under the MPP analyzes its MPP loans on a quarterly basis by estimating probable incurred losses, comparing these losses to credit enhancements, including the recoverability of insured amounts, and then establishes general or specific reserves based on the results. If an MPP FHLBank had losses in excess of the estimated liquidation value of collateral held, PMI (if applicable), lender risk account, and SMI (if applicable), credit losses would be recognized for financial reporting purposes.

The MPP FHLBanks apply a consistent methodology to determine the adequacy of the allowance for credit losses. The key estimates and assumptions that affect each MPP FHLBank's allowance for credit losses generally include the following: (1) the characteristics of specific delinquent conventional loans outstanding under the MPP; (2) evaluations of the overall delinquent loan portfolio through the use of migration analysis; (3) loss severity estimates; (4) historical claims and default experience; (5) expected proceeds from credit enhancements; (6) comparisons to reported industry data; and (7) current economic trends and conditions. Setting the level of reserves requires significant judgment, due to the inability to readily determine the fair value of all underlying properties and the uncertainty in other macroeconomic factors that make estimating defaults and severity imprecise, and regular evaluation by management.

Government-Guaranteed or -Insured Mortgage Loans Held for Portfolio. An FHLBank may purchase both conventional mortgage loans and government-guaranteed or -insured mortgage loans under the MPF Program and MPP. Government loans are insured or guaranteed by federal agencies, including the Federal Housing Administration, Department of Veterans Affairs, Rural Housing Service, and Department of Housing and Urban Development. Any losses from these mortgage loans are expected to be recovered from those entities or absorbed by the servicer or PFI, as applicable. Accordingly, the FHLBanks have determined that no allowance for credit losses is necessary in connection with government-guaranteed or -insured mortgage loans held for portfolio at December 31, 2016 and 2015.

Recent Accounting Developments

See *Note 2 - Recently Issued and Adopted Accounting Guidance* to the accompanying combined financial statements for a discussion regarding the effect of recently issued accounting guidance on the FHLBanks' combined financial condition, combined results of operations, or combined cash flows.

Legislative and Regulatory Developments

Significant regulatory actions and developments for the period covered by this report are summarized below.

FHFA Final Rule on Acquired Member Assets. On December 19, 2016, the FHFA published the final Acquired Member Assets (AMA) rule, which governs an FHLBank’s ability to purchase and hold certain types of mortgage loans from its members. The final rule, effective January 18, 2017, has, among other things:

- expanded the types of assets that will qualify as AMA to include mortgage loans insured or guaranteed by a department or agency of the U.S. government that exceed the conforming loan limits and certificates representing interests in whole loans under certain conditions;

- enhanced the credit risk sharing requirement by allowing an FHLBank to utilize its own model to determine the credit enhancement for AMA loan assets and pool loans in lieu of a nationally recognized statistical rating organization ratings model. The assets delivered must now be credit enhanced by the member up to an FHLBank determined “AMA investment grade” instead of a specific nationally recognized statistical rating organization rating; and

- retained the option to allow a member to meet its credit enhancement obligation by purchasing loan level supplemental mortgage insurance or pool level insurance once an FHLBank has established standards for qualified insurers.

The FHLBanks do not anticipate that the final rule will have a negative effect on the volume of AMA loan assets or on each FHLBank's costs of operation.

FHFA Final Rule on New Business Activities. On December 19, 2016, the FHFA issued a final rule effective January 18, 2017, that, among other things, reduces the scope of new business activities for which an FHLBank must seek approval from the FHFA. In addition, the final rule establishes certain timelines for FHFA review and approval of new business activity notices. The final rule also clarifies the protocol for FHFA review of new business activities. Under the final rule, acceptance of new types of legally permissible collateral by the FHLBanks would not constitute a new business activity or require approval from the FHFA prior to acceptance. Instead, the FHFA would review new collateral types as part of the annual exam process.

The final rule is not expected to materially affect the FHLBanks' combined financial condition or combined results of operations.

FHFA Proposed Rule on Minority and Women Inclusion. On October 27, 2016, the FHFA proposed amendments to its Minority and Women Inclusion regulations that, if adopted, would clarify the scope of the FHLBanks' and the Office of Finance's obligation to promote diversity and ensure inclusion. These proposed amendments update existing FHFA regulations aimed at promoting diversity and the inclusion and utilization of minorities, women, and individuals with disabilities in the FHLBanks' and the Office of Finance's business and activities, including management, employment, and contracting.

The proposed amendments would:

- require the FHLBanks and the Office of Finance to develop standalone diversity and inclusion strategic plans or incorporate diversity and inclusion into their existing strategic planning processes and adopt strategies for promoting diversity and ensuring inclusion;
- encourage the FHLBanks and the Office of Finance to expand contracting opportunities for minorities, women, and individuals with disabilities through subcontracting arrangements;
- require the FHLBanks and the Office of Finance to amend their policies on equal opportunity in employment and contracting by adding sexual orientation, gender identity, and status as a parent to the list of protected classifications; and
- require the FHLBanks and the Office of Finance to provide information in their annual reports to the FHFA about their efforts to advance diversity and inclusion through capital market transactions, affordable housing and community investment programs, initiatives to improve access to mortgage credit, and strategies for promoting the diversity of supervisors and managers.

The FHLBanks and the Office of Finance submitted a joint comment letter on December 27, 2016, which primarily related to the proposed rule's enhanced reporting and contract requirements. The proposed rule, if adopted, may substantially increase the amount of tracking, monitoring, and reporting that would be required of each FHLBank and the Office of Finance.

FHFA Proposed Rule on FHLBank Membership for Non-Federally-Insured Credit Unions. On September 28, 2016, the FHFA proposed amendments to regulations governing FHLBank membership that would implement statutory amendments to the FHLBank Act authorizing FHLBanks to accept applications for membership from state-chartered credit unions without federal share insurance, provided that certain prerequisites have been met. The new rule, if adopted, would generally treat these credit unions the same as other depository institutions with an additional requirement that they obtain: an affirmative statement from their state regulator that they meet the requirements for federal insurance as of the date of their application for FHLBank membership; a written statement from the state regulator that it cannot or will not make any determination regarding eligibility for federal insurance; or if the regulator fails or refuses to respond to the credit union's request within six months, confirmation of the failure to receive a response.

The FHLBanks are continuing to assess the effect of the proposed rule but, if adopted, it is not expected to materially affect the FHLBanks' combined financial condition or combined results of operations.

FHFA Proposed Rule on Indemnification Payments. On September 20, 2016, the FHFA issued a re-proposed rule that, if adopted, would establish standards for identifying whether an indemnification payment by an FHLBank or the Office of Finance to an officer, director, employee, or other entity-affiliated party in connection with an administrative proceeding or civil action instituted by the FHFA is prohibited or permissible. Under the proposed rule, those payments with respect to an administrative proceeding or civil action instituted by the FHFA are only permitted if they relate to:

- premiums for professional liability insurance or fidelity bonds for directors and officers, to the extent that the insurance or fidelity bond covers expenses and restitution, but not a judgment in favor of the FHFA or a civil money penalty;
- expenses of defending an action, subject to an agreement to repay those expenses in certain instances; and
- amounts due under an indemnification agreement entered into on or prior to September 20, 2016.

The proposed rule also outlines the process a board of directors must undertake prior to making any permitted indemnification payment for expenses of defending an action initiated by the FHFA.

The FHLBanks and the Office of Finance submitted a joint comment letter on the proposed rule on December 21, 2016. The FHLBanks are continuing to assess the effect of the proposed rule but, if adopted, it is not expected to materially affect the FHLBanks' combined financial condition or combined results of operations.

European Union (EU) Market Abuse Regulation. The EU issued updated Market Abuse Regulation that became effective July 3, 2016, and which contain rules on insider dealing, unlawful disclosure of inside information, and market manipulation for debt and equity securities on European securities exchanges, which differ in certain respects from U.S. regulations. The Market Abuse Regulation applies to issuers with securities admitted to trading on EU regulated exchanges, including EU exchanges on which FHLBank COs are listed. The FHLBanks anticipate that the most significant effect of the Market Abuse Regulation on each FHLBank will be more stringent and detailed recordkeeping, creation of detailed lists on parties who have access to inside information, and notification requirements.

External Credit Ratings

During the year ended December 31, 2016, there were no changes to external credit ratings with regard to the FHLBanks or their consolidated obligations. At March 15, 2017, consolidated obligations are rated Aaa/P-1 by Moody's and AA+/A-1+ by S&P, with outlook stable. Table 43 presents each FHLBank's long-term credit rating, short-term credit rating, and outlook at March 15, 2017.

Table 43 - FHLBanks' Long-Term Credit Ratings, Short-Term Credit Ratings, and Outlook at March 15, 2017

	S&P		Moody's	
	Long-Term/ Short-Term Rating	Outlook	Long-Term/ Short-Term Rating	Outlook
Boston	AA+/A-1+	Stable	Aaa/P-1	Stable
New York	AA+/A-1+	Stable	Aaa/P-1	Stable
Pittsburgh	AA+/A-1+	Stable	Aaa/P-1	Stable
Atlanta	AA+/A-1+	Stable	Aaa/P-1	Stable
Cincinnati	AA+/A-1+	Stable	Aaa/P-1	Stable
Indianapolis	AA+/A-1+	Stable	Aaa/P-1	Stable
Chicago	AA+/A-1+	Stable	Aaa/P-1	Stable
Des Moines	AA+/A-1+	Stable	Aaa/P-1	Stable
Dallas	AA+/A-1+	Stable	Aaa/P-1	Stable
Topeka	AA+/A-1+	Stable	Aaa/P-1	Stable
San Francisco	AA+/A-1+	Stable	Aaa/P-1	Stable

Risk Management

The fundamental business of each FHLBank is to provide a readily available, competitively-priced source of funds, in a wide range of maturities, to meet the borrowing demands of its members and housing associates. The principal sources of funds for these activities are the proceeds from the issuance of consolidated obligations and, to a lesser extent, capital and deposits from members. Lending and investing funds, and engaging in derivative transactions, can potentially expose the FHLBanks to a number of risks, including market risk and credit risk. (See *Quantitative and Qualitative Disclosures about Market Risk* for a discussion of market risk). The FHLBanks are also subject to liquidity risk, operational risk, and business risk. Each FHLBank has established policies and procedures to evaluate, manage, and control these risks, and must file periodic compliance reports with the FHFA. The FHFA has established regulations governing the risk management practices of the FHLBanks and conducts an annual on-site examination, interim on-site visits of each FHLBank and the Office of Finance, as well as off-site analyses.

Credit Risk

Advances. Each FHLBank manages its credit exposure to advances through an integrated approach that provides for the ongoing review of the financial condition of its borrowers coupled with conservative collateral and lending policies and procedures to limit its risk of loss while balancing its borrowers' needs for a reliable source of funding. Each FHLBank uses a methodology to evaluate its borrowers, based on financial, regulatory, and other qualitative information, including examination reports. Each FHLBank reviews its borrowers' financial condition on an ongoing basis using current information and makes changes to its collateral guidelines to mitigate the credit risk on advances. As of December 31, 2016, the management of each FHLBank believed it had adequate policies and procedures in place to manage its credit risk on advances effectively.

The FHLBanks protect against credit risk on advances by collateralizing all advances. Advances and other credit product obligations to an FHLBank are fully secured with eligible collateral, the value of which is discounted to protect the FHLBanks from credit loss. Eligible collateral values are determined by the market value for securities collateral, and the market value or unpaid principal balance for all loan collateral. For collateral which market prices are not readily available, the FHLBanks may use internal or external valuation models or methodologies to determine the fair value of the collateral. These valuation models incorporate assumptions related to factors that may affect collateral values, such as market liquidity, discounts rates, potential prepayments, and liquidation and servicing costs in the event of default, among others, which may be adjusted in response to changes in economic and market conditions in order to produce reliable results. The FHLBanks also have policies and procedures for validating the reasonableness of their collateral valuations. In addition, collateral verifications and on-site reviews are performed by the FHLBanks based on the risk profile of the borrower. At December 31, 2016, each FHLBank had rights to collateral with an estimated value greater than the related outstanding advances.

The FHLBank Act requires that FHLBanks obtain and maintain collateral from their borrowers to secure advances at the time the advances are originated or renewed. Furthermore, under the FHLBank Act, an FHLBank has a statutory lien on that FHLBank's capital stock held by its members, which serves as further collateral for the indebtedness of these members to the FHLBank. The FHLBank Act also allows FHLBanks to further protect their security position with respect to advances by allowing them to require the posting of additional collateral, whether or not such additional collateral is eligible to originate or renew an advance. The FHLBanks perfect their security interests by filing applicable financing statements or taking delivery of collateral. In addition, the FHLBank Act states that notwithstanding any other provision of law, any security interest granted to an FHLBank by any member of any FHLBank, or any affiliate of any member, is entitled to a priority over the claims and rights of any party (including any receiver, conservator, trustee, or similar lien creditor), other than claims and rights that (1) would be entitled to priority under otherwise applicable law, and (2) are held by actual bona fide purchasers for value or by actual secured parties that are secured by actual perfected security interests. Collateral arrangements will vary depending on: (1) borrower credit quality, financial condition, and performance; (2) borrowing capacity; (3) collateral availability; and (4) overall credit exposure to the borrower.

Each FHLBank establishes each borrower's borrowing capacity by determining the amount it will lend against each collateral type. Borrowers are also required to collateralize the face amount of any letters of credit issued for their benefit by an FHLBank. In addition, an FHLBank must take any steps necessary to ensure that its security interest in all collateral pledged by non-depository member institutions, such as insurance companies and housing associates, is as secure as its security interests in collateral pledged by depository member institutions.

Residential mortgage loans are the principal form of collateral for advances. Collateral eligible to secure new or renewed advances includes:

- one-to-four family and multifamily mortgage loans (delinquent for no more than 90 days) and securities representing such mortgages;
- loans and securities issued, insured, or guaranteed by the U.S. government or any U.S. government agency (for example, mortgage-backed securities issued or guaranteed by Fannie Mae, Freddie Mac, or Ginnie Mae);
- cash or deposits in the FHLBank;
- certain other collateral that is real estate-related, provided that the collateral has a readily ascertainable value and that the FHLBank can perfect a security interest in it; and
- certain qualifying securities representing undivided equity interests in eligible advance collateral.

Each FHLBank generally establishes an overall FHLBank credit limit for each borrower, which caps the amount of FHLBank credit availability to the borrower. This limit is designed to reduce an FHLBank's credit exposure to an individual borrower, while encouraging borrowers to diversify their funding sources. A borrower's total credit limit with an FHLBank includes the principal amount of outstanding advances, the face amount of outstanding letters of credit, the total exposure of the FHLBank to the borrower under any derivative contract, and the credit enhancement obligation of the borrower on mortgage loans sold to the FHLBank. Each FHLBank determines the credit limit of its borrower by evaluating a wide variety of factors, including, but not limited to, the borrower's overall creditworthiness and collateral management practices. The FHLBanks impose borrowing limits on most borrowers with a maximum ranging from 20% to 60% of a borrower's total assets. However, certain borrowers may be approved for a higher borrowing limit when it is supported by that borrower's creditworthiness and collateral.

Collateral discounts, or haircuts, used in determining lending values of the collateral, are calculated to project that the lending value of collateral securing each borrower's obligations exceeds the amount the borrower may borrow from the FHLBanks. Table 44 presents the range of collateral lending values for the blanket lien, listing, and delivery methods of pledging collateral across the FHLBanks.

Collateral lending values are determined by subtracting the collateral haircut from 100%. Certain collateral haircuts may also reflect haircuts applied to advances outstanding based on borrowers' actual financial performance. Effective lending value percentages are equal to the collateral lending value divided by the unpaid principal balance of eligible loan collateral or market value of eligible securities collateral. Average effective lending values are calculated based on the total lending value against eligible collateral for all borrowers without regard to the amount of credit extended to any particular borrower; however, individual borrower credit obligations to the FHLBanks are not cross-collateralized between borrowers.

Table 44 - Effective Lending Values by Type of Collateral for all Borrowers at December 31, 2016

Collateral Type	Effective Lending Values Applied to Collateral	Average Effective Lending Value
Blanket Lien		
Single-family mortgage loans(1)	21%-96%	80%
Multifamily mortgage loans	19%-85%	74%
Other U.S. government-guaranteed loans	82%-92%	84%
Home equity loans and lines of credit	3%-90%	64%
Community Financial Institutions (CFI) collateral	15%-83%	55%
Commercial real estate loans	11%-83%	68%
Other loan collateral	40%-82%	49%
Listing		
Single-family mortgage loans(1)	10%-97%	86%
Multifamily mortgage loans	35%-94%	82%
Other U.S. government-guaranteed loans	87%-91%	91%
Home equity loans and lines of credit	2%-93%	65%
CFI collateral	15%-72%	68%
Commercial real estate loans	27%-90%	73%
Other loan collateral	32%-96%	79%
Delivery		
Cash, U.S. government, and U.S. Treasury securities	80%-100%	93%
State and local government securities	17%-98%	89%
Municipal debt	76%-97%	88%
U.S. agency securities	75%-98%	95%
U.S. agency MBS and collateralized mortgage obligations (CMOs)	50%-99%	95%
Private-label MBS and CMOs	30%-96%	83%
CFI securities	94%	94%
Commercial MBS	50%-97%	84%
Other securities	51%-97%	86%
Single-family mortgage loans(1)	8%-93%	78%
Multifamily mortgage loans	38%-90%	75%
Home equity loans and lines of credit	12%-79%	63%
CFI collateral	30%-65%	57%
Commercial real estate loans	9%-89%	71%
Other loan collateral	3%-80%	72%
Student loan securities	75%-97%	86%

(1) Includes Federal Housing Administration and Department of Veterans Affairs loans.

As of December 31, 2016, there were 98 individual FHLBank borrowers (97 FHLBank members and 1 non-member financial institutions) that each held advance balances of at least $1.0 billion. When a non-member financial institution acquires some or all of the assets and liabilities of an FHLBank member, including outstanding advances and FHLBank capital stock, an FHLBank may allow those advances to remain outstanding to that non-member financial institution. The non-member borrower would be required to meet all of that FHLBank's credit and collateral requirements, including requirements regarding creditworthiness and collateral borrowing capacity. A borrower's total credit obligation to an FHLBank could include outstanding advances, outstanding letters of credit, collateralized derivative contracts, and credit enhanced obligations on mortgage loans sold to the FHLBank. Eligible collateral values include market values for securities and the unpaid principal balance for all other collateral pledged by the blanket lien, listing, or delivery method. The collateralization ratio was 2.3 at December 31, 2016, which represents the total of these 98 individual FHLBank borrowers' eligible collateral divided by these borrowers' advances and other credit products outstanding. The collateralization ratio for all borrowers was 2.8 at December 31, 2016. However, individual borrower credit obligations to the FHLBanks are not cross-collateralized between borrowers.

Table 45 presents advances, other credit products (which primarily includes letters of credit), and collateral outstanding for borrowers with at least $1.0 billion of advances outstanding as compared to all borrowers.

Table 45 - Advances, Other Credit Products, and Collateral Outstanding at December 31, 2016
(dollars in millions)

	Borrowers with at Least $1.0 Billion of Advances Outstanding	All Borrowers	Percentage
Advances outstanding, at par	$ 508,999	$ 704,309	72.3%
Other credit products outstanding, at par	$ 69,613	$ 134,160	51.9%
Collateral outstanding	$ 1,340,922	$ 2,358,009	56.9%

Based on the financial condition of the borrower, each FHLBank classifies each borrower by the method of pledging collateral into one of three collateral categories: (1) blanket lien status; (2) listing (specific identification) status; or (3) delivery (possession) status. The blanket lien status is the least restrictive collateral status, and is generally assigned to lower risk institutions pledging collateral. Under the blanket lien status, an individual FHLBank allows a borrower to retain possession of eligible collateral pledged to that FHLBank, provided the borrower executes a written security agreement and agrees to hold the collateral for the benefit of that FHLBank. Origination of new advances or renewal of advances must only be supported by certain eligible collateral categories. A blanket lien is typically accepted by the FHLBanks only for loan collateral; most securities collateral must be delivered to an FHLBank, or an FHLBank-approved third-party custodian, and pledged for the benefit of that FHLBank.

An FHLBank may require borrowers to provide a detailed listing of eligible advance collateral being pledged to the FHLBank due to their high usage of FHLBank credit products, the type of assets being pledged, or the credit condition of the borrower. Under the listing status, the borrower retains physical possession of specific collateral pledged to an FHLBank, but the borrower provides listings of loans pledged to its FHLBank with detailed loan information, such as loan amount, payments, maturity date, interest rate, loan-to-value, collateral type, and FICO® scores. From a borrower's perspective, the benefit of listing collateral in lieu of a blanket lien security agreement is that, in some cases, the discount or haircut applicable to that collateral may be lower than that for blanket lien collateral. From an FHLBank's perspective, the benefit of listing collateral is that it provides more detailed loan information to arrive at a more precise valuation.

Under the delivery status, an FHLBank requires the borrower to place physical possession of eligible collateral with the FHLBank or a third-party custodian to sufficiently secure all outstanding obligations. Typically, an FHLBank would take physical possession or control of collateral if the financial condition of the borrower was deteriorating or if the borrower exceeded certain credit product usage triggers. However, to ensure its position as a first-priority secured creditor, an FHLBank will generally require insurance company borrowers to place physical possession of all pledged eligible collateral with the FHLBank or deposit it with a custodian or control agent. Delivery of collateral may also be required if there is a regulatory action against the borrower by its regulator that would indicate inadequate controls or other conditions that would be of concern to that FHLBank.

Table 46 presents information on a combined basis regarding the type of collateral securing advances and other credit products outstanding.

Table 46 - Type of Collateral Securing Advances and Other Credit Products Outstanding at December 31, 2016
(dollars in millions)

	Blanket Lien		Listing		Delivery		Total	
Collateral Type	**Amount**	**Percentage**	**Amount**	**Percentage**	**Amount**	**Percentage**	**Amount**	**Percentage**
Single-family mortgage loans (1)	$ 430,196	18.2%	$ 794,129	33.7%	$ 10,942	0.5%	$ 1,235,267	52.4%
Commercial real estate loans	319,468	13.6%	107,232	4.5%	28,860	1.2%	455,560	19.3%
Multifamily mortgage loans	60,937	2.6%	134,774	5.7%	10,703	0.5%	206,414	8.8%
Home equity loans and lines of credit	84,554	3.6%	110,358	4.7%	373	—%	195,285	8.3%
U.S. agency MBS and CMOs	—	N/A	—	N/A	99,687	4.2%	99,687	4.2%
Other real estate loans	45,889	1.9%	6,574	0.3%	3,130	0.1%	55,593	2.3%
CFI loans	36,472	1.6%	1,863	0.1%	66	—%	38,401	1.7%
U.S. agency securities (excluding MBS)	—	N/A	—	N/A	20,041	0.8%	20,041	0.8%
Commercial MBS	—	N/A	—	N/A	18,843	0.8%	18,843	0.8%
Private-label MBS and CMOs	—	N/A	—	N/A	4,358	0.2%	4,358	0.2%
Other	618	—%	4,082	0.2%	23,860	1.0%	28,560	1.2%
Total collateral	$ 978,134	41.5%	$ 1,159,012	49.2%	$ 220,863	9.3%	$ 2,358,009	100.0%

(1) Includes Federal Housing Administration and Department of Veterans Affairs loans.
N/A Collateral is not pledged using this pledging method.

The FHLBank Act also permits borrowers that qualify as a Community Financial Institution (CFI) to pledge certain CFI-specific collateral to the extent that its FHLBank accepts those loans as collateral for advances. The FHLBank Act, as amended by the Housing Act, defines CFIs as depository institutions insured by the FDIC with average total assets over the preceding three-year period of less than $1.0 billion (the average total asset cap), with the average total asset cap adjusted annually for inflation. The average total asset cap for 2016 was $1.128 billion and the average total asset cap for 2017 is $1.148 billion.

The FHLBanks that accept CFI-specific collateral mitigate the potential increased credit risk through higher haircuts (lower lending values) on that collateral as presented in Table 44. CFI-specific collateral consists of small business, small farm, and small agri-business loans. Furthermore, the FHFA provides the FHLBanks with regulatory authority to receive community development loans as collateral for advances from CFI members.

Member Failures. The financial condition of all members and housing associates is closely monitored for compliance with financial criteria as set forth in each FHLBank's credit policies. During the year ended December 31, 2016, no FHLBank incurred any credit loss on any of its advances, including advances to failed borrowers. During the same period, five of the six FDIC-insured institutions that failed were members of the FHLBanks with approximately $1 million of advances outstanding at the time of the failure, all of which were prepaid by the acquiring non-member institution.

All extensions of credit by the FHLBanks to members are secured by eligible collateral. However, if a member were to default, and the value of the collateral pledged by the member declined to a point such that an FHLBank was unable to realize sufficient value from the pledged collateral to cover the member's obligations, and an FHLBank was unable to obtain additional collateral to make up for the reduction in value of that collateral, that FHLBank could incur losses. A default by a borrower with significant obligations to an FHLBank could result in significant financial losses, which would adversely affect the FHLBank's results of operations and financial condition.

Investments. The FHLBanks are subject to credit risk on investments consisting of investment securities, interest-bearing deposits, securities purchased under agreements to resell, and federal funds sold. These investments are generally transacted with government agencies and large financial institutions that are considered by an individual FHLBank to be of investment quality. FHFA regulation defines investment quality as a determination by an FHLBank, with respect to a security, that there is adequate financial backing so that full and timely payment of principal and interest on such a security is expected, and there is minimal risk that the timely payment of principal and interest would not occur because of adverse changes in economic and financial conditions during the projected life of the security.

The FHLBanks maintain short-term investment portfolios, which may provide funds to meet the credit needs of their members and to maintain liquidity. Within this portfolio of short-term investments, the FHLBanks have unsecured credit exposure on certain investments.

The FHLBanks maintain long-term investment portfolios primarily to provide additional liquidity and to earn interest income. These investments generally provide the FHLBanks with higher returns than those available on short-term investments. Within this portfolio of long-term investments, the FHLBanks are primarily subject to credit risk related to private-label mortgage-backed securities that are either directly or indirectly supported by underlying mortgage loans.

Regulatory Restrictions on Investments. To minimize credit risk on investments, the FHLBanks are prohibited by FHFA regulations from investing in any of the following security types:

- instruments, such as common stock that represent an ownership interest in an entity, other than stock in small business investment companies or certain investments targeted at low-income persons or communities;
- instruments issued by non-U.S. entities, other than those issued by U.S. branches and agency offices of foreign commercial banks (e.g., federal funds);
- debt instruments that are not investment quality, other than certain investments targeted at low-income persons or communities and instruments that became less than investment quality after their purchase by the FHLBank;
- whole mortgages or other whole loans, or interests in mortgages or loans, other than:
  - whole mortgages or loans acquired under an FHLBank's Acquired Member Asset program;
  - certain investments targeted at low-income persons or communities;
  - certain marketable direct obligations of state, local, or tribal government units or agencies that are investment quality;
  - mortgage-backed securities (which include agency and private-label pools of commercial and residential mortgage loans), or asset-backed securities collateralized by manufactured housing loans or home equity loans that meet the definition of the term "securities" under the Securities Act of 1933, as amended; and
  - certain foreign housing loans authorized under section 12(b) of the FHLBank Act;
- residual interest and interest accrual classes of securities;
- interest-only and principal-only securities;
- mortgage-backed securities or eligible asset-backed securities that on the trade date are at rates equal to their contractual cap, with average lives that vary more than six years under an assumed instantaneous rate change of 300 basis points, unless the instrument qualifies as an Acquired Member Asset; and
- foreign currency or commodity positions.

Investment Quality and Ratings. The FHLBanks reduce the credit risk by investing in investment-quality securities. The FHLBanks consider a variety of credit quality factors when analyzing potential investments, including collateral performance, marketability, asset class or sector considerations, local and regional economic conditions, credit ratings based on the nationally recognized statistical rating organization(s), and/or the financial health of the underlying issuer. Table 47 presents the credit rating of the investment securities held by the FHLBanks as of December 31, 2016 and 2015, using the lowest long-term credit rating for each security owned by an individual FHLBank based on the nationally recognized statistical rating organization(s) used by that FHLBank. The internal ratings of an individual FHLBank may differ from those obtained from the nationally recognized statistical rating organization(s) and other FHLBank internal ratings.

Table 47 - Investment Ratings
(dollars in millions)

	December 31, 2016(1)(2)						
Carrying Value	**Triple-A**	**Double-A**	**Single-A**	**Triple-B**	**Below Triple-B**	**Unrated**	**Total**
Interest-bearing deposits	$ —	$ 1	$ 2,832	$ 45	$ —	$ —	$ 2,878
Securities purchased under agreements to resell	9,725	31,697	2,500	6,449	—	2,400	52,771
Federal funds sold	—	12,336	33,106	3,061	—	130	48,633
Total investment securities by major security type							
Non-mortgage backed securities							
U.S. Treasury obligations	—	1,606	—	—	—	—	1,606
Certificates of deposit	—	1,900	1,150	—	—	—	3,050
Other U.S. obligations	—	6,249	—	—	—	—	6,249
GSE and Tennessee Valley Authority obligations	—	28,406	—	—	—	—	28,406
State or local housing agency obligations	1,521	1,956	371	—	—	—	3,848
Federal Family Education Loan Program ABS	54	4,518	—	—	—	—	4,572
Other	1,192	101	—	—	—	61	1,354
Total non-mortgage-backed securities	2,767	44,736	1,521	—	—	61	49,085
Mortgage-backed securities							
Other U.S. obligations single-family MBS	210	13,880	—	—	—	—	14,090
Other U.S. obligations multifamily MBS	—	568	—	—	—	—	568
GSE single-family MBS	—	50,802	10	—	7	—	50,819
GSE multifamily MBS	463	61,519	—	—	—	—	61,982
Private-label residential MBS	7	76	116	988	9,729	35	10,951
Manufactured housing loan ABS	—	—	69	—	—	—	69
Home equity loan ABS	1	4	84	24	58	—	171
Total mortgage-backed securities	681	126,849	279	1,012	9,794	35	138,650
Total investment securities	3,448	171,585	1,800	1,012	9,794	96	187,735
Total investments	$ 13,173	$ 215,619	$ 40,238	$ 10,567	$ 9,794	$ 2,626	$ 292,017

Carrying Value	December 31, 2015(2)(3) Triple-A	Double-A	Single-A	Triple-B	Below Triple-B	Unrated	Total
Interest-bearing deposits	$ —	$ 1	$ 1,800	$ 35	$ —	$ —	$ 1,836
Securities purchased under agreements to resell	6,125	29,182	1,575	7,500	500	2,945	47,827
Federal funds sold	—	17,491	23,446	1,441	—	2	42,380
Total investment securities by major security type							
Non-mortgage backed securities							
U.S. Treasury obligations	—	1,310	—	—	—	—	1,310
Certificates of deposit	—	600	100	—	—	—	700
Other U.S. obligations	—	7,023	—	—	—	—	7,023
GSE and Tennessee Valley Authority obligations	—	28,305	—	—	—	—	28,305
State or local housing agency obligations	1,748	1,723	439	—	—	—	3,910
Federal family education loan program ABS	15	5,284	—	—	—	—	5,299
Other	890	103	372	—	—	49	1,414
Total non-mortgage-backed securities	2,653	44,348	911	—	—	49	47,961
Mortgage-backed securities							
Other U.S. obligations single-family MBS	248	14,586	—	—	—	—	14,834
Other U.S. obligations multifamily MBS	—	767	—	—	—	—	767
GSE single-family MBS	—	57,979	15	—	9	—	58,003
GSE multifamily MBS	464	45,703	—	—	—	—	46,167
Private-label residential MBS	10	39	238	1,231	12,064	32	13,614
Manufactured housing loan ABS	—	—	86	—	—	—	86
Home equity loan ABS	1	5	98	30	75	—	209
Total mortgage-backed securities	723	119,079	437	1,261	12,148	32	133,680
Total investment securities	3,376	163,427	1,348	1,261	12,148	81	181,641
Total investments	$ 9,501	$ 210,101	$ 28,169	$ 10,237	$ 12,648	$ 3,028	$ 273,684

(1) Does not reflect any changes in ratings, outlook, or watch status occurring after December 31, 2016.
(2) Investment amounts represent the carrying value and do not include related accrued interest.
(3) Does not reflect any changes in ratings, outlook, or watch status occurring after December 31, 2015.

Long-term Investments. Within the portfolio of long-term investments, the FHLBanks are primarily subject to credit risk related to private-label mortgage-backed securities that are either directly or indirectly supported by underlying mortgage loans. The FHLBanks invested in private-label mortgage-backed securities, which consisted of private-label residential MBS, manufactured housing loan ABS, and home equity loan ABS. Each private-label mortgage-backed security may contain one or more forms of credit protection/enhancements, including, but not limited to, (1) guarantee of principal and interest, (2) subordination, (3) over-collateralization and excess interest, and (4) insurance wrap. Credit enhancement achieved through subordination features results in the subordination of payments to junior classes to support cash flows received by senior classes held by investors such as the FHLBanks.

Although the FHLBanks invested in private-label mortgage-backed securities that at the date of purchase were substantially all rated triple-A, many of these securities have incurred credit losses based on economic conditions and housing market trends.

Current credit enhancement percentages reflect the ability of subordinated classes of securities to absorb principal losses and interest shortfalls before the senior classes held by the FHLBanks are affected (i.e., the losses, expressed as a percentage of the outstanding principal balances, that could be incurred in the underlying loan pools before the securities held by the FHLBanks would be affected, assuming that all of those losses occurred on the measurement date). Depending on the timing and amount of losses in the underlying loan pools, it is possible that the senior classes held by the FHLBanks could have losses in scenarios where the cumulative loan losses do not exceed the current credit enhancement percentage.

Table 48 presents collateral performance and credit enhancement information related to private-label mortgage-backed securities at December 31, 2016. No FHLBank has purchased private-label mortgage-backed securities since 2008.

Table 48 - Credit Ratings of Private-Label Mortgage-Backed Securities at December 31, 2016
(dollars in millions)

	Total	Prime(1)	Alt-A(1)(2)	Subprime(1)
Unpaid Principal Balance (UPB) by credit rating(3)				
Triple-A	$ 7	$ —	$ 6	$ 1
Double-A	82	41	35	6
Single-A	269	61	49	159
Triple-B	1,019	792	191	36
Double-B	1,156	825	299	32
Single-B	1,053	373	631	49
Triple-C	4,145	982	3,079	84
Double-C	1,043	217	576	250
Single-C	334	123	94	117
Single-D	4,278	1,830	2,424	24
Unrated	37	26	10	1
Total	$ 13,423	$ 5,270	$ 7,394	$ 759
Amortized cost	$ 11,262	$ 4,649	$ 6,079	$ 534
Gross unrealized losses(4)	(389)	(172)	(167)	(50)
Fair value	11,773	4,869	6,269	635
Credit losses(5)				
Total OTTI	$ (30)	$ (2)	$ (27)	$ (1)
AOCI(6)	8	(2)	9	1
Credit losses	$ (22)	$ (4)	$ (18)	$ —
Weighted-average percentage				
Fair value to UPB	87.7%	92.4%	84.8%	83.7%
Original credit support(7)	18.9%	10.5%	22.8%	38.8%
Credit support(8)	8.8%	6.7%	8.6%	26.2%
Collateral delinquency(9)	14.6%	10.4%	16.9%	21.4%

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(1) The FHLBanks classify securities as prime, Alt-A, and subprime based on the originator's classification at the time of origination or based on classification by a nationally recognized statistical rating organization upon issuance of the securities.
(2) The FHLBanks held a total of $594 million in Alt-A option adjustable-rate mortgages, of which $1,668 million are in a gross unrealized loss position based on their unpaid principal balance at December 31, 2016.
(3) Represents the lowest rating available for each security owned by an individual FHLBank based on the nationally recognized statistical rating organization(s) used by that FHLBank. The internal ratings of an individual FHLBank may differ from those obtained from the nationally recognized statistical rating organization(s) and other FHLBank internal ratings.
(4) Represents total gross unrealized losses including non-credit-related other-than-temporary impairment recognized in AOCI. The unpaid principal balance and amortized cost of private-label mortgage-backed securities in a gross unrealized loss position was $5,606 million and $5,009 million at December 31, 2016.
(5) The credit losses presented are for the year ended December 31, 2016.
(6) Represents the net amount of other-than-temporary impairment losses reclassified to/(from) AOCI.
(7) Original weighted-average credit support is based on the credit support at the time of issuance and is determined based on the unpaid principal balance of the individual securities in the category and their respective original credit support.
(8) Weighted-average credit support is based on the credit support as of December 31, 2016, and is determined based on the unpaid principal balance of the individual securities in the category and their respective credit support as of December 31, 2016.
(9) Weighted-average collateral delinquency rate is determined based on the underlying loans that are 60 days or more past due and is determined based on the unpaid principal balance of the individual securities in the category and their respective delinquencies.

Monoline Bond Insurance. Certain FHLBank investment securities portfolios include a limited number of investments that are insured by monoline bond insurers. The monoline bond insurance on these investments guarantees the timely payment of principal and interest if these payments cannot be satisfied from the cash flows of the underlying mortgage collateral.

The monoline bond insurers continue to be subject to adverse ratings and weak financial performance measures, which imply an increased risk that the monoline bond insurer will fail to fulfill its obligations to reimburse the insured investor for claims made under the related insurance policies. There are five monoline bond insurers that insure the affected FHLBanks' investment securities. Of the five monoline bond insurers, the financial guarantee from Assured Guaranty Municipal Corp. is considered sufficient to cover all future claims and therefore excluded from the burnout period analysis. Conversely, the key burnout period for monoline bond insurers Financial Guaranty Insurance Company, Syncora Guarantee Inc., and MBIA Insurance Corp. are not considered applicable due to regulatory intervention that has suspended all claims, and the affected

FHLBanks have placed no reliance on these monoline insurers. For the remaining monoline bond insurer, Ambac Assurance Corp., the affected FHLBanks established a burnout period ending on December 31, 2020. In addition, Ambac Assurance Corp. reimbursements are limited to 45% of new claims during the burnout period. The FHLBanks monitor the financial condition of Ambac Assurance Corp. on an ongoing basis, and, as facts and circumstances change, the burnout period could significantly change. (See *Critical Accounting Estimates - OTTI for Investment Securities* for information regarding the FHLBanks' processes for evaluating monoline bond insurance for purposes of OTTI analysis.)

As of December 31, 2016, total monoline bond insurance coverage was $279 million, of which $179 million represents the FHLBanks' private-label MBS covered by the monoline bond insurance that the FHLBanks were relying on at December 31, 2016, for modeling cash flows. Of the $179 million, 86.6% represents subprime loans and 13.4% represents Alt-A loans. The FHLBanks classify securities as prime, Alt-A, and subprime based on the originator's classification at the time of origination or based on classification by a nationally recognized statistical rating organization upon issuance of the securities.

Short-term Investments. The FHLBanks maintain short-term investment portfolios, which may provide funds to meet the credit needs of their members and to maintain liquidity. The FHLBank Act and FHFA regulations set liquidity requirements for the FHLBanks, and an individual FHLBank's board of directors may also adopt additional liquidity policies. In addition, each FHLBank maintains a contingency liquidity plan in the event of operational disruptions at either the FHLBanks or the Office of Finance. (See *Liquidity and Capital Resources* for a discussion of the FHLBanks' liquidity management.)

Within the portfolio of short-term investments, the FHLBanks are subject to credit risk from unsecured credit exposures with private counterparties. Each FHLBank manages its own credit risk independently. The FHLBanks' unsecured credit investments have maturities ranging between overnight and nine months, and generally include the following types:

- *Interest-bearing deposits.* Primarily consists of unsecured deposits that earn interest.
- *Federal funds sold.* Unsecured loans of reserve balances at the Federal Reserve Banks between financial institutions that are made on an overnight and term basis.
- *Certificates of deposit.* Unsecured negotiable promissory notes issued by banks and payable to the bearer on demand.

Table 49 presents the FHLBanks' unsecured credit exposure with private counterparties by investment type. At December 31, 2016, the FHLBanks had aggregate unsecured credit exposure from investments of $1 billion or more to each of 14 private counterparties. The aggregate unsecured credit exposure to these counterparties represented 74.8% of the FHLBanks' total unsecured investment credit exposure to private counterparties. The unsecured investment credit exposure presented in Table 49 does not reflect the average or maximum exposure during the period, as the balances presented reflect the balances at period end.

Table 49 - Unsecured Credit Exposure by Investment Type
(dollars in millions)

Carrying Value(1)(2)	December 31, 2016	December 31, 2015
Interest-bearing deposits	$ 2,877	$ 1,835
Federal funds sold	48,633	42,380
Certificates of deposit	3,050	700
Total	$ 54,560	$ 44,915

(1) Excludes unsecured investment credit exposure to U.S. government, U.S. government agencies, government instrumentalities, government-sponsored enterprises, and supranational entities, and does not include related accrued interest.
(2) May include unsecured investment credit exposure to members. (See *Security Ownership of Certain Beneficial Owners and Certain Relationships and Related Transactions* for further discussion of related-party transactions.)

Each FHLBank actively monitors its credit exposures and the credit quality of its counterparties, including an assessment of each counterparty's financial performance, capital adequacy, sovereign support, and the current market perceptions of the counterparties. General macroeconomic, political, and market conditions may also be considered when deciding on unsecured exposure. As a result, the FHLBanks may limit or suspend existing exposures.

FHFA regulations include limits on the amount of unsecured credit an individual FHLBank may extend to a counterparty or to a group of affiliated counterparties. This limit is based on a percentage of eligible capital and the counterparty's overall credit rating. Under these regulations, the level of eligible capital is determined as the lesser of an individual FHLBank's total

regulatory capital or the eligible amount of Tier 1 capital or regulatory capital of the counterparty. The eligible amount of capital is then multiplied by a stated percentage. The percentage that an FHLBank may offer for term extensions of unsecured credit ranges from 1% to 15% based on the counterparty's credit rating. The calculation of term extensions of unsecured credit includes on-balance sheet transactions, off-balance sheet commitments, and derivative transactions. (See *Credit Risk - Derivative Counterparties* for additional information related to derivatives exposure.)

FHFA regulation also permits the FHLBanks to extend additional unsecured credit for sales of federal funds with a maturity of one day or less and sales of federal funds subject to a continuing contract that renews automatically. An FHLBank's total unsecured exposure to a counterparty may not exceed twice the regulatory limit for term exposures, or a total of 2% to 30% of the eligible amount of capital, based on the counterparty's credit rating. As of December 31, 2016, each of the FHLBanks was in compliance with the regulatory limits established for unsecured credit.

The FHLBanks are prohibited by FHFA regulation from investing in financial instruments issued by non-U.S. entities, other than those issued by U.S. branches and agency offices of foreign commercial banks. The FHLBanks' unsecured credit exposures to U.S. branches and agency offices of foreign commercial banks include the risk that, as a result of political or economic conditions in a country, the counterparty may be unable to meet its contractual repayment obligations. The FHLBanks' unsecured credit exposures to domestic counterparties and U.S. subsidiaries of foreign commercial banks include the risk that these counterparties have extended credit to foreign counterparties. As of December 31, 2016, an FHLBank held full faith and credit U.S. guaranteed securities with foreign issuers totaling $466 million. Other than these investments, the FHLBanks are in compliance with the FHFA regulation as of December 31, 2016.

As of December 31, 2016, the FHLBanks' unsecured investment credit exposure to U.S. branches and agency offices of foreign commercial banks was comprised of federal funds sold and certificates of deposit. As of December 31, 2016, 85.4% of the FHLBanks' unsecured investments in federal funds sold and 90.2% of the FHLBanks' unsecured investment in certificates of deposit were to U.S. branches and agency offices of foreign commercial banks.

Table 50 presents the lowest long-term credit ratings of the unsecured investment credit exposures presented 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 based on the nationally recognized statistical rating organization(s) used by the individual FHLBank holding the investment. This table does not reflect the foreign sovereign government's credit rating.

Table 50 - Ratings of Unsecured Investment Credit Exposure by Domicile of Counterparty at December 31, 2016 (1)
(dollars in millions)

	Investment Grade				
Carrying Value(2)	**Double-A**	**Single-A**	**Triple-B**	**Unrated**	**Total**
Domestic	$ 680	$ 6,063	$ 3,106	$ 130	$ 9,979
U.S. subsidiaries of foreign commercial banks	—	297	—	—	297
Total domestic and U.S. subsidiaries of foreign commercial banks	680	6,360	3,106	130	10,276
U.S. branches and agency offices of foreign commercial banks					
Canada	1,913	8,460	—	—	10,373
Netherlands	—	6,579	—	—	6,579
Australia	5,948	—	—	—	5,948
France	—	5,319	—	—	5,319
Finland	4,695	—	—	—	4,695
Germany	500	3,223	—	—	3,723
Norway	—	3,575	—	—	3,575
Japan	—	2,322	—	—	2,322
Sweden	500	1,250	—	—	1,750
Total U.S. branches and agency offices of foreign commercial banks	13,556	30,728	—	—	44,284
Total unsecured investment credit exposure	$ 14,236	$ 37,088	$ 3,106	$ 130	$ 54,560

(1) Does not reflect any changes in ratings, outlook, or watch status occurring after December 31, 2016. The ratings presented in this table represent the lowest long-term rating available for each security owned by an individual FHLBank, based on the nationally recognized statistical rating organization(s) used by that FHLBank. The internal ratings of an individual FHLBank may differ from those obtained from the nationally recognized statistical rating organization(s) and other FHLBank internal ratings.

(2) Excludes unsecured investment credit exposure to U.S. government, U.S. government agencies, government instrumentalities, government-sponsored enterprises, and supranational entities, and does not include related accrued interest.

Table 51 presents the contractual maturity of the FHLBanks' 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. The FHLBanks also reduce the credit risk on investments by generally investing in investments that have short-term maturities. At December 31, 2016, 91.7% of the carrying value of the total unsecured investments held by the FHLBanks had overnight maturities.

Table 51 - Contractual Maturity of Unsecured Investment Credit Exposure by Domicile of Counterparty at December 31, 2016
(dollars in millions)

Carrying Value(1)	Overnight	Due 2 days through 30 days	Due 31 days through 90 days	Total
Domestic	$ 9,679	$ —	$ 300	$ 9,979
U.S. subsidiaries of foreign commercial banks	297	—	—	297
Total domestic and U.S. subsidiaries of foreign commercial banks	9,976	—	300	10,276
U.S. branches and agency offices of foreign commercial banks				
Canada	9,023	100	1,250	10,373
Netherlands	6,279	300	—	6,579
Australia	5,148	500	300	5,948
France	4,769	—	550	5,319
Finland	4,595	100	—	4,695
Germany	3,383	340	—	3,723
Norway	3,575	—	—	3,575
Japan	1,822	500	—	2,322
Sweden	1,450	—	300	1,750
Total U.S. branches and agency offices of foreign commercial banks	40,044	1,840	2,400	44,284
Total unsecured investment credit exposure	$ 50,020	$ 1,840	$ 2,700	$ 54,560

(1) Excludes unsecured investment credit exposure to U.S. government, U.S. government agencies, government instrumentalities, government-sponsored enterprises, and supranational entities and does not include related accrued interest.

Mortgage Loans Held for Portfolio. The FHFA's Acquired Member Asset regulation permits the FHLBanks to purchase and hold specified mortgage loans from their members. Each FHLBank has established or participated in the Acquired Member Asset programs such as the MPF Program and MPP as services to their members. Members and eligible housing associates may apply to become a participating financial institution (PFI) of their respective FHLBank. The mortgage loans purchased under these programs may carry more credit risk than advances, even though the respective member or housing associate provides credit enhancement and bears a portion of the credit risk.

An FHLBank must hold risk-based capital against acquired member assets or pools of assets based on the applicable percentage required by the FHFA. This percentage is determined by the credit rating of those assets or pools of assets after taking into account any credit enhancements on those assets. However, neither the PFI's credit enhancements nor the mortgage loans are rated by the rating agencies. For the years ended December 31, 2016 and 2015, the regulation requires that the credit rating must be determined by a formal rating from a nationally recognized statistical rating organization, or using a model from a nationally recognized statistical rating organization approved by the FHFA to establish an implied credit rating standard, or other similar standards. All of the mortgage loans acquired under these programs that are not government-guaranteed or -insured are credit-enhanced by the PFI to a level at least equivalent to an investment-grade rating in accordance with the FHFA's regulation. (See *Legislative and Regulatory Developments* for more information about the FHFA final rule on acquired member assets effective January 18, 2017.)

Management at each FHLBank believes that it has adequate policies and procedures in place to manage credit risk on mortgage loans appropriately. At December 31, 2016 and 2015, each FHLBank that is currently participating or previously participated in the Acquired Member Asset programs has established loan loss allowances under each program. (See *Note 10 - Allowance for Credit Losses* to the accompanying combined financial statements for additional information about mortgage loan credit quality indicators, allowance for credit losses, and delinquency statistics by the Acquired Member Asset program and type of loan.)

Table 52 presents the comparison of MPF and MPP products at December 31, 2016. A variety of MPF products have been developed to meet the differing needs of PFIs with different risk-sharing characteristics as summarized in Table 52. While the MPP operates with a single structure, it also includes Federal Housing Administration (FHA) insured mortgage loans.

Table 52 - MPP and MPF Product Comparison at December 31, 2016

Product Name	FHLBank First Loss Account/Lender Risk Account Size	PFI Credit Enhancement Description	Credit Enhancement Fee to PFI(1)	Credit Enhancement Fee Offset(2)	Servicing Fee to PFI
MPF Original	3 to 6 basis points; added each year based on the unpaid balance	Equivalent to at least triple-B	0 to 11 basis points/year-paid monthly	No	25 basis points/year
MPF 100	100 basis points; fixed based on the size of the loan pool at closing	Equivalent at least triple-B including First Loss Account	7 to 10 basis points/year-paid monthly; performance-based after 2 or 3 years	Yes - after first 2 to 3 years	25 basis points/year
MPF 125	100 basis points; fixed based on the size of the loan pool at closing	Equivalent to at least triple-B including First Loss Account	6 to 10 basis points/year-paid monthly; performance-based	Yes	25 basis points/year
MPF Plus	An agreed-upon amount not less than expected losses	0 to 20 basis points including First Loss Account and SMI, equivalent to at least triple-B	13 to 14 basis points/year in total, with a varying split between performance-based (delayed for 1 year) and a fixed rate; all paid monthly	Yes	25 basis points/year
MPF 35(3)	An agreed-upon amount not less than expected losses	Equivalent to at least triple-B including First Loss Account	9 to 14 basis points/year in total, with a varying split between performance-based (delayed for 1 year) and a fixed rate; all paid monthly	Yes	25 basis points/year
MPF Government(4)	N/A	N/A (8)	N/A	N/A	44 basis points/year plus 2 basis points/year
MPF Xtra(5)	N/A	N/A	N/A	N/A	25 basis points/year
MPF Direct(6)	N/A	N/A	N/A	N/A	N/A
MPF Government MBS(7)	N/A	N/A (8)	N/A	N/A	Based on Note Rate
MPP	30 to 175 basis points; based on pool risk factors and expected losses	After Lender Risk Account to at least triple-B	N/A	N/A	25 basis points/year
MPP FHA	N/A	N/A - Unreimbursed servicing expenses	N/A	N/A	44 basis points/year

(1) For the FHLBank of Des Moines, the credit enhancement fees on certain MPF products differ from those listed above as follows:
- MPF Original: 8 to 11 basis points/year-paid monthly
- MPF 100: 7 to 11 basis points/year-paid monthly; performance-based after three years
- MPF Plus: 0 to 8.5 basis points/year-plus 0 to 10 basis points/year; performance-based (delayed for one year); all fees are paid monthly

(2) Future payouts of performance-based credit enhancement fees are reduced when losses are allocated to the First Loss Account.
(3) For the FHLBank of Boston, the MPF 35 first loss account differs from that listed above as follows: 35 basis points of the aggregate principal balance of the MPF loans funded under the master commitment.
(4) For master commitments issued prior to February 2, 2007, the PFI is paid a monthly government loan fee equal to 0.02% (2 basis points) annually based on the month-end outstanding aggregate principal balance of the master commitment, which is in addition to the customary 0.44% (44 basis points) annual servicing fee that continues to apply for master commitments issued after February 1, 2007, and that is retained by the PFI on a monthly basis, based on the outstanding aggregate principal balance of the MPF Government loans.
(5) MPF loans acquired under the MPF Xtra product are concurrently sold to Fannie Mae and are not retained in an MPF FHLBank's portfolio.
(6) MPF loans acquired under the MPF Direct product are concurrently sold to third party investors and are not retained in an MPF FHLBank's portfolio.
(7) MPF loans acquired under the MPF Government MBS product are intended to be included in FHLBank of Chicago's held-for-sale portfolio for a short period of time until pooled into Ginnie Mae mortgage-backed securities.
(8) For MPF Government and MPF Government MBS loans, PFIs provide the required credit enhancement by delivering loans that are guaranteed or insured by a department or agency of the U.S. government.

MPF Loans - Loss Allocation. Credit losses on conventional MPF loans held for portfolio not absorbed by the borrower's equity in the mortgaged property, property insurance, or primary mortgage insurance (PMI) are allocated for each master commitment between an MPF FHLBank and the PFI as follows:

- First, losses are recovered by withholding performance-based credit enhancement fees. The PFI is paid a monthly credit enhancement fee for managing credit risk on the mortgage loans. In certain cases, the credit enhancement fees are performance-based, which provides incentive to the PFI to minimize credit losses on MPF loans. These fees may be

withheld to recover losses incurred by an MPF FHLBank for each master commitment, if any, up to the First Loss Account.

- Second, up to an agreed-upon amount to the First Loss Account maintained by an MPF FHLBank. The First Loss Account functions as a tracking mechanism for determining the point in which a PFI's credit enhancement amount would cover the next layer of losses. An MPF FHLBank's First Loss Account exposure varies by MPF loan product type.

- Third, credit losses in excess of the First Loss Account, if any, to the PFI under its credit enhancement obligation, up to the credit enhancement amount. The credit enhancement amount may consist of a direct liability of the PFI to pay credit losses up to a specified amount, a contractual obligation of the PFI to provide supplemental mortgage insurance (SMI), or a combination of both.

- Fourth, any remaining unallocated losses are absorbed by an MPF FHLBank.

An MPF FHLBank's share of credit losses is based on its respective participation interest in the entire master commitment. An MPF FHLBank's credit risk on MPF loans is the potential for financial loss due to borrower default or depreciation in the value of the real estate collateral securing the MPF loan, offset by the PFI's credit enhancement amount. The PFI is required to pledge collateral to secure any portion of its credit enhancement amount that is a direct obligation.

The MPF FHLBanks also face credit risk through potential losses on conventional MPF loans to the extent that those losses are not recoverable from PFIs, and with respect to MPF Government loans, amounts not recoverable from the applicable government agency, servicer, or PFI, as applicable. The outstanding balance of MPF loans exposed to credit losses that are not recoverable from these sources was approximately $24.3 billion and $22.7 billion at December 31, 2016 and 2015. The MPF FHLBanks' actual credit exposure is less than these amounts because the borrower's equity, which represents the fair value of underlying property in excess of the outstanding MPF loan balance, has not been considered. The MPF FHLBanks require PMI for those loans with a loan-to-value ratio over 80% at origination. If the original value of the real estate collateral securing an MPF loan does not decline, then the principal paydowns will lower the loan-to-value ratio over the life of the loan.

MPF Loans - Setting Credit Enhancements. The type of the credit enhancement fee depends on the product selected; however, no credit enhancement fee is payable nor does the PFI have any credit enhancement amount under the MPF Xtra, MPF Direct, MPF Government, and MPF Government MBS products. A model-based rating methodology (based on a nationally recognized statistical rating organization's model) is used to determine the required credit enhancement amount, which is calculated to equal the difference between the amount needed for the master commitment to have a rating equivalent to at least a triple-B rated mortgage-backed security and an MPF FHLBank's initial First Loss Account exposure. An MPF FHLBank determines its First Loss Account exposure by taking the initial First Loss Account and reducing it by the estimated value of any performance-based credit enhancement fees that would be payable to the PFI. On December 19, 2016, the FHFA published the final acquired member assets rule, which governs an FHLBank's authority to purchase and hold certain types of mortgage loans acquired from its PFIs. The final rule, among other things, enhanced the credit risk sharing requirement by allowing an FHLBank to utilize its own model to determine the credit enhancement for AMA loan assets and pool loans in lieu of a nationally recognized statistical rating organization ratings model. (See *Legislative and Regulatory Developments* for more information about the FHFA final rule on acquired member assets effective January 18, 2017.)

The MPF products were designed to allow for periodic resets of the credit enhancement amount for each master commitment, and of the First Loss Account for each master commitment for certain products, because the amount of credit enhancement necessary to maintain an FHLBank's risk of loss equivalent to the losses of an investor in at least a triple-B rated mortgage-backed security for any master commitment is usually reduced over time. Under the MPF Program, the PFI's credit enhancement amount may take the form of a contingent, performance-based credit enhancement fee as well as the credit enhancement amount (which is a direct liability to pay credit losses or the requirement for the PFI to pay for an SMI policy insuring a portion of the credit losses).

MPP Loans - Loss Allocation. Each FHLBank participating in the MPP is exposed to credit risk on loans purchased from members through its MPP. Like the MPF Program, MPP is governed by the Acquired Member Asset regulation. Mortgage loans purchased from PFIs under this program also must carry sufficient credit enhancements to provide a credit risk exposure equivalent to no less than triple-B rated assets based on a model-based rating methodology (based on a nationally recognized statistical rating organization's model) at the time of purchase. For FHA-insured loans, MPP FHLBanks believe they bear no credit risk on purchased FHA loans, and therefore do not require either a Lender Risk Account or SMI coverage for these U.S. government-insured loans.

The MPP FHLBanks' primary management of credit risk for conventional loans involves the mortgage assets themselves (homeowners' equity) as well as additional layers of credit enhancements. The order of priority for credit enhancements is as follows:

- PMI (when applicable);
- Lender Risk Account; and
- SMI (when applicable).

For conventional loans, PMI, if applicable, covers losses or exposure down to a loan-to-value ratio of between approximately 61% and 80% based on the original appraisal, original loan-to-value ratio, term, amount of PMI coverage, and characteristics of the loan. At the time the underlying conventional loan is purchased, a Lender Risk Account is established by the FHLBank for each PFI selling an MPP loan to that FHLBank. Generally, after five years, if the balance of the funds in the Lender Risk Account exceeds the required balance, the excess amounts are distributed to the PFI based on a step-down schedule set forth in the master commitment contract that establishes the Lender Risk Account.

The MPP mortgage loans are not rated by any nationally recognized statistical rating organization. Participating MPP FHLBanks use a model-based rating methodology (based on a nationally recognized statistical rating organization's model) to assign the Lender Risk Account percentage to each master commitment and to manage the credit risk of committed and purchased conventional loans. The rating model evaluates the characteristics of the loans the PFIs actually delivered to the FHLBanks for the likelihood of timely payment of principal and interest. The model results are based on numerous standard borrower and loan attributes, such as the loan-to-value ratio, loan purpose (such as purchase of home, refinance, or cash-out refinance), type of documentation, income and debt expense ratios, and credit scores. Based on the credit assessment, each MPP FHLBank is required to hold risk-based capital to help mitigate the potential credit risk in accordance with the FHFA regulations.

In addition to the Lender Risk Accounts, participating MPP FHLBanks with SMI coverage are protected from a portion of the credit losses. This coverage may be exceeded based on the severity of a loss on a loan and in certain cases subject to an aggregate stop-loss provision in the SMI policy. If an MPP FHLBank does not have SMI coverage for its MPP loans, it would seek additional credit enhancements, including expanded use of the Lender Risk Account and aggregation of loan purchases into larger loan pools, in order for the purchased mortgage loan pool to achieve a rating equivalent to at least triple-B at the time of acquisition. If any loss extends beyond the insurance coverage and the balance held in the Lender Risk Account, the FHLBank holding the interest in the affected MPP loan would be responsible for absorbing this remaining loss. In total, the credit enhancements are designed to adequately protect the MPP FHLBanks 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.

Each MPP FHLBank performs periodic reviews of its portfolio to identify incurred losses and to determine the likelihood of loan collection. If an MPP FHLBank has incurred losses in excess of the collateral held, PMI (if applicable), Lender Risk Account, and SMI (if applicable), these amounts would be recognized as credit losses. In addition to the MPP FHLBanks' credit enhancements, the underwriting and loan characteristics indicate favorable credit performance and the portfolios have experienced only a modest amount of delinquencies and defaults. Because of these factors, participating MPP FHLBanks believe their exposure to credit risk on conventional loans is moderate.

Credit Exposure to Insurance Providers. In addition to credit risk associated with mortgage loans purchased or funded through the Acquired Member Asset programs, the FHLBanks are exposed to the risk of non-performance of mortgage insurers that provide PMI and SMI coverage on mortgage loans.

Primary Mortgage Insurance. Qualified mortgage insurance companies issue PMI for conventional mortgage loans with loan-to-value ratios greater than 80% to cover principally those losses incurred related to borrower default. Historically, the FHLBanks have depended on the PMI policies for loss coverage. An FHLBank may be exposed to credit risk if a PMI provider fails to fulfill its claims payment obligations to that FHLBank. Each FHLBank has policies to limit its credit exposure to each mortgage insurance company, or limit its credit exposure to a certain percentage of the mortgage insurance company's regulatory capital. The FHLBanks receive PMI coverage information at acquisition of the mortgage loans and generally do not receive notification of any subsequent changes in PMI coverage. As a result, they can only estimate the amount of PMI in force at any time subsequent to acquisition.

If a PMI provider does not meet an FHLBank's policies, an FHLBank may request that the servicer obtain replacement PMI coverage with a different provider. However, it is possible that replacement coverage may be unavailable or may result in additional cost to the FHLBank. PMI for conventional mortgage loans must be issued by a mortgage insurance company on that FHLBank's approved mortgage insurance company list whenever PMI coverage is required. In order for a mortgage insurance company to remain on the current approved mortgage insurance company list, the mortgage insurance company must be acceptable for use in that FHLBank's rating modeling software used to calculate the required amount of credit enhancement. In addition, many FHLBanks perform a quarterly analysis evaluating the financial condition and concentration risk regarding the PMI providers, which may include a review of rating levels, ratings watch and outlook, and profitability.

Tables 53 and 54 present the FHLBanks' PMI coverage for seriously delinquent loans (conventional loans 90 days or more delinquent or in the process of foreclosure) by MPF Program and MPP.

Table 53 - Seriously Delinquent Conventional MPF Loans with Primary Mortgage Insurance
(dollars in millions)

		December 31, 2016	
Insurance Provider	Credit Rating(1) by Moody's/S&P	Unpaid Principal Balance(2)	Maximum Coverage Outstanding(3)
Mortgage Guaranty Insurance Co.	Baa3/BBB+	$ 10	$ 3
Genworth Mortgage Insurance	Ba1/BB+	7	3
Republic Mortgage Insurance(4)	WR/Not Rated	6	2
United Guaranty Residential Insurance	Baa1/A	5	2
PMI Mortgage Insurance Co.(4)	WR/Not Rated	5	2
Radian Guaranty, Inc.	Baa3/BBB	3	1
Other		5	1
Total		$ 41	$ 14

(1) Represents the credit rating as of March 15, 2017.
(2) Represents the unpaid principal balance of conventional loans 90 days or more delinquent or in the process of foreclosure. Assumes PMI is in effect at time of origination. Insurance coverage may be discontinued once a certain loan-to-value ratio is met.
(3) Represents the estimated contractual limit for reimbursement of principal losses (i.e., risk in force) assuming the PMI at origination is still in effect. The amount of expected claims under these insurance contracts is substantially less than the contractual limit for reimbursement.
(4) WR represents a previously issued credit rating that has been withdrawn by the rating agency.

Table 54 - Seriously Delinquent Conventional MPP Loans with Primary Mortgage Insurance
(dollars in millions)

		December 31, 2016	
Insurance Provider	Credit Rating(1) by Moody's/S&P	Unpaid Principal Balance(2)	Maximum Coverage Outstanding(3)
Mortgage Guaranty Insurance Co.	Baa3/BBB+	$ 4	$ 1
Genworth Mortgage Insurance	Ba1/BB+	2	1
Republic Mortgage Insurance(4)	WR/Not Rated	1	—
Radian Guaranty, Inc.	Baa3/BBB	1	1
United Guaranty Residential Insurance	Baa1/A	1	—
PMI Mortgage Insurance Co.(4)	WR/Not Rated	1	—
Other		1	—
Total		$ 11	$ 3

(1) Represents the credit rating as of March 15, 2017.
(2) Represents the unpaid principal balance of conventional loans 90 days or more delinquent or in the process of foreclosure. Assumes PMI in effect at time of origination. Insurance coverage may be discontinued once a certain loan-to-value ratio is met.
(3) Represents the estimated contractual limit for reimbursement of principal losses (i.e., risk in force) assuming the PMI at origination is still in effect. The amount of expected claims under these insurance contracts is substantially less than the contractual limit for reimbursement.
(4) WR represents a previously issued credit rating that has been withdrawn by the rating agency.

Certain MPF FHLBanks have discontinued accepting new loans with PMI coverage from mortgage insurers that have a rating below triple-B, as rated by any nationally recognized statistical rating organization, or from mortgage insurers where the new coverage would exceed an FHLBank's internal exposure limits. In addition, certain MPF FHLBanks have discontinued accepting new loans with PMI coverage from mortgage insurers that have been placed under the control or conservatorship of their state insurance regulators.

Supplemental Mortgage Insurance. Certain FHLBanks use SMI as a credit enhancement to limit the loss exposure for their Acquired Member Asset programs. For MPF/MPP loans credit enhanced with SMI as of December 31, 2016, the FHFA's regulations require the FHLBank members that sell loans to their respective FHLBanks to maintain SMI with an insurer rated no lower than the second-highest rating category by any nationally recognized statistical rating organization, unless this requirement is waived by the FHFA. If a mortgage insurer fails to fulfill its obligations, the affected FHLBank(s) may bear any remaining loss of the borrower's default on the related mortgage loans not covered by the member.

On December 19, 2016, the FHFA published the final acquired member assets rule, which governs an FHLBank's authority to purchase and hold certain types of mortgage loans acquired from its PFIs. The final rule, among other things, retains the option of allowing a PFI to meet its credit enhancement obligation by purchasing loan-level SMI or pool-level insurance once an FHLBank has established standards for qualified insurers. (See *Legislative and Regulatory Developments* for more information about the FHFA final rule on acquired member assets effective January 18, 2017.)

Each MPF FHLBank evaluates the claims-paying ability of its SMI providers. As a result of losses experienced in the mortgage markets, SMI providers may no longer meet the program's required credit standards. If an SMI provider no longer qualifies, the PFI must either replace the SMI policy or agree to act as a surety for any losses that would have been covered by the policy. If a PFI neither replaces the policy nor agrees to act as a surety, its MPF FHLBank would no longer pay the PFI performance-based credit enhancement fees.

For the year ended December 31, 2016, each MPP FHLBank has evaluated the claims-paying ability of its SMI providers and determined that it is not necessary to increase the amount of required risk-based capital as a result of assigning a higher risk weighting to the assets covered by a downgraded SMI provider under the credit risk-based capital calculations. Certain MPP FHLBanks have canceled their respective SMI policies, or have discontinued obtaining SMI on new loans, and continue to use the downgraded insurance providers for existing loans.

FICO® Score and Loan-to-Value Ratios. High loan-to-value ratios, in which homeowners have little or no equity at stake, and low FICO® scores are key drivers of potential mortgage delinquencies and defaults. The FHLBanks generally consider a FICO® score of over 660, and a loan-to-value ratio of 80% or lower, as benchmarks indicating reduced credit risk of default. As of December 31, 2016, outstanding conventional loans with FICO® scores under 660 at origination totaled 6.6% and 1.1% of the MPF Program and MPP total mortgage loan portfolios. Considering both qualitative and quantitative factors, these loans were not considered high-risk loans at origination or at the time of purchase based on the Acquired Member Asset program's design and the original terms and structure of the loans. Each FHLBank's allowance for credit losses on mortgage loans reflects the incurred losses associated with loans that are considered high-risk subsequent to origination or purchase.

Table 55 presents conventional MPF Program and MPP loans by FICO® score at origination and current delinquency rate at December 31, 2016.

Table 55 - MPF and MPP Conventional Loans by FICO® Score and Delinquency Rate at December 31, 2016
(dollars in millions)

FICO® Score at Origination (1)	Unpaid Principal Balance	Current	Delinquent 30 Days	Delinquent 60 Days	Delinquent 90 Days or More
MPF Conventional Loans					
619 or less	$ 264	81.3%	8.3%	2.8%	7.6%
620-659	1,362	90.7%	4.6%	1.4%	3.3%
660 or higher	24,305	98.4%	0.8%	0.2%	0.6%
No FICO® score	85	95.2%	1.9%	0.8%	2.1%
Total	$ 26,016	97.8%	1.1%	0.3%	0.8%
Weighted average FICO® score - MPF	743				
MPP Conventional Loans					
619 or less	$ 7	84.8%	8.3%	4.3%	2.6%
620-659	191	86.5%	6.0%	1.9%	5.6%
660 or higher	17,332	99.1%	0.5%	0.1%	0.3%
No FICO® score	—	—	—	—	—
Total	$ 17,530	98.9%	0.5%	0.2%	0.4%
Weighted average FICO® score - MPP	761				

(1) Represents the original lowest FICO® score of the borrowers and co-borrowers.

Table 56 presents loan-to-value ratios at origination for MPF and MPP conventional loans outstanding at December 31, 2016.

Table 56 - MPF and MPP Conventional Loans by Loan-to-Value Ratio at Origination at December 31, 2016
(dollars in millions)

	MPF Conventional Loans		MPP Conventional Loans	
Loan-to-Value Ratio at Origination	Unpaid Principal Balance	Percentage	Unpaid Principal Balance	Percentage
< = 60%	$ 4,928	19.0%	$ 2,797	16.0%
> 60% to 70%	3,969	15.3%	2,780	15.9%
> 70% to 80%	13,274	51.0%	9,374	53.5%
> 80% to 90%(1)	2,067	7.9%	1,687	9.6%
> 90%(1)	1,778	6.8%	892	5.0%
Total	$ 26,016	100.0%	$ 17,530	100.0%
Weighted-average loan-to-value %		72.3%		72.6%

(1) These conventional loans were required to have PMI at origination.

Geographic Concentrations. Tables 57 and 58 provide the percentage of unpaid principal balance of conventional mortgage loans held for portfolio outstanding at December 31, 2016, for the five largest state concentrations, with comparable data at December 31, 2015. These tables show the state concentration on an aggregated basis for all FHLBanks that hold loans under the MPF Program and MPP. As a result, these tables do not necessarily reflect the actual state concentration with respect to each individual FHLBank.

Table 57 - State Concentrations of MPF Program

	December 31,(1)	
	2016	2015
Iowa	9.2%	8.9%
Kansas	9.1%	9.0%
Pennsylvania	8.2%	7.8%
Massachusetts	6.8%	6.4%
New York	6.3%	6.5%
All Other	60.4%	61.4%
Total	100.0%	100.0%

(1) Calculated percentage based on unpaid principal balance of conventional loans at the end of the period. The state concentrations reflect the top five states at December 31, 2016.

Table 58 - State Concentrations of MPP

	December 31,(1)	
	2016	2015
Ohio	32.5%	32.3%
Indiana	20.5%	20.3%
Michigan	15.5%	14.8%
California	7.9%	7.4%
Kentucky	7.1%	7.0%
All Other	16.5%	18.2%
Total	100.0%	100.0%

(1) Calculated percentage based on unpaid principal balance of conventional loans at the end of the period. The state concentrations reflect the top five states at December 31, 2016.

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

Each FHLBank is subject to credit risk due to the risk of non-performance by counterparties to its derivative transactions. The amount of credit risk on derivatives depends on the extent to which netting procedures, collateral requirements, and other credit enhancements are used and are effective in mitigating the risk. Each FHLBank manages credit risk through credit analysis, collateral management, and other credit enhancements. The FHLBanks are also required to follow the requirements set forth by applicable regulation.

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

Uncleared Derivatives. Each FHLBank is subject to the risk of non-performance by the counterparties to its uncleared derivative transactions. An FHLBank generally requires collateral on uncleared derivative transactions. Unless the collateral delivery threshold is set to zero, the amount of net unsecured credit exposure that is permissible with respect to each counterparty depends on the credit rating of that counterparty. A counterparty generally must deliver collateral if the total market value of the FHLBank's exposure to that counterparty rises above a specific trigger point. As a result of these risk mitigation initiatives, the management of each FHLBank did not anticipate any credit losses on its uncleared derivative transactions as of December 31, 2016.

Cleared Derivatives. Each FHLBank is subject to the risk of non-performance by the Derivative Clearing Organization(s) (Clearinghouse) and the clearing agents. The requirement that an FHLBank posts initial and variation margin through the clearing agent, to the Clearinghouse, exposes an FHLBank to credit risk in the event that the clearing agent or the Clearinghouse fails to meet its obligations. However, the use of cleared derivatives is intended to mitigate an FHLBank's overall credit risk exposure because a central counterparty is substituted for individual counterparties and collateral is posted daily for changes in the value of cleared derivatives through a clearing agent. The management of each FHLBank did not anticipate any credit losses on its cleared derivatives as of December 31, 2016.

Table 59 presents the derivative positions with non-member counterparties and member institutions to which the FHLBanks had credit exposure at December 31, 2016.

Table 59 - Derivative Counterparty Credit Exposure at December 31, 2016
(dollars in millions)

Credit Rating(1)	Notional Amount	Net Derivatives Fair Value Before Collateral	Cash Collateral Pledged To (From) Counterparties	Non-cash Collateral Pledged To (From) Counterparties	Net Credit Exposure to Counterparties
Non-member counterparties					
Asset positions with credit exposure					
Uncleared derivatives					
Double-A	$ 3,358	$ 13	$ —	$ —	$ 13
Single-A	13,847	157	(36)	(104)	17
Triple-B	826	2	(1)	—	1
Unrated	8	—	—	—	—
Cleared derivatives(2)	149,641	628	(221)	553	960
Liability positions with credit exposure					
Uncleared derivatives					
Double-A	6,466	(68)	69	—	1
Single-A	11,543	(124)	127	10	13
Triple-B	4,126	(44)	24	23	3
Cleared derivatives(2)	201,344	(1,329)	2,155	158	984
Total derivative positions with credit exposure to non-member counterparties	391,159	(765)	2,117	640	1,992
Member institutions(3)	593	4	—	—	4
Total	$ 391,752	$ (761)	$ 2,117	$ 640	$ 1,996

(1) This chart does not reflect any changes in rating, outlook, or watch status occurring after December 31, 2016. The ratings presented in this table represent the lowest long-term counterparty credit rating available for each counterparty of an individual FHLBank, based on the nationally recognized statistical rating organization(s) used by that FHLBank.

(2) Represents derivative transactions cleared with LCH.Clearnet LLC and CME Clearing, the FHLBanks' clearinghouses, which are not rated. LCH.Clearnet LLC's parent company, LCH.Clearnet Group Ltd, is rated A+ by S&P and CME Clearing's parent company, CME Group Inc., is rated Aa3 by Moody's and AA- by S&P.

(3) Member institutions include mortgage delivery commitments and derivatives with members where an FHLBank is acting as an intermediary. Collateral held with respect to derivatives with member institutions where an FHLBank is acting as an intermediary represents the amount of eligible collateral physically held by or on behalf of the FHLBank or collateral assigned to the FHLBank, as evidenced by a written security agreement, and held by the member institution for the benefit of that FHLBank.

Liquidity Risk

Liquidity risk is the risk that an FHLBank will be unable to meet its financial obligations as they come due or meet the credit needs of its members and housing associates in a timely, cost-effective manner. There are two types of liquidity risk that affect the FHLBanks:

- *Operational Liquidity Risk.* The potential inability of an FHLBank to meet its anticipated (or unanticipated) day-to-day needs through normal sources of funding, including the short-term discount note market; and

- *Contingency Liquidity Risk.* The potential inability of an FHLBank to meet its liquidity needs when its access to the capital markets is impeded, including the short-term discount note market.

To address liquidity risk, the FHLBank Act and FHFA regulations set liquidity requirements for the FHLBanks. (See *Liquidity and Capital Resources* for FHFA regulations on the FHLBanks' liquidity requirements.) An individual FHLBank's board of directors may also set additional liquidity policies.

The FHLBanks' primary sources of liquidity are proceeds from the issuance of consolidated obligations and advance repayments, as well as cash and investment holdings that are primarily high-quality, short-, and intermediate-term financial instruments. During 2016, the FHLBanks maintained access to funding and were able to structure their debt issuance to meet the credit and liquidity needs of their members and to meet their financial commitments. (See *Combined Financial Condition - Consolidated Obligations* for additional analysis and discussion about the FHLBanks' consolidated obligations and *Risk Factors* - *Liquidity Risk* for additional discussion on liquidity risk.)

Operational Risk

Operational risk is the risk of potential loss resulting from inadequate or failed internal processes, people, or systems, or from external events. These failures may be due to:

- human error;
- key person dependency;
- business or financial model errors;
- systems malfunctions or cyber attacks;
- man-made or natural disasters;
- critical vendor or third-party failure;
- unenforceability of legal contracts;
- fraud; or
- circumvention or failure of internal controls.

Each of the FHLBanks and the Office of Finance has established comprehensive risk assessments, as well as financial and operating policies and procedures, to reduce the likelihood of these occurrences and the potential for damage that could result from them. They have also each instituted insurance coverage that may mitigate damages that could result from certain of these risks. The internal audit department of each of the FHLBanks and the Office of Finance, which reports directly to its audit committee, regularly monitors and tests its entity's compliance with established policies and procedures.

Each of the FHLBanks and the Office of Finance relies heavily on its information systems and other technology to conduct and manage its business. Controls are in place to ensure information technology assets are well managed and secure from unauthorized access, and to identify cyber risk events. In addition, each of the FHLBanks and the Office of Finance has a business continuity plan that is designed to restore critical business processes and systems in the event of a disruption. Some of the operational risks of the FHLBanks and Office of Finance, however, are beyond their control. Furthermore, the failure of other parties to address their operational risk adequately could adversely affect the FHLBanks and the Office of Finance. (See

Risk Factors - *Operational Risk* for additional information about certain operational risks and *Controls and Procedures* for additional information regarding each FHLBank's controls over its financial reporting and the Office of Finance's controls and procedures over the combined financial reporting process.)

Business Risk

Business risk is the risk of an adverse effect on an FHLBank's profitability and its ability to fulfill its mission as a result of external factors that may occur in both the short and long term. Business risk includes political, strategic, reputation, and/or regulatory events that are beyond the individual FHLBank's control. From time to time, proposals or changes in laws and regulations are made or considered, which could affect the status of the FHLBanks and their costs of doing business. (See *Risk Factors* for additional discussions of general business risk, legislative and regulatory business risk, and strategic business risk.)

Each FHLBank's board of directors and management try to reduce these business risks through long-term strategic planning and by continually monitoring economic indicators and their external environment. Additionally, the FHLBanks are members of the Council of Federal Home Loan Banks (Council), a trade association based in Washington, D.C. whose primary function is to represent the positions and views of the Council's members to policymakers. The Council's mission is to: (1) ensure the FHLBanks' common legislative and regulatory interests are served; (2) promote enactment of laws and regulations that are beneficial to the FHLBanks; and (3) enhance awareness and understanding of the FHLBanks among Washington, D.C. leaders, including members of the U.S. Congress, the executive branch of the U.S. government, regulators, trade associations, and the financial media.

An FHLBank's financial strategies are generally designed to enable it to safely expand and contract its assets, liabilities, and capital in response to changes in its member base and in its members' credit needs. An FHLBank's capital generally grows when members are required to purchase additional capital stock as they increase their advances borrowings or other business activities with their FHLBank. The FHLBanks may also repurchase excess capital stock from members as business activities with those members decline. In addition, in order to meet internally established thresholds or to meet its regulatory capital requirement, an individual FHLBank, at the discretion of its board of directors or management, could undertake capital preservation initiatives such as: (1) voluntarily reducing or eliminating dividend payments; (2) suspending excess capital stock repurchases; or (3) raising capital stock holding requirements for its members.

An FHLBank may have borrower concentration risk in advances, and therefore, it analyzes the implications for its financial management and profitability if it were to lose the advances of one or more of these borrowers. (See *Combined Financial Condition - Advances* for the *Top 10 Advance Holding Borrowers by Holding Company at December 31, 2016*, for the FHLBank System's member concentration risk and *Top 5 Advance Holding Borrowers by FHLBank at December 31, 2016,* for more information regarding each FHLBank's member concentration risk.)

If an FHLBank loses one or more large borrowers that represent a significant portion of its business, that FHLBank could, depending on the magnitude of the effect, compensate for the loss by:

- lowering dividend rates;
- raising advance rates;
- attempting to reduce operating expenses; or
- undertaking some combination of these actions.

The magnitude of the effect would depend, in part, on the FHLBank's size and profitability at the time the institution ceases to be a borrower. Each FHLBank describes its risk management policies, including disclosures about its member concentration risk, if any, in its periodic reports filed with the SEC.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Each FHLBank is responsible for establishing its own risk management philosophies, practices, and policies. Each FHLBank describes its risk management policies for its business, including quantitative and qualitative disclosures about its market risk, in its periodic reports filed with the SEC. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report.*)

Each FHLBank has established policies and procedures to evaluate, manage, and mitigate market risks. The FHFA has established regulations governing the risk management practices of the FHLBanks. The FHLBanks must file periodic compliance reports with the FHFA. The FHFA conducts annual on-site examinations, interim on-site visits, and off-site analyses of each FHLBank and the Office of Finance.

Interest-Rate Risk

Interest-rate risk is the risk that relative and absolute changes in interest rates may adversely affect an institution's financial condition. The goal of an interest-rate risk management strategy is not necessarily to eliminate interest-rate risk, but to manage it by setting, and operating within, an appropriate framework and limits. The FHLBanks generally manage interest-rate risk by acquiring and maintaining a portfolio of assets and liabilities and entering into related derivative transactions to limit the expected mismatches in duration and market value of equity sensitivity. The FHLBanks measure and monitor interest rate-risk with commonly used methods, which include the calculations of market value of equity, duration of equity, and duration gap.

The optionality embedded in certain financial instruments held by the FHLBanks can create interest-rate risk. For example, when a member prepays an advance, this can lead to lower future income for the FHLBank. If the principal portion of the advance being prepaid is reinvested in assets yielding a lower return, but that principal amount continues to be funded by the original (higher-cost) debt, the FHLBank can suffer lower net returns. To protect against this risk, each FHLBank generally charges members a prepayment fee to compensate the FHLBank for this potential loss, making it financially indifferent to the prepayment. When an FHLBank offers advances (other than short-term advances) that a member may prepay without a prepayment fee, it usually finances these advances with callable debt or otherwise hedges this option.

The FHLBanks hold mortgage-related investments, such as mortgage loans and mortgage-backed securities. Because mortgage-related investments may contain prepayment options, changes in interest rates may cause the expected maturities of these investments to become shorter (prepay) or longer (extend). The rate and timing of unscheduled payments and collections of principal on mortgage loans are difficult to predict accurately and will be affected by a variety of factors. While the FHLBanks manage prepayment and extension risk by using a combination of debt instruments and derivative transactions, if the level of actual prepayments is higher or lower than expected, the FHLBanks may incur additional costs to hedge the change in this market-risk exposure, which would result in reduced earnings. FHFA regulation also limits this source of interest-rate risk by restricting the types of mortgage-backed securities the FHLBanks may own. FHLBanks may own only those mortgage-backed securities with limited average life extension and contraction under certain interest-rate shock scenarios. The FHLBanks may hedge against prepayment risk by funding some mortgage-related investments with consolidated obligations that have call features. In addition, the FHLBanks may use caps, floors, and other derivative transactions to manage the interest-rate risk and extension and contraction variability of mortgage-related investments. The FHLBanks may also use derivative transactions to manage the interest-rate risk associated with investment securities, other than mortgage-backed securities, to match the cash flow characteristics and/or market value of the hedged item. (See *Quantitative and Qualitative Disclosures About Market Risk - Use of Derivatives to Manage Interest-Rate Risk* for additional information.*)*

Market Value of Equity and Duration of Equity

An FHLBank may analyze its interest-rate risk exposure by estimating its theoretical market value of equity. Market value of equity represents the difference between the theoretical market value of total assets and the theoretical market value of total liabilities, including off-balance sheet items. It measures, in present value terms, the long-term economic value of current capital and the long-term level and volatility of net interest income. Generally, an FHLBank analyzes the sensitivity of the market value of equity to changes in interest rates, prepayment speeds, options prices, mortgage and debt spreads, interest-rate volatility, and other market variables. Therefore, market values can be calculated under various interest-rate scenarios, and the resulting changes in net equity can provide an indicator of the exposure of that FHLBank's market value of equity to market volatility.

Another measure of interest-rate risk is duration of equity, which measures how sensitive a theoretical market value of equity is to incremental changes in interest rates. Generally, duration of equity equals the market value-weighted duration of assets minus the market value-weighted duration of liabilities (factoring in the effect of derivatives), divided by the market value of equity. Each FHLBank has an internal modeling system for measuring its duration of equity; therefore, individual FHLBank measurements may not be directly comparable. Each FHLBank reports the results of its duration of equity calculations to the FHFA each quarter. However, not all FHLBanks manage to the duration of equity risk measure. The capital adequacy rules of the FHFA require each FHLBank to hold permanent capital in an amount sufficient to cover the sum of its credit, market, and operations risk-based capital requirements, which are defined by applicable regulations. Each FHLBank has implemented a market-risk model that calculates the market-risk component of this requirement.

Table 60 presents each FHLBank that includes quantitative market value of equity and duration of equity information in its individual 2016 SEC Form 10-K.

Table 60 - Individual FHLBank's Market Value of Equity and Duration of Equity Disclosures

FHLBank	Market Value of Equity	Duration of Equity
Boston	✓	✓
New York	✓	✓
Pittsburgh	(1)	✓
Atlanta	✓	✓
Cincinnati	✓	✓
Indianapolis	✓	✓
Chicago	✓	(2)
Des Moines	(3)	(3)
Dallas	✓	✓
Topeka	(4)	✓
San Francisco	✓	(5)

(1) The FHLBank of Pittsburgh monitors and measures market value of equity to par value of capital stock, as described in its 2016 SEC Form 10-K. In addition, the FHLBank of Pittsburgh also monitors return on equity spread volatility relative to a return on equity spread volatility limit, established and approved by its board of directors.
(2) The FHLBank of Chicago disclosed the dollar limits on changes in market value under parallel interest rate shocks in addition to duration of equity in its 2016 SEC Form 10-K.
(3) Although the FHLBank of Des Moines measures and monitors market value of equity and duration of equity, those measures are not disclosed as key market risk measures. The FHLBank of Des Moines disclosed, in its 2016 SEC Form 10-K, market value of capital stock (MVCS) sensitivity and projected income sensitivity as key market risk measures and MVCS as its key capital adequacy measure.
(4) The FHLBank of Topeka measures and monitors market value of equity (MVE); however, the FHLBank of Topeka measures market value risk in terms of its MVE in relation to its total regulatory capital stock outstanding instead of to its book value of equity. As described in its 2016 SEC Form 10-K, the FHLBank of Topeka believes this is a reasonable metric because, as a cooperative, the metric reflects the market value of the FHLBank of Topeka relative to the book value of its capital stock.
(5) The FHLBank of San Francisco does not disclose duration of equity, rather it discloses a comparable metric, "Market Value of Capital Sensitivity" as a key market risk measure.

Table 61 presents the duration of equity reported by each FHLBank to the FHFA in accordance with the FHFA's guidance, which prescribes that down and up interest-rate shocks equal 200 basis points. However, the applicable guidance restricts the down rate from assuming a negative interest rate. Therefore, each FHLBank adjusts the down rate accordingly in periods of very low levels of interest rates.

Table 61 - Duration of Equity
(in years)

	December 31, 2016			December 31, 2015		
FHLBank	Down	Base	Up	Down	Base	Up
Boston	(3.4)	1.7	3.9	(4.1)	0.1	3.5
New York	1.3	0.1	0.8	1.9	(0.6)	0.8
Pittsburgh	4.5	0.2	0.8	3.3	(0.6)	0.8
Atlanta	(0.3)	0.8	3.6	(0.3)	0.2	3.9
Cincinnati	(3.7)	1.8	2.0	(5.7)	0.6	3.3
Indianapolis	(8.1)	1.7	3.4	(3.2)	2.2	3.2
Chicago	2.3	1.3	1.8	2.8	0.6	0.7
Des Moines	0.8	1.1	2.6	(2.5)	(1.8)	1.4
Dallas	0.9	(0.9)	0.9	3.5	(0.5)	2.2
Topeka	3.0	(1.0)	2.6	2.0	1.0	2.0
San Francisco	4.2	1.9	2.7	2.2	2.3	3.0

Duration Gap

A related measure of interest-rate risk is duration gap, which is the difference between the estimated durations (market value sensitivity) of assets and liabilities, and reflects the extent to which estimated maturity and repricing cash flows for assets and liabilities are matched. Duration gap determines the sensitivity of assets and liabilities to interest-rate changes. Each FHLBank has an internal modeling system for measuring its duration gap; therefore, individual FHLBank measurements may not be directly comparable. Duration generally indicates the expected change in an instrument's market value resulting from an increase or a decrease in interest rates. Higher duration numbers, whether positive or negative, indicate greater volatility in the market value of equity in response to changing interest rates. Duration gap numbers in Table 62 include the effect of derivative transactions.

Table 62 - Duration Gap
(in months)

FHLBank	December 31, 2016	December 31, 2015
Boston	1.2	0.1
New York	(0.2)	(0.8)
Pittsburgh	(0.1)	(0.6)
Atlanta	0.4	(0.1)
Cincinnati	0.0	0.0
Indianapolis	0.3	0.7
Chicago	1.0	0.5
Des Moines	0.4	(1.1)
Dallas	(0.7)	(0.6)
Topeka	(0.6)	0.5
San Francisco	1.2	1.4

Use of Derivatives to Manage Interest-Rate Risk

An FHLBank enters into derivatives to manage interest-rate risk, prepayment risk, and other exposure inherent in otherwise unhedged assets and funding positions. An FHLBank attempts to use derivatives to reduce interest-rate exposure in the most cost-efficient manner. Derivatives are also used to manage the effective maturity, repricing frequency, or option characteristics of financial instruments to achieve risk-management objectives. (See *Note 11 - Derivatives and Hedging Activities* to the accompanying combined financial statements for a discussion of managing interest-rate risk exposure and *Financial Discussion and Analysis - Combined Results of Operations* for the effect of derivatives and hedging activities on net interest income and non-interest income resulting from the FHLBanks' hedging strategies.)

Table 63 presents the notional amount and hedging objectives of the derivatives used to manage interest-rate risk, prepayment risk, and other exposure inherent in otherwise unhedged assets and funding positions. The notional amount of derivatives serves as a factor in determining periodic interest payments or cash flows received and paid, and reflects the FHLBanks' involvement in the various classes of financial instruments. However, the notional amount of derivatives does not represent the actual amounts exchanged or the overall exposure of the FHLBanks to credit and market risk; the overall risk is much smaller. The risks of derivatives 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 63 - Hedging Strategies
(dollars in millions)

Hedged Item / Hedging Instrument	Hedging Objective	Hedge Accounting Designation(1)	December 31, 2016 Notional Amount	December 31, 2015 Notional Amount
Advances(2)				
Pay-fixed, receive-float interest-rate swap (without options)	Converts the advance's fixed rate to a variable-rate index.	Fair Value	$ 105,476	$ 106,067
		Economic	8,721	11,794
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.	Fair Value	35,867	37,304
		Economic	327	508
Pay-fixed, receive-float interest-rate swap (with purchased swaption)	Converts the advance's fixed rate to a variable-rate index and offsets an optional commitment embedded in the advance that allows the member to increase the amount of the advance.	Fair Value	10	8
Receive-fixed, pay-float interest-rate swap	Converts the advance's variable rate to a fixed rate.	Economic	1,472	672
Pay-fixed with embedded features, receive-float interest-rate swap (non-callable)	Reduces interest-rate sensitivity and repricing gaps by converting the advance's fixed rate to a variable-rate index and/or offsets embedded option risk in the advance.	Fair Value	180	—
Pay-float with embedded features, receive-float interest-rate swap (non-callable)	Reduces interest-rate sensitivity and repricing gaps by converting the advance's variable rate to a different variable-rate index and/or offsets embedded option risk in the advance.	Fair Value	237	577
Pay-float with embedded features, receive-float interest-rate swap (callable)	Reduces interest-rate sensitivity and repricing gaps by converting the advance's variable rate to a different variable-rate index and/or offsets embedded option risk in the advance.	Fair Value	—	850
		Economic	—	15
Pay-float, receive-float basis swap	Reduces interest-rate sensitivity and repricing gaps by converting the advance's variable rate to a different variable-rate index.	Economic	628	179
Interest-rate cap, floor, corridor, or collar	Offsets the interest cap, floor, corridor, or collar embedded in a variable-rate advance.	Fair Value	—	60
		Economic	40	92
Interest-rate swaption	Provides the option to enter into an interest-rate swap to offset interest-rate risk associated with an optional advance commitment.	Economic	—	405
		Total	152,958	158,531
Investment securities(3)				
Pay-fixed, receive-float interest-rate swap	Converts the investment security's fixed rate to a variable-rate index.	Fair Value	32,239	26,949
		Economic	5,509	7,263
Pay-float, receive-float interest-rate swap	Converts the investment security's variable rate to a different variable-rate index.	Economic	750	575
Interest-rate cap or floor	Offsets the interest-rate cap or floor embedded in a variable-rate investment.	Economic	7,735	8,118
Pay-fixed, receive-float interest-rate swap (with options)	Converts the investment securities' fixed rate to a variable-rate index and offsets option risk in the investment.	Fair Value	1,117	272
Interest-rate swaption	Provides the option to enter into an interest-rate swap to offset the embedded option risk in certain investment securities.	Economic	—	25
		Total	47,350	43,202
Mortgage loans(4)				
Pay-fixed, receive-float interest-rate swap	Converts the mortgage loan's fixed rate to a variable-rate index.	Economic	7,803	8,244
Receive-fixed, pay-float interest-rate swap	Converts the variable rate to a fixed rate in a pooled mortgage portfolio hedge.	Economic	6,099	6,825
Interest-rate swaption	Provides the option to enter into an interest-rate swap to offset interest-rate or prepayment risk in a pooled mortgage portfolio hedge.	Economic	765	865
Interest-rate cap or floor	Protects against changes in income of certain mortgage assets due to changes in interest rates.	Economic	1,125	1,125
Forward settlement agreement	Protects against changes in market value of fixed-rate mortgage delivery commitments resulting from changes in interest rates.	Economic	837	733
		Total	16,629	17,792

Hedged Item / Hedging Instrument	Hedging Objective	Hedge Accounting Designation(1)	December 31, 2016 Notional Amount	2015 Notional Amount
Consolidated bonds(5)				
Receive-fixed or structured, pay-float interest-rate swap (without options)	Converts the bond's fixed or structured rate to a variable-rate index.	Fair Value	113,446	118,019
		Economic	20,558	24,921
Receive-fixed or structured, pay-float interest-rate swap (with options)	Converts the bond's fixed- or structured-rate to a variable-rate index and offsets option risk in the bond.	Fair Value	31,855	40,155
		Economic	7,333	6,781
Receive-float with embedded features, pay-float interest-rate swap (callable)	Reduces interest-rate sensitivity and repricing gaps by converting the bond's variable rate to a different variable-rate index and/or offsets embedded option risk in the bond.	Fair Value	185	55
		Economic	290	15
Receive-float with embedded features, pay-float interest rate swap (non-callable)	Reduces interest-rate sensitivity and repricing gaps by converting the bond's variable rate to a different variable-rate index and/or offsets embedded option risk in the bond.	Fair Value	20	120
Receive-float, pay-float basis swap	Reduces interest-rate sensitivity and repricing gaps by converting the bond's variable rate to a different variable-rate index.	Economic	10,790	4,635
Pay-fixed, receive-float interest-rate swap	Fixed-rate or variable-rate non-callable bond, which may have been previously converted to LIBOR, converted to fixed-rate debt that offsets the interest-rate risk of mortgage assets.	Economic	—	170
Basis swap	Fixed-rate or variable-rate non-callable bond previously converted to a variable-rate index, converted to another variable-rate index to reduce interest-rate sensitivity and repricing gaps.	Economic	500	14,986
Forward-starting interest-rate swap	Locks in the cost of funding on anticipated issuance of debt.	Cash Flow	623	563
		Total	185,600	210,420
Consolidated discount notes(6)				
Receive-fixed, pay-float interest-rate swap	Converts the discount note's fixed rate to a variable-rate index.	Fair Value	16,189	16,065
		Economic	47,510	46,437
Pay-fixed, receive-float interest-rate swap (with options)	Discount note converted to fixed-rate callable debt that offsets the prepayment risk of mortgage assets.	Economic	1,535	1,355
Pay-fixed, receive-float interest-rate swap (without options)	Discount note converted to fixed-rate non-callable debt that offsets the interest-rate risk of mortgage assets.	Economic	450	720
Interest-rate cap, floor, or swap	Mitigates the variability of cash flows associated with the benchmark interest rate (LIBOR).	Cash Flow	8,232	7,657
		Total	73,916	72,234
Balance sheet				
Pay-fixed, receive-float interest-rate swap	Converts the asset or liability fixed rate to a variable-rate index.	Economic	105	105
Pay-float, receive-fixed interest-rate swap	Interest-rate swap not linked to a specific asset, liability or forecasted transaction.	Economic	325	—
Pay-float, receive-float basis swap	To reduce interest-rate sensitivity and repricing gaps by converting the asset's or liability's variable rate to the same variable-rate index as the funding source or asset being funded.	Economic	1,000	—
Interest-rate swaption	Provides the option to enter into an interest-rate swap to offset interest-rate or prepayment risk.	Economic	2,346	481
Interest-rate cap or floor	Protects against changes in income of certain assets due to changes in interest rates.	Economic	17,692	19,192
		Total	21,468	19,778

Hedged Item / Hedging Instrument	Hedging Objective	Hedge Accounting Designation(1)	December 31, 2016 Notional Amount	December 31, 2015 Notional Amount
Intermediary positions and other				
Pay-fixed, receive-float interest-rate swap, and receive-fixed, pay-float interest-rate swap	To offset interest-rate swaps executed with members by executing interest-rate swaps with derivatives counterparties.	Economic	1,280	2,443
Interest-rate cap or floor	To offset interest-rate caps or floors executed with members by executing interest-rate caps or floors with derivatives counterparties.	Economic	80	88
Pay-fixed, receive-float interest-rate swap, and receive-fixed, pay-float interest-rate swap	Interest-rate swap used to offset the economic effect of an interest-rate swap that is no longer designated to advances, investment securities, mortgage loans, consolidated bonds or consolidated discount notes.	Economic	512	605
		Total	1,872	3,136
Stand-alone derivatives				
Mortgage delivery commitment	Exposed to fair-value risk associated with fixed-rate mortgage purchase commitments.	N/A	1,584	1,207
		Total	1,584	1,207
Total Notional Amount			$ 501,377	$ 526,300

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(1) The Fair Value and Cash Flow categories represent hedging strategies for which qualifying hedge accounting is achieved. The Economic category represents hedging strategies for which qualifying hedge accounting is not achieved.
(2) At December 31, 2016 and 2015, the par value of advances outstanding was $704,309 million and $631,233 million.
(3) At December 31, 2016 and 2015, the fair value of trading securities was $9,461 million and $10,760 million and the amortized cost of AFS securities was $80,911 million and $75,309 million.
(4) At December 31, 2016 and 2015, the unpaid principal balance of mortgage loans held for portfolio was $47,585 million and $43,768 million.
(5) At December 31, 2016 and 2015, the par value of consolidated bonds outstanding was $578,968 million and $410,581 million.
(6) At December 31, 2016 and 2015, the par value of consolidated discount notes outstanding was $410,122 million and $494,343 million.

All fair value hedges presented in Table 63 at December 31, 2016, represent benchmark interest-rate hedges.

FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Financial Statements

The combined financial statements and accompanying notes, including the Office of Finance Audit Committee Report and the Independent Auditor's Report, begin on page F-1 of this Combined Financial Report.

Supplementary Financial Data

Table 64 - Selected Quarterly Combined Results of Operations (Unaudited)
(dollars in millions)

	2016 Quarter Ended			
	December 31	September 30	June 30	March 31
Total interest income	$ 2,972	$ 2,778	$ 2,634	$ 2,546
Total interest expense	1,957	1,800	1,729	1,609
Net interest income	1,015	978	905	937
Provision (reversal) for credit losses	1	3	1	1
Net interest income after provision (reversal) for credit losses	1,014	975	904	936
Non-interest income (loss)	351	281	254	268
Non-interest expense	346	291	270	276
Affordable Housing Program assessments	106	100	92	94
Net income	$ 913	$ 865	$ 796	$ 834

	2015 Quarter Ended			
	December 31	September 30	June 30	March 31
Total interest income	$ 2,266	$ 2,026	$ 1,854	$ 2,015
Total interest expense	1,258	1,140	1,121	1,089
Net interest income	1,008	886	733	926
Provision (reversal) for credit losses	1	1	3	(1)
Net interest income after provision (reversal) for credit losses	1,007	885	730	927
Non-interest income (loss)	51	(78)	390	480
Non-interest expense	307	261	359	272
Affordable Housing Program assessments	77	56	83	116
Net income	$ 674	$ 490	$ 678	$ 1,019

CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON COMBINED ACCOUNTING AND FINANCIAL DISCLOSURES

There were no changes in accountants or disagreements with accountants in the period covered by this Combined Financial Report.

CONTROLS AND PROCEDURES

FHLBanks

The management of each FHLBank is required under applicable laws and regulations to establish and maintain effective disclosure controls and procedures as well as effective internal control over financial reporting, as such disclosure controls and procedures and internal control over financial reporting relate to that FHLBank only. Each FHLBank's management assessed the effectiveness of its individual internal control over financial reporting as of December 31, 2016, based on the criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management of each FHLBank, other than the FHLBank of Des Moines, concluded, as of December 31, 2016, that its individual internal control over financial reporting is effective based on the criteria established in *Internal Control-Integrated Framework (2013).* Additionally, the independent registered public accounting firm of each FHLBank, other than the FHLBank of Des Moines, opined that the respective individual FHLBank maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016. (See *Part II. Item 8 - Financial Statements and Supplementary Data* or *Item 9A - Controls and Procedures* of each FHLBank's 2016 SEC Form 10-K for its *Management's Report on Internal Control over Financial Reporting*.)

Each FHLBank, other than the FHLBank of Des Moines, indicated that there were no changes to its internal control over financial reporting during the quarter ended December 31, 2016, that materially affected, or are reasonably likely to affect, its internal control over financial reporting. Additionally, management of each of these FHLBanks concluded that its disclosure controls and procedures were effective at a reasonable assurance level as of the end of the period covered by its respective 2016 SEC Form 10-K. (See *Part II. Item 9A - Controls and Procedures* of each FHLBank's 2016 SEC Form 10-K.)

During the quarter ended December 31, 2016, the management of the FHLBank of Des Moines continued to take steps to remediate the material weaknesses identified as of December 31, 2015. Other than these remediation steps, there were no changes to its internal control over financial reporting during the quarter ended December 31, 2016, that materially affected, or are reasonably likely to affect, its internal control over financial reporting. (See *Part II. Item 9A - Controls and Procedures* of the FHLBank of Des Moines' 2016 SEC Form 10-K.)

FHLBank of Des Moines' Material Weakness in Internal Control over Financial Reporting

As of December 31, 2016, the FHLBank of Des Moines' management identified a material weakness in its internal control over financial reporting process, related to ineffective controls over spreadsheets used in its financial close and reporting process. As a result, the FHLBank of Des Moines' management concluded that its internal control over financial reporting was not effective as of December 31, 2016, and that its disclosure controls and procedures were not effective at a reasonable assurance level as of the end of the period covered by its 2016 SEC Form 10-K. There were no material misstatements identified in the FHLBank of Des Moines' 2016 annual and interim financial statements as a result of this material weakness. However, this material weakness could result in a material misstatement to the FHLBank of Des Moines' annual or interim financial statements that would not be prevented or detected. The management of the FHLBank of Des Moines continues to take steps to remediate the material weakness related to spreadsheet controls, including streamlining certain spreadsheets, providing additional training to its personnel, and beginning to reduce its reliance on spreadsheets. (See *Part II. Item 8 - Financial Statements and Supplementary Data* and *Item 9A - Controls and Procedures of the FHLBank of Des Moines' 2016 SEC Form 10-K* for additional information.)

Previously Identified Material Weaknesses and Their Remediation. At December 31, 2015, the FHLBank of Des Moines' management identified three material weaknesses in its internal controls relating to: 1) ineffective control over multiple changes within its business environment during 2015, including certain implications of its merger with the FHLBank of Seattle; 2) ineffective controls over key spreadsheets used in its financial close and reporting process; and 3) failure to consistently conform to its existing internal control procedures established to ensure appropriate logical access to its information technology systems.

During 2016, the management of the FHLBank of Des Moines has taken steps to remediate these material weaknesses. As of December 31, 2016, the FHLBank of Des Moines' management concluded that two of the three previously identified material weaknesses in its internal control over financial reporting have been fully remediated. For the outstanding material weakness, the management of the FHLBank of Des Moines concluded that while the enhanced controls, designed and implemented during 2016, over spreadsheets used in its financial close and reporting process are expected to remediate this material weakness, the enhanced controls have not yet operated consistently for a period sufficient to conclude the material weakness

is remediated as of December 31, 2016. (See *Part II. Item 9A - Controls and Procedures of the FHLBank of Des Moines' 2016 SEC Form 10-K* for additional information.)

Office of Finance Controls and Procedures over the Combined Financial Reporting Combining Process

The Office of Finance is not responsible for the preparation, accuracy, or adequacy of the information or financial data provided by the FHLBanks to the Office of Finance for use in preparing the combined financial reports, or for the quality or effectiveness of the disclosure controls and procedures or internal control over financial reporting of the FHLBanks as they relate to that information and financial data. Each FHLBank is responsible for establishing and maintaining disclosure controls and procedures and internal control over financial reporting with respect to the information and financial data provided to the Office of Finance. Although the Office of Finance is not an SEC registrant, FHFA regulations require that the combined financial report form and content generally be consistent with SEC Regulations S-K and S-X, as interpreted by the FHFA. The Office of Finance is not required to establish and maintain, and in light of the nature of its role has not established and maintained, disclosure controls and procedures and internal control over financial reporting in the same manner as those maintained by each FHLBank. The Office of Finance has established controls and procedures concerning the FHLBanks' submission of information and financial data to the Office of Finance, the process of combining the financial statements and other financial information of the individual FHLBanks, and the review of that information.

The Office of Finance does not independently verify the financial information submitted by each FHLBank that comprise the combined financial statements, the condensed combining schedules, and other disclosures included in this Combined Financial Report. Instead, the Office of Finance relies on each FHLBank management's certification and representation regarding the accuracy and completeness, in all material respects, of its data submitted to the Office of Finance for use in preparing this Combined Financial Report.

Audit Committee Charter

The charter of the audit committee of the Office of Finance's board of directors is available on the Office of Finance's web site at www.fhlb-of.com. This web site address is provided as a matter of convenience only, and its contents are not made part of this report and are not intended to be incorporated by reference into this report.

OTHER INFORMATION

PricewaterhouseCoopers LLP (PwC) serves as the independent registered public accounting firm for each of the FHLBanks. Rule 2-01(c)(1)(ii)(A) of SEC Regulation S-X (the Loan Rule) prohibits an accounting firm, such as PwC, from having certain financial relationships with its audit clients and affiliated entities. Specifically, the Loan Rule provides, in relevant part, that an accounting firm generally would not be independent if it or any covered person in the firm receives a loan from a lender that is a “record or beneficial owner of more than ten percent of the audit client’s equity securities.” A covered person in the firm includes personnel on the audit engagement team, personnel in the chain of command, partners and managers who provide ten or more hours of non-audit services to the audit client, and partners in the office where the lead engagement partner practices in connection with the client.

PwC has advised certain FHLBanks that, as of December 31, 2016, PwC and certain covered persons had borrowing relationships with certain FHLBank members (referred below as the “lenders”) who own more than 10% of the affected FHLBanks' capital stock, which under the Loan Rule, could call into question PwC’s independence with respect to the affected FHLBanks. This disclosure is intended to explain the facts and circumstances, as well as conclusions of PwC and the Audit Committee of each affected FHLBank, concerning PwC’s objectivity and impartiality with respect to the audit of each affected FHLBank.

PwC advised the Audit Committee of each affected FHLBank that it believes, in light of the facts of each borrowing relationship, its ability to exercise objective and impartial judgment on all matters encompassed within PwC’s audit engagements has not been impaired and that a reasonable investor with knowledge of all relevant facts and circumstances would reach the same conclusion. PwC has advised the Audit Committee of each affected FHLBank that this conclusion is based in part on the following considerations:

- the borrowings are in good standing and the lenders do not have the right to take action against PwC, as borrower, in connection with the financings;
- the debt balances outstanding are immaterial to PwC and to the lenders;
- PwC has borrowing relationships with a diverse group of lenders, therefore PwC is not dependent on any single lender or group of lenders; and
- PwC audit engagement teams have no involvement in PwC’s treasury function and PwC’s treasury function has no oversight or ability to influence PwC audit engagement teams.

Additionally, each affected FHLBank and its Audit Committee reviewed PwC’s analysis and continue to conclude that PwC has maintained objectivity and impartiality in connection with its audit of the respective FHLBank's financial statements. The conclusion is based on the unique nature and status of the FHLBanks, and due to the ownership structure of the FHLBanks and the limited voting rights of the FHLBanks' members.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

Each FHLBank is a member-owned cooperative, whose members elect a majority of that FHLBank's directors from among the officers and directors of its members. The FHLBanks conduct their advances and mortgage loan business primarily with members. As a result, in the normal course of business, the FHLBanks regularly extend credit to members whose officers and/or directors may serve as directors of the FHLBanks and members (or affiliates) owning more than 5% of an FHLBank's capital stock. This credit is extended on market terms that are no more favorable to these "related" members than comparable transactions with other members of the same FHLBank. As of December 31, 2016, the FHLBanks had $53.6 billion of advances outstanding to members whose officers and/or directors were serving as directors of the FHLBanks, which represented 7.6% of total advances at par value. (See *Market for Capital Stock and Related Stockholder Matters* and *Financial Discussion and Analysis - Combined Financial Condition - Advances* for additional information on FHLBank advances and membership.)

An FHLBank provides Affordable Housing Program subsidies in the form of direct grants and below-market interest rate advances to members, which use the funds to assist in the purchase, construction, or rehabilitation of housing for very low-, low-, and moderate-income households. Only FHLBank members, along with their non-member Affordable Housing Program project sponsors, may submit Affordable Housing Program applications. All Affordable Housing Program subsidies are made in the normal course of business.

An FHLBank also provides subsidies in the form of grants and below-market interest rate advances or standby letters of credit to members for community lending and economic development projects under the Community Investment Program and Community Investment Cash Advance programs. Only FHLBank members may submit applications for these credit program subsidies. These subsidies are made in the normal course of business.

In instances where an Affordable Housing Program, Community Investment Program, or Community Investment Cash Advance transaction involves a member (or its affiliate) owning more than 5% of an FHLBank's capital stock, a member with an officer or director who serves as a director of an FHLBank, or an entity with an officer, director, or general partner who serves as a director of an FHLBank (and has a direct or indirect interest in the subsidy), the transaction is subject to the same eligibility and other program criteria and requirements as all other transactions, and the regulations governing the operations of the relevant program.

An FHLBank may also have investments in interest-bearing deposits, securities purchased under agreements to resell, federal funds sold, and certificates of deposit, and may also execute mortgage-backed securities and derivative transactions, with members, former members, or their affiliates, some of whose officers and/or directors may serve as directors of their respective FHLBank. All investments are transacted at then-current market prices without preference to the status of the counterparty or the issuer of the investment as a member, former member, or affiliate. (See each FHLBank's 2016 SEC Form 10-K under *Item 13—Certain Relationships and Related Transactions, and Director Independence* for additional information regarding related transactions with its members.)

PRINCIPAL ACCOUNTING FEES AND SERVICES

Each of the audit committees of the FHLBanks and the Office of Finance pre-approve audit and non-audit services provided by the principal independent public accountant to the entity it oversees. Also, each audit committee annually considers whether the services identified under the caption "all other fees" and rendered to the entity it oversees are compatible with maintaining the principal accountant's independence. Table 65 presents the aggregate fees billed or to be billed to the FHLBanks and the Office of Finance by their principal independent public accountant, PricewaterhouseCoopers LLP.

Table 65 - Principal Accounting Fees and Services
(dollars in millions)

	Year Ended December 31,	
	2016	**2015**
Audit fees(1)	$ 10	$ 10
Audit-related fees(2)	1	1
Tax fees	—	—
All other fees(3)	—	—
Total fees	$ 11	$ 11

(1) Audit fees consist of fees incurred in connection with the annual audits and quarterly reviews of the FHLBanks' individual and combined financial statements, including audits of internal controls over financial reporting, and for the review of related financial information.
(2) Audit-related fees primarily consist of assurance and related services for accounting consultations and combined audit central team services.
(3) All other fees consist of services rendered for non-financial information system related consulting. No fees were paid to the principal independent public accountant for financial information system design and implementation.

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OFFICE OF FINANCE AUDIT COMMITTEE REPORT

By Federal Housing Finance Agency (FHFA) regulation, the Audit Committee of the Office of Finance Board of Directors performs oversight duties in connection with the preparation of the combined financial report of the Federal Home Loan Banks (FHLBanks), which includes the audited combined financial statements of the FHLBanks. The Audit Committee is comprised of five independent directors not employed by an FHLBank or the Office of Finance; who were selected by the Office of Finance Board of Directors, subject to review by the FHFA; and who as a group must have substantial experience in financial and accounting matters. In connection with its duties, the Audit Committee has adopted a written charter, which has been posted on the Office of Finance web site. The Audit Committee members are not required to satisfy any express qualification or independence standards governing their service as audit committee members that are separate and distinct from their qualifications to serve as members of the Office of Finance Board of Directors.

There is no system-wide centralized management of the FHLBanks. Each FHLBank is a separately chartered entity and has its own board of directors and management. Each FHLBank's board of directors has established an audit committee, the members of which are required to meet express qualification and independence standards established by the FHFA and the audit committee independence requirements set forth in Section 10A(m) of the Securities Exchange Act of 1934, as amended. For disclosure purposes, each FHLBank is required to identify audit committee members who may not be considered "independent" based on corporate governance standards of independence used by the FHLBanks as required under Securities and Exchange Commission rules and regulations. In addition, each FHLBank's board of directors and management is responsible for establishing its own accounting and financial reporting policies in accordance with accounting principles generally accepted in the United States of America. Each FHLBank is subject to certain reporting requirements of the Securities Exchange Act of 1934, as amended, and must file periodic reports and other information including annual audited financial statements with the Securities and Exchange Commission. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report*.)

In connection with its responsibilities in preparing the combined financial reports and the combined financial statements, the Office of Finance is responsible for combining the financial information it receives from each of the FHLBanks. Each FHLBank is responsible for the financial information and the underlying data it provides to the Office of Finance for inclusion in the combined financial reports and combined financial statements. Based on FHFA regulation and guidance related to the combined financial reports, the Audit Committee's responsibilities are limited to the oversight of the preparation of the combined financial reports with regard to the basis and approach to combining information from the FHLBanks. The Audit Committee is responsible for ensuring that the FHLBanks adopt consistent accounting policies and procedures to the extent necessary for information submitted by the FHLBanks to the Office of Finance to be combined to create accurate and meaningful combined financial reports. However, the Audit Committee is not responsible for overseeing the reliability and integrity of the accounting policies and financial reporting of the individual FHLBanks or the accuracy of the information that they submit to the Office of Finance.

The Audit Committee has reviewed and discussed the audited combined financial statements with senior management of the Office of Finance, and discussed with the independent accountant the matters required to be discussed in accordance with auditing standards generally accepted in the United States of America.

The Audit Committee has also received the written disclosures from the independent accountant required to be disclosed in accordance with auditing standards generally accepted in the United States of America regarding the independent accountant's communications with the Audit Committee concerning independence, and has discussed with the independent accountant their independence.

Based on the review and discussions referred to above, the Audit Committee of the Office of Finance Board of Directors determined to include the audited combined financial statements in the FHLBanks' Combined Financial Report for the Year Ended December 31, 2016.

Patricia A. Oelrich, Chair
Jonathan A. Scott, Vice-Chair
Janice C. Eberly
Kathleen C. McKinney
Joel W. Motley

March 28, 2017

REPORT OF INDEPENDENT AUDITORS

To the Board of Directors of the Federal Home Loan Banks Office of Finance:

We have audited the accompanying combined financial statements of the Federal Home Loan Banks (FHLBanks), which comprise the combined statements of condition as of December 31, 2016 and 2015, and the related combined statements of income, comprehensive income, capital, and cash flows for each of the years in the three-year period ended December 31, 2016.

Management's Responsibility for the Combined Financial Statements

Management of the FHLBanks Office of Finance (OF) and the FHLBanks are responsible for the preparation and fair presentation of the combined financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the combined financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the combined financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the combined financial statements are free from material misstatement.

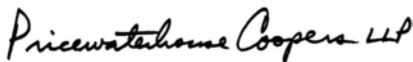
An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the combined financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the combined financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the OF's and the FHLBanks' preparation and fair presentation of the combined financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the combined financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the combined financial position of the FHLBanks as of December 31, 2016 and 2015, and the combined results of their operations and their combined cash flows for each of the years in the three-year period ended December 31, 2016, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

Our audits were conducted for the purpose of forming an opinion on the combined financial statements taken as a whole. The condensed combining information shown on pages F-78 to F-95 is the responsibility of management of the OF and the FHLBanks and was derived from and relates directly to the underlying accounting and other records used to prepare the combined financial statements. The condensed combining information has been subjected to the auditing procedures applied in the audit of the combined financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the combined financial statements or to the combined financial statements themselves, and other additional procedures, in accordance with auditing standards generally accepted in the United States of America. In our opinion, the condensed combining information is fairly stated, in all material respects, in relation to the combined financial statements taken as a whole. The condensed combining information is presented for purposes of additional analysis of the combined financial statements rather than to present the financial position, results of operations, and cash flows of the individual FHLBanks and is not a required part of the combined financial statements.



McLean, Virginia
March 28, 2017

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF CONDITION

(dollars in millions, except par value)	December 31, 2016	December 31, 2015
Assets		
Cash and due from banks *(Note 3)*	$ 7,441	$ 14,289
Interest-bearing deposits	2,878	1,836
Securities purchased under agreements to resell	52,771	47,827
Federal funds sold	48,633	42,380
Investment securities		
Trading securities, includes $97 and $62 pledged as collateral that may be repledged *(Note 4)*	9,461	10,760
Available-for-sale securities, includes $621 and $323 pledged as collateral that may be repledged *(Note 5)*	81,673	75,916
Held-to-maturity securities, includes $24 and $51 pledged as collateral that may be repledged, fair value of $97,357 and $96,123 *(Note 6)*	96,601	94,965
Total investment securities	187,735	181,641
Advances, includes $14,279 and $13,744 at fair value held under fair value option *(Note 8)*	705,225	634,022
Mortgage loans held for portfolio, net		
Mortgage loans held for portfolio *(Note 9)*	48,494	44,575
Allowance for credit losses on mortgage loans *(Note 10)*	(18)	(18)
Total mortgage loans held for portfolio, net	48,476	44,557
Accrued interest receivable	1,260	1,112
Premises, software, and equipment, net	228	217
Derivative assets, net *(Note 11)*	1,407	755
Other assets	658	603
Total assets	$ 1,056,712	$ 969,239
Liabilities		
Deposits *(Note 12)*	$ 8,089	$ 8,533
Consolidated obligations *(Note 13)*		
Discount notes, includes $18,597 and $21,478 at fair value held under fair value option	409,815	494,045
Bonds, includes $16,898 and $20,735 at fair value held under fair value option	578,927	411,851
Total consolidated obligations	988,742	905,896
Mandatorily redeemable capital stock	1,704	745
Accrued interest payable	1,100	986
Affordable Housing Program payable *(Note 14)*	946	841
Derivative liabilities, net *(Note 11)*	810	1,131
Other liabilities	2,862	2,121
Subordinated notes *(Note 15)*	—	944
Total liabilities	1,004,253	921,197
Commitments and contingencies *(Note 20*)		
Capital *(Note 16)*		
Capital stock		
Class B putable ($100 par value) issued and outstanding shares: 360,715,721 and 340,049,634	36,072	34,005
Class A putable ($100 par value) issued and outstanding shares: 1,621,432 and 1,796,836	162	180
Total capital stock	36,234	34,185
Additional capital from merger	52	194
Retained earnings		
Unrestricted	11,789	10,447
Restricted	4,541	3,850
Total retained earnings	16,330	14,297
Accumulated other comprehensive income (loss) *(Note 17)*	(157)	(634)
Total capital	52,459	48,042
Total liabilities and capital	$ 1,056,712	$ 969,239

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

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF INCOME

(dollars in millions)	Year Ended December 31, 2016	2015	2014
Interest income			
Advances	$ 5,273	$ 2,794	$ 2,541
Prepayment fees on advances, net	86	179	79
Interest-bearing deposits	39	11	9
Securities purchased under agreements to resell	92	33	17
Federal funds sold	274	84	60
Investment securities			
Trading securities	186	182	187
Available-for-sale securities	1,603	1,439	1,396
Held-to-maturity securities	1,794	1,803	2,036
Total investment securities	3,583	3,424	3,619
Mortgage loans held for portfolio	1,579	1,636	1,715
Other	4	—	2
Total interest income	10,930	8,161	8,042
Interest expense			
Consolidated obligations			
Discount notes	2,020	825	536
Bonds	4,931	3,650	3,779
Total consolidated obligations	6,951	4,475	4,315
Deposits	19	4	3
Subordinated notes	24	54	54
Mandatorily redeemable capital stock	101	75	138
Total interest expense	7,095	4,608	4,510
Net interest income	3,835	3,553	3,532
Provision (reversal) for credit losses	6	4	(21)
Net interest income after provision (reversal) for credit losses	3,829	3,549	3,553
Non-interest income			
Other-than-temporary impairment losses			
Total other-than-temporary impairment losses	(30)	(36)	(17)
Net amount of impairment losses reclassified to/(from) accumulated other comprehensive income (loss)	8	(42)	2
Net other-than-temporary impairment losses	(22)	(78)	(15)
Net gains (losses) on trading securities	(41)	(131)	(17)
Net realized gains (losses) from sale of available-for-sale securities	18	60	1
Net realized gains (losses) from sale of held-to-maturity securities	40	15	9
Net gains (losses) on financial instruments held under fair value option	3	(31)	(76)
Net gains (losses) on derivatives and hedging activities	47	182	(148)
Gains on litigation settlements, net	952	688	135
Net gains (losses) on debt extinguishments	(5)	(4)	—
Other, net	162	142	128
Total non-interest income (loss)	1,154	843	17
Non-interest expense			
Compensation and benefits	640	637	559
Other operating expenses	385	447	372
Federal Housing Finance Agency	59	59	58
Office of Finance	47	46	43
Other	52	10	14
Total non-interest expense	1,183	1,199	1,046
Net income before assessments	3,800	3,193	2,524
Affordable Housing Program assessments	392	332	269
Net income	$ 3,408	$ 2,861	$ 2,255

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

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF COMPREHENSIVE INCOME

(dollars in millions)	Year Ended December 31, 2016	2015	2014
Net income	$ 3,408	$ 2,861	$ 2,255
Other comprehensive income			
Net unrealized gains/losses on available-for-sale securities			
Unrealized gains (losses)	58	(778)	199
Reclassification of realized net (gains) losses included in net income	(17)	(8)	(1)
Total net unrealized gains/losses on available-for-sale securities	41	(786)	198
Net unrealized gains/losses on held-to-maturity securities transferred from available-for-sale securities			
Unrealized gains (losses)	1	—	—
Total net unrealized gains/losses on held-to-maturity securities transferred from available-for-sale securities	1	—	—
Net non-credit portion of other-than-temporary impairment losses on available-for-sale securities			
Non-credit portion of other-than-temporary impairment losses transferred from held-to-maturity securities	—	(14)	—
Net change in fair value of other-than-temporarily impaired securities	123	(84)	277
Net amount of impairment losses reclassified to (from) non-interest income	(8)	42	(3)
Reclassification of (gains) losses included in net income	(1)	(52)	—
Total net non-credit portion of other-than-temporary impairment losses on available-for-sale securities	114	(108)	274
Net non-credit portion of other-than-temporary impairment losses on held-to-maturity securities			
Net amount of impairment losses reclassified to (from) non-interest income	—	—	1
Accretion of non-credit portion	95	114	133
Non-credit portion of other-than-temporary impairment losses transferred to available-for-sale securities	—	14	—
Total net non-credit portion of other-than-temporary impairment losses on held-to-maturity securities	95	128	134
Net unrealized gains/losses relating to hedging activities			
Unrealized gains (losses)	221	104	(5)
Reclassification of (gains) losses included in net income	19	19	4
Total net unrealized gains/losses relating to hedging activities	240	123	(1)
Pension and postretirement benefits	(14)	6	(40)
Total other comprehensive income (loss)	477	(637)	565
Comprehensive income	$ 3,885	$ 2,224	$ 2,820

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

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF CAPITAL
YEARS ENDED DECEMBER 31, 2016, 2015, AND 2014

	Capital Stock - Putable			
	Class B		Class A	
(dollars and shares in millions)	Shares	Par Value	Shares	Par Value
Balance, December 31, 2013	330	$ 32,900	5	$ 475
Adjustment for cumulative effect of accounting change - change in amortization methodology	—	—	—	—
Comprehensive income (loss)	—	—	—	—
Proceeds from issuance of capital stock	173	17,303	—	2
Repurchases/redemptions of capital stock	(157)	(15,715)	(7)	(706)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(6)	(570)	—	(35)
Transfers between Class B and Class A shares	(5)	(505)	5	505
Dividends on capital stock				
Cash	—	—	—	—
Stock	—	51	—	—
Balance, December 31, 2014	335	33,464	3	241
Comprehensive income (loss)	—	—	—	—
Proceeds from issuance of capital stock	210	20,960	—	2
Capital stock issued from merger	9	863	—	31
Repurchases/redemptions of capital stock	(191)	(19,023)	(6)	(494)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(10)	(1,016)	—	(22)
Transfers between Class B and Class A shares	(5)	(453)	5	453
Additional capital from merger	—	—	—	—
Transfers to/(from) restricted retained earnings	—	—	—	—
Capital stock canceled and other merger activity	(9)	(863)	—	(31)
Dividends on capital stock				
Cash	—	—	—	—
Stock	1	73	—	—
Balance, December 31, 2015	340	34,005	2	180
Comprehensive income (loss)	—	—	—	—
Proceeds from issuance of capital stock	252	25,160	—	2
Repurchases/redemptions of capital stock	(201)	(20,100)	(6)	(582)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(25)	(2,463)	—	(63)
Transfers between Class B and Class A shares	(6)	(625)	6	625
Dividends on capital stock				
Cash	—	—	—	—
Stock	1	95	—	—
Balance, December 31, 2016	361	$ 36,072	2	$ 162

Capital Stock - Putable							
Total		Additional Capital from Merger	Retained Earnings			Accumulated Other Comprehensive Income (Loss)	Total Capital
Shares	Par Value		Unrestricted	Restricted	Total		
335	$ 33,375	$ —	$ 9,080	$ 3,104	$ 12,184	$ (511)	$ 45,048
—	—	—	(37)	(6)	(43)	—	(43)
—	—	—	1,849	406	2,255	565	2,820
173	17,305	—	—	—	—	—	17,305
(164)	(16,421)	—	—	—	—	—	(16,421)
(6)	(605)	—	—	—	—	—	(605)
—	—	—	—	—	—	—	—
—	—	—	(1,134)	—	(1,134)	—	(1,134)
—	51	—	(51)	—	(51)	—	—
338	33,705	—	9,707	3,504	13,211	54	46,970
—	—	—	2,302	559	2,861	(637)	2,224
210	20,962	—	—	—	—	—	20,962
9	894	—	—	—	—	—	894
(197)	(19,517)	—	—	—	—	—	(19,517)
(10)	(1,038)	—	—	—	—	—	(1,038)
—	—	—	—	—	—	—	—
—	—	246	—	—	—	—	246
—	—	—	150	(150)	—	—	—
(9)	(894)	—	(250)	(63)	(313)	(51)	(1,258)
—	—	(52)	(1,389)	—	(1,389)	—	(1,441)
1	73	—	(73)	—	(73)	—	—
342	34,185	194	10,447	3,850	14,297	(634)	48,042
—	—	—	2,717	691	3,408	477	3,885
252	25,162	—	—	—	—	—	25,162
(207)	(20,682)	—	—	—	—	—	(20,682)
(25)	(2,526)	—	—	—	—	—	(2,526)
—	—	—	—	—	—	—	—
—	—	(142)	(1,280)	—	(1,280)	—	(1,422)
1	95	—	(95)	—	(95)	—	—
363	$ 36,234	$ 52	$ 11,789	$ 4,541	$ 16,330	$ (157)	$ 52,459

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

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF CASH FLOWS

(dollars in millions)	Year Ended December 31, 2016	2015	2014
Operating activities			
Net income	$ 3,408	$ 2,861	$ 2,255
Adjustments to reconcile net income to net cash provided by operating activities			
Depreciation and amortization	137	(23)	(182)
Net change in derivatives and hedging activities	276	905	997
Net other-than-temporary impairment losses	22	78	15
Other adjustments	(59)	(65)	(69)
Net change in fair value adjustments on trading securities	41	131	40
Net change in fair value adjustments on financial instruments held under fair value option	(3)	31	76
Net change in			
Trading securities	(1)	(114)	(53)
Accrued interest receivable	(176)	(27)	47
Other assets	(91)	(121)	(68)
Accrued interest payable	142	(132)	(40)
Other liabilities	59	340	31
Total adjustments	347	1,003	794
Net cash provided by (used in) operating activities	3,755	3,864	3,049
Investing activities			
Net change in			
Interest-bearing deposits	464	628	(145)
Securities purchased under agreements to resell	(4,944)	(22,408)	(5,069)
Federal funds sold	(6,253)	10,393	(23,273)
Premises, software, and equipment	(66)	(57)	(49)
Trading securities			
Net decrease (increase) in short-term	102	196	860
Proceeds from long-term	7,296	4,356	5,827
Purchases of long-term	(6,331)	(4,913)	(4,578)
Available-for-sale securities			
Net decrease (increase) in short-term	(600)	889	835
Proceeds from long-term	14,358	13,747	9,181
Purchases of long-term	(19,681)	(14,164)	(14,942)
Held-to-maturity securities			
Net decrease (increase) in short-term	(1,712)	222	1,437
Proceeds from long-term	20,915	21,770	16,414
Purchases of long-term	(20,052)	(14,098)	(11,968)
Advances			
Principal collected	6,613,082	5,359,730	4,602,200
Made	(6,686,143)	(5,425,265)	(4,675,304)
Mortgage loans held for portfolio			
Principal collected	8,687	8,051	6,995
Purchases	(12,772)	(9,218)	(6,237)
Proceeds from sales of foreclosed assets	97	103	163
Principal collected on other loans	2	2	2
Net cash provided by (used in) investing activities	(93,551)	(70,036)	(97,651)

FEDERAL HOME LOAN BANKS
COMBINED STATEMENT OF CASH FLOWS (continued)

(dollars in millions)	Year Ended December 31, 2016	2015	2014
Financing activities			
Net change in			
Deposits and pass-through reserves	$ (1,178)	$ (59)	$ (1,266)
Net proceeds (payments) on derivative contracts with financing element	(381)	(703)	(798)
Net proceeds from issuance of consolidated obligations			
Discount notes	3,863,143	3,553,414	3,969,949
Bonds	524,098	304,426	348,749
Payments for maturing and retiring consolidated obligations			
Discount notes	(3,947,549)	(3,421,830)	(3,900,963)
Bonds	(355,733)	(378,287)	(337,198)
Payments for retirement of subordinated notes	(944)	—	—
Proceeds from issuance of capital stock	25,162	20,962	17,305
Payments for repurchases/redemptions of mandatorily redeemable capital stock	(1,566)	(2,925)	(2,973)
Payments for repurchases/redemptions of capital stock	(20,682)	(19,517)	(16,421)
Cash dividends paid	(1,422)	(1,441)	(1,134)
Net cash provided by (used in) financing activities	82,948	54,040	75,250
Net increase (decrease) in cash and due from banks	(6,848)	(12,132)	(19,352)
Cash and due from banks at beginning of the period	14,289	26,421	45,773
Cash and due from banks at end of the period	$ 7,441	$ 14,289	$ 26,421
Supplemental disclosures			
Interest paid	$ 6,928	$ 5,296	$ 5,096
Affordable Housing Program payments, net	$ 285	$ 286	$ 263
Transfers of mortgage loans to other assets	$ 47	$ 74	$ 127
Transfers of other-than-temporarily impaired held-to-maturity securities to available-for-sale securities	$ —	$ 88	$ —
Transfers of mortgage loans held for sale to securitized mortgage loans	$ 422	$ —	$ —
Non-cash merger activity, net	$ —	$ 118	$ —
Transfer of held-to-maturity securities to available-for-sale securities that are not other-than-temporarily impaired	$ —	$ 8,963	$ —
Net capital stock reclassified to/(from) mandatorily redeemable capital stock	$ 2,526	$ 1,038	$ 605

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

NOTES TO COMBINED FINANCIAL STATEMENTS

Background Information

These financial statements present the combined financial position and combined results of operations of the 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. They are financial cooperatives that provide a readily available, competitively-priced source of funds to their member institutions. All federally-insured depository institutions and insurance companies engaged in residential housing finance may apply for membership. Additionally, qualified community development financial institutions are eligible to be members of an FHLBank. Housing associates, including state and local housing authorities, that meet certain statutory and regulatory criteria may also borrow from the FHLBanks. While eligible to borrow, housing associates are not members of the FHLBanks. All members must purchase stock in their district's FHLBank. On a combined basis, member institutions own most of the FHLBanks' capital stock. Former members (including certain non-members that own FHLBank capital stock as a result of merger or acquisition, relocation, charter termination, or involuntary termination of an FHLBank member) own the remaining capital stock to support business transactions still carried on an FHLBank's statement of condition. All holders of an FHLBank's capital stock may, to the extent declared by that FHLBank's board of directors, receive dividends on their capital stock.

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

The Federal Housing Finance Agency (FHFA) is the independent Federal regulator of the FHLBanks, Federal Home Loan Mortgage Corporation (Freddie Mac), and Federal National Mortgage Association (Fannie Mae). The FHFA's stated mission is to ensure that the housing GSEs 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.

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 (consolidated bonds and consolidated discount notes), and to prepare the quarterly and annual combined financial reports of the FHLBanks. As provided by the Federal Home Loan Bank Act of 1932, as amended (FHLBank Act), and applicable regulations, consolidated obligations are backed only by the financial resources of the FHLBanks. Consolidated obligations are the primary source of funds for the FHLBanks in addition to deposits, other borrowings, and capital stock issued to members. The FHLBanks primarily use these funds to provide advances to members. Certain FHLBanks also use these funds to acquire mortgage loans from members (acquired member assets) through their respective FHLBank's Mortgage Purchase Program (MPP) or the Mortgage Partnership Finance® (MPF®) Program. "Mortgage Partnership Finance," "MPF," and "MPF Xtra" are registered trademarks of the FHLBank of Chicago. In addition, some FHLBanks offer correspondent services to their member institutions, including wire transfer, security safekeeping, and settlement services.

Unless otherwise stated, dollar amounts disclosed in this Combined Financial Report represent values rounded to the nearest million. Dollar amounts rounding to less than one million are not reflected in this Combined Financial Report.

FHLBanks of Des Moines and Seattle Merger

Effective May 31, 2015, the FHLBank of Des Moines and the FHLBank of Seattle completed the merger pursuant to the definitive merger agreement, dated September 25, 2014. At closing, the FHLBank of Seattle merged with and into the FHLBank of Des Moines, with the FHLBank of Des Moines surviving the merger as the continuing FHLBank. The first date of operations for the combined FHLBank was June 1, 2015. Thus, the combined statements of income, comprehensive income, capital, and cash flows, along with the supporting condensed combining schedules, for the period ended December 31, 2015, reflect the FHLBank of Seattle’s activities through May 31, 2015.

Note 1 - Summary of Significant Accounting Policies

Basis of Presentation

These combined financial statements include the financial statements and records of the FHLBanks that are prepared in accordance with generally accepted accounting principles in the United States of America (GAAP).

Principles of Combination. Transactions between the FHLBanks have been eliminated in accordance with combination accounting principles similar to consolidation under GAAP. The more significant transactions between the FHLBanks are:

1. *Transfers of Direct Liability on Consolidated Bonds between FHLBanks.* These transfers occur when the primary obligation under consolidated bonds issued on behalf of one FHLBank are transferred to and assumed by another FHLBank. The transferring FHLBank treats the transfer as a debt extinguishment because it is released from being the primary obligor when the Office of Finance records the transfer, pursuant to its duties under applicable regulations. The assuming FHLBank then becomes the primary obligor while the transferring FHLBank has a contingent liability because it still has joint and several liability with respect to repaying the transferred consolidated bonds.

   The FHLBank assuming the consolidated bond liability initially records the consolidated bond at fair value, which represents the amount paid to the assuming FHLBank by the transferring FHLBank to assume the debt. A premium or discount exists for the amount paid above or below par. Because these transfers represent inter-company transfers under combination accounting principles, an inter-company elimination is made for any gain or loss on transfer. As a result, the subsequent amortization of premium or discount, amortization of concession fees, and recognition of hedging-related adjustments in the combined financial statements represent those of the transferring FHLBank.

2. *Purchases of Consolidated Bonds.* These purchases occur when consolidated bonds issued on behalf of one FHLBank are purchased by another FHLBank in the open market. All purchase transactions occur at market prices with third parties and the purchasing FHLBanks treat these consolidated bonds as investments. Under combination accounting principles, the investment and the consolidated bonds, and related contractual interest income and expense, are eliminated in combination.

No other transactions among the FHLBanks had a material effect on operating results. (See the *Condensed Combining Schedules* for the combining adjustments made to the combined financial statements.)

Segment Reporting. FHFA regulations consider each FHLBank to be a segment. However, there is no single chief operating decision maker because there is no centralized, system-wide management or centralized board of director oversight of the individual FHLBanks. (See the *Condensed Combining Schedules* for segment information.)

Reclassifications and Revisions to Prior Period Amounts. Certain amounts in the 2015 and 2014 combined financial statements have been reclassified or revised to conform to the financial statement presentation for the year ended December 31, 2016. Additionally, certain other prior period amounts have been revised and may not agree to the Federal Home Loan Banks Combined Financial Report for the years ended December 31, 2015 and 2014. These amounts were not deemed to be material.

Changes in the Presentation of Debt Issuance Costs (also referred to as Concessions). On January 1, 2016, the FHLBanks retrospectively adopted the guidance, *Simplifying the Presentation of Debt Issuance Costs*, issued by the Financial Accounting Standards Board (FASB) on April 7, 2015. As a result, $86 million of unamortized concessions included in other assets at December 31, 2015, were reclassified as a reduction in the balance of the corresponding consolidated obligations. The reclassification resulted in decreases of $10 million in consolidated discount notes and $76 million in consolidated bonds at December 31, 2015. Accordingly, the FHLBanks' total assets and total liabilities each decreased by $86 million at December 31, 2015. The adoption of this guidance did not have any effect on the FHLBanks' combined results of operations and combined cash flows.

Change in Accounting Principle. Effective October 1, 2016, the FHLBank of Cincinnati changed its method of accounting for the amortization and accretion of premiums and discounts and hedging adjustments on its mortgage loans held for portfolio from the retrospective interest method to the contractual interest method. While both methods are acceptable under GAAP, the FHLBank of Cincinnati believes the contractual interest method has become preferable for its mortgage loan portfolio. The FHLBank of Cincinnati's change to the contractual method has been reported through retroactive application to all periods presented. As a result, a cumulative adjustment of $43 million, as a reduction to retained earnings, was reported at January 1, 2014. The net adjustments to net income for the years ended December 31, 2014, 2015, and 2016, were an increase of $10 million, an increase of $5 million, and a decrease of $6 million. For the quarters ended March 31, June 30, September 30, and December 31, 2016, the effect of this change was an increase of $8 million, an increase of $5 million, an increase of $4 million, and a decrease of $23 million.

Significant Accounting Policies

The following summary of significant accounting policies has been compiled from the FHLBanks' individual summaries of significant accounting policies. While the FHLBanks' accounting and financial reporting policies are not necessarily always identical, each FHLBank is responsible for establishing its own accounting and financial reporting policies in accordance with GAAP. The following paragraphs describe the more significant accounting policies followed by the FHLBanks, including the more notable alternatives acceptable under GAAP.

Use of Estimates

The preparation of financial statements in accordance with GAAP requires each FHLBank's management to make subjective assumptions and estimates that may affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities, and the reported amounts of income and expense. The most significant of these estimates include the determination of other-than-temporary impairments of certain mortgage-backed securities (MBS) and fair value of derivatives, certain advances, certain investment securities, and certain consolidated obligations that are reported at fair value on the Combined Statement of Condition. Actual results could differ from these estimates significantly.

Fair Value. The fair value amounts, recorded on the Combined Statement of Condition and in the footnotes for the periods presented, have been determined by the FHLBanks using available market and other pertinent information, and reflect each FHLBank's best judgment of appropriate valuation methods. Although an FHLBank uses its best judgment in estimating the fair value of these financial instruments, there are inherent limitations in any valuation technique. Therefore, these fair values may not be indicative of the amounts that would have been realized in market transactions at the reporting dates. (See *Note 19 - Fair Value* for more information.)

Financial Instruments Meeting Netting Requirements

The FHLBanks present certain financial instruments on a net basis when they have a legal right of offset and all other requirements for netting are met (collectively referred to as the netting requirements). For these financial instruments, each of the affected FHLBanks has elected to offset its asset and liability positions, as well as cash collateral received or pledged, when it has met the netting requirements.

The net exposure for these financial instruments can change on a daily basis; therefore, there may be a delay between the time this exposure change is identified and additional collateral is requested, and the time when this collateral is received or pledged. Likewise, there may be a delay for excess collateral to be returned. For derivative instruments that meet the netting requirements, any excess cash collateral received or pledged is recognized as a derivative liability or derivative asset. (See *Note 11 - Derivatives and Hedging Activities* for additional information regarding these agreements.)

At December 31, 2016 and 2015, the FHLBanks had $52,771 million and $47,827 million in securities purchased under agreements to resell. Based on the fair value of the related collateral held, the securities purchased under agreements to resell were fully collateralized for the periods presented. There were no offsetting liabilities related to these securities at December 31, 2016 and 2015.

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 deposit and bank notes not meeting the definition of a security. The FHLBanks treat securities purchased under agreements to resell as short-term collateralized loans that are classified as assets on the Combined Statement of Condition. Securities purchased under agreements to resell are held in safekeeping in the name of the affected FHLBank by third-party custodians approved by that FHLBank. If the fair value of the underlying securities decreases below the fair 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 FHLBank 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 an FHLBank to be of investment quality.

Investment Securities

The FHLBanks classify investment securities as trading, available-for-sale (AFS), and held-to-maturity (HTM) at the date of acquisition. Purchases and sales of securities are recorded on a trade date basis.

Trading. Securities classified as trading are held for liquidity purposes and carried at fair value. The FHLBanks record changes in the fair value of these securities through non-interest income as net gains (losses) on trading securities. FHFA regulation and each FHLBank's risk management policy prohibit trading in or the speculative use of these instruments and limit credit risk arising from these instruments.

Available-for-Sale. Securities that are not classified as HTM or trading are classified as AFS and are carried at fair value. The FHLBanks record changes in the fair value of these securities in other comprehensive income (loss) (OCI) as net unrealized gains (losses) on available-for-sale securities. For AFS securities that have been hedged and qualify as a fair value hedge, the FHLBanks record the portion of the change in value related to the risk being hedged in non-interest income as net gains (losses) on derivatives and hedging activities together with the related change in the fair value of the derivative, and record the remainder of the change in the fair value of the investment in OCI as net unrealized gains (losses) on available-for-sale securities. For AFS securities that have been hedged and qualify as a cash flow hedge, the FHLBanks record the effective portion of the change in value of the derivative related to the risk being hedged in OCI as net unrealized gains (losses) relating to hedging activities. The ineffective portion is recorded in non-interest income and presented as net gains (losses) on derivatives and hedging activities.

Held-to-Maturity. Securities that the FHLBanks have both the ability and intent to hold to maturity are classified as HTM and are carried at cost adjusted for periodic principal repayments, amortization of premiums and accretion of discounts, previous other-than-temporary impairment (OTTI), and accretion of the non-credit portion of OTTI recognized in OCI.

Certain changes in circumstances may cause an FHLBank 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 an HTM 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 FHLBanks that could not have been reasonably anticipated may cause an FHLBank to sell or transfer an HTM security without necessarily calling into question its intent to hold other debt securities to maturity. In addition, sale of a debt security that meets either of the following two conditions would not be considered inconsistent with the original classification of that security:

1. the sale occurs near enough to its maturity date (or call date if exercise of the call is probable) that interest-rate risk is substantially eliminated as a pricing factor and the changes in market interest rates would not have a significant effect on the security's fair value; or

2. the sale of a security occurs after an FHLBank has already collected a substantial portion (at least 85 percent) of the principal outstanding at acquisition due either to prepayments on the debt security or to scheduled payments on a debt security payable in equal installments (both principal and interest) over its term.

Premiums and Discounts. The FHLBanks amortize purchased premiums and accrete purchased discounts on investment securities using either the contractual level-yield (contractual interest method) or the retrospective level-yield (retrospective interest method) over the estimated cash flows of the securities. The contractual interest method recognizes the income effects of premiums and discounts over the contractual life of the securities based on the actual behavior of the underlying assets, including adjustments for actual prepayment activities, and reflects the contractual terms of the securities without regard to changes in estimated prepayments based on assumptions about future borrower behavior. The retrospective interest method requires that an FHLBank estimate prepayments over the estimated life of the securities and make a retrospective adjustment of the effective yield each time that it changes the estimated life as if the new estimate had been known since the original acquisition date of the securities.

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

Investment Securities - Other-than-Temporary Impairment

Each FHLBank evaluates its individual AFS and HTM securities in unrealized loss positions for OTTI on a quarterly basis. A security is considered impaired (i.e., in an unrealized loss position) when its fair value is less than its amortized cost. An FHLBank considers an OTTI to have occurred under any of the following conditions:

- It has an intent to sell the impaired debt security;
- If, based on available evidence, it 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; or
- It does not expect to recover the entire amortized cost of the impaired debt security.

Recognition of OTTI. If either of these first two conditions is met, an FHLBank recognizes an OTTI charge in earnings equal to the entire difference between the security's amortized cost and its fair value as of the statement of condition date. For securities in an unrealized loss position that do not meet either of these conditions, the entire loss position, or total OTTI, is evaluated to determine the extent and amount of credit loss.

To determine whether a credit loss exists, each FHLBank performs an analysis, which includes a cash flow analysis for private-label MBS, to determine if it will recover the entire amortized cost of each of these securities. The present value of the cash flows expected to be collected is compared to the amortized cost of the debt security. If there is a credit loss (the difference between the present value of the cash flows expected to be collected and the amortized cost of the debt security), the carrying value of the debt security is adjusted to its fair value. However, rather than recognizing the entire difference between the amortized cost and fair value in earnings, only the amount of the impairment representing the credit loss (i.e., the credit component) is recognized in earnings, while the amount related to all other factors (i.e., the non-credit component) is recognized in OCI. The credit loss on a debt security is limited to the amount of that security's unrealized losses.

The total OTTI is presented on the statement of income with an offset for the amount of the non-credit portion of OTTI that is recognized in OCI. The remaining amount on the statement of income represents the credit loss for the period.

Accounting for OTTI Recognized in OCI. For subsequent accounting of an other-than-temporarily impaired security, an FHLBank records an additional OTTI if the present value of cash flows expected to be collected is less than the amortized cost of the security. The total amount of this additional OTTI (both credit and non-credit component, if any) is determined as the difference between the security's amortized cost less the amount of OTTI recognized in OCI prior to the determination of this additional OTTI and its fair value. Any additional credit loss is limited to that security's unrealized losses, or the difference between the security's amortized cost and its fair value as of the statement of condition date. This additional credit loss, up to the amount in OCI related to the security, is reclassified out of OCI and recognized in earnings. Any credit loss in excess of the related OCI is also recognized in earnings.

Subsequent related increases and decreases (if not an additional OTTI) in the fair value of AFS securities are netted against the non-credit component of OTTI recognized previously in OCI. For HTM securities, if the current carrying value is less than its current fair value, the carrying value of the security is not increased. However, the OTTI recognized in OCI for HTM securities is accreted to the carrying value of each security on a prospective basis, based on the amount and timing of future estimated cash flows (with no effect on earnings unless the security is subsequently sold or there are additional decreases in cash flows expected to be collected). For debt securities classified as AFS, the FHLBanks do not accrete the OTTI recognized in OCI to the carrying value because the subsequent measurement basis for these securities is fair value.

Interest Income Recognition. When a security has been other-than-temporarily impaired, a new accretable yield is calculated for that security at its impairment measurement date. This adjusted yield is used to calculate the interest income recognized over the remaining life of that security, matching the amount and timing of its estimated future collectible cash flows. Subsequent to that security's initial OTTI, an FHLBank re-evaluates estimated future collectible cash flows on a quarterly basis. If the security has no additional OTTI based on this evaluation, the accretable yield is reassessed for possible adjustment on a prospective basis. Depending on an FHLBank's accounting method, the accretable yield is adjusted if there is either: (1) a significant increase in the security's expected cash flows or (2) a favorable or unfavorable change in the timing and amount of the security's expected cash flows.

Variable Interest Entities

Certain FHLBanks have investments in variable interest entities (VIEs) that include, but are not limited to, senior interests in private-label MBS and asset-backed securities (ABS). The carrying amounts and classification of the assets that relate to the FHLBanks' investments in VIEs are included in investment securities on the Combined Statement of Condition. The affected FHLBanks have no liabilities related to these VIEs. The maximum loss exposure for these VIEs is limited to the FHLBanks' investments in the VIEs.

If an FHLBank determines it is the primary beneficiary of a VIE, it would be required to consolidate that VIE. On an ongoing basis, each affected FHLBank performs a quarterly evaluation to determine whether it is the primary beneficiary in any VIE. To perform this evaluation, an FHLBank considers whether it possesses both of the following characteristics:

- the power to direct the VIE's activities that most significantly affect the VIE's economic performance; and
- the obligation to absorb the VIE's losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

Based on an evaluation of these characteristics, each affected FHLBank has determined that consolidation is not required for its VIEs for the periods presented. In addition, each of these FHLBanks has not provided financial or other support (explicitly or implicitly) during the periods presented. Furthermore, each affected FHLBank was not previously contractually required to provide, nor does it intend to provide, that support in the future.

Advances

The FHLBanks report advances (secured 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 related to the Affordable Housing Program (AHP)), unearned commitment fees, and hedging adjustments. The FHLBanks amortize or accrete premiums and discounts, and recognize unearned commitment fees and hedging adjustments, to interest income using a level-yield methodology. The FHLBanks record interest on advances to interest 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 an FHLBank funds a new advance concurrently with or within a short period of time before or after the prepayment of an existing advance, the FHLBank 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 FHLBank 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 present value of cash flows or if the FHLBank concludes the difference between the advances is more than minor based on a qualitative assessment of the modifications made to the original contractual terms, then 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 FHLBanks charge a borrower a prepayment fee when the borrower prepays certain advances before the original maturity. The FHLBanks record prepayment fees net of basis adjustments related to hedging activities included in the carrying value of the advance as prepayment fees on advances, net in the interest income section of the Combined Statement of Income.

If a new advance does not qualify as a modification of an existing advance, the existing advance is treated as an advance termination and any prepayment fee, net of hedging adjustments, is recorded to prepayment fees on advances, net in the interest income section of the Combined Statement of Income.

If a new advance qualifies as a modification of an existing advance, any prepayment fee, net of hedging adjustments, is deferred, recorded in the basis of the modified advance, and amortized using a level-yield methodology over the life of the modified advance to advance interest income. If the modified advance is hedged and meets hedge accounting requirements, the modified advance is marked to benchmark or full fair value, depending on the risk being hedged, and subsequent fair value changes that are attributable to the hedged risk are recorded in non-interest income.

Mortgage Loans Held for Portfolio

Each FHLBank classifies mortgage loans that it has the intent and ability to hold for the foreseeable future or until maturity or payoff as held for portfolio. Accordingly, these mortgage loans are reported net of premiums, discounts, deferred loan fees or costs, hedging adjustments, charge-offs, and the allowance for credit losses.

Premiums and Discounts. An FHLBank defers and amortizes premiums and accretes discounts paid to and received by participating financial institutions (PFIs), deferred loan fees or costs, and hedging basis adjustments to interest income using either the contractual interest method or the retrospective interest method. In determining prepayment estimates for the retrospective interest method, mortgage loans are aggregated by similar characteristics (type, maturity, note rate, and acquisition date).

Credit Enhancement Fees. For conventional mortgage loans, PFIs retain a portion of the credit risk on the loans they sell to the FHLBanks by providing credit enhancement either through a direct liability to pay credit losses up to a specified amount or through a contractual obligation to the FHLBanks. To secure this obligation, a PFI may either pledge collateral or purchase supplemental mortgage insurance (SMI). For certain mortgage loans purchased under the MPF Program, PFIs are paid a credit enhancement fee (CE Fee) for assuming credit risk and in some instances all or a portion of the CE Fee may be performance-based. CE Fees are paid monthly based on the remaining unpaid principal balance of the loans in a master commitment. CE Fees are recorded as an offset to mortgage loan interest income. To the extent an FHLBank experiences losses in a master commitment, it may be able to recapture performance-based CE Fees paid to that PFI to offset these losses.

Other Fees. The FHLBanks may receive other non-origination fees, such as delivery commitment extension fees, pair-off fees, and price adjustment fees. Delivery commitment extension fees are received when a PFI requests to extend the delivery commitment period beyond the original stated expiration. These fees compensate the FHLBanks for lost interest as a result of late funding and are recorded in non-interest income as received. Pair-off fees represent a make-whole provision; they are received when the amount funded is less than a specific percentage of the delivery commitment amount and are recorded in non-interest income. Price adjustment fees are received when the amount funded is greater than a specified percentage of the delivery commitment amount; they represent purchase price adjustments to the related loans acquired and are recorded as a part of the carrying value of the loans.

Allowance for Credit Losses

Establishing Allowance for Credit Losses. An allowance for credit losses is a valuation allowance separately established for each identified portfolio segment, if it is probable that impairment has occurred in an FHLBank's portfolio as of the statement of condition date and the amount of loss can be reasonably estimated. To the extent necessary, an allowance for credit losses for off-balance sheet credit exposures is recorded as a liability. (See *Note 10 - Allowance for Credit Losses* 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. Each FHLBank has developed and documented a systematic methodology for determining an allowance for credit losses, where applicable, for:

- credit products (advances, letters of credit, and other extensions of credit to borrowers);
- government-guaranteed or -insured mortgage loans held for portfolio;
- conventional MPF loans held for portfolio, conventional MPP loans held for portfolio, and other loans;
- term federal funds sold; and
- term securities purchased under agreements to resell.

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

Non-accrual Loans. The FHLBanks place a conventional mortgage loan on non-accrual status if it is determined that either (1) the collection of interest or principal is doubtful or (2) interest or principal is past due for 90 days or more, except when the loan is well-secured (e.g., through credit enhancements) and in the process of collection. As such, FHLBanks do not place conventional mortgage loans over 90 days delinquent on non-accrual status when losses are not expected to be incurred. The FHLBanks do not place government-guaranteed or -insured mortgage loans on non-accrual status due to the U.S. government guarantee or insurance on these loans and the contractual obligation of the loan servicer to repurchase the loans when certain criteria are met. For those mortgage loans placed on non-accrual status, accrued but uncollected interest is reversed against interest income. The FHLBanks record cash payments received 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, then cash payments received would be 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 an FHLBank expects repayment of the remaining contractual interest and principal, or (2) it otherwise becomes well secured and in the process of collection.

Troubled Debt Restructuring. An FHLBank considers a troubled debt restructuring 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. An FHLBank has granted a concession when it does not expect to collect all amounts due to the FHLBank under the original contract as a result of the restructuring. Loans that are discharged in Chapter 7 bankruptcy and have not been reaffirmed by the borrowers are also considered to be troubled debt restructurings, except in certain cases where supplemental mortgage insurance policies are held or where all contractual amounts due are still expected to be collected as a result of certain credit enhancements or government guarantees.

Impairment Methodology. A loan is considered impaired when, based on current information and events, it is probable that an FHLBank will be unable to collect all amounts due according to the contractual terms of the loan agreement.

Loans that are on non-accrual status and that are considered collateral-dependent are measured for impairment based on the fair value of the underlying property less estimated selling costs. Loans are 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. Collateral-dependent loans are impaired if the fair value of the underlying collateral is insufficient to recover the unpaid principal balance on the loan. Interest income on impaired loans is recognized in the same manner as non-accrual loans.

Charge-off Policy. A charge-off is recorded if it is estimated that the recorded investment in a loan will not be recovered. The FHLBanks evaluate whether to record a charge-off on a conventional mortgage loan upon the occurrence of a confirming event. Confirming events include, but are not limited to, the occurrence of foreclosure or notification of a claim against any of the credit enhancements. The FHLBanks charge 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.

Real Estate Owned

Real estate owned (REO) includes assets that have been received in satisfaction of debt through foreclosures. REO is initially recorded at fair value less estimated selling costs and is subsequently carried at the lower of that amount or current fair value less estimated selling costs. The FHLBanks recognize a charge-off to the allowance for credit losses if the fair value of the REO less estimated selling costs is less than the recorded investment in the loan at the date of transfer from loans to REO. Any subsequent realized gains, realized or unrealized losses, and carrying costs are included in other non-interest income (loss) or other non-interest expense on the Combined Statement of Income. REO is recorded in other assets on the Combined Statement of Condition.

Derivatives

All derivatives are recognized on the Combined Statement of Condition at their fair values and are reported as either derivative assets or derivative liabilities, net of cash collateral, including initial and variation margin, and accrued interest received from or pledged to clearing agents and/or counterparties. The fair values of derivatives are netted by clearing agent and/or 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 on the Combined Statement of Cash Flows unless the derivative meets the criteria to be a financing derivative.

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

- a qualifying hedge of the change in fair value of a recognized asset or liability or an unrecognized firm commitment (a fair value hedge);
- a qualifying hedge of a forecasted transaction or the variability of cash flows that are to be received or paid in connection with a recognized asset or liability (a cash flow hedge);
- a non-qualifying hedge (economic hedge) for asset-liability management purposes; or
- a non-qualifying hedge of another derivative (an intermediation hedge) that is offered as a product to members or used to offset other derivatives with non-member counterparties.

Accounting for Fair Value or Cash Flow 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 qualify for fair value or cash flow hedge accounting and the offsetting changes in fair value of the hedged items attributable to the hedged risk may be recorded either in earnings (fair value hedges) or OCI (cash flow hedges). Two approaches to hedge accounting include:

- *Long-haul hedge accounting.* The application of long-haul hedge accounting requires an FHLBank to formally assess (both at the hedge's inception and at least quarterly) whether the derivatives that are used in hedging transactions have been effective in offsetting changes in the fair value or cash flows of hedged items attributable to the hedged risk or forecasted transactions and whether those derivatives may be expected to remain effective in future periods.

- *Short-cut hedge accounting*. Transactions that meet certain criteria qualify for the short-cut method of hedge accounting in which an assumption can be made that the change in fair value of a hedged item, due to changes in the benchmark rate, exactly offsets the change in fair value of the related derivative. Under the short-cut method, the entire change in fair value of the interest-rate swap is considered to be effective at achieving offsetting changes in fair values or cash flows of the hedged asset or liability.

Derivatives are typically executed at the same time as the hedged item, and each FHLBank designates the hedged item in a qualifying hedge relationship at the trade date. In many hedging relationships, an FHLBank may designate the hedging relationship upon its commitment to disburse an advance or trade a consolidated obligation in which settlement occurs within the shortest period of time possible for the type of instrument based on market settlement conventions. An FHLBank then records the changes in fair value of the derivative and the hedged item beginning on the trade date.

Changes in the fair value of a derivative that is designated and qualifies as a fair value hedge, along with changes in the fair value of the hedged asset or liability that are attributable to the hedged risk, are recorded in non-interest income as net gains (losses) on derivatives and hedging activities.

Changes in the fair value of a derivative that is designated and qualifies as a cash flow hedge, to the extent that the hedge is effective, are recorded in accumulated other comprehensive income (loss) (AOCI), a component of capital, until earnings are affected by the variability of the cash flows of the hedged transaction.

For both fair value and cash flow hedges, any hedge ineffectiveness (which represents the amount by which the change in the fair value of the derivative differs from the change in the fair value of the hedged item attributable to the hedged risk or the variability in the cash flows of the forecasted transaction) is recorded in non-interest income as net gains (losses) on derivatives and hedging activities.

Accounting for Economic Hedges or Intermediary Activities. 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 fair value or cash flow hedge accounting, but is an acceptable hedging strategy under an FHLBank's risk management program. These economic hedging strategies also comply with FHFA regulatory requirements prohibiting speculative hedge transactions. An economic hedge by definition introduces the potential for earnings variability caused by the changes in fair value of the derivatives that are recorded in an FHLBank's income but that are not offset by corresponding changes in the value of the economically hedged assets, liabilities, or firm commitments. As a result, an FHLBank recognizes only the net interest and the change in fair value of these derivatives in non-interest income as net gains (losses) on derivatives and hedging activities with no offsetting fair value adjustments for the assets, liabilities, or firm commitments.

The derivatives used in intermediary activities do not qualify for hedge accounting treatment and are separately marked-to-market through earnings. The net result of the accounting for these derivatives does not significantly affect the operating results of the FHLBanks. These amounts are recorded in non-interest income as net gains (losses) on derivatives and hedging activities.

Accrued Interest Receivables and Payables. The net settlements of interest receivables and payables related to derivatives designated in fair value or cash flow hedge relationships are recognized as adjustments to the income or expense of the designated hedged item. The net settlements of interest receivables and payables related to intermediated derivatives for members and other economic hedges are recognized in non-interest income as net gains (losses) on derivatives and hedging activities.

Discontinuance of Hedge Accounting. An FHLBank discontinues hedge accounting prospectively when:

- it determines that the derivative is no longer effective in offsetting changes in the fair value or cash flows of a hedged item attributable to the hedged risk (including hedged items such as firm commitments or forecasted transactions);
- the derivative and/or the hedged item expires or is sold, terminated, or exercised;
- it is no longer probable that the forecasted transaction will occur in the originally expected period;
- a hedged firm commitment no longer meets the definition of a firm commitment; or
- management determines that designating the derivative as a hedging instrument is no longer appropriate.

When hedge accounting is discontinued, an FHLBank either terminates the derivative or continues to carry the derivative on the statement 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.

When hedge accounting is discontinued because an FHLBank determines that the derivative no longer qualifies as an effective cash flow hedge of an existing hedged item, that FHLBank continues to carry the derivative on the statement of condition at its fair value and reclassifies the cumulative other comprehensive income adjustment into earnings when earnings are affected by the existing hedged item (i.e., the original forecasted transaction).

Under limited circumstances, when an FHLBank discontinues cash flow hedge accounting because it is no longer probable that the forecasted transaction will occur by the end of the originally specified time period, or within the following two months, but it is probable the transaction will still occur in the future, the gain or loss on the derivative remains in AOCI and is recognized as earnings when the forecasted transaction affects earnings. However, if it is probable that a forecasted transaction will not occur by the end of the originally specified time period or within the following two months, the gains and losses that were in AOCI are recognized immediately in earnings.

When hedge accounting is discontinued because the hedged item no longer meets the definition of a firm commitment, an FHLBank continues to carry the derivative on the statement of condition at its fair value, removing from the statement of condition any asset or liability that was recorded to recognize the firm commitment and recording it as a gain or loss in current period earnings.

Embedded Derivatives. The FHLBanks may issue debt, make advances, or purchase financial instruments in which a derivative instrument is "embedded." Upon execution of these transactions, an FHLBank 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. 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 when an FHLBank 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. 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 an FHLBank cannot reliably identify and measure the embedded derivative for purposes of separating that derivative from its host contract.

Premises, Software, and Equipment

The FHLBanks record premises, software, and equipment at cost less accumulated depreciation and amortization and compute depreciation using the straight-line method over the estimated useful lives of assets, which range from one to 40 years. The FHLBanks amortize leasehold improvements using the straight-line method over the shorter of the estimated useful life of the improvement or the remaining term of the lease. The FHLBanks may capitalize improvements and major renewals but expense ordinary maintenance and repairs when incurred. The FHLBanks include gains and losses on the disposal of premises, software, and equipment in non-interest income (loss).

The cost of computer software developed or obtained for internal use is capitalized and amortized over future periods. Unamortized computer software costs were $131 million and $132 million at December 31, 2016 and 2015. Amortization of computer software costs charged to expense was $37 million, $34 million, and $33 million for the years ended December 31, 2016, 2015 and 2014.

Accumulated Depreciation and Amortization. At December 31, 2016 and 2015, the accumulated depreciation and amortization related to premises, software, and equipment was $561 million and $532 million.

Depreciation and Amortization Expense. For the years ended December 31, 2016, 2015, and 2014, the depreciation and amortization expense for premises, software, and equipment was $54 million, $52 million, and $55 million.

Consolidated Obligations

Consolidated obligations are recorded at amortized cost unless an FHLBank has elected the fair value option, in which case the consolidated obligations are carried at fair value.

Discounts and Premiums. The FHLBanks amortize premiums and accrete discounts as well as hedging basis adjustments on consolidated obligations to interest expense using the interest method over the term to maturity or the estimated life of the corresponding consolidated obligation.

Concessions. The FHLBanks pay concessions to dealers in connection with the issuance of certain consolidated obligations. The Office of Finance prorates the amount of the concession to each FHLBank based upon the percentage of the debt issued that is assumed by that FHLBank. Concessions paid on consolidated obligations designated under the fair value option are expensed as incurred in non-interest expense. The FHLBanks record concessions paid on consolidated obligations 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 the interest method, over the term to maturity or the estimated life of the corresponding consolidated obligations. The amortization of those concessions is included in consolidated obligation interest expense.

Mandatorily Redeemable Capital Stock

An FHLBank generally reclassifies stock subject to redemption from capital stock to a liability after a member provides written notice of redemption, gives notice of intention to withdraw from membership, or attains non-member status by merger or acquisition, relocation, charter termination, or other involuntary termination from membership, because the member's shares will 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 on the Combined Statement of Income. The repurchase or redemption of mandatorily redeemable capital stock is reflected as a financing cash outflow on the Combined Statement of Cash Flows.

If a member cancels its written notice of redemption or notice of withdrawal, the affected FHLBank will reclassify mandatorily redeemable capital stock from liabilities to capital. After the reclassification, dividends on the capital stock will no longer be classified as interest expense.

Restricted Retained Earnings

In 2011, the FHLBanks entered into a Joint Capital Enhancement Agreement, as amended (Capital Agreement). Under the Capital Agreement, beginning in the third quarter of 2011, each FHLBank allocates 20% of its quarterly net income to a separate restricted retained earnings account at that FHLBank until the account balance equals at least one percent of that FHLBank's average balance of outstanding consolidated obligations for the previous quarter. The FHLBanks' restricted retained earnings are not available to pay dividends and are presented separately on the Combined Statement of Condition.

Gains on Litigation Settlement, Net

Litigation settlement gains, net of related legal expenses, are recorded in non-interest income as gains on litigation settlements, net on the Combined Statement of Income. A litigation settlement gain is considered realized and recorded when an affected FHLBank receives cash or assets that are readily convertible to known amounts of cash or claims to cash. In addition, a litigation settlement gain is considered realizable and recorded when an FHLBank enters into a signed agreement that is not subject to appeal, where the counterparty has the ability to pay, and the amount to be received can be reasonably estimated. Prior to being realized or realizable, the FHLBanks consider potential litigation settlement gains to be gain contingencies, and therefore they are not recorded on the Combined Statement of Income. The related legal expenses are contingent-based fees and are only incurred and recorded upon a litigation settlement gain.

FHFA Expenses

The portion of the FHFA's expenses and working capital fund paid by the FHLBanks are allocated among the FHLBanks based on the pro-rata share of the 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

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.

Assessments

Affordable Housing Program (AHP). The FHLBank Act requires each FHLBank to establish and fund an AHP, providing subsidies to members to assist in the purchase, construction, or rehabilitation of housing for very low-to-moderate-income households. Each FHLBank charges the required funding for AHP to earnings and establishes a liability. An FHLBank issues AHP advances at interest rates below the customary interest rate for non-subsidized advances. A discount on the AHP advance and charge against AHP liability is recorded for the present value of the variation in the cash flow caused by the difference in the interest rate between the AHP advance rate and that FHLBank's related cost of funds for comparable maturity funding. As an alternative, that FHLBank 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 and Adopted Accounting Guidance

Classification of Certain Cash Receipts and Cash Payments

On August 26, 2016, the FASB issued amendments to clarify guidance on the classification of certain cash receipts and payments in the statement of cash flows. This guidance is intended to reduce existing diversity in practice in how certain cash receipts and cash payments are presented and classified on the statement of cash flows. This guidance is effective for the FHLBanks for interim and annual periods beginning on January 1, 2018, and early adoption is permitted. This guidance should be applied using a retrospective transition method to each period presented. The FHLBanks do not intend to adopt this guidance early. The FHLBanks are in the process of evaluating this guidance. Although the adoption of this guidance will have no effect on the FHLBanks' combined financial condition or combined results of operations, its effect on the combined cash flows has not yet been determined.

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 measure expected credit losses 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. An entity must use judgment in determining the relevant information and estimation methods that are appropriate in its circumstances. The new guidance requires a financial asset, or a group of financial assets, measured at amortized cost basis to be presented at the net amount expected to be collected over the contractual term of the financial asset(s). The guidance also requires, among other things, the following:

- The statement of income reflects the measurement of credit losses for newly recognized financial assets, as well as the expected increases or decreases of expected credit losses that have taken place during the period.
- Entities determine the allowance for credit losses for purchased financial assets with a more-than-insignificant amount of credit deterioration since origination that are measured at amortized cost basis in a similar manner to other financial assets measured at amortized cost basis. The initial allowance for credit losses is required to be added to the purchase price.
- Entities record credit losses relating to available-for-sale debt securities through an allowance for credit losses. The amendments limit the allowance for credit losses to the amount by which fair value is below amortized cost.
- Public entities further disaggregate the current disclosure of credit quality indicators in relation to the amortized cost of financing receivables by the year of origination (i.e., vintage).

This guidance is effective for the FHLBanks for interim and annual periods beginning on January 1, 2020. Early application is permitted as of the interim and annual reporting periods beginning after December 15, 2018. This guidance should be 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 is effective. In addition, entities are required to use a prospective transition approach for purchased financial assets with a more-than-insignificant amount of credit deterioration since origination and for debt securities for which an other-than-temporary impairment had been recognized before the effective date. The FHLBanks do not intend to adopt this guidance early. While the FHLBanks are in the process of evaluating the guidance, the FHLBanks expect the adoption of this guidance may result in an increase in the allowance for credit losses, including an allowance for debt securities, given the requirement to assess losses for the entire estimated life of the financial asset. The effect on the FHLBanks’ combined financial condition, combined results of operations, and combined cash flows will depend upon the composition of financial assets held by the individual FHLBanks at the adoption date, as well as the economic conditions and forecasts at that time.

Leases

On February 25, 2016, the FASB issued guidance which requires recognition of lease assets and lease liabilities on the statement of condition and disclosure of key information about leasing arrangements. In particular, this guidance requires a lessee, of operating or finance leases, to recognize on the statement of condition a liability to make lease payments and a right-of-use asset representing its right to use the underlying asset for the lease term. However, for leases with a term of 12

months or less, a lessee is permitted to make an accounting policy election not to recognize lease assets and lease liabilities. Under previous GAAP, a lessee was not required to recognize lease assets and lease liabilities arising from operating leases on the statement of condition. While this guidance does not fundamentally change lessor accounting, some changes have been made to align that guidance with the lessee guidance and other areas within GAAP.

This guidance becomes effective for the FHLBanks for the interim and annual periods beginning on January 1, 2019, and early application is permitted. This guidance requires lessors and lessees to recognize and measure leases at the beginning of the earliest period presented in the financial statements using a modified retrospective approach. The FHLBanks do not intend to adopt this guidance early. Upon adopting this guidance, the FHLBanks expect to report higher assets and liabilities as a result of recording right-of-use assets and lease liabilities for their existing leases on their statements of condition. The FHLBanks are in the process of evaluating this guidance, but its effect on the FHLBanks' combined financial condition, combined results of operations, and combined cash flows has not yet been determined.

Recognition and Measurement of Financial Assets and Financial Liabilities

On January 5, 2016, the FASB issued amended guidance on certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. This guidance includes, but is not limited to, the following:

- Requires equity investments (with certain exceptions) to be measured at fair value with changes in fair value recognized in net income.

- Requires an entity to present separately in other comprehensive income the portion of the total change in the fair value of a liability resulting from a change in the instrument-specific credit risk when the entity has elected to measure the liability at fair value in accordance with the fair value option for financial instruments.

- Requires separate presentation of financial assets and financial liabilities by measurement category and form of financial asset (that is, securities or loans and receivables) on the statement of condition or the accompanying notes to the financial statements.

- Eliminates the requirement for public entities to disclose the method(s) and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost on the statement of condition.

This guidance becomes effective for the FHLBanks for the interim and annual periods beginning on January 1, 2018, and early adoption is only permitted for certain provisions. The amendments, in general, should be applied by means of a cumulative-effect adjustment on the statement of condition as of the beginning of the period of adoption. The FHLBanks do not intend to adopt this guidance early. The FHLBanks are in the process of evaluating this guidance, but its effect on the FHLBanks' combined financial condition, combined results of operations, and combined cash flows has not yet been determined.

Revenue from Contracts with Customers

On May 28, 2014, the FASB issued guidance on revenue from contracts with customers. This guidance outlines a comprehensive model for recognizing revenue arising from contracts with customers and supersedes most current revenue recognition guidance. In addition, this guidance amends the existing requirements for the recognition of a gain or loss on the transfer of non-financial assets that are not in a contract with a customer. This guidance applies to all contracts with customers except those that are within the scope of certain other standards, such as financial instruments, certain guarantees, insurance contracts, and lease contracts. The guidance provides entities with the option of using either of the following adoption methods: a full retrospective method, retrospectively to each prior reporting period presented; or a modified retrospective method, retrospectively with the cumulative effect of initially applying this guidance recognized at the date of initial application.

On August 12, 2015, the FASB issued an amendment to defer the effective date of the guidance issued in May 2014 by one year. In 2016, the FASB has issued additional amendments to clarify certain aspects of the new revenue guidance. However, these amendments do not change the core principle of the new revenue standard.

This guidance is effective for the FHLBanks for interim and annual periods beginning on January 1, 2018. Early application is permitted only as of the interim and annual reporting periods beginning after December 15, 2016. The FHLBanks do not intend to adopt this guidance early. Given that the majority of the FHLBanks' financial instruments and other contractual rights that generate revenue are covered by other U.S. GAAP, the effect of this guidance on the FHLBanks' combined financial condition, combined results of operations, and combined cash flows is not expected to be material.

Contingent Put and Call Options in Debt Instruments

On March 14, 2016, the FASB issued amendments to clarify the requirements for assessing whether contingent call (put) options that can accelerate the payment of principal on debt instruments are clearly and closely related to their debt hosts. The guidance requires entities to apply only the four-step decision sequence when assessing whether the economic characteristics and risks of call (put) options are clearly and closely related to the economic characteristics and risks of their debt hosts. Consequently, when a call (put) option is contingently exercisable, an entity does not have to assess whether the event that triggers the ability to exercise a call (put) option is related to interest rates or credit risks. This guidance became effective for the FHLBanks for the interim and annual periods beginning on January 1, 2017. The adoption of this guidance did not have any effect on the FHLBanks' combined financial condition, combined results of operations, and combined cash flows.

Effect of Derivative Contract Novations on Existing Hedge Accounting Relationships

On March 10, 2016, the FASB issued amendments to clarify that a change in the counterparty to a derivative instrument that has been designated as the hedging instrument under GAAP does not, in and of itself, require dedesignation of that hedging relationship provided that all other hedge accounting criteria continue to be met. This guidance became effective for the FHLBanks for the interim and annual periods beginning on January 1, 2017, and early adoption was permitted. The amendments provide entities with the option to apply the guidance using either a prospective approach or a modified retrospective approach, retrospectively applied to all derivative instruments that meet the specific conditions.

The FHLBanks elected to early adopt this guidance prospectively on January 1, 2016. The adoption of this guidance did not have any effect on the FHLBanks' combined financial condition, combined results of operations, and combined cash flows.

Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern

On August 27, 2014, the FASB issued guidance about management's responsibility to evaluate whether there is substantial doubt about an entity's ability to continue as a going concern and to provide related footnote disclosures if substantial doubt exists. This guidance requires management to perform interim and annual assessments of an entity's ability to continue as a going concern within one year after the date the financial statements are issued or within one year after the financial statements are available to be issued, when applicable. Substantial doubt exists if it is probable that the entity will be unable to meet its obligations for the assessed period. This guidance became effective for the FHLBanks for the annual period ending December 31, 2016, and for the annual and interim periods thereafter. The adoption of this guidance did not affect the disclosures to the FHLBanks' combined financial statements.

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 FHLBanks maintain 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 were $921 million and $859 million for the years ended December 31, 2016 and 2015.

Pass-through Deposit Reserves

Certain FHLBanks act as pass-through correspondents 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 the Federal Reserve Banks of $141 million and $124 million at December 31, 2016 and 2015.

Note 4 - Trading Securities

Table 4.1 - Trading Securities by Major Security Type
(dollars in millions)

Fair Value	December 31, 2016	December 31, 2015
Non-mortgage-backed securities		
U.S. Treasury obligations	$ 1,606	$ 1,310
Other U.S. obligations	216	237
GSE and Tennessee Valley Authority obligations	5,693	7,216
State or local housing agency obligations	—	1
Other	290	290
Total non-mortgage-backed securities	7,805	9,054
Mortgage-backed securities		
Other U.S. obligations single-family MBS	20	24
GSE single-family MBS	127	159
GSE multifamily MBS	1,509	1,523
Total mortgage-backed securities	1,656	1,706
Total	$ 9,461	$ 10,760

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

	Year Ended December 31,		
	2016	2015	2014
Net unrealized gains (losses) on trading securities held at period-end	$ (10)	$ (130)	$ 10
Net unrealized and realized gains (losses) on trading securities sold/matured during the period	(31)	(1)	(27)
Net gains (losses) on trading securities	$ (41)	$ (131)	$ (17)

Note 5 - Available-for-Sale Securities

Table 5.1 - Available-for-Sale (AFS) Securities by Major Security Type
(dollars in millions)

	December 31, 2016				
	Amortized Cost(1)	OTTI Recognized in AOCI(2)	Gross Unrealized Gains(3)	Gross Unrealized Losses(3)	Fair Value
Non-mortgage-backed securities					
Certificates of deposit	$ 1,300	$ —	$ —	$ —	$ 1,300
Other U.S. obligations	4,270	—	25	(13)	4,282
GSE and Tennessee Valley Authority obligations	16,218	—	102	(77)	16,243
State or local housing agency obligations	1,289	—	1	(17)	1,273
Federal Family Education Loan Program ABS	4,430	—	165	(23)	4,572
Other	1,085	—	9	(30)	1,064
Total non-mortgage-backed securities	28,592	—	302	(160)	28,734
Mortgage-backed securities					
Other U.S. obligations single-family MBS	5,561	—	36	(20)	5,577
Other U.S. obligations multifamily MBS	565	—	—	(2)	563
GSE single-family MBS	9,613	—	23	(60)	9,576
GSE multifamily MBS	30,108	—	359	(77)	30,390
Private-label residential MBS	6,472	(120)	485	(4)	6,833
Total mortgage-backed securities	52,319	(120)	903	(163)	52,939
Total	$ 80,911	$ (120)	$ 1,205	$ (323)	$ 81,673

	December 31, 2015				
	Amortized Cost(1)	OTTI Recognized in AOCI(2)	Gross Unrealized Gains(3)	Gross Unrealized Losses(3)	Fair Value
Non-mortgage-backed securities					
Certificates of deposit	$ 700	$ —	$ —	$ —	$ 700
Other U.S. obligations	4,833	—	27	(31)	4,829
GSE and Tennessee Valley Authority obligations	14,936	—	48	(121)	14,863
State or local housing agency obligations	1,199	—	3	(3)	1,199
Federal Family Education Loan Program ABS	5,089	—	233	(23)	5,299
Other	1,151	—	5	(32)	1,124
Total non-mortgage-backed securities	27,908	—	316	(210)	28,014
Mortgage-backed securities					
Other U.S. obligations single-family MBS	4,547	—	57	(17)	4,587
Other U.S. obligations multifamily MBS	747	—	—	(3)	744
GSE single-family MBS	9,584	—	45	(43)	9,586
GSE multifamily MBS	24,476	—	419	(202)	24,693
Private-label residential MBS	8,039	(185)	442	(14)	8,282
Home equity loan ABS	8	—	2	—	10
Total mortgage-backed securities	47,401	(185)	965	(279)	47,902
Total	$ 75,309	$ (185)	$ 1,281	$ (489)	$ 75,916

(1) Amortized cost of AFS securities includes adjustments made to the cost basis of an investment for accretion, amortization, previous OTTI recognized in earnings, and/or fair value hedge accounting adjustments.

(2) OTTI recognized in AOCI does not include $475 million and $426 million in subsequent unrealized gains (losses) in fair value of previously other-than-temporarily impaired AFS securities at December 31, 2016 and 2015, which is included in net non-credit portion of OTTI losses on AFS securities in *Note 17 - Accumulated Other Comprehensive Income (Loss)*.

(3) Gross unrealized gains and gross unrealized losses on AFS securities include $475 million and $426 million in subsequent unrealized gains (losses) in fair value of previously other-than-temporarily impaired AFS securities at December 31, 2016 and 2015, which is not included in net unrealized gains (losses) on AFS securities in *Note 17 - Accumulated Other Comprehensive Income (Loss)*.

Table 5.2 presents the AFS securities with unrealized losses by major security type and length of time that individual securities have been in a continuous unrealized loss position.

Table 5.2 - AFS Securities in a Continuous Unrealized Loss Position
(dollars in millions)

	December 31, 2016					
	Less than 12 Months		12 months or more		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses(1)
Non-mortgage-backed securities						
Other U.S. Obligations	$ 209	$ (1)	$ 2,972	$ (12)	$ 3,181	$ (13)
GSE and Tennessee Valley Authority obligations	3,342	(14)	945	(63)	4,287	(77)
State or local housing agency obligations	530	(16)	395	(1)	925	(17)
Federal Family Education Loan Program ABS	—	—	753	(23)	753	(23)
Other	—	—	423	(30)	423	(30)
Total non-mortgage-backed securities	4,081	(31)	5,488	(129)	9,569	(160)
Mortgage-backed securities						
Other U.S. obligations single-family MBS	1,318	(3)	2,260	(17)	3,578	(20)
Other U.S. obligations multifamily MBS	326	(1)	165	(1)	491	(2)
GSE single-family MBS	5,943	(50)	735	(10)	6,678	(60)
GSE multifamily MBS	4,564	(22)	9,043	(55)	13,607	(77)
Private-label residential MBS	132	(1)	1,514	(123)	1,646	(124)
Total mortgage-backed securities	12,283	(77)	13,717	(206)	26,000	(283)
Total	$ 16,364	$ (108)	$ 19,205	$ (335)	$ 35,569	$ (443)

	December 31, 2015					
	Less than 12 Months		12 months or more		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses(1)
Non-mortgage-backed securities						
Other U.S. Obligations	$ 3,875	$ (31)	$ —	$ —	$ 3,875	$ (31)
GSE and Tennessee Valley Authority obligations	5,509	(42)	721	(79)	6,230	(121)
State or local housing agency obligations	601	(3)	10	—	611	(3)
Federal Family Education Loan Program ABS	64	(1)	787	(22)	851	(23)
Other	376	(2)	487	(30)	863	(32)
Total non-mortgage-backed securities	10,425	(79)	2,005	(131)	12,430	(210)
Mortgage-backed securities						
Other U.S. obligations single-family MBS	2,431	(14)	126	(3)	2,557	(17)
Other U.S. obligations multifamily MBS	537	(2)	109	(1)	646	(3)
GSE single-family MBS	3,855	(30)	520	(13)	4,375	(43)
GSE multifamily MBS	12,748	(147)	2,782	(55)	15,530	(202)
Private-label residential MBS	340	(5)	2,250	(194)	2,590	(199)
Total mortgage-backed securities	19,911	(198)	5,787	(266)	25,698	(464)
Total	$ 30,336	$ (277)	$ 7,792	$ (397)	$ 38,128	$ (674)

(1) Total unrealized losses in Table 5.2 will not agree to total gross unrealized losses in Table 5.1. Total unrealized losses in Table 5.2 includes non-credit-related OTTI recognized in AOCI.

Table 5.3 - AFS Securities by Contractual Maturity
(dollars in millions)

	December 31, 2016		December 31, 2015	
Year of Maturity	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Non-mortgage-backed securities				
Due in one year or less	$ 3,838	$ 3,843	$ 2,145	$ 2,147
Due after one year through five years	5,870	5,908	8,529	8,545
Due after five years through ten years	11,019	11,052	8,580	8,563
Due after ten years	3,435	3,359	3,565	3,460
Federal Family Education Loan Program ABS(1)	4,430	4,572	5,089	5,299
Total non-mortgage-backed securities	28,592	28,734	27,908	28,014
Mortgage-backed securities(1)	52,319	52,939	47,401	47,902
Total	$ 80,911	$ 81,673	$ 75,309	$ 75,916

(1) Federal Family Education Loan Program ABS and MBS are not presented by contractual maturity because 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.

Table 5.4 - Proceeds from Sale and Gross Gains and Losses on AFS Securities
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Proceeds from sale of AFS securities	$ 3,267	$ 2,576	$ 98
Gross gains on sale of AFS securities	$ 18	$ 74	$ 1
Gross losses on sale of AFS securities	—	(14)	—
Net realized gains/(losses) from sale of AFS securities	$ 18 (a)	$ 60 (b)	$ 1

(a) Includes $1 million of net realized gains relating to sales of previously other-than-temporarily impaired securities.
(b) Includes $52 million of net realized gains relating to sales of previously other-than-temporarily impaired securities.

See *Note 7 - Other-than-Temporary Impairment Analysis* for analysis related to OTTI.

Note 6 - Held-to-Maturity Securities

Table 6.1 - HTM Securities by Major Security Type
(dollars in millions)

	December 31, 2016					
	Amortized Cost(1)	OTTI Recognized in AOCI(2)	Carrying Value(2)	Gross Unrecognized Holding Gains(3)	Gross Unrecognized Holding Losses(3)	Fair Value
Non-mortgage-backed securities						
Certificates of deposit	$ 1,750	$ —	$ 1,750	$ —	$ —	$ 1,750
Other U.S. obligations	1,751	—	1,751	42	(1)	1,792
GSE and Tennessee Valley Authority obligations	6,470	—	6,470	63	(6)	6,527
State or local housing agency obligations	2,575	—	2,575	2	(104)	2,473
Total non-mortgage-backed securities	12,546	—	12,546	107	(111)	12,542
Mortgage-backed securities						
Other U.S. obligations single-family MBS	8,493	—	8,493	30	(37)	8,486
Other U.S. obligations multifamily MBS	5	—	5	—	—	5
GSE single-family MBS	41,116	—	41,116	290	(266)	41,140
GSE multifamily MBS	30,083	—	30,083	231	(70)	30,244
Private-label residential MBS	4,520	(402)	4,118	576	(48)	4,646
Manufactured housing loan ABS	69	—	69	3	(1)	71
Home equity loan ABS	201	(30)	171	55	(3)	223
Total mortgage-backed securities	84,487	(432)	84,055	1,185	(425)	84,815
Total	$ 97,033	$ (432)	$ 96,601	$ 1,292	$ (536)	$ 97,357

	December 31, 2015					
	Amortized Cost(1)	OTTI Recognized in AOCI(2)	Carrying Value(2)	Gross Unrecognized Holding Gains(3)	Gross Unrecognized Holding Losses(3)	Fair Value
Non-mortgage-backed securities						
Other U.S. obligations	$ 1,957	$ —	$ 1,957	$ 64	$ (1)	$ 2,020
GSE and Tennessee Valley Authority obligations	6,226	—	6,226	57	(15)	6,268
State or local housing agency obligations	2,710	—	2,710	10	(116)	2,604
Total non-mortgage-backed securities	10,893	—	10,893	131	(132)	10,892
Mortgage-backed securities						
Other U.S. obligations single-family MBS	10,223	—	10,223	46	(41)	10,228
Other U.S. obligations multifamily MBS	23	—	23	—	—	23
GSE single-family MBS	48,258	—	48,258	546	(238)	48,566
GSE multifamily MBS	19,951	—	19,951	289	(58)	20,182
Private-label residential MBS	5,822	(490)	5,332	636	(83)	5,885
Manufactured housing loan ABS	86	—	86	2	(1)	87
Home equity loan ABS	236	(37)	199	65	(4)	260
Total mortgage-backed securities	84,599	(527)	84,072	1,584	(425)	85,231
Total	$ 95,492	$ (527)	$ 94,965	$ 1,715	$ (557)	$ 96,123

(1) Amortized cost of HTM securities includes adjustments made to the cost basis of an investment for accretion, amortization, and/or previous OTTI recognized in earnings.
(2) Carrying value of HTM securities represents amortized cost after adjustment for the non-credit-related OTTI recognized in AOCI.
(3) Gross unrecognized holding gains (losses) represent the difference between fair value and carrying value.

Table 6.2 presents the HTM 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 6.2 - HTM Securities in a Continuous Unrealized Loss Position
(dollars in millions)

	December 31, 2016					
	Less than 12 Months		12 months or more		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses(1)
Non-mortgage-backed securities						
Other U.S. obligations	$ 37	$ —	$ 16	$ (1)	$ 53	$ (1)
GSE and Tennessee Valley Authority obligations	2,605	(6)	—	—	2,605	(6)
State or local housing agency obligations	368	(13)	843	(91)	1,211	(104)
Total non-mortgage-backed securities	3,010	(19)	859	(92)	3,869	(111)
Mortgage-backed securities						
Other U.S. obligations single-family MBS	2,896	(25)	1,503	(12)	4,399	(37)
GSE single-family MBS	16,052	(164)	6,237	(102)	22,289	(266)
GSE multifamily MBS	11,349	(45)	4,973	(25)	16,322	(70)
Private-label residential MBS	66	—	3,148	(261)	3,214	(261)
Manufactured housing loan ABS	—	—	7	(1)	7	(1)
Home equity loan ABS	6	—	47	(3)	53	(3)
Total mortgage-backed securities	30,369	(234)	15,915	(404)	46,284	(638)
Total	$ 33,379	$ (253)	$ 16,774	$ (496)	$ 50,153	$ (749)

	December 31, 2015					
	Less than 12 Months		12 months or more		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses(1)
Non-mortgage-backed securities						
Other U.S. obligations	$ 618	$ —	$ 16	$ (1)	$ 634	$ (1)
GSE and Tennessee Valley Authority obligations	4,631	(10)	745	(5)	5,376	(15)
State or local housing agency obligations	115	—	861	(116)	976	(116)
Total non-mortgage-backed securities	5,364	(10)	1,622	(122)	6,986	(132)
Mortgage-backed securities						
Other U.S. obligations single-family MBS	4,716	(35)	605	(6)	5,321	(41)
GSE single-family MBS	14,691	(141)	3,234	(97)	17,925	(238)
GSE multifamily MBS	9,212	(42)	2,208	(16)	11,420	(58)
Private-label residential MBS	820	(6)	3,854	(351)	4,674	(357)
Manufactured housing loan ABS	—	—	9	(1)	9	(1)
Home equity loan ABS	—	—	61	(4)	61	(4)
Total mortgage-backed securities	29,439	(224)	9,971	(475)	39,410	(699)
Total	$ 34,803	$ (234)	$ 11,593	$ (597)	$ 46,396	$ (831)

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(1) Total unrealized losses in Table 6.2 will not agree to total gross unrecognized holding losses in Table 6.1. Total unrealized losses in Table 6.2 includes non-credit-related OTTI recognized in AOCI and gross unrecognized holding gains on previously other-than-temporarily impaired securities.

Table 6.3 - HTM Securities by Contractual Maturity
(dollars in millions)

	December 31, 2016			December 31, 2015		
Year of Maturity	**Amortized Cost**	**Carrying Value(1)**	**Fair Value**	**Amortized Cost**	**Carrying Value(1)**	**Fair Value**
Non-mortgage-backed securities						
Due in one year or less	$ 4,917	$ 4,917	$ 4,919	$ 1,499	$ 1,499	$ 1,499
Due after one year through five years	3,879	3,879	3,885	5,509	5,509	5,501
Due after five years through ten years	799	799	826	827	827	858
Due after ten years	2,951	2,951	2,912	3,058	3,058	3,034
Total non-mortgage-backed securities	12,546	12,546	12,542	10,893	10,893	10,892
Mortgage-backed securities(2)	84,487	84,055	84,815	84,599	84,072	85,231
Total	$ 97,033	$ 96,601	$ 97,357	$ 95,492	$ 94,965	$ 96,123

(1) Carrying value of HTM securities represents amortized cost after adjustment for non-credit-related OTTI recognized in AOCI.
(2) MBS are not presented by contractual maturity because 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.

Realized Gains and Losses

Certain FHLBanks sold securities out of their respective HTM portfolio that were either within three months of maturity or had less than 15% of the acquired principal outstanding at the time of the sale. These sales are considered maturities for purposes of security classification.

Table 6.4 - Proceeds from Sale and Gains and Losses on HTM Securities
(dollars in millions)

	Year Ended December 31,		
	2016	**2015**	**2014**
Proceeds from sale of HTM securities	$ 1,010	$ 825	$ 90
Carrying value of HTM securities sold	970	810	81
Net realized gains (losses) from sale of HTM securities	$ 40	$ 15	$ 9

Note 7 - Other-than-Temporary Impairment Analysis

Each FHLBank evaluates its individual AFS and HTM investment securities holdings in an unrealized loss position for OTTI on a quarterly basis.

To ensure consistency in determination of OTTI for private-label MBS among all FHLBanks, the FHLBanks use a system-wide governance committee and a formal process to ensure consistency in key OTTI modeling assumptions used for purposes of their cash flow analyses for the majority of these securities. Most of the FHLBanks select all of their private-label MBS in an unrealized loss position to be evaluated using the FHLBanks' common framework and approved assumptions for purposes of OTTI cash flow analysis. For certain private-label MBS where underlying collateral data is not available, alternative procedures as determined by each FHLBank are used to assess these securities for OTTI.

Each FHLBank's evaluation includes estimating the projected cash flows that the FHLBank is likely to collect based on an assessment of available information, including the structure of the applicable security and certain assumptions such as:

- the remaining payment terms for the security;
- prepayment speeds based on underlying loan-level borrower and loan characteristics;
- default rates based on underlying loan-level borrower and loan characteristics;
- loss severity on the collateral supporting each FHLBank's security based on underlying loan-level borrower and loan characteristics;
- expected housing price changes; and
- interest-rate assumptions.

Certain Private-label MBS

Each FHLBank performed a cash flow analysis using two third-party models to assess whether the entire amortized cost basis of its private-label MBS securities will be recovered. The projected cash flows are based on a number of assumptions and expectations, and the results of these models can vary significantly with changes in assumptions and expectations. The scenario of cash flows determined based on the model approach reflects a best estimate scenario and includes a base case housing price forecast and a base case housing price recovery path.

The first third-party model considers borrower characteristics and the particular attributes of the loans underlying an FHLBank's securities, in conjunction with assumptions about future changes in home prices and interest rates, to project prepayments, defaults, and loss severities. A significant input to the first model is the forecast of future housing price changes for the relevant states and core based statistical areas (CBSAs), which are based upon an assessment of the individual housing markets. CBSA refers collectively to metropolitan and micropolitan statistical areas as defined by the United States Office of Management and Budget; as currently defined, a CBSA must contain at least one urban area with a population of 10,000 or more people. The FHLBanks' system-wide governance committee developed a short-term housing price forecast with projected changes ranging from a decrease of 3.0% to an increase of 10.0% over the twelve month period beginning October 1, 2016. For the vast majority of markets, the projected short-term housing price changes range from an increase of 2.0% to an increase of 6.0%. Thereafter, a unique path is projected for each geographic area based on an internally developed framework derived from historical data.

The month-by-month projections of future loan performance derived from the first model, which reflect projected prepayments, defaults, and loss severities, are then input into a second model that allocates the projected loan level cash flows and losses to the various security classes in the securitization structure in accordance with its prescribed cash flow and loss allocation rules. In a securitization in which the credit enhancement for the senior securities is derived from the presence of subordinate securities, losses are generally allocated first to the subordinate securities until their principal balance is reduced to zero.

Credit Loss. In performing a detailed cash flow analysis, each FHLBank identifies the best estimate of the cash flows expected to be collected. If this estimate results in a present value of expected cash flows (discounted at the security's effective yield) that is less than the amortized cost basis of a security (that is, a credit loss exists), an OTTI loss is considered to have occurred. For variable-rate and hybrid private-label MBS, the affected FHLBank uses the effective interest rate derived from a variable-rate index (e.g., one-month LIBOR) plus the contractual spread, plus or minus a fixed spread adjustment when there is an existing discount or premium on the security. As the implied forward curve of the index changes over time, the effective interest rates derived from that index will also change over time.

Table 7.1 presents the December 31, 2016 balance of the total HTM and AFS MBS with OTTI charges during the life of the security, which represents securities other-than-temporarily impaired prior to and at December 31, 2016, based on each individual FHLBank's impairment analyses of its investment portfolio.

Table 7.1 - Total MBS Other-than-Temporarily Impaired during the Life of the Security
(dollars in millions)

	December 31, 2016(1)						
	Held-to-Maturity Securities				Available-for-Sale Securities		
	Unpaid Principal Balance	Amortized Cost	Carrying Value	Fair Value	Unpaid Principal Balance	Amortized Cost	Fair Value
Private-label residential MBS(2)							
Prime	$ 817	$ 671	$ 518	$ 708	$ 2,463	$ 1,987	$ 2,193
Alt-A	1,250	952	748	1,001	5,500	4,480	4,635
Subprime	441	245	200	323	2	1	1
Total private-label residential MBS	2,508	1,868	1,466	2,032	7,965	6,468	6,829
Home equity loan ABS(2)							
Subprime	126	98	68	119	—	—	—
Total home equity loan ABS	126	98	68	119	—	—	—
Total	$ 2,634	$ 1,966	$ 1,534	$ 2,151	$ 7,965	$ 6,468	$ 6,829

(1) Table 7.1 does not include all HTM and AFS securities that are in an unrealized loss position as of December 31, 2016. This table includes only HTM and AFS MBS with OTTI charges during the life of the security.
(2) The FHLBanks classify securities as prime, Alt-A, and subprime based on the originator's classification at the time of origination or based on classification by a nationally recognized statistical rating organization upon issuance of the securities.

Table 7.2 presents a rollforward of the amounts related to credit losses recognized in earnings. The rollforward relates to the amount of credit losses on investment securities held by the FHLBanks for which a portion of OTTI losses was recognized in accumulated other comprehensive income (loss).

Table 7.2 - Rollforward of the Amounts Related to Credit Losses Recognized into Earnings
(dollars in millions)

	Year ended December 31,		
	2016	2015	2014
Balance, at beginning of period	$ 3,240	$ 3,836	$ 4,075
Additions			
Credit losses for which OTTI was not previously recognized	—	2	—
Additional OTTI credit losses for securities upon which an OTTI charge was previously recognized (1)(2)	22	24	15
Reductions			
Securities sold or matured during the period(3)	(20)	(2)	—
Credit losses on securities that an FHLBank intends to sell before recovery of its amortized cost basis	—	(367)	(1)
Increases in cash flows expected to be collected (accreted as interest income over the remaining lives of the applicable securities)	(259)	(253)	(253)
Balance, at end of period	$ 2,983	$ 3,240	$ 3,836

(1) For the years ended December 31, 2016, 2015, and 2014, additional OTTI credit losses for securities upon which an OTTI charge was previously recognized relates to all securities that were also previously impaired prior to January 1, 2016, 2015, and 2014.
(2) Does not include $52 million of OTTI charges related to AFS private-label mortgage-backed securities for the year ended December 31, 2015, that the FHLBank of Seattle intended to sell, and subsequently sold.
(3) Represents reductions related to securities sold or having reached final maturity during the period, and therefore are no longer held by the FHLBanks at the end of the period.

All other AFS and HTM Investment Securities

At December 31, 2016, the FHLBanks held certain other AFS and HTM securities in unrealized loss positions. These unrealized losses are due primarily to interest rate volatility and/or illiquidity. These losses are considered temporary as each FHLBank expects to recover the entire amortized cost basis on its remaining AFS and HTM securities in unrealized loss positions and neither intends to sell these securities nor considers it more likely than not that it will be required to sell these securities before its anticipated recovery of each security's remaining amortized cost basis. As a result, each FHLBank does not consider these other AFS and HTM investment securities to be other-than-temporarily impaired at December 31, 2016.

Note 8 - Advances

The FHLBanks offer 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 20 years, where the interest rates reset periodically at a fixed spread to LIBOR or other specified indices, or consolidated discount note rates.

Table 8.1 - Advances Redemption Terms
(dollars in millions)

	December 31, 2016		December 31, 2015	
Contractual Maturity	**Amount**	**Weighted-Average Interest Rate**	**Amount**	**Weighted-Average Interest Rate**
Overdrawn demand and overnight deposit accounts	$ 6	1.53%	$ 26	3.70%
Due in 1 year or less	286,615	0.91%	251,458	0.70%
Due after 1 year through 2 years	141,504	1.27%	103,118	1.16%
Due after 2 years through 3 years	86,360	1.25%	95,768	1.23%
Due after 3 years through 4 years	53,816	1.32%	61,161	0.99%
Due after 4 years through 5 years	53,765	1.41%	46,331	1.13%
Thereafter	80,795	1.38%	71,890	1.54%
Index-amortizing advances(1)	1,448	2.76%	1,481	3.15%
Total par value	704,309	1.15%	631,233	1.02%
Commitment fees	(1)		(2)	
Discounts on AHP advances	(29)		(32)	
Premiums	140		201	
Discounts	(59)		(63)	
Hedging adjustments	846		2,644	
Fair value option valuation adjustments	19		41	
Total	$ 705,225		$ 634,022	

(1) Index-amortizing advances require repayment according to predetermined amortization schedules linked to the level of various indices. Generally, as market interest rates rise (fall), the maturity of an index-amortizing advance extends (contracts).

The FHLBanks offer advances to members and housing associates that provide the right, based upon predetermined option exercise dates, to call the advance prior to maturity without incurring prepayment or termination fees (callable advances). The FHLBanks also offer certain floating-rate and/or amortizing advances that may be contractually prepaid by the borrower on specified dates without incurring prepayment or termination fees (prepayable advances). At December 31, 2016 and 2015, the FHLBanks had callable and prepayable advances outstanding totaling $215.5 billion and $170.0 billion. Other advances may only be prepaid by paying a fee to the FHLBank (prepayment fee) that makes the FHLBank financially indifferent to the prepayment of the advance.

Some advances contain embedded options allowing an FHLBank to offer putable and convertible advances. A member either can sell an embedded option to an FHLBank or can purchase an embedded option from an FHLBank.

With a putable advance to a member, an FHLBank effectively purchases a put option from the member that allows that FHLBank to put or extinguish the fixed-rate advance to the member on predetermined exercise dates. Generally, these put options are exercised when interest rates increase relative to contractual rates. At December 31, 2016 and 2015, the FHLBanks had putable advances outstanding totaling $11.7 billion and $12.5 billion.

Convertible advances allow an FHLBank to convert an advance from one interest-payment term structure to another. When issuing convertible advances, an FHLBank may purchase put options from a member that allow that FHLBank to convert the fixed-rate advance to a variable-rate advance at the current market rate or another structure after an agreed-upon lockout period. A convertible advance carries a lower interest rate than a comparable-maturity fixed-rate advance without the conversion feature. Variable- to fixed-rate convertible advances have a defined lockout period during which the interest rates adjust based on a spread to LIBOR or other specified index. At the end of the lockout period, these advances may convert to fixed-rate advances. The fixed rates on the converted advances are determined at origination. At December 31, 2016 and 2015, the FHLBanks had convertible advances outstanding totaling $3.1 billion and $5.3 billion.

Table 8.2 - Advances by Year of Contractual Maturity or Next Call Date and Next Put or Convert Date
(dollars in millions)

	Year of Contractual Maturity or Next Call Date(1)		Year of Contractual Maturity or Next Put or Convert Date	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Overdrawn demand and overnight deposit accounts	$ 6	$ 26	$ 6	$ 26
Due in 1 year or less	444,438	380,262	293,854	264,554
Due after 1 year through 2 years	103,668	86,223	138,499	96,655
Due after 2 years through 3 years	62,894	74,732	86,466	91,702
Due after 3 years through 4 years	34,513	35,660	52,780	61,083
Due after 4 years through 5 years	31,367	25,288	53,717	45,348
Thereafter	25,975	27,561	77,539	70,384
Index-amortizing advances	1,448	1,481	1,448	1,481
Total par value	$ 704,309	$ 631,233	$ 704,309	$ 631,233

(1) Also includes certain floating-rate and/or amortizing advances that may be contractually prepaid by the borrower on specified dates without incurring prepayment or termination fees.

Table 8.3 - Advances by Current Interest Rate Terms
(dollars in millions)

Contractual Maturity	December 31, 2016	December 31, 2015
Fixed-rate		
Due in one year or less	$ 186,927	$ 171,880
Due after one year	142,849	151,096
Total fixed-rate	329,776	322,976
Variable-rate		
Due in one year or less	99,770	79,618
Due after one year	274,763	228,639
Total variable-rate	374,533	308,257
Total par value	$ 704,309	$ 631,233

Credit Risk Exposure and Security Terms

The FHLBanks' potential credit risk from advances is concentrated in commercial banks. The FHLBanks' advances outstanding that were greater than or equal to $1.0 billion per borrower were $509.0 billion and $442.6 billion at December 31, 2016 and 2015. These advances were made to 98 and 96 borrowers (members and non-members) at December 31, 2016 and 2015, which represented 72.3% and 70.1% of total advances outstanding at December 31, 2016 and 2015. (See *Note 10 - Allowance for Credit Losses* for information related to the FHLBanks' credit risk on advances and allowance methodology for credit losses.)

Note 9 - Mortgage Loans

Mortgage Loans Held for Portfolio

Mortgage loans held for portfolio consist of loans obtained through the MPP and MPF Program and are either conventional mortgage loans or government-guaranteed or -insured mortgage loans. Under the MPP and MPF Program, the FHLBanks purchase single-family mortgage loans that are originated or acquired by participating financial institutions. These mortgage loans are credit-enhanced by participating financial institutions or are guaranteed or insured by Federal agencies.

Table 9.1 - Mortgage Loans Held for Portfolio
(dollars in millions)

	December 31,	
	2016	2015
Fixed-rate, long-term single-family mortgage loans	$ 40,941	$ 36,346
Fixed-rate, medium-term(1) single-family mortgage loans	6,644	7,422
Total unpaid principal balance	47,585	43,768
Premiums	873	754
Discounts	(47)	(54)
Deferred loan costs, net	(3)	(3)
Hedging adjustments	86	110
Total mortgage loans held for portfolio	$ 48,494	$ 44,575

(1) Medium-term is defined as a term of 15 years or less.

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

	December 31,	
	2016	2015
Conventional mortgage loans	$ 43,519	$ 39,320
Government-guaranteed or -insured mortgage loans	4,066	4,448
Total unpaid principal balance	$ 47,585	$ 43,768

Note 10 - Allowance for Credit Losses

Each FHLBank has established an allowance methodology for its applicable portfolio segments:

- credit products (advances, letters of credit, and other extensions of credit to borrowers);
- government-guaranteed or -insured mortgage loans held for portfolio;
- conventional MPF loans held for portfolio and conventional MPP loans held for portfolio;
- term federal funds sold; and
- term securities purchased under agreements to resell.

Credit Products

Each FHLBank manages its credit exposure to credit products through an integrated approach that includes establishing a credit limit for each borrower, includes an ongoing review of each borrower's financial condition, and is coupled with collateral and lending policies to limit risk of loss while balancing borrowers' needs for a reliable source of funding. In addition, each FHLBank lends to eligible borrowers in accordance with federal statutes and FHFA regulations. Specifically, each FHLBank complies with the FHLBank Act, which requires the FHLBank 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 market value or unpaid principal balance of the collateral, as applicable. Each FHLBank accepts certain investment securities, residential mortgage loans, deposits, and other real estate related assets as collateral. In addition, community financial institutions are eligible to use expanded statutory collateral provisions for small business, agriculture loans, and community development loans. The FHLBank capital stock owned by each borrower is also pledged as collateral. Collateral arrangements may vary depending upon borrower credit quality, financial condition, and performance; borrowing capacity; and overall credit exposure to the borrower. Each FHLBank can also require additional or substitute collateral to protect its security interest. Management of each FHLBank believes that these policies effectively manage that FHLBank's respective credit risk from credit products.

Based upon the financial condition of the borrower, an FHLBank either allows a borrower to retain physical possession of the collateral assigned to it, or requires the borrower to specifically assign or place physical possession of the collateral with the FHLBank or its safekeeping agent. Each FHLBank perfects its security interest in all pledged collateral. The FHLBank Act states that any security interest granted to an FHLBank by a borrower will have priority over the claims or rights of any other party, except for claims or rights of a third party that would be entitled to priority under otherwise applicable law and 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 and taking into consideration each borrower's financial strength, the FHLBanks consider the types and level of collateral to be the primary indicator of credit quality on their credit products. At December 31, 2016 and 2015, each FHLBank had rights to collateral on a borrower-by-borrower basis with an estimated value equal to, or greater than, its outstanding extensions of credit.

Each FHLBank continues to evaluate and make changes to its collateral guidelines, as necessary, based on current market conditions. At December 31, 2016 and 2015, none of the FHLBanks had any credit products that were past due, on non-accrual status, or considered impaired. In addition, there were no troubled debt restructurings related to credit products at any FHLBank during the years ended December 31, 2016 and 2015.

Based on the collateral held as security, each FHLBank management's credit extension and collateral policies and repayment history on credit products, no FHLBank has incurred any losses on its credit products. Accordingly, at December 31, 2016 and 2015, no FHLBank recorded any allowance for credit losses on these credit products, and no FHLBank recorded any liability to reflect an allowance for credit losses for off-balance sheet credit exposures. (See *Note 20 - Commitments and Contingencies* for additional information on the FHLBanks' off-balance sheet credit exposure.)

Government-Guaranteed or -Insured Mortgage Loans Held for Portfolio

An FHLBank invests in fixed-rate mortgage loans that are insured or guaranteed by the Federal Housing Administration, the Department of Veterans Affairs, the Rural Housing Service of the Department of Agriculture, and/or the Department of Housing and Urban Development. The servicer provides and maintains insurance or a guarantee from the applicable government agency. The servicer is responsible for compliance with all government agency requirements and for obtaining the benefit of the applicable guarantee or insurance with respect to defaulted government-guaranteed or -insured mortgage loans. Any losses incurred on these loans that are not recovered from the issuer or the guarantor are absorbed by the servicer. Therefore, each FHLBank only has credit risk for these loans if the servicer fails to pay for losses not covered by the guarantee or insurance. Based on each FHLBank's assessment of its servicers, no FHLBank established an allowance for credit losses for its government-guaranteed or -insured mortgage loan portfolio at December 31, 2016 and 2015. Furthermore, none of these mortgage loans has been placed on non-accrual status because of the U.S. government guarantee or insurance on these loans and the contractual obligation of the loan servicer to repurchase the loans when certain criteria are met.

Mortgage Loans Held for Portfolio - Conventional MPF and Conventional MPP

Each FHLBank determines its allowances 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 loan losses may consist of: (1) mortgage loans evaluated at the individual master commitment level; (2) individually evaluated mortgage loans including collateral dependent mortgage loans; (3) collectively evaluated mortgage loans; or (4) estimating additional credit losses on mortgage loans.

Mortgage Loans Evaluated at the Individual Master Commitment Level. The credit risk analysis of all conventional MPF loans is performed at the individual master commitment level to determine the credit enhancements available to recover losses on MPF loans under each individual master commitment.

Individually Evaluated Mortgage Loans Including Collateral Dependent Mortgage Loans. Certain conventional mortgage loans, primarily impaired mortgage loans that are considered collateral dependent, may be specifically identified for purposes of calculating the allowance for credit losses. A mortgage loan is considered collateral dependent if repayment is expected to be provided by the sale of the underlying property, that is, if it is considered likely that the borrower will default and there is no credit enhancement from a participating financial institution to offset losses under the master commitment. The estimated credit losses on impaired collateral-dependent loans may be separately determined because sufficient information exists to make a reasonable estimate of the inherent loss on these loans on an individual loan basis. An FHLBank may estimate the fair value of this collateral by applying an appropriate loss severity rate or using third party estimates or property valuation model (s). The incurred loss of an individually evaluated mortgage loan is equal to the difference between the carrying value of the loan and the estimated fair value of the collateral, less estimated selling costs, and may include expected proceeds from primary mortgage insurance and other applicable credit enhancements.

Collectively Evaluated Mortgage Loans. The credit risk analysis of conventional loans evaluated collectively for impairment by an FHLBank considers loan pool specific attribute data, including historical delinquency migration, applies estimated loss severities, and incorporates the associated credit enhancements in order to determine the FHLBank's best estimate of probable incurred losses at the reporting date. Migration analysis is a methodology for determining, through an FHLBank's experience over a historical period, the rate of default on pools of similar loans. Certain FHLBanks apply migration analysis to loans based on payment status categories, such as current, 30, 60, and 90 days past due, as well as to loans 60 days past due following receipt of notice of filing from the bankruptcy court. Each FHLBank then estimates how many loans in these categories may migrate to a realized loss position and applies a loss severity factor to estimate losses incurred at the statement of condition date. The losses are then reduced by the probable cash flows resulting from available credit enhancements. Credit enhancement cash flows that are projected and assessed as not probable of receipt are not considered in reducing the estimated losses.

Estimating Additional Credit Losses on Mortgage Loans. Certain FHLBanks also assess other factors in the estimation of loan losses for their respective homogeneous loan population. These factors represent subjective management judgment based on facts and circumstances that exist as of the reporting date that are unallocated to any specific measurable economic or credit event and are intended to cover other inherent losses that may not otherwise be captured in the methodology. Therefore, the allowance for credit losses that includes these factors represents management's best estimate of probable loan losses. However, the actual loss that may occur on homogeneous pools of mortgage loans may be more or less than the estimated loss.

Rollforward of Allowance for Credit Losses on Mortgage Loans. Each FHLBank established an allowance for credit losses on its conventional mortgage loans held for portfolio. Table 10.1 presents a rollforward of the allowance for credit losses on mortgage loans for the years ended December 31, 2016, 2015, and 2014, and Table 10.2 presents the recorded investment in mortgage loans by impairment methodology at December 31, 2016 and 2015. The recorded investment in a loan is the unpaid principal balance of the loan, adjusted for accrued interest, net deferred loan fees or costs, unamortized premiums or discounts, fair value hedge adjustments, and direct write-downs. The recorded investment is not net of any valuation allowance.

Table 10.1 - Rollforward of Allowance for Credit Losses on Conventional MPF/MPP Mortgage Loans
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Balance, at beginning of period	$ 18	$ 52	$ 88
Charge-offs, net of recoveries	(6)	(38)	(15)
Provision (reversal) for credit losses	6	4	(21)
Balance, at end of period	$ 18	$ 18	$ 52

Table 10.2 - Allowance for Credit Losses and Recorded Investment by Impairment Methodology on Conventional MPF/MPP Mortgage Loans
(dollars in millions)

	December 31,	
	2016	2015
Allowance for credit losses		
Individually evaluated for impairment	$ 6	$ 5
Collectively evaluated for impairment	12	13
Total allowance for credit losses	$ 18	$ 18
Recorded investment		
Individually evaluated for impairment	$ 307	$ 2,661
Collectively evaluated for impairment	44,243	37,568
Total recorded investment	$ 44,550	$ 40,229

Credit Quality Indicators. Key credit quality indicators for mortgage loans include the migration of past due loans, non-accrual loans, loans in process of foreclosure, and impaired loans. Table 10.3 presents the FHLBanks' key credit quality indicators for mortgage loans at December 31, 2016 and 2015.

Table 10.3 - Recorded Investment in Delinquent Mortgage Loans
(dollars in millions)

	December 31, 2016		
	Conventional MPF/MPP	Government-Guaranteed or -Insured	Total
Past due 30-59 days	$ 386	$ 178	$ 564
Past due 60-89 days	102	55	157
Past due 90 days or more	256	75	331
Total past due mortgage loans	744	308	1,052
Total current mortgage loans	43,806	3,850	47,656
Total mortgage loans(1)	$ 44,550	$ 4,158	$ 48,708
Other delinquency statistics			
In process of foreclosure, included above(2)	$ 136	$ 21	$ 157
Serious delinquency rate(3)	0.59%	1.83%	0.69%
Past due 90 days or more and still accruing interest	$ 53	$ 75	$ 128
Loans on non-accrual status	$ 240	$ —	$ 240

	December 31, 2015		
	Conventional MPF/MPP	Government-Guaranteed or -Insured	Total
Past due 30-59 days	$ 402	$ 203	$ 605
Past due 60-89 days	118	61	179
Past due 90 days or more	343	76	419
Total past due mortgage loans	863	340	1,203
Total current mortgage loans	39,366	4,211	43,577
Total mortgage loans(1)	$ 40,229	$ 4,551	$ 44,780
Other delinquency statistics			
In process of foreclosure, included above(2)	$ 183	$ 23	$ 206
Serious delinquency rate(3)	0.86%	1.67%	0.94%
Past due 90 days or more and still accruing interest	$ 66	$ 76	$ 142
Loans on non-accrual status	$ 321	$ —	$ 321

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(1) The difference between the recorded investment and the carrying value of total mortgage loans of $214 million and $205 million at December 31, 2016 and 2015, relates primarily to accrued interest. (See *Note 9 - Mortgage Loans* for details on the carrying values of total mortgage loans.)

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

(3) Represents seriously delinquent loans as a percentage of total mortgage loans. Seriously delinquent loans are comprised of all loans past due 90 days or more delinquent or loans that are in the process of foreclosure (including past due or current loans in the process of foreclosure).

Individually Evaluated Impaired Loans. Table 10.4 presents the recorded investment, unpaid principal balance, and related allowance of impaired conventional MPF/MPP mortgage loans individually assessed for impairment at December 31, 2016 and 2015, and Table 10.5 presents the average recorded investment and related interest income recognized on these loans during the years ended December 31, 2016, 2015, and 2014.

Table 10.4 - Individually Evaluated Impaired Conventional MPF/MPP Mortgage Loans
(dollars in millions)

	December 31, 2016			December 31, 2015		
	Recorded Investment	Unpaid Principal Balance	Related Allowance	Recorded Investment	Unpaid Principal Balance	Related Allowance
With no related allowance	$ 275	$ 281	$ —	$ 312	$ 321	$ —
With an allowance	31	31	6	37	37	5
Total	$ 306	$ 312	$ 6	$ 349	$ 358	$ 5

Table 10.5 - Average Recorded Investment of Individually Impaired Conventional MPF/MPP Mortgage Loans and Related Interest Income Recognized
(dollars in millions)

	Year Ended December 31,					
	2016		2015		2014	
	Average Recorded Investment	Interest Income Recognized	Average Recorded Investment	Interest Income Recognized	Average Recorded Investment	Interest Income Recognized
With no related allowance	$ 294	$ 3	$ 356	$ 4	$ 137	$ 3
With an allowance	34	1	43	1	286	1
Total	$ 328	$ 4	$ 399	$ 5	$ 423	$ 4

Credit Enhancements. An FHLBank's allowance for credit losses considers the credit enhancements associated with conventional mortgage loans under the MPF Program and MPP. These credit enhancements apply after a homeowner's equity is exhausted. Credit enhancements may include primary mortgage insurance, supplemental mortgage insurance, the credit enhancement amount plus any recoverable performance-based credit enhancement fees (for MPF loans), and Lender Risk Account (for MPP loans). The amount of credit enhancements estimated to protect an FHLBank against credit losses is determined through the use of a validated model. Any incurred losses that would be recovered from the credit enhancements are not reserved as part of an FHLBank's allowance for credit losses on mortgage loans.

Mortgage Partnership Finance Program. The conventional MPF loans held for portfolio are required to be credit enhanced so that the risk of loss is limited to the losses equivalent to an investor in at least a triple-B rated mortgage-backed security at the time of purchase. Each MPF FHLBank and its participating financial institution share the risk of credit losses on conventional MPF loan products held for portfolio, by structuring potential losses into layers with respect to each master commitment. Each MPF FHLBank analyzes the risk characteristics of its MPF loans using a model from a nationally recognized statistical rating organization or an equivalent model using a comparable methodology to determine the amount of credit enhancement at the time of purchase. This credit enhancement amount is broken into a First Loss Account and a credit enhancement obligation of a participating financial institution, which is calculated based on the risk analysis to equal the difference between the amounts needed for the master commitment to have a rating equivalent to at least a triple-B rated mortgage-backed security and an MPF FHLBank's initial First Loss Account exposure.

The First Loss Account represents the first layer or portion of credit losses that each MPF FHLBank absorbs with respect to its MPF loans after considering the borrower's equity, primary mortgage insurance, and recoverable credit enhancement fees. The participating financial institution is required to cover the next layer of losses up to an agreed-upon credit enhancement obligation amount, which may consist of a direct liability of the participating financial institution to pay credit losses up to a specified amount, a contractual obligation of a participating financial institution to provide supplemental mortgage insurance, or a combination of both. Any remaining unallocated losses are absorbed by the MPF FHLBank.

Participating financial institutions are paid a credit enhancement fee for assuming credit risk, and in some instances all or a portion of the credit enhancement fee may be performance-based. An MPF FHLBank's losses incurred under the First Loss Account may be recovered by withholding future performance-based credit enhancement fees otherwise payable to the participating financial institutions. If at any time an MPF FHLBank cancels all or a portion of its supplemental mortgage insurance policies required under certain MPF products, that MPF FHLBank will hold additional retained earnings to protect against losses and no performance-based credit enhancement fees are paid to the participating financial institution.

At December 31, 2016 and 2015, the amounts of First Loss Account remaining to cover the losses under the MPF program were $396 million and $385 million. This balance excludes amounts that may be recovered through the recapture of performance-based credit enhancement fees. An FHLBank records credit enhancement fees paid to the participating financial institutions as a reduction to mortgage interest income.

Unlike conventional MPF products held for portfolio, under the MPF Xtra, MPF Direct, MPF Government, and MPF Government MBS products, participating financial institutions are not required to provide credit enhancement and do not receive credit enhancement fees. Loans sold to the FHLBank of Chicago under the MPF Xtra and MPF Direct products are concurrently sold to third-party investors, and are not held on the participating MPF FHLBank's statement of condition. (See *Note 20 - Commitments and Contingencies* for additional information.)

Mortgage Purchase Program. The conventional mortgage loans under the MPP are supported by a combination of primary mortgage insurance, supplemental mortgage insurance, and Lender Risk Account, in addition to the associated property as collateral. The Lender Risk Account is funded by an MPP FHLBank either upfront as a portion of the purchase proceeds or through a portion of the net interest remitted monthly by the borrower. The Lender Risk Account is a lender-specific account funded by an MPP FHLBank in an amount approximately sufficient to cover expected losses on the pool of mortgages. The Lender Risk Account is recorded in other liabilities on the Combined Statement of Condition. To the extent available, Lender Risk Account funds are used to offset any losses that occur. Typically after five years, excess funds over required balances are distributed to the member in accordance with a step-down schedule that is established upon execution of a master commitment contract. The Lender Risk Account is released in accordance with the terms of the master commitment.

Table 10.6 - Changes in the MPP Lender Risk Account
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Balance, at beginning of period	$ 248	$ 191	$ 161
Additions	72	65	40
Claims	(2)	(4)	(6)
Scheduled distributions	(6)	(4)	(4)
Balance, at end of period	$ 312	$ 248	$ 191

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. An FHLBank has granted a concession when it does not expect to collect all amounts due to the FHLBank under the original contract as a result of the restructuring. Loans outstanding as of December 31, 2016 and 2015 that are discharged in Chapter 7 bankruptcy and have not been reaffirmed by the borrowers are also considered to be troubled debt restructurings, except in certain cases where supplemental mortgage insurance policies are held or where all contractual amounts due are still expected to be collected as a result of certain credit enhancements or government guarantees.

An MPF or MPP loan considered to be a troubled debt restructuring is individually evaluated for impairment when determining its related allowance for credit losses. Credit loss is measured by factoring in expected cash shortfalls (i.e., loss severity rate) incurred as of the reporting date as well as the economic loss attributable to delaying the original contractual principal and interest due dates, if applicable. As of December 31, 2016 and 2015, the recorded investment balances of mortgage loans classified as troubled debt restructurings were $152 million and $169 million.

Term Federal Funds Sold and Term Securities Purchased Under Agreements to Resell

These investments are generally short-term, their recorded balance approximates fair value, and they are generally transacted with counterparties that are considered by an individual FHLBank to be of investment quality. FHLBank investments in term federal funds are evaluated for purposes of a reserve for credit losses only if the investment is not paid when due. All investments in term federal funds sold are unsecured and were repaid or expected to be repaid according to the contractual terms as of December 31, 2016 and 2015. Term securities purchased under agreements to resell are considered collateralized financing arrangements and effectively represent short-term loans. The terms of these loans are structured such that if the market value of the underlying securities decreases below the market value required as collateral, the counterparty must place an equivalent amount of additional securities as collateral or remit an equivalent amount of cash. If an agreement to resell is deemed to be impaired, the difference between the fair value of the collateral and the amortized cost of the agreement is charged to earnings. Based upon the collateral held as security, each FHLBank determined that no allowance for credit losses was needed for its term securities purchased under agreements to resell at December 31, 2016 and 2015.

Note 11 - Derivatives and Hedging Activities

Nature of Business Activity

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

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

Each FHLBank reevaluates its hedging strategies from time to time and may change the hedging techniques it uses or may adopt new strategies. The most common ways in which an FHLBank uses derivatives are to:

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

Application of Derivatives

Each FHLBank documents at inception all relationships between derivatives designated as hedging instruments and hedged items, its risk management objectives and strategies for undertaking various hedge transactions, and its method of assessing effectiveness for all derivatives qualifying for hedge accounting. This process includes linking all derivatives that are designated as fair value or cash flow hedges to: (1) assets and liabilities on the statement of condition, (2) firm commitments, or (3) forecasted transactions. An FHLBank also formally assesses (both at the hedge's inception and at least quarterly) whether the derivatives that it uses in hedging transactions have been effective in offsetting changes in the fair value or cash flows of the hedged items attributable to the hedged risk and whether those derivatives may be expected to remain effective in future periods. An FHLBank typically uses regression analyses or other statistical analyses to assess the effectiveness of its hedges.

Derivative instruments are designated by the FHLBanks as:

- A qualifying fair value or cash flow hedge of an associated financial instrument, a firm commitment, or an anticipated transaction.

- A non-qualifying economic hedge to manage certain defined risks on the statement of condition. These hedges are primarily used to: (1) manage mismatches between the coupon features of assets and liabilities, (2) offset prepayment risks in certain assets, (3) mitigate the income statement volatility that occurs when financial instruments are recorded at fair value and hedge accounting is not permitted, or (4) to reduce exposure reset risk.

- A non-qualifying intermediary hedge to meet the asset or liability management needs of its members. An FHLBank acts as an intermediary by entering into derivatives with its members and offsetting derivatives with other counterparties. This intermediation grants smaller members indirect access to the derivatives market. The derivatives used in intermediary activities do not receive hedge accounting treatment and are separately marked-to-market through earnings. The net result of the accounting for these derivatives does not significantly affect the operating results of the FHLBanks.

Each FHLBank transacts most of its derivatives with large banks and major broker-dealers. Some of these banks and broker-dealers, or their affiliates, buy, sell, and distribute consolidated obligations. Derivative transactions may be either executed with a counterparty (uncleared derivatives) or cleared through a Futures Commission Merchant (i.e., clearing agent) with a Derivative Clearing Organization (cleared derivatives). Once a derivative transaction has been accepted for clearing by a Derivative Clearing Organization (Clearinghouse), the derivative transaction is novated and the executing counterparty is replaced with the Clearinghouse. FHLBanks are not derivative dealers and do not trade derivatives for short-term profit.

Types of Derivatives

The FHLBanks primarily use 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 paid 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 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 amount at a variable-rate index for the same period of time. The variable rate received or paid by the FHLBanks in most derivative transactions is the London Interbank Offered Rate (LIBOR).

Options. An option is an agreement between two entities that conveys the right, but not the obligation, to engage in a future transaction on some underlying security or other financial asset at an agreed-upon price during a certain period of time or on a specific date. Premiums paid to acquire options are considered the fair value of the derivative at inception of the hedge and are reported in derivative assets or derivative liabilities.

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. When used as a hedge, a swaption can protect an FHLBank that is planning to lend or borrow funds in the future against future interest rate changes. The FHLBanks 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.

Interest-Rate Cap and Floor Agreements. In an interest-rate cap agreement, a cash flow is generated if the price or rate of an underlying variable rises above a certain threshold (or cap) price. In an interest-rate floor agreement, a cash flow is generated if the price or rate of an underlying variable falls below a certain threshold (or floor) price. Interest-rate caps and floors are designed as protection against the interest rate on a variable-rate asset or liability falling below or rising above a certain level.

Futures and Forwards Contracts. Futures and 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 an FHLBank are considered derivatives. An FHLBank 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.

Types of Hedged Items

An FHLBank may have the following types of hedged items:

Investments. The FHLBanks classify investment securities as held-to-maturity, available-for-sale, or trading securities. The interest-rate and prepayment risks associated with these investment securities are managed through a combination of debt issuance and derivatives. An FHLBank may manage the prepayment and interest-rate risks by funding investment securities with consolidated obligations that have call features or by hedging the prepayment risk with caps or floors, callable swaps or swaptions. An FHLBank may manage prepayment and duration risk by funding investment securities with consolidated obligations that contain call features. An FHLBank 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 an FHLBank that are associated with trading and held-to-maturity securities are designated as economic hedges and derivatives held by an FHLBank associated with available-for-sale securities may qualify as either a fair value hedge, an economic hedge, or a cash flow hedge.

Advances. The FHLBanks offer a wide range of fixed- and variable-rate advance products with different maturities, interest rates, payment characteristics, and optionality. An FHLBank may use derivatives to manage the repricing and/or option characteristics of advances in order to more closely match the characteristics of that FHLBank's funding liabilities. In general, whenever a member executes a fixed-rate advance or a variable-rate advance with embedded options, the FHLBank may simultaneously execute a derivative with terms that offset the terms and embedded options, in the advance. For example, an FHLBank may hedge a fixed-rate advance with an interest-rate swap where the FHLBank pays a fixed-rate and receives a variable-rate, effectively converting the fixed-rate advance to a variable-rate advance. This type of hedge is typically treated as a fair value hedge. In addition, an FHLBank may hedge a callable, prepayable, convertible or putable advance by entering into a cancelable interest-rate swap.

Mortgage Loans. The FHLBanks invest 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 FHLBanks manage the interest-rate and prepayment risks associated with mortgage loans through a combination of debt issuance and derivatives. The FHLBanks issue 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. Interest-rate swaps, to the extent the payments on the mortgage loans result in a simultaneous reduction of the notional amount on the swaps, may receive fair value hedge accounting.

A combination of swaps and options, including futures, may be used as a portfolio of derivatives linked to a portfolio of mortgage loans. The portfolio of mortgage loans consists of one or more pools of similar assets, as determined by factors such as product type and coupon. As the portfolio of loans changes due to new loans, liquidations, and payments, the derivative portfolio is modified accordingly to hedge the interest-rate and prepayment risks effectively. A new hedging relationship is created and is treated as a fair value hedge.

The FHLBanks may also enter into interest-rate caps and floors, swaptions, callable swaps, and calls and puts to minimize the prepayment risk embedded in the mortgage loans. These type of hedges are treated as economic hedges as they are not identified to specific mortgage loans and are marked-to-market through earnings.

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

For example, an FHLBank may issue a fixed-rate consolidated obligation and simultaneously enter into a matching derivative in which the FHLBank receives a fixed cash flow designed to match in timing and amount the cash outflows the FHLBank pays on the consolidated obligation and the FHLBank pays a variable cash flow that closely matches the interest payments it receives on short-term or variable-rate advances (typically one- or three-month LIBOR). These transactions are typically treated as fair value hedges. The FHLBanks may issue variable-rate consolidated obligations indexed to the federal funds effective rate, LIBOR, or others and simultaneously execute interest-rate swaps to hedge the basis risk of the variable-rate debt. This type of hedge is treated as an economic hedge and is marked-to-market through earnings.

This strategy of issuing consolidated obligations while simultaneously entering into derivatives enables an FHLBank to offer a wider range of attractively-priced advances to its members and may allow an FHLBank to reduce its funding costs. The continued attractiveness of this strategy depends on yield relationships between the FHLBank's consolidated obligations and the derivatives markets. If conditions change, an FHLBank may alter the types or terms of the consolidated obligations that it issues.

Anticipated Streams of Future Cash Flows. An FHLBank may enter into an option to hedge a specified future variable cash stream as a result of rolling over short-term, fixed-rate financial instruments, such as LIBOR advances and consolidated discount notes. The option will effectively cap the variable cash stream at a predetermined target rate.

Firm Commitments. Certain mortgage loan purchase commitments are considered derivatives. An FHLBank normally hedges these commitments by selling TBA mortgage-backed securities or other derivatives 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 with the basis of the mortgage loan and amortized accordingly.

An FHLBank may also hedge a firm commitment for a forward-starting advance through the use of an interest-rate swap. In this case, the interest-rate swap functions as the hedging instrument for both the firm commitment and the subsequent advance and is treated as a fair value hedge. If the hedge relationship is de-designated when the commitment is terminated and the advance is issued, the fair value change associated with the firm commitment is recorded as a basis adjustment of the advance and amortized accordingly. In addition, if a hedged firm commitment no longer qualifies as a fair value hedge, the hedge would be terminated and net gains and losses would be recognized in current period earnings. There were no material amounts of gains and losses recognized due to disqualification of firm commitment hedges during the years ended December 31, 2016, 2015, and 2014.

Anticipated Debt Issuance. Certain FHLBanks use derivatives to lock in the cost of funding prior to an anticipated debt issuance and designate them as cash flow hedges. The derivative is terminated upon issuance of the debt instrument.

Variable Cash Streams. Certain FHLBanks use derivatives to hedge the variability of cash flows over a specified period of time as a result of the issuances and maturities of short-term, fixed-rate instruments, such as discount notes, and designate them as cash flow hedges. The maturity dates of the cash flow streams are matched to the maturity dates of the derivatives. If the derivatives are terminated prior to their maturity dates, the amount in AOCI is recognized over the remaining lives of the specified cash streams as unrealized gains or losses on hedging activities.

Financial Statement Effect and Additional Financial Information

Derivative Notional Amounts. The notional amount of derivatives serves as a factor in determining periodic interest payments or cash flows received and paid. However, the notional amount of derivatives reflects the FHLBanks' involvement in the various classes of financial instruments and represents neither the actual amounts exchanged nor the overall exposure of the FHLBanks to credit and market risk; the overall risk is much smaller. The risks of derivatives 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 presents the notional amount and fair value of derivative instruments, including 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
(dollars in millions)

	December 31, 2016			December 31, 2015		
	Notional Amount of Derivatives	Derivative Assets	Derivative Liabilities	Notional Amount of Derivatives	Derivative Assets	Derivative Liabilities
Derivatives designated as hedging instruments						
Interest-rate swaps	$ 345,673	$ 1,923	$ 4,273	$ 354,657	$ 1,447	$ 5,636
Interest-rate swaptions	3	—	—	4	—	—
Interest-rate caps or floors	—	—	—	60	—	—
Total derivatives designated as hedging instruments	345,676	1,923	4,273	354,721	1,447	5,636
Derivatives not designated as hedging instruments						
Interest-rate swaps	123,240	520	627	139,185	605	752
Interest-rate swaptions	3,111	54	—	1,776	41	—
Interest-rate caps or floors	26,671	75	13	28,615	111	12
Interest-rate futures or forwards	767	2	1	620	2	—
Mortgage delivery commitments	1,584	4	15	1,207	2	3
Other	328	6	5	176	1	—
Total derivatives not designated as hedging instruments	155,701	661	661	171,579	762	767
Total derivatives before netting and collateral adjustments	$ 501,377	2,584	4,934	$ 526,300	2,209	6,403
Netting adjustments and cash collateral(1)		(1,177)	(4,124)		(1,454)	(5,272)
Total derivative assets and total derivative liabilities		$ 1,407	$ 810		$ 755	$ 1,131

(1) Amounts represent the application of the netting requirements that allow an FHLBank to settle positive and negative positions and also cash collateral and related accrued interest held or placed by that FHLBank with the same clearing agent and/or counterparty. Cash collateral posted and related accrued interest was $3,600 million and $4,363 million at December 31, 2016 and 2015. Cash collateral received and related accrued interest was $653 million and $544 million at December 31, 2016 and 2015.

Table 11.2 presents the components of net gains (losses) on derivatives and hedging activities as presented on the Combined Statement of Income.

Table 11.2 - Net Gains (Losses) on Derivatives and Hedging Activities
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Derivatives designated as hedging instruments			
Total net gains related to fair value hedge ineffectiveness(1)	$ 159	$ 230	$ 74
Total net gains related to cash flow hedge ineffectiveness	5	2	1
Derivatives not designated as hedging instruments			
Economic hedges			
Interest-rate swaps	(28)	9	(29)
Interest-rate swaptions	6	3	(13)
Interest-rate caps or floors	(42)	(44)	(126)
Interest-rate futures or forwards	6	(5)	(30)
Net interest settlements	(64)	(33)	(70)
Other	3	—	—
Mortgage delivery commitments	1	18	44
Intermediary interest-rate swap transactions	1	2	1
Total net gains (losses) related to derivatives not designated as hedging instruments	(117)	(50)	(223)
Net gains (losses) on derivatives and hedging activities	$ 47	$ 182	$ (148)

(1) Consists of interest-rate swaps.

Table 11.3 presents, by type of hedged item, the gains (losses) on derivatives and the related hedged items in fair value hedging relationships and the effect of those derivatives on the FHLBanks' net interest income.

Table 11.3 - Effect of Fair Value Hedge-Related Derivative Instruments
(dollars in millions)

	Year Ended December 31, 2016			
Hedged Item Type	Gains (Losses) on Derivatives	Gains (Losses) on Hedged Items	Net Fair Value Hedge Ineffectiveness	Net Effect of Derivatives on Net Interest Income(1)
Advances	$ 1,740	$ (1,582)	$ 158	$ (1,716)
Consolidated bonds	(1,174)	1,143	(31)	872
Consolidated discount notes	2	(5)	(3)	(3)
Available-for-sale securities	764	(729)	35	(643)
Total	$ 1,332	$ (1,173)	$ 159	$ (1,490)

	Year Ended December 31, 2015			
Hedged Item Type	Gains (Losses) on Derivatives	Gains (Losses) on Hedged Items	Net Fair Value Hedge Ineffectiveness	Net Effect of Derivatives on Net Interest Income(1)
Advances	$ 1,333	$ (1,056)	$ 277	$ (2,807)
Consolidated bonds	(167)	139	(28)	1,870
Consolidated discount notes	(6)	8	2	10
Available-for-sale securities	15	(36)	(21)	(691)
Total	$ 1,175	$ (945)	$ 230	$ (1,618)

Hedged Item Type	Year Ended December 31, 2014			
	Gains (Losses) on Derivatives	Gains (Losses) on Hedged Items	Net Fair Value Hedge Ineffectiveness	Net Effect of Derivatives on Net Interest Income(1)
Advances	$ 713	$ (552)	$ 161	$ (3,174)
Consolidated bonds	814	(842)	(28)	2,036
Available-for-sale securities	(670)	611	(59)	(658)
Deposits	(1)	1	—	1
Total	$ 856	$ (782)	$ 74	$ (1,795)

(1) The net effect of derivatives, in fair value hedge relationships, on net interest income is included in the interest income or interest expense line item of the respective hedged item type. These amounts include the effect of net interest settlements attributable to designated fair value hedges but do not include $(74) million, $(298) million, and $(124) million of amortization/accretion related to fair value hedging activities for the years ended December 31, 2016, 2015, and 2014.

Table 11.4 presents by type of hedged item in cash flow hedging relationships, the gains (losses) recognized in OCI, the gains (losses) reclassified from AOCI into income, and the effect of those hedging activities on the FHLBanks' net gains (losses) on derivatives and hedging activities on the Combined Statement of Income. (See *Note 17 - Accumulated Other Comprehensive Income (Loss)* for more details on the effect of cash flow hedges on AOCI.)

Table 11.4 - Effect of Cash Flow Hedge-Related Derivative Instruments
(dollars in millions)

Derivatives and Hedged Items in Cash Flow Hedging Relationships(1)	Year Ended December 31, 2016			
	Amount of Gains (Losses) Recognized in OCI on Derivatives (Effective Portion)	Location of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains Recognized in Net Gains (Losses) on Derivatives and Hedging Activities (Ineffective Portion)
Interest-rate swaps				
Consolidated bonds	$ 6	Interest expense	$ (29)	$ —
Consolidated discount notes	215	Interest expense	(5)	5
Interest-rate caps or floors				
Advances	—	Interest income	10	—
Total	$ 221		$ (24)	$ 5

Derivatives and Hedged Items in Cash Flow Hedging Relationships(1)	Year Ended December 31, 2015			
	Amount of Gains (Losses) Recognized in OCI on Derivatives (Effective Portion)	Location of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains Recognized in Net Gains (Losses) on Derivatives and Hedging Activities (Ineffective Portion)
Interest-rate swaps				
Consolidated bonds	$ (16)	Interest expense	$ (29)	$ —
Consolidated discount notes	120	Interest expense	(3)	2
Interest-rate caps or floors				
Advances	—	Interest income	11	—
Total	$ 104		$ (21)	$ 2

Derivatives and Hedged Items in Cash Flow Hedging Relationships(1)	Year Ended December 31, 2014			
	Amount of Gains (Losses) Recognized in OCI on Derivatives (Effective Portion)	Location of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains (Losses) Reclassified from AOCI into Income (Effective Portion)	Amount of Gains Recognized in Net Gains (Losses) on Derivatives and Hedging Activities (Ineffective Portion)
Interest-rate swaps				
Consolidated bonds	$ (39)	Interest expense	$ (14)	$ —
Consolidated discount notes	34	Interest expense	(2)	1
Interest-rate caps or floors				
Advances	—	Interest income	11	—
Total	$ (5)		$ (5)	$ 1

(1) Table 11.4 does not include $(231) million, $(276) million, and $(281) million for the effect of net interest settlements on net interest income attributable to open cash flow hedges for the years ended December 31, 2016, 2015, and 2014.

For the years ended December 31, 2016, 2015, and 2014, no material amounts were reclassified from AOCI into earnings as a result of discontinued cash flow hedges because the original forecasted transactions occurred by the end of the originally specified time period or within a two-month period thereafter. At December 31, 2016, $22 million of deferred net losses on derivative instruments in AOCI is expected to be reclassified to earnings during the next twelve months. At December 31, 2016, the maximum length of time over which an FHLBank is hedging its exposure to the variability in future cash flows for forecasted transactions is fifteen years, excluding those forecasted transactions related to the payment of variable interest on existing financial instruments.

Managing Credit Risk on Derivatives

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

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

Certain of the FHLBanks' uncleared derivative instruments contain provisions that require an FHLBank to post additional collateral with its counterparties if there is deterioration in that FHLBank's credit rating. If an FHLBank's credit rating is lowered by a nationally recognized statistical rating organization, that FHLBank may be required to deliver additional collateral on uncleared derivative instruments in net liability positions. The aggregate fair value of all uncleared derivative instruments with credit-risk-related contingent features that were in a net liability position (before cash collateral and related accrued interest) at December 31, 2016, was $1.5 billion, for which the FHLBanks have posted collateral with a fair value of $1.2 billion in the normal course of business. If each FHLBank's credit rating had been lowered from its current rating to the next lower rating that would have triggered additional collateral to be delivered, the FHLBanks would have been required to deliver an additional $0.2 billion of collateral at fair value to their uncleared derivatives counterparties at December 31, 2016.

Cleared Derivatives. For cleared derivatives, the Clearinghouse is an FHLBank's counterparty. The Clearinghouse notifies the clearing agent of the required initial and variation margin and the clearing agent in turn notifies the FHLBank. The requirement that an FHLBank post initial and variation margin, through the clearing agent to the Clearinghouse, exposes an FHLBank to credit risk if the clearing agent or the Clearinghouse fails to meet its obligations. The use of cleared derivatives is intended to mitigate credit risk exposure because a central counterparty is substituted for individual counterparties and collateral for changes in the fair value of cleared derivatives is posted daily through a clearing agent.

Each FHLBank has analyzed the enforceability of offsetting rights incorporated in its cleared derivative transactions and determined that the exercise of those offsetting rights by a non-defaulting party under these transactions should be upheld under applicable law upon an event of default including a bankruptcy, insolvency, or similar proceeding involving the Clearinghouse or that FHLBank's clearing agent, or both. Based on this analysis, each FHLBank presents a net derivative receivable or payable for all of its transactions through a particular clearing agent with a particular Clearinghouse. 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. None of the FHLBanks were required to post additional initial margin by its clearing agents, based on credit considerations, at December 31, 2016.

Offsetting of Derivative Assets and Derivative Liabilities

An FHLBank presents derivative instruments, related cash collateral, including initial and variation margin, received or pledged, and associated accrued interest, on a net basis by clearing agent and/or by counterparty when it has met the netting requirements.

Table 11.5 presents separately the fair value of derivative instruments meeting or not meeting netting requirements, with and without the legal right of offset, including the related collateral received from or pledged to counterparties.

Table 11.5 - Offsetting of Derivative Assets and Derivative Liabilities
(dollars in millions)

	December 31, 2016		December 31, 2015	
	Derivative Assets	Derivative Liabilities	Derivative Assets	Derivative Liabilities
Derivative instruments meeting netting requirements				
Gross recognized amount				
Uncleared derivatives	$ 947	$ 2,586	$ 1,446	$ 4,667
Cleared derivatives	1,632	2,333	761	1,733
Total gross recognized amount	2,579	4,919	2,207	6,400
Gross amounts of netting adjustments and cash collateral				
Uncleared derivatives	(789)	(1,802)	(1,384)	(3,550)
Cleared derivatives	(388)	(2,322)	(70)	(1,722)
Total gross amounts of netting adjustments and cash collateral	(1,177)	(4,124)	(1,454)	(5,272)
Net amounts after netting adjustments and cash collateral				
Uncleared derivatives	158	784	62	1,117
Cleared derivatives	1,244	11	691	11
Total net amounts after netting adjustments and cash collateral	1,402	795	753	1,128
Derivative instruments not meeting netting requirements(1)				
Uncleared derivatives	5	15	2	3
Total derivative instruments not meeting netting requirements(1)	5	15	2	3
Total derivative assets and total derivative liabilities				
Uncleared derivatives	163	799	64	1,120
Cleared derivatives	1,244	11	691	11
Total derivative assets and total derivative liabilities presented on the Combined Statement of Condition	1,407	810	755	1,131
Non-cash collateral received or pledged not offset				
Can be sold or repledged				
Uncleared derivatives	—	30	12	64
Cleared derivatives	—	2	—	—
Total can be sold or repledged	—	32	12	64
Cannot be sold or repledged				
Uncleared derivatives	113	291	16	332
Cleared derivatives(2)	(2)	9	—	11
Total cannot be sold or repledged	111	300	16	343
Net amount(3)				
Uncleared derivatives	50	478	36	724
Cleared derivatives	1,246	—	691	—
Total net amount(3)	$ 1,296	$ 478	$ 727	$ 724

(1) Represents derivatives that are not subject to an enforceable netting agreement (e.g., mortgage delivery commitments and certain interest-rate futures or forwards).
(2) The $2 million represents non-cash collateral pledged for initial margin for cleared derivatives at December 31, 2016.
(3) Any overcollateralization at an FHLBank's individual clearing agent and/or counterparty level is not included in the determination of the net amount. At December 31, 2016 and 2015, the FHLBanks had additional net credit exposure of $700 million and $353 million due to instances where an FHLBank's non-cash collateral to a counterparty exceeded the FHLBank's net derivative liability position.

Note 12 - Deposits

The FHLBanks offer demand and overnight deposit programs to members and qualifying non-members. In addition, certain FHLBanks offer short-term interest-bearing deposit programs to members, and in certain cases, qualifying non-members. A member that services mortgage loans may deposit in its FHLBank funds collected in connection with the mortgage loans, pending disbursement of these funds to the owners of the mortgage loans. The FHLBanks classify these items as other 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. The weighted-average interest rates paid on interest-bearing deposits were 0.20%, 0.03%, and 0.02% during the years ended December 31, 2016, 2015, and 2014.

Table 12.1 - Deposits
(dollars in millions)

	December 31, 2016	December 31, 2015
Interest-bearing		
Demand and overnight	$ 7,101	$ 7,635
Term	634	489
Other	13	15
Total interest-bearing	7,748	8,139
Non-interest-bearing		
Demand and overnight	167	252
Other	174	142
Total non-interest-bearing	341	394
Total deposits	$ 8,089	$ 8,533

The aggregate amount of term deposits with a denomination of $250 thousand or more was $633 million and $488 million at December 31, 2016 and 2015.

Note 13 - Consolidated Obligations

Consolidated obligations consist of consolidated bonds and consolidated discount notes. The FHLBanks issue consolidated obligations through the Office of Finance as their agent. In connection with each debt issuance, an 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, each FHLBank records as a liability its specific portion of consolidated obligations for which it is the primary obligor.

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

Although each FHLBank is primarily liable for its portion of consolidated obligations, each FHLBank is also jointly and severally liable with the other FHLBanks for the payment of principal and interest on all consolidated obligations of the FHLBanks. The par values of the FHLBanks' outstanding consolidated obligations, including consolidated obligations held by other FHLBanks, were $989.3 billion and $905.2 billion at December 31, 2016 and 2015. The FHFA, 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 that 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, FHFA regulations provide that the paying FHLBank is entitled to reimbursement from the non-complying FHLBank for any payments made on its behalf and other associated costs, including interest to be determined by the FHFA. If, however, the FHFA determines that the non-complying FHLBank is unable to satisfy its repayment obligations, then the FHFA may allocate the outstanding liabilities of the non-complying 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.

Regulations require each FHLBank 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 FHLBank 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 millions)

	Book Value	Par Value	Weighted-Average Interest Rate(1)
December 31, 2016	$ 409,815	$ 410,122	0.48%
December 31, 2015	$ 494,045	$ 494,343	0.26%

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(1) Represents yield to maturity excluding concession fees.

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

	December 31,			
	2016		2015	
Year of Contractual Maturity	Amount	Weighted-Average Interest Rate	Amount	Weighted-Average Interest Rate
Due in 1 year or less	$ 335,399	0.86%	$ 192,642	0.75%
Due after 1 year through 2 years	109,532	1.06%	86,088	1.27%
Due after 2 years through 3 years	44,422	1.48%	40,794	1.52%
Due after 3 years through 4 years	18,798	2.07%	22,917	1.89%
Due after 4 years through 5 years	28,007	1.77%	20,628	2.11%
Thereafter	42,687	2.67%	47,354	2.82%
Index-amortizing notes	123	4.74%	158	4.73%
Total par value	578,968	1.16%	410,581	1.31%
Net premiums	436		570	
Hedging adjustments	(437)		721	
Fair value option valuation adjustments	(40)		(21)	
Total	$ 578,927		$ 411,851	

Consolidated obligations outstanding were issued with either fixed-rate coupon payment terms or variable-rate coupon payment terms that may use a variety of indices for interest-rate resets, such as LIBOR. To meet the specific needs of certain investors in consolidated obligations, both fixed-rate consolidated bonds and variable-rate consolidated bonds may contain features that result in complex coupon payment terms and call options. When these consolidated obligations are issued, an FHLBank may enter into derivatives containing features that offset the terms and embedded options, if any, of the consolidated bond obligations.

Table 13.3 - Consolidated Bonds Outstanding by Call Features
(dollars in millions)

	December 31,	
Par Value of Consolidated Bonds	2016	2015
Non-callable/non-putable	$ 513,846	$ 336,930
Callable	65,122	73,651
Total par value	$ 578,968	$ 410,581

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

Year of Contractual Maturity or Next Call Date	December 31, 2016	December 31, 2015
Due in 1 year or less	$ 395,363	$ 260,664
Due after 1 year through 2 years	99,898	80,929
Due after 2 years through 3 years	38,185	25,982
Due after 3 years through 4 years	13,441	13,234
Due after 4 years through 5 years	14,927	9,956
Thereafter	17,031	19,658
Index-amortizing notes	123	158
Total par value	$ 578,968	$ 410,581

Consolidated bonds, beyond having fixed-rate or simple variable-rate interest-rate payment terms, may also have the following interest-rate payment types:

- *Step-up bonds* pay interest at increasing fixed rates and *step-down bonds* pay interest at decreasing fixed rates for specified intervals over the life of the consolidated bond. These consolidated bonds generally contain provisions enabling an FHLBank to call consolidated bonds at its option on the step-up or step-down dates.
- *Conversion bonds* have interest rates that convert from fixed to variable, or variable to fixed, or from one index to another, on predetermined dates according to the terms of the consolidated bond offerings.
- *Range bonds* pay interest based on the number of days a specified index is within/outside of a specified range. The computation of the variable interest rate differs for each consolidated bond issue, but the consolidated bond generally pays zero interest or a minimal rate if the specified index is outside of the specified range.

Table 13.5 - Consolidated Bonds by Interest-Rate Payment Type
(dollars in millions)

Par Value of Consolidated Bonds	December 31, 2016	December 31, 2015
Simple variable-rate	$ 301,325	$ 97,417
Fixed-rate	261,777	295,240
Step-up	13,051	14,886
Step-down	1,555	2,106
Fixed-rate that converts to variable-rate	1,020	675
Range bonds	130	190
Other	110	67
Total par value	$ 578,968	$ 410,581

Consolidated Bonds Denominated in Foreign Currencies. Consolidated bonds issued can be denominated in foreign currencies. Concurrent with these issuances, the FHLBanks exchange the interest and principal payment obligations related to the issues for equivalent amounts denominated in U.S. dollars. There were no consolidated bonds denominated in foreign currencies outstanding at December 31, 2016 and 2015.

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 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. Annually, the FHLBanks must set aside for the AHP the greater of the aggregate of $100 million or 10% of each individual FHLBank's income subject to assessment. For purposes of the AHP calculation, each FHLBank's income subject to assessment is defined as the individual FHLBank's net income before assessments, plus interest expense related to mandatorily redeemable capital stock. Each FHLBank accrues this expense monthly based on its net earnings. An FHLBank reduces its AHP liability as members use subsidies.

If an FHLBank experienced a net loss during a quarter, but still had net earnings for the year, the FHLBank's obligation to the AHP would be calculated based on the FHLBank's year-to-date net earnings. If the FHLBank had net earnings in subsequent quarters, it would be required to contribute additional amounts to meet its calculated annual obligation. If the FHLBank experienced a net loss for a full year, the FHLBank would have no obligation to the AHP for the year, because each FHLBank's required annual AHP contribution is limited to its annual net earnings. If the aggregate 10% calculation previously discussed was less than $100 million for the FHLBanks, each FHLBank would be required to assure that the aggregate contribution of the FHLBanks equals $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, subject to the annual earnings limitation as previously discussed. In addition to the required AHP assessment, an FHLBank's board of directors may elect to make voluntary contributions to the AHP. There was no shortfall in the years ended December 31, 2016, 2015, or 2014. If an FHLBank finds that its required contributions are contributing to the financial instability of that FHLBank, it may apply to the FHFA for a temporary suspension of its contributions. The FHLBanks did not make any such applications in the years ended December 31, 2016, 2015, or 2014.

The FHLBanks had outstanding principal of $199 million and $217 million at December 31, 2016 and 2015 related to AHP advances.

Table 14.1 - Analysis of AHP Liability
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Balance, at beginning of year	$ 841	$ 794	$ 788
Assessments	392	332	269
Subsidy usage, net(1)	(287)	(285)	(263)
Balance, at end of year	$ 946	$ 841	$ 794

(1) Amounts may not agree to the Affordable Housing Program payments, net amounts on the Combined Statement of Cash Flows for each applicable period due to rounding.

Note 15 - Subordinated Notes

As approved by the Federal Housing Finance Board (predecessor to the FHFA), the FHLBank of Chicago issued $1 billion of 10-year subordinated notes in 2006, and during 2013, the FHLBank of Chicago purchased $56 million of these notes in the open market. On June 13, 2016, the FHLBank of Chicago's remaining $944 million subordinated notes matured and the FHLBank of Chicago paid the holders of its subordinated notes in full in accordance with the terms of the notes.

Note 16 - Capital

Each FHLBank is subject to three capital requirements under its capital plan and the FHFA rules and regulations. Regulatory capital does not include AOCI, but does include mandatorily redeemable capital stock.

1. *Risk-based capital.* Each FHLBank 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 FHFA.

2. *Total regulatory capital.* Each FHLBank is required to maintain at all times a total 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 FHFA as available to absorb losses (including additional capital from merger).

3. *Leverage capital.* Each FHLBank is required to 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 FHFA may require an FHLBank to maintain greater minimum capital levels than are required based on FHFA rules and regulation. At December 31, 2016, each FHLBank was in compliance with FHFA regulatory capital requirements.

Table 16.1 - Risk-Based Capital Requirements at December 31, 2016
(dollars in millions)

	Risk-Based Capital	
FHLBank	Minimum Requirement	Actual
Boston	$ 616	$ 3,661
New York	748	7,751
Pittsburgh	908	4,746
Atlanta	1,701	6,848
Cincinnati	580	5,026
Indianapolis	761	2,550
Chicago	1,088	5,032
Des Moines	1,046	8,031
Dallas	684	2,757
Topeka	333	1,800
San Francisco	2,241	5,883

Table 16.2 - Regulatory Capital Requirements at December 31, 2016
(dollars in millions)

	Regulatory Capital Ratio		Regulatory Capital	
FHLBank	Minimum Requirement	Actual	Minimum Requirement	Actual
Boston	4.0%	5.9%	$ 2,462	$ 3,661
New York	4.0%	5.4%	5,744	7,751
Pittsburgh	4.0%	4.7%	4,050	4,746
Atlanta	4.0%	4.9%	5,547	6,848
Cincinnati	4.0%	4.8%	4,185	5,026
Indianapolis	4.0%	4.7%	2,156	2,550
Chicago	4.0%	6.4%	3,148	5,032
Des Moines	4.0%	4.5%	7,224	8,083
Dallas	4.0%	4.7%	2,328	2,757
Topeka	4.0%	4.3%	1,809	1,965
San Francisco	4.0%	6.4%	3,678	5,883

Table 16.3 - Leverage Capital Requirements at December 31, 2016
(dollars in millions)

	Leverage Capital Ratio		Leverage Capital	
FHLBank	Minimum Requirement	Actual	Minimum Requirement	Actual
Boston	5.0%	8.9%	$ 3,077	$ 5,491
New York	5.0%	8.1%	7,180	11,627
Pittsburgh	5.0%	7.0%	5,063	7,120
Atlanta	5.0%	7.4%	6,934	10,273
Cincinnati	5.0%	7.2%	5,232	7,539
Indianapolis	5.0%	7.1%	2,695	3,825
Chicago	5.0%	9.6%	3,935	7,549
Des Moines	5.0%	6.7%	9,030	12,098
Dallas	5.0%	7.1%	2,911	4,136
Topeka	5.0%	6.3%	2,261	2,865
San Francisco	5.0%	9.6%	4,597	8,825

Capital Stock

Each FHLBank is a cooperative whose member financial institutions and former members own all of the FHLBank's capital stock. Shares of capital stock cannot be purchased or sold except between an FHLBank and its members at its $100 per share par value, as mandated by each FHLBank's capital plan.

Members can redeem Class A stock by giving six-months written notice, and members can redeem Class B stock by giving five-years written notice, subject to certain restrictions. Any member that withdraws from membership may not be readmitted to membership in any FHLBank until five years from the divestiture date for all capital stock that is held as a condition of membership, as that requirement is set out in an FHLBank's capital plan, unless the institution has canceled its notice of withdrawal prior to that date. This restriction does not apply if the member is transferring its membership from one FHLBank to another on an uninterrupted basis.

In accordance with the FHLBank Act, each class of FHLBank stock is considered putable by the member and an FHLBank may repurchase, at 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 an FHLBank repurchased (at an FHLBank'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 in part on whether the FHLBank is in compliance with those restrictions.

An FHLBank's board of directors may declare and pay dividends in either cash or capital stock, assuming the FHLBank is in compliance with FHFA rules.

Additional Capital from Merger

As a result of the merger between the FHLBanks of Des Moines and Seattle, effective May 31, 2015, the FHLBank of Des Moines recognized net assets acquired from the FHLBank of Seattle by recording the par value of capital stock issued in the transaction as capital stock, with the remaining portion of net assets acquired recorded as additional capital from merger. The FHLBank of Des Moines treats this additional capital from merger as a component of total capital for regulatory capital purposes. Following the merger, the FHLBank of Des Moines began distributing dividends on capital stock from additional capital from merger. For the years ended December 31, 2016 and 2015, the FHLBank of Des Moines paid dividends in the amount of $142 million and $52 million. At December 31, 2016 and 2015, the additional capital from merger balance was $52 million and $194 million. The FHLBank of Des Moines intends to pay future dividends, when and if declared, from this account until the additional capital from merger balance is depleted.

Restricted Retained Earnings

The Joint Capital Enhancement Agreement, as amended (Capital Agreement), is intended to enhance the capital position of each FHLBank. The Capital Agreement provides that each FHLBank will allocate 20% 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.

The FHLBank of San Francisco's Excess Stock Repurchase, Retained Earnings, and Dividend Framework establishes amounts to be retained in restricted retained earnings, which are not made available for dividends in the current dividend period. These amounts are not related to the Capital Agreement; however, they are also classified as restricted retained earnings on the Combined Statement of Condition. The FHLBank of San Francisco retains in restricted retained earnings any cumulative net gains in earnings (net of applicable assessments) resulting from gains or losses on derivatives and associated hedged items and financial instruments carried at fair value (valuation adjustments). In addition to any cumulative net gains resulting from valuation adjustments, the FHLBank of San Francisco holds an additional amount in restricted retained earnings intended to protect paid-in capital from the effects of an extremely adverse credit event, an extremely adverse operations risk event, a cumulative net loss related to the FHLBank of San Francisco's derivatives and associated hedged items and financial instruments carried at fair value, an extremely adverse change in the market value of the FHLBank of San Francisco's capital, a significant amount of additional credit-related OTTI on private-label residential MBS, or some combination of these effects, especially in periods of extremely low net income, and to maintain capital compliance.

Table 16.4 presents the components of retained earnings, including the restricted amounts related to the Capital Agreement and the restricted amounts related to the FHLBank of San Francisco's Excess Stock Repurchase, Retained Earnings, and Dividend Framework.

Table 16.4 - Retained Earnings
(dollars in millions)

	Unrestricted Retained Earnings	Capital Agreement Restricted Retained Earnings	Other Restricted Retained Earnings(1)	Total Restricted Retained Earnings	Total Retained Earnings
Balance, December 31, 2013	$ 9,080	$ 1,216	$ 1,888	$ 3,104	$ 12,184
Adjustment for cumulative effect of accounting change - change in amortization methodology(2)	(37)	(6)	—	(6)	(43)
Net income	1,849	459	(53)	406	2,255
Dividends on capital stock					
Cash	(1,134)	—	—	—	(1,134)
Stock	(51)	—	—	—	(51)
Balance, December 31, 2014	9,707	1,669	1,835	3,504	13,211
Net income	2,302	584	(25)	559	2,861
Transfers to unrestricted/(from) restricted retained earnings(1)	150	—	(150)	(150)	—
Merger activity(3)	(250)	(63)	—	(63)	(313)
Dividends on capital stock					
Cash	(1,389)	—	—	—	(1,389)
Stock	(73)	—	—	—	(73)
Balance, December 31, 2015	10,447	2,190	1,660	3,850	14,297
Net income	2,717	683	8	691	3,408
Dividends on capital stock					
Cash	(1,280)	—	—	—	(1,280)
Stock	(95)	—	—	—	(95)
Balance, December 31, 2016	$ 11,789	$ 2,873	$ 1,668	$ 4,541	$ 16,330

(1) Represents retained earnings restricted by the FHLBank of San Francisco's Excess Stock Repurchase, Retained Earnings, and Dividend Framework related to valuation adjustments and the retained earnings buildup. On July 31, 2015, the FHLBank of San Francisco's board of directors lowered the requirement for the retained earnings build up from $1.8 billion to $1.65 billion and transferred $150 million to unrestricted retained earnings.

(2) Represents the FHLBank of Cincinnati's change in method of accounting for the amortization and accretion of premiums and discounts, and hedging adjustments on its mortgage loans held for portfolio to the contractual interest method. (See *Note 1 - Summary of Significant Accounting Policies* for additional information related to the FHLBank of Cincinnati's change in accounting principle.)

(3) Represents the elimination of the FHLBank of Seattle's closing retained earnings balance in connection with the merger.

Mandatorily Redeemable Capital Stock

An FHLBank generally reclassifies capital stock subject to redemption from capital to the mandatorily redeemable capital stock liability upon expiration of a grace period, if applicable, after a member exercises a written redemption right, or gives notice of intent to withdraw from membership, or attains non-member status by merger or acquisition, relocation, charter termination, or involuntary termination from membership. Shares of capital stock meeting these definitions are reclassified to mandatorily redeemable capital stock at fair value. Dividends related to capital stock classified as mandatorily redeemable capital stock are accrued at the expected dividend rate and reported as interest expense on the Combined Statement of Income. For the years ended December 31, 2016, 2015, and 2014, dividends on mandatorily redeemable capital stock in the amount of $101 million, $75 million, and $138 million were recorded as interest expense.

A member may cancel or revoke its written notice of redemption or its notice of withdrawal from membership prior to the end of the applicable redemption period. Each FHLBank's capital plan provides the terms for cancellation fees that may be incurred by the member upon cancellation.

Table 16.5 presents capital stock subject to mandatory redemption. Payment is contingent on each FHLBank's waiting period and the FHLBank's ability to meet its minimum regulatory capital requirements. These amounts have been classified as a liability on the Combined Statement of Condition. The number of stockholders holding mandatorily redeemable capital stock was 171, 127, and 208 at December 31, 2016, 2015, and 2014.

Table 16.5 - Mandatorily Redeemable Capital Stock Rollforward
(dollars in millions)

	Year Ended December 31,		
	2016	2015	2014
Balance, beginning of year	$ 745	$ 2,631	$ 4,998
Capital stock subject to mandatory redemption reclassified from capital	2,526 [(a)]	1,131	611
Capital stock previously subject to mandatory redemption reclassified to capital	—	(93)	(6)
Redemption/repurchase of mandatorily redeemable capital stock	(1,566)	(2,925) [(b)]	(2,973)
Accrued stock dividend classified as mandatorily redeemable capital stock	(1)	1	1
Balance, end of year	$ 1,704	$ 745	$ 2,631

(a) Includes $1,274 million of reclassifications to mandatorily redeemable capital stock resulting from an FHFA rule effective February 19, 2016, that made captive insurance companies ineligible for FHLBank membership. Captive insurance company members that were admitted as FHLBank members prior to September 12, 2014, will have their memberships terminated no later than February 19, 2021. Captive insurance company members that were admitted as FHLBank members on or after September 12, 2014, had their memberships terminated no later than February 19, 2017.

(b) Consists primarily of mandatorily redeemable capital stock redeemed in connection with the merger of the FHLBanks of Des Moines and Seattle as well as additional repurchases/redemptions by certain other FHLBanks.

Table 16.6 presents the amount of mandatorily redeemable capital stock at December 31, 2016, by contractual year of redemption. The year of redemption in the table is the end of the appropriate redemption period applicable to each FHLBank's capital plan. An FHLBank is not required to redeem membership stock until either five years or six months, depending on the type of capital stock issuable under its capital plan, after the membership is terminated or the FHLBank receives notice of withdrawal. However, if membership is terminated due to merger or consolidation, the FHLBank may recalculate the former member's stock requirement following that termination and the stock may be deemed excess stock subject to repurchase at the FHLBank's discretion. An FHLBank 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, an FHLBank may repurchase those shares, at its sole discretion, subject to the statutory and regulatory restrictions on excess capital stock redemption.

Table 16.6 - Mandatorily Redeemable Capital Stock by Contractual Year of Redemption
(dollars in millions)

	December 31, 2016	December 31, 2015
Year 1	$ 7	$ 106
Year 2	17	8
Year 3	36	79
Year 4	388	47
Year 5	27	403
Thereafter(1)	1,084	—
Past contractual redemption date due to remaining activity(2)	145	102
Total	$ 1,704	$ 745

(1) Represents mandatorily redeemable capital stock resulting from an FHFA rule effective February 19, 2016, that made captive insurance companies ineligible for FHLBank membership. Captive insurance company members that were admitted as FHLBank members prior to September 12, 2014, will have their memberships terminated no later than February 19, 2021. Captive insurance company members that were admitted as FHLBank members on or after September 12, 2014, had their memberships 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

Excess capital stock is defined as the amount of stock held by a member (or former member) in excess of that institution's minimum stock ownership requirement. FHFA rules limit the ability of an FHLBank to create member excess capital stock under certain circumstances. An FHLBank may not pay dividends in the form of capital stock or issue new excess capital stock to members if that FHLBank's excess capital stock exceeds one percent of its total assets or if the issuance of excess capital stock would cause that FHLBank's excess capital stock to exceed one percent of its total assets. At December 31, 2016, no FHLBank had excess capital stock outstanding totaling more than one percent of its total assets.

Capital Classification Determination

The FHFA has implemented the prompt corrective action provisions of the Housing Act. The FHFA rule defined four capital classifications for the FHLBanks: adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized, and the FHFA issued a regulation implementing the prompt corrective action provisions that apply to FHLBanks that are not deemed to be adequately capitalized. The FHFA determines each FHLBank's capital classification on at least a quarterly basis. If an FHLBank is determined to be other than adequately capitalized, that FHLBank becomes subject to additional supervisory authority by the FHFA. Before implementing a reclassification, the Director of the FHFA is required to provide that FHLBank with written notice of the proposed action and an opportunity to submit a response. Each FHLBank is classified by the FHFA as adequately capitalized as of the date of the FHFA's most recent notification to each FHLBank.

Note 17 - Accumulated Other Comprehensive Income (Loss)

Table 17.1 presents a summary of changes in accumulated other comprehensive income (loss) for the years ended December 31, 2016, 2015, and 2014.

Table 17.1 - Accumulated Other Comprehensive Income (Loss)
(dollars in millions)

	Net Unrealized Gains (Losses) on AFS Securities (Note 5)	Net Unrealized Gains (Losses) on HTM Securities Transferred from AFS Securities	Net Non-Credit Portion of OTTI Losses on AFS Securities (Notes 5 and 7)	Net Non-Credit Portion of OTTI Losses on HTM Securities (Notes 6 and 7)	Net Unrealized Gains (Losses) Relating to Hedging Activities (Note 11)	Pension and Postretirement Benefits (Note 18)	Total Accumulated Other Comprehensive Income (Loss)
Balance, December 31, 2013	$ 1,005	$ (1)	$ 75	$ (789)	$ (748)	$ (53)	$ (511)
Other comprehensive income before reclassifications							
Unrealized gains (losses)	199	—	103	—	(5)	—	297
Non-credit OTTI losses	—	—	(11)	(1)	—	—	(12)
Change in fair value of other-than-temporarily impaired securities	—	—	174	—	—	—	174
Accretion of non-credit loss	—	—	—	133	—	—	133
Reclassifications from accumulated other comprehensive income (loss) to net income							
Reclassification of realized net (gains) losses included in net income	(1)	—	—	—	—	—	(1)
Non-credit OTTI to credit OTTI	—	—	8	2	—	—	10
Amortization on hedging activities(1)	—	—	—	—	4	—	4
Amortization - pension and postretirement	—	—	—	—	—	(40)	(40)
Net current period other comprehensive income (loss)	198	—	274	134	(1)	(40)	565

	Net Unrealized Gains (Losses) on AFS Securities (Note 5)	Net Unrealized Gains (Losses) on HTM Securities Transferred from AFS Securities	Net Non-Credit Portion of OTTI Losses on AFS Securities (Notes 5 and 7)	Net Non-Credit Portion of OTTI Losses on HTM Securities (Notes 6 and 7)	Net Unrealized Gains (Losses) Relating to Hedging Activities (Note 11)	Pension and Postretirement Benefits (Note 18)	Total Accumulated Other Comprehensive Income (Loss)
Balance, December 31, 2014	$ 1,203	$ (1)	$ 349	$ (655)	$ (749)	$ (93)	$ 54
Other comprehensive income before reclassifications							
Unrealized gains (losses)	(778)	—	(169)	—	104	—	(843)
Non-credit OTTI losses	—	—	(18)	(4)	—	—	(22)
Non-credit OTTI losses transferred	—	—	(14)	14	—	—	—
Change in fair value of other-than-temporarily impaired securities	—	—	85	—	—	—	85
Accretion of non-credit loss	—	—	—	114	—	—	114
Reclassifications from accumulated other comprehensive income (loss) to net income							
Reclassification of realized net (gains) losses included in net income	(8)	—	(52)	—	—	—	(60)
Non-credit OTTI to credit OTTI	—	—	60	4	—	—	64
Amortization on hedging activities(1)	—	—	—	—	19	—	19
Amortization - pension and postretirement	—	—	—	—	—	6	6
Net current period other comprehensive income (loss)	(786)	—	(108)	128	123	6	(637)
Merger activity(2)	(51)	—	—	—	—	—	(51)
Balance, December 31, 2015	366	(1)	241	(527)	(626)	(87)	(634)
Other comprehensive income before reclassifications							
Unrealized gains (losses)	58	1	50	—	221	—	330
Non-credit OTTI losses	—	—	(18)	(3)	—	—	(21)
Change in fair value of other-than-temporarily impaired securities	—	—	73	—	—	—	73
Accretion of non-credit loss	—	—	—	95	—	—	95
Reclassifications from accumulated other comprehensive income (loss) to net income							
Reclassification of realized net (gains) losses included in net income	(17)	—	(1)	—	—	—	(18)
Non-credit OTTI to credit OTTI	—	—	10	3	—	—	13
Amortization on hedging activities(1)	—	—	—	—	19	—	19
Amortization - pension and postretirement	—	—	—	—	—	(14)	(14)
Net current period other comprehensive income (loss)	41	1	114	95	240	(14)	477
Balance, December 31, 2016	$ 407	$ —	$ 355	$ (432)	$ (386)	$ (101)	$ (157)

(1) **Amortization on hedging activities consists of amortization to:**	December 31, 2016	2015	2014
Interest income - Advances	$ 10	$ 11	$ 11
Interest expense - Consolidated bonds	(29)	(29)	(14)
Interest expense - Consolidated discount notes	(5)	(3)	(2)
Net gains (losses) on derivatives and hedging activities	5	2	1
Total amortization on hedging activities	$ (19)	$ (19)	$ (4)

(2) Represents the elimination of the FHLBank of Seattle's closing AOCI balance in connection with the merger.

Note 18 - Pension and Postretirement Benefit Plans

Qualified Defined Benefit Multiemployer Plan

All of the FHLBanks participate in the Pentegra Defined Benefit Plan for Financial Institutions (Pentegra DB Plan), except for the FHLBank of San Francisco, which provides a Cash Balance Plan to eligible employees. The Pentegra DB Plan is a tax-qualified, defined-benefit pension plan. The Pentegra DB Plan is treated as a multiemployer 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 multiemployer plan disclosures are not applicable to the Pentegra DB Plan. Under the Pentegra DB Plan, contributions made by a 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 DB Plan covers substantially all officers and employees of the FHLBanks that meet certain eligibility requirements, except that:

- FHLBank of Atlanta employees are eligible to participate only if hired before March 1, 2011;

- FHLBank of Indianapolis employees are eligible to participate only if hired before February 1, 2010;

- In August 2016, the FHLBank of Des Moines' board of directors elected to freeze the Pentegra DB Plan effective January 1, 2017. After January 1, 2017, participants no longer accrue new benefits under the Pentegra DB Plan. As a result of the merger with the FHLBank of Seattle, the FHLBank of Des Moines has two Pentegra DB Plans. Prior to the plan freeze, employees of the FHLBank of Des Moines were eligible to participate in the FHLBank of Des Moines pension plan if hired on or before December 31, 2010. Employees previously employed by the FHLBank of Seattle were eligible to participate in the former FHLBank of Seattle pension plan if they were hired before January 1, 2005;

- FHLBank of Dallas employees are eligible to participate only if hired before January 1, 2007, or hired on or after January 1, 2007, provided that the new employee had prior service with a financial services institution that participated in the Pentegra DB Plan, during which service the employee was covered by that plan. Effective July 1, 2015, coverage was extended to include all of the FHLBank of Dallas' non-highly compensated employees (as defined by the Internal Revenue Service rules) who were hired on and after January 1, 2007, but before August 1, 2010; and

- FHLBank of Topeka employees are eligible to participate only if hired before January 1, 2009.

The Pentegra DB Plan operates on a fiscal year from July 1 through June 30. The Pentegra DB 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 any FHLBank.

The Pentegra DB 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% of the present value of all benefit liabilities accrued at that date). As permitted by ERISA, the Pentegra DB Plan accepts contributions for the prior plan year up to eight and a half months after the asset valuation date. 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 DB Plan is for the plan year ended June 30, 2015. The contributions made by the FHLBank of Atlanta during 2016 were more than 5% of the total contributions to the Pentegra DB Plan for the plan year ended June 30, 2015. The contributions made by each of the FHLBanks of New York and Atlanta during 2015 were more than 5% of the total contributions to the Pentegra DB Plan for the plan year ended June 30, 2014.

Table 18.1 - Pentegra DB Plan Net Pension Cost and Funded Status
(dollars in millions)

	2016	2015	2014
Net pension cost charged to compensation and benefit expense for the year ended December 31	$ 64	$ 75	$ 47
Pentegra DB Plan funded status as of July 1	104.1% [(a)]	107.0% [(b)]	111.4%
Range of the FHLBanks' funded status as of July 1	93.8%-129.6%	95.1%-126.7%	101.9%-128.6%

(a) The Pentegra DB Plan's funded status as of July 1, 2016, is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2016 through March 15, 2017. Contributions made on or before March 15, 2017, and designated for the plan year ended June 30, 2016, will be included in the final valuation as of July 1, 2016. The final funded status as of July 1, 2016, will not be available until the Form 5500 for the plan year July 1, 2016 through June 30, 2017, is filed (this Form 5500 is due to be filed no later than April 2018).

(b) The Pentegra DB Plan's funded status as of July 1, 2015, is preliminary and may increase because the plan's participants were permitted to make contributions for the plan year ended June 30, 2015 through March 15, 2016. Contributions made on or before March 15, 2016, and designated for the plan year ended June 30, 2015, will be included in the final valuation as of July 1, 2015. The final funded status as of July 1, 2015, will not be available until the Form 5500 for the plan year July 1, 2015 through June 30, 2016, is filed (this Form 5500 is due to be filed no later than April 2017).

Defined Contribution Retirement Plans

Qualified Defined Contribution Plans. Each FHLBank participates in a defined contribution plan. The FHLBanks of Boston, New York, Pittsburgh, Cincinnati, Indianapolis, Chicago, Dallas, and Topeka participate in the Pentegra Defined Contribution Plan for Financial Institutions, a tax-qualified, defined-contribution plan. The FHLBanks of Atlanta, Des Moines, and San Francisco have similar defined contribution plans. Under these plans, each FHLBank contributes a percentage of the participants' compensation by making a matching contribution equal to a percentage of the employee's voluntary contributions, subject to certain limitations.

Nonqualified Supplemental Defined Contribution Retirement Plans. Certain FHLBanks maintain at least one or more nonqualified, unfunded supplemental defined contribution plans. These plans restore all or a portion of defined contributions to those employees who have had their qualified defined contribution benefits limited by IRS regulations. The unfunded liability associated with these nonqualified supplemental defined contribution retirement plans was $77 million and $67 million at December 31, 2016 and 2015. However, certain of these FHLBanks have established a grantor/rabbi trust to meet future benefit obligations and current payments to the beneficiaries.

Costs expensed for all qualified and nonqualified defined contribution plans were $21 million for the year ended December 31, 2016, $18 million for the year ended December 31, 2015, and $19 million for the year ended December 31, 2014.

Defined Benefit Retirement Plans

Nonqualified Supplemental Defined Benefit Retirement Plans. Certain FHLBanks maintain one or more nonqualified, unfunded supplemental defined benefit plans. These plans ensure 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. Certain of these FHLBanks have established a grantor/rabbi trust to meet future benefit obligations and current payments to the beneficiaries. There are no funded plan assets that have been designated to provide supplemental retirement benefits.

FHLBank of San Francisco Cash Balance Plan. The FHLBank of San Francisco provides retirement benefits through its Cash Balance Plan, a qualified defined benefit plan. The Cash Balance Plan is provided to all employees who have completed six months of FHLBank of San Francisco service. Under the plan, each eligible FHLBank of San Francisco employee accrues benefits annually equal to six percent of the employee's total annual compensation, plus six percent interest on the benefits accrued to the employee through the prior year end. The Cash Balance Plan is funded through a qualified trust established by the FHLBank of San Francisco. The fair value of the plan assets were $53 million and $43 million at December 31, 2016 and 2015; all plan assets were Level 1 within the fair value hierarchy. (See *Note 19 - Fair Value* for more information.)

Table 18.2 presents the obligations and funding status of the FHLBanks' nonqualified supplemental defined benefit retirement plans and the FHLBank of San Francisco's Cash Balance Plan (collectively referred to as "Defined Benefit Retirement Plans").

Table 18.2 - Benefit Obligation, Fair Value of Plan Assets, and Funded Status
(dollars in millions)

Defined Benefit Retirement Plans	Year Ended December 31, 2016	2015
Change in benefit obligation		
Benefit obligation at beginning of year	$ 256	$ 250
Service cost	11	10
Interest cost	11	9
Loss (gain)	27	(1)
Benefits paid	(9)	(9)
Plan amendments	1	—
Settlements and curtailments	(6)	(3)
Benefit obligation at end of year	291	256
Change in plan assets		
Fair value of plan assets at beginning of year	43	41
Actual return on plan assets	3	(1)
Acquisition	—	2
Employer contributions	22	12
Benefits paid	(9)	(9)
Settlements and curtailments	(6)	(2)
Fair value of plan assets at end of year	53	43
Funded status	$ (238)	$ (213)

Amounts recognized in other liabilities on the Combined Statement of Condition for the FHLBanks' defined benefit retirement plans at December 31, 2016 and 2015, were $238 million and $213 million. Amounts recognized for net actuarial loss in accumulated other comprehensive income (loss) on the Combined Statement of Condition for the FHLBanks' defined benefit retirement plans at December 31, 2016 and 2015, were $97 million and $83 million. The accumulated benefit obligation for the defined benefit retirement plans was $249 million and $224 million at December 31, 2016 and 2015.

Table 18.3 - Net Periodic Benefit Cost and Other Amounts Recognized in Other Comprehensive Income (Loss)
(dollars in millions)

Defined Benefit Retirement Plans	Year Ended December 31, 2016	2015	2014
Net Periodic Benefit Cost			
Service cost	$ 11	$ 10	$ 9
Interest cost	11	9	9
Expected return on plan assets	(4)	(3)	(3)
Amortization of net loss (gain)	11	11	6
Settlement loss	2	—	—
Net periodic benefit cost	31	27	21
Other Changes in Benefit Obligations Recognized in Other Comprehensive Income			
Net loss (gain)	22	—	41
Prior service cost (benefit)	4	1	3
Amortization of net (loss) gain	(11)	(11)	(6)
Prior service cost recognized due to curtailment/settlement loss	(1)	—	—
Total recognized in other comprehensive income	14	(10)	38
Total recognized in net periodic benefit cost and other comprehensive income	$ 45	$ 17	$ 59

The estimated net actuarial loss that will be amortized from AOCI into net periodic benefit cost over the next fiscal year is $10 million.

Table 18.4 presents the key assumptions used for the actuarial calculations to determine benefit obligations for the FHLBanks' defined benefit retirement plans (displayed as a range from low to high).

Table 18.4 - Benefit Obligation Key Assumptions

Defined Benefit Retirement Plans	2016	2015
Discount rate	3.5% - 4.2%	3.8% - 4.5%
Salary increases	3.0% - 5.5%	3.0% - 6.5%

Table 18.5 presents the key assumptions used for the actuarial calculations to determine net periodic benefit cost for the FHLBanks' defined benefit retirement plans (displayed as a range from low to high).

Table 18.5 - Net Periodic Benefit Cost Key Assumptions

	December 31,		
Defined Benefit Retirement Plans	2016	2015	2014
Discount rate	3.8% - 4.5%	3.5% - 4.1%	4.3% - 5.0%
Salary increases	3.0% - 6.5%	3.0% - 6.5%	3.0% - 5.5%
Expected return on plan assets	7.8%	8.0%	8.0%

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 duration-based interest rate yields from a variety of highly rated relevant corporate bond indices as of December 31, 2016, and solving for the single discount rate that produces the same present value.

The nonqualified supplemental retirement plans are not funded; therefore, no contributions will be made in 2017 other than for the payment of benefits. Table 18.6 presents the estimated future payments of benefits.

Table 18.6 - Estimated Future Benefit Payments
(dollars in millions)

Years	Payments
2017	$ 14
2018	17
2019	16
2020	18
2021	28
2022-2026	110

Postretirement Benefit Plans

Certain FHLBanks offer postretirement benefit plans that may include health care and/or life insurance benefits for eligible retirees. There are no funded plan assets that have been designated to provide postretirement benefits. The financial amounts related to postretirement benefit plans are immaterial to the FHLBanks' combined financial condition, combined results of operations, and combined cash flows.

Note 19 - Fair Value

The fair value amounts recorded on the Combined Statement of Condition and presented in the note disclosures for the periods presented have been determined by the FHLBanks using available market and other pertinent information and reflect each FHLBank's best judgment of appropriate valuation methods. Although each FHLBank uses its best judgment in estimating the fair value of its financial instruments, there are inherent limitations in any valuation technique. Therefore, the fair values may not be indicative of the amounts that would have been realized in market transactions at December 31, 2016 and 2015.

Fair Value Hierarchy

The FHLBanks record trading securities, available-for-sale securities, derivative assets, derivative liabilities, certain advances, certain consolidated obligations, and certain other assets at fair value on a recurring basis, and on occasion certain private-label MBS, certain mortgage loans held for portfolio, and certain other assets on a non-recurring basis. GAAP establishes a fair value hierarchy and requires an entity to maximize the use of significant observable inputs and minimize the use of significant unobservable inputs when measuring fair value. The inputs are evaluated and an overall level for the fair value measurement is determined. This overall level is an indication of market observability of the fair value measurement for the asset or liability. 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.
- 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 or 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.

Each FHLBank reviews its fair value hierarchy classifications on a quarterly basis. Changes in the observability of the valuation inputs may result in a reclassification of certain assets or liabilities. These reclassifications are reported as transfers in/out at fair value at the beginning of the quarter in which the changes occur. The FHLBanks had no other transfers of assets or liabilities recorded at fair value on a recurring basis during the years ended December 31, 2016, 2015, or 2014.

Table 19.1 presents the carrying value, fair value, and fair value hierarchy of financial assets and liabilities of the FHLBanks at December 31, 2016 and 2015. These values do not represent an estimate of the overall market value of the FHLBanks as going concerns, which would take into account future business opportunities and the net profitability of assets and liabilities.

Table 19.1 - Fair Value Summary
(dollars in millions)

	December 31, 2016					
		Fair Value				
Financial Instruments	Carrying Value	Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
Assets						
Cash and due from banks	$ 7,441	$ 7,441	$ 7,441	$ —	$ —	$ —
Interest-bearing deposits	2,878	2,878	1,390	1,488	—	—
Securities purchased under agreements to resell	52,771	52,771	—	52,771	—	—
Federal funds sold	48,633	48,633	—	48,633	—	—
Trading securities	9,461	9,461	17	9,444	—	—
Available-for-sale securities	81,673	81,673	44	74,788	6,841	—
Held-to-maturity securities	96,601	97,357	—	90,942	6,415	—
Advances(2)	705,225	705,656	—	705,656	—	—
Mortgage loans held for portfolio, net	48,476	49,079	—	48,908	171	—
Mortgage loans held for sale(3)	44	44	—	44	—	—
Accrued interest receivable	1,260	1,260	—	1,260	—	—
Derivative assets, net	1,407	1,407	—	2,584	—	(1,177)
Other assets	107	107	98	9	—	—
Liabilities						
Deposits	8,089	8,089	—	8,089	—	—
Consolidated obligations						
Discount notes(4)	409,815	409,821	—	409,821	—	—
Bonds(5)	578,927	579,798	—	579,798	—	—
Total consolidated obligations	988,742	989,619	—	989,619	—	—
Mandatorily redeemable capital stock	1,704	1,704	1,704	—	—	—
Accrued interest payable	1,100	1,100	—	1,100	—	—
Derivative liabilities, net	810	810	—	4,934	—	(4,124)
Other liabilities	68	68	68	—	—	—

Financial Instruments	Carrying Value	Fair Value: Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
	December 31, 2015					
Assets						
Cash and due from banks	$ 14,289	$ 14,289	$ 14,289	$ —	$ —	$ —
Interest-bearing deposits	1,836	1,836	650	1,186	—	—
Securities purchased under agreements to resell	47,827	47,827	—	47,827	—	—
Federal funds sold	42,380	42,380	—	42,380	—	—
Trading securities	10,760	10,760	14	10,746	—	—
Available-for-sale securities	75,916	75,916	35	67,589	8,292	—
Held-to-maturity securities	94,965	96,123	—	88,610	7,513	—
Advances(2)	634,022	633,569	—	633,569	—	—
Mortgage loans held for portfolio, net	44,557	45,960	—	45,717	243	—
Mortgage loans held for sale(3)	54	54	—	54	—	—
Accrued interest receivable	1,112	1,112	—	1,112	—	—
Derivative assets, net	755	755	—	2,205	4	(1,454)
Other assets	90	90	81	9	—	—
Liabilities						
Deposits	8,533	8,533	—	8,533	—	—
Consolidated obligations						
Discount notes(4)	494,045	494,021	—	494,021	—	—
Bonds(5)	411,851	413,127	—	413,072	55	—
Total consolidated obligations	905,896	907,148	—	907,093	55	—
Mandatorily redeemable capital stock	745	745	745	—	—	—
Accrued interest payable	986	986	—	986	—	—
Derivative liabilities, net	1,131	1,131	—	6,403	—	(5,272)
Other liabilities	48	48	48	—	—	—
Subordinated notes	944	966	—	966	—	—

(1) Amounts represent the application of the netting requirements that allow an FHLBank to settle positive and negative positions and also cash collateral and related accrued interest held or placed by that FHLBank with the same clearing agent and/or counterparty.
(2) Includes $14,279 million and $13,744 million of advances recorded under fair value option at December 31, 2016 and 2015.
(3) Represents mortgage loans held for sale recorded under fair value option, included in other assets on the Combined Statement of Condition at December 31, 2016.
(4) Includes $18,597 million and $21,478 million of consolidated discount notes recorded under fair value option at December 31, 2016 and 2015.
(5) Includes $16,898 million and $20,735 million of consolidated bonds recorded under fair value option at December 31, 2016 and 2015, and $55 million of consolidated bonds that are carried at fair value under a full fair value hedge strategy at December 31, 2015.

Summary of Valuation Methodologies and Primary Inputs

Cash and due from banks. The fair values equal the carrying values.

Interest-bearing deposits. The fair values are determined based on prices obtained from a pricing service or by calculating the present value of the expected future cash flows and reducing the amount for accrued interest receivable. For certain FHLBanks' interest-bearing deposits with three months or less to maturity or repricing, the fair values approximate the carrying values.

Securities purchased under agreements to resell. The fair values are determined by calculating the present value of the future cash flows and reducing the amount for accrued interest receivable. The discount rates used in these calculations are the rates for securities with similar terms. For certain FHLBanks' securities with three months or less to maturity or repricing, the fair values approximate the carrying values.

Federal funds sold. The fair values of overnight federal funds sold approximate the carrying values. The fair values of term federal funds sold are determined by calculating the present value of the expected future cash flows and reducing the amount for accrued interest receivable. The discount rates used in these calculations are the rates for federal funds with similar terms.

Investment securities-MBS. Using a uniform framework, each FHLBank's valuation technique incorporates prices from up to four designated third-party pricing vendors, when available. The third-party 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. Because many MBS do not trade on a daily basis, the pricing vendors use applicable, 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 FHLBanks.

Each FHLBank has conducted reviews of up to four pricing vendors to confirm and further augment its understanding of the vendors' pricing processes, methodologies, and control procedures for specific instruments.

The FHLBanks' valuation technique for estimating the fair values of MBS first requires the establishment of a median price for each security. If four prices are received, the average of the middle two prices is the median price; if three prices are received, the middle price is the median price; if two prices are received, the average of the two prices is the median price; and if one price is received, it is the median price (and also the final price), subject to validation of outliers.

All prices that are within a specified tolerance threshold of the median price are included in the cluster of prices that are averaged to compute a default price. All prices that are outside the threshold (outliers) are subject to further analysis to determine if an outlier is a better estimate of fair value. These steps include, but are not limited to, comparison to prices provided by an additional third-party valuation service, prices for similar securities, and/or non-binding dealer estimates. 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 (or outliers) is (are) 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.

As of December 31, 2016 and 2015, four prices were received for a majority of the FHLBanks' MBS holdings and the final prices for those securities were computed by averaging the prices received. Based on each FHLBank's review of the pricing methods employed by the third-party pricing vendors and the relative lack of dispersion among the vendor prices (or, in those instances in which there were outliers or significant yield variances, the FHLBanks' additional analyses), each FHLBank 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. Based on the lack of significant market activity for private-label residential MBS and home equity loan ABS, the recurring and non-recurring fair value measurements for those securities were classified as Level 3 within the fair value hierarchy as of December 31, 2016 and 2015.

Investment securities-Non-MBS. To determine the estimated fair values of non-MBS investment securities, each FHLBank uses either a market approach using prices from third-party pricing vendors, generally consistent with the methodologies for MBS, or an income approach based on a market-observable interest rate curve adjusted for a spread, which may be based on unobservable information. Differing spreads may be applied to distinct term points along the discount curve in determining the fair values of instruments with varying maturities. Each FHLBank believes that its methodologies result in fair values that are reasonable and similar in all material respects based on the nature of the financial instruments being measured. The market-observable interest rate curves used by the FHLBanks and the related financial instrument they measure are as follows:

- *Treasury Curve.* U.S. Treasury obligations.
- *LIBOR Swap Curve*. Certificates of deposit, promissory notes, and Federal Family Education Loan Program ABS.
- *U.S. Government Agency Fair Value Curve.* Government-sponsored enterprises and Tennessee Valley Authority obligations.

Advances. Each FHLBank generally determines the fair values of its advances by calculating the present value of expected future cash flows from the advances, excluding the amount of the accrued interest receivable. The discount rates used in these calculations are equivalent to the replacement advance rates for advances with similar terms. Each FHLBank calculates its replacement advance rates at a spread to its cost of funds. Each FHLBank's cost of funds approximates the consolidated obligation (CO) curve. (See *Summary of Valuation Methodologies and Primary Inputs - Consolidated obligations* within this note for a discussion of the CO curve.) To estimate the fair values of advances with optionality, market-based expectations of future interest rate volatility implied from current market prices for similar options are also used. In accordance with the FHFA's advances regulations, an advance with a maturity or repricing period greater than six months requires a prepayment fee sufficient to make an FHLBank financially indifferent to the borrower's decision to prepay the advances. Therefore, the fair values of advances do not assume prepayment risk.

The FHLBanks did not adjust their fair value measurement of advances for creditworthiness primarily because advances were fully collateralized. (See *Note 8 - Advances* and *Note 10 - Allowance for Credit Losses* for additional information.)

Mortgage loans held for portfolio. The fair values of mortgage loans are estimated based on quoted market prices for similar mortgage loans, if available, or modeled values. The modeled values generally start with prices for newly issued mortgage-backed securities issued by U.S. government-sponsored enterprises or similar new mortgage loans, adjusted for underlying assumptions or characteristics. The prices are adjusted for differences in coupon, average loan rate, seasoning, credit risk, and cash flow remittance between the FHLBank's mortgage loans and the referenced mortgage-backed securities or mortgage loans. The prices of the referenced mortgage-backed securities and mortgage loans are highly dependent upon the underlying prepayment and other assumptions. Changes in the prepayment rates often have a material effect on the fair value estimates. The fair values of certain non-performing loans are estimated based on the values of the underlying collateral or the present values of future cash flows, which may include estimates of prepayment rates and other assumptions.

Mortgage loans held for sale. The fair value of mortgage loans held for sale is based on to-be-announced (TBA) securities, which represent quoted market prices for new mortgage-backed securities issued by U.S. government-sponsored enterprises.

Impaired mortgage loans held for portfolio and real estate owned. The estimated fair values of impaired mortgage loans held for portfolio and real estate owned on a non-recurring basis are generally based on broker prices, property values obtained from a third-party pricing vendor, or current actual loss severity rates that the FHLBanks have incurred on sales. All estimated fair values of impaired mortgage loans held for portfolio and real estate owned are net of any estimated selling costs.

Accrued interest receivable and payable. The fair values approximate the carrying values.

Derivative assets/liabilities. Each FHLBank bases the fair values of derivatives with similar terms on market prices, when available. However, active markets do not exist for many of the FHLBanks' derivatives. Consequently, fair values for these instruments are generally estimated using standard valuation techniques such as discounted cash flow analysis and comparisons to similar instruments. In limited instances, fair value estimates for derivatives are obtained from dealers and are corroborated by an FHLBank using a pricing model and observable market data. Each FHLBank 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. In addition, each FHLBank requires collateral agreements with collateral delivery thresholds on the majority of its uncleared derivatives. The use of cleared derivatives is intended to mitigate credit risk exposure because a central counterparty is substituted for individual counterparties and collateral is posted daily, through a clearing agent, for changes in the value of cleared derivatives. Each FHLBank has evaluated the potential for the fair value of the instruments to be affected by counterparty credit risk and its own credit risk and has determined that no adjustments were significant to the overall fair value measurements.

The fair values of each FHLBank's derivative assets and liabilities include accrued interest receivable/payable and related cash collateral, including initial and variation margin, remitted to/received from counterparties. 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 clearing agent and/or by counterparty when it has met the netting requirements. If these netted amounts are positive, they are classified as an asset and, if negative, they are classified as a liability.

Each FHLBank's discounted cash flow analysis uses market-observable inputs. Inputs by class of derivative are as follows:

Interest-rate related:
- *Discount rate assumption*. The FHLBanks used the Overnight Index Swap (OIS) curve or the LIBOR swap curve depending on the terms of the derivative.
- *Forward interest rate assumption.* LIBOR swap curve.
- *Volatility assumption.* Market-based expectations of future interest rate volatility implied from current market prices for similar options.
- *Prepayment assumption* (if applicable).
- *TBA securities prices.* Market-based prices of TBAs are determined by coupon class and expected term until settlement.
- *TBA "drops."* TBA price "drops" are used to adjust base TBA prices and are a function of current short-term interest rates, prepayment estimates, and the supply and demand for pass-throughs in the current delivery month. TBA drops are obtained from a market-observable source.

Mortgage delivery commitments:
- *TBA securities prices.* TBA security prices are generally adjusted for differences in coupon, average loan rate, and seasoning.

Deposits. The fair values of deposits are generally equal to its carrying values because the deposits are primarily overnight instruments or due on demand. Each FHLBank determines the fair values of term deposits by calculating the present value of expected future cash flows from the deposits and reducing this amount for accrued interest payable. The discount rates used in these calculations are the cost of deposits with similar terms.

Consolidated obligations. Each FHLBank estimates the fair values of consolidated obligations based on prices received from pricing vendors, consistent with the methodology for MBS previously discussed, or by using standard valuation techniques and inputs based on the cost of raising comparable term debt.

The inputs used to determine the fair values of consolidated obligations are as follows:

- *CO Curve and LIBOR Swap Curve.* The Office of Finance constructs an internal curve, referred to as the CO curve, using the U.S. Treasury curve as a base curve that is then adjusted by adding indicative spreads obtained from market observable sources. These market indications are generally derived from pricing indications from dealers, historical pricing relationships, recent GSE trades, and secondary market activity. The LIBOR swap curve is used for certain callable consolidated obligations.

- *Volatility assumption.* To estimate the fair values of consolidated obligations with optionality the FHLBanks use market-based expectations of future interest rate volatility implied from current market prices for similar options.

- *Spread adjustment.* FHLBanks may apply an adjustment to the curve.

The FHLBanks monitor their own creditworthiness and determine if any credit risk adjustments are necessary in their fair value measurement of consolidated obligations.

Mandatorily redeemable capital stock. The fair value of capital stock subject to mandatory redemption is generally equal to its par value as indicated by contemporaneous member purchases and sales at par value. Fair value also includes an estimated dividend earned at the time of reclassification from equity to liabilities, until that amount is paid, and any subsequently declared dividend. FHLBank stock can only be acquired and redeemed at par value. FHLBank stock is not traded and no market mechanism exists for the exchange of stock outside the FHLBank System's cooperative structure.

Commitments. The fair value of the FHLBanks' commitments to extend credit for advances, letters of credit, and standby bond-purchase agreements was immaterial at December 31, 2016 and 2015.

Subordinated notes. The FHLBank of Chicago estimates the fair values of its subordinated notes based on the cost of raising comparable term debt. The subordinated notes issued by the FHLBank of Chicago, matured and were paid in full on June 13, 2016. (See *Note 15 - Subordinated Notes* for additional information.)

Subjectivity of estimates. Estimates of the fair value of financial assets and liabilities using the methodologies described above are highly subjective and require judgments regarding significant matters such as the amount and timing of future cash flows, prepayment speed assumptions, expected interest rate volatility, possible distributions of future interest rates used to value options, and the selection of discount rates that appropriately reflect market and credit risks. The use of different assumptions could have a material effect on the fair value estimates.

Fair Value Measurements

Table 19.2 presents the fair value of assets and liabilities that are recorded on a recurring or non-recurring basis at December 31, 2016 and 2015, by level within the fair value hierarchy. The FHLBanks measure certain held-to-maturity securities and mortgage loans at fair value on a non-recurring basis due to the recognition of a credit loss. Real estate owned is measured using fair value when the asset's fair value less costs to sell is lower than its carrying amount.

Table 19.2 - Fair Value Measurements
(dollars in millions)

	December 31, 2016				
	Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
Recurring fair value measurements - Assets					
Trading securities					
U.S. Treasury obligations	$ 1,606	$ —	$ 1,606	$ —	$ —
Other U.S. obligations	216	—	216	—	—
GSE and Tennessee Valley Authority obligations	5,693	—	5,693	—	—
Other non-MBS	290	17	273	—	—
Other U.S. obligations single-family MBS	20	—	20	—	—
GSE single-family MBS	127	—	127	—	—
GSE multifamily MBS	1,509	—	1,509	—	—
Total trading securities	9,461	17	9,444	—	—
Available-for-sale securities					
Certificates of deposit	1,300	—	1,300	—	—
Other U.S. obligations	4,282	—	4,282	—	—
GSE and Tennessee Valley Authority obligations	16,243	—	16,243	—	—
State or local housing agency obligations	1,273	—	1,265	8	—
Federal Family Education Loan Program ABS	4,572	—	4,572	—	—
Other non-MBS	1,064	44	1,020	—	—
Other U.S. obligations single-family MBS	5,577	—	5,577	—	—
Other U.S. obligations multifamily MBS	563	—	563	—	—
GSE single-family MBS	9,576	—	9,576	—	—
GSE multifamily MBS	30,390	—	30,390	—	—
Private-label residential MBS	6,833	—	—	6,833	—
Total available-for-sale securities	81,673	44	74,788	6,841	—
Advances(2)	14,279	—	14,279	—	—
Mortgage loans held for sale(3)	44	—	44	—	—
Derivative assets, net					
Interest-rate related	1,403	—	2,580	—	(1,177)
Mortgage delivery commitments	4	—	4	—	—
Total derivative assets, net	1,407	—	2,584	—	(1,177)
Other assets	107	98	9	—	—
Total recurring assets at fair value	$ 106,971	$ 159	$ 101,148	$ 6,841	$ (1,177)

	December 31, 2016				
	Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
Recurring fair value measurements - Liabilities					
Consolidated Obligations					
Discount notes(4)	$ 18,597	$ —	$ 18,597	$ —	$ —
Bonds(5)	16,898	—	16,898	—	—
Total consolidated obligations	35,495	—	35,495	—	—
Derivative liabilities, net					
Interest-rate related	795	—	4,919	—	(4,124)
Mortgage delivery commitments	15	—	15	—	—
Total derivative liabilities, net	810	—	4,934	—	(4,124)
Total recurring liabilities at fair value	$ 36,305	$ —	$ 40,429	$ —	$ (4,124)
Non-recurring fair value measurements - Assets (6)					
Held-to-maturity securities					
Private-label residential MBS	$ 13	$ —	$ —	$ 13	
Mortgage loans held for portfolio	75	—	3	72	
Real estate owned	19	—	—	19	
Total non-recurring assets at fair value	$ 107	$ —	$ 3	$ 104	

	December 31, 2015				
	Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
Recurring fair value measurements - Assets					
Trading securities					
U.S. Treasury obligations	$ 1,310	$ —	$ 1,310	$ —	$ —
Other U.S. obligations	237	—	237	—	—
GSE and Tennessee Valley Authority obligations	7,216	—	7,216	—	—
State or local housing agency obligations	1	—	1	—	—
Other non-MBS	290	14	276	—	—
Other U.S. obligations single-family MBS	24	—	24	—	—
GSE single-family MBS	159	—	159	—	—
GSE multifamily MBS	1,523	—	1,523	—	—
Total trading securities	10,760	14	10,746	—	—
Available-for-sale securities					
Certificates of deposit	700	—	700	—	—
Other U.S. obligations	4,829	—	4,829	—	—
GSE and Tennessee Valley Authority obligations	14,863	—	14,863	—	—
State or local housing agency obligations	1,199	—	1,199	—	—
Federal Family Education Loan Program ABS	5,299	—	5,299	—	—
Other non-MBS	1,124	35	1,089	—	—
Other U.S. obligations single-family MBS	4,587	—	4,587	—	—
Other U.S. obligations multifamily MBS	744	—	744	—	—
GSE single-family MBS	9,586	—	9,586	—	—
GSE multifamily MBS	24,693	—	24,693	—	—
Private-label residential MBS	8,282	—	—	8,282	—
Home equity loan ABS	10	—	—	10	—
Total available-for-sale securities	75,916	35	67,589	8,292	—

	December 31, 2015				
	Total	Level 1	Level 2	Level 3	Netting Adjustment and Cash Collateral(1)
Advances(2)	$ 13,744	$ —	$ 13,744	$ —	$ —
Mortgage loans held for sale(3)	54	—	54	—	—
Derivative assets, net					
Interest-rate related	753	—	2,203	4	(1,454)
Mortgage delivery commitments	2	—	2	—	—
Total derivative assets, net	755	—	2,205	4	(1,454)
Other assets	90	81	9	—	—
Total recurring assets at fair value	$ 101,319	$ 130	$ 94,347	$ 8,296	$ (1,454)
Recurring fair value measurements - Liabilities					
Consolidated Obligations					
Discount notes(4)	$ 21,478	$ —	$ 21,478	$ —	$ —
Bonds(5)	20,790	—	20,735	55	—
Total consolidated obligations	42,268	—	42,213	55	—
Derivative liabilities, net					
Interest-rate related	1,128	—	6,400	—	(5,272)
Mortgage delivery commitments	3	—	3	—	—
Total derivative liabilities, net	1,131	—	6,403	—	(5,272)
Total recurring liabilities at fair value	$ 43,399	$ —	$ 48,616	$ 55	$ (5,272)
Non-recurring fair value measurements - Assets (6)					
Held-to-maturity securities					
Private-label residential MBS	$ 36	$ —	$ —	$ 36	
Mortgage loans held for portfolio	127	—	11	116	
Real estate owned	32	—	—	32	
Total non-recurring assets at fair value	$ 195	$ —	$ 11	$ 184	

(1) Amounts represent the application of the netting requirements that allow an FHLBank to settle positive and negative positions and also cash collateral and related accrued interest held or placed by that FHLBank with the same clearing agent and/or counterparty.

(2) Represents advances recorded under fair value option at December 31, 2016 and 2015.

(3) Represents mortgage loans held for sale recorded under fair value option, included in other assets on the Combined Statement of Condition at December 31, 2016 and 2015.

(4) Represents consolidated discount notes recorded under fair value option at December 31, 2016 and 2015.

(5) Represents $16,898 million and $20,735 million of consolidated bonds recorded under fair value option at December 31, 2016 and 2015, and $55 million of consolidated bonds that are carried at fair value under a full fair value hedge strategy at December 31, 2015.

(6) The fair value information presented is as of the date the fair value adjustment was recorded during the years ended December 31, 2016 and 2015.

Level 3 Disclosures for All Assets and Liabilities that are Measured at Fair Value on a Recurring Basis

Table 19.3 presents a rollforward of assets and liabilities measured at fair value on a recurring basis and classified as Level 3 during the years ended December 31, 2016, 2015, and 2014.

Table 19.3 - Rollforward of Level 3 Assets and Liabilities
(dollars in millions)

	Year Ended December 31, 2016				
	Available-for-Sale Securities			Derivative Assets(1)	
	State and Local Housing Agency Obligations	Private-Label Residential MBS	Home Equity Loan ABS	Interest-Rate Related	Consolidated Bonds
Balance, at beginning of period	$ —	$ 8,282	$ 10	$ 4	$ (55)
Total gains (losses) included in earnings					
Net gains (losses) on sale of available-for-sale securities	—	—	1	—	—
Net gains (losses) on derivatives and hedging activities	—	—	—	(4)	55
Interest income	—	187	—	—	—
Net other-than-temporary impairment losses	—	(19)	—	—	—
Total gains (losses) included in other comprehensive income					
Net unrealized gains (losses) on available-for-sale securities	(1)	2	—	—	—
Net amount of impairment losses reclassified to (from) non-interest income	—	(7)	(1)	—	—
Net change in fair value of other-than-temporarily impaired securities	—	123	—	—	—
Purchases, issuances, sales, and settlements					
Purchases	9	—	—	—	—
Sales	—	(9)	(9)	—	—
Settlements	—	(1,726)	(1)	—	—
Balance, at end of period	$ 8	$ 6,833	$ —	$ —	$ —
Total amount of gains (losses) for the period included in earnings attributable to the change in unrealized gains/losses relating to assets and liabilities held at end of period	$ —	$ 112	$ —	$ —	$ —

	Year Ended December 31, 2015			
	Available-for-Sale Securities		Derivative Assets(1)	
	Private-Label Residential MBS	Home Equity Loan ABS	Interest-Rate Related	Consolidated Bonds
Balance, at beginning of period	$ 11,036	$ 12	$ 13	$ (62)
Total gains (losses) included in earnings				
Net gains (losses) on sale of available-for-sale securities	52	—	—	—
Net gains (losses) on derivatives and hedging activities	—	—	(9)	7
Interest income	162	2	—	—
Net other-than-temporary impairment losses	(73)	—	—	—
Total gains (losses) included in other comprehensive income				
Net unrealized gains (losses) on available-for-sale securities	(47)	—	—	—
Net amount of impairment losses reclassified to (from) non-interest income	42	—	—	—
Net change in fair value of other-than-temporarily impaired securities	(83)	(1)	—	—
Purchases, issuances, sales, and settlements				
Sales	(1,560)	—	—	—
Settlements	(1,596)	(3)	—	—
Transfers from held-to-maturity to available-for-sale securities(2)	349	—	—	—
Balance, at end of period	$ 8,282	$ 10	$ 4	$ (55)
Total amount of gains (losses) for the period included in earnings attributable to the change in unrealized gains/losses relating to assets and liabilities held at end of period	$ 93	$ 1	$ —	$ 7

	Year Ended December 31, 2014			
	Available-for-Sale Securities		Derivative Assets(1)	
	Private-Label Residential MBS	Home Equity Loan ABS	Interest-Rate Related	Consolidated Bonds
Balance, at beginning of period	$ 12,290	$ 15	$ 19	$ (68)
Total gains (losses) included in earnings				
Net gains (losses) on derivatives and hedging activities	—	—	(6)	6
Interest income	146	1	—	—
Net other-than-temporary impairment losses	(13)	—	—	—
Total gains (losses) included in other comprehensive income				
Net unrealized gains (losses) on available-for-sale securities	2	—	—	—
Net amount of impairment losses reclassified to (from) non-interest income	(1)	—	—	—
Net change in fair value of other-than-temporarily impaired securities	274	—	—	—
Purchases, issuances, sales, and settlements				
Settlements	(1,662)	(4)	—	—
Balance, at end of period	$ 11,036	$ 12	$ 13	$ (62)
Total amount of gains (losses) for the period included in earnings attributable to the change in unrealized gains/losses relating to assets and liabilities held at end of period	$ 78	$ 1	$ —	$ 6

(1) Balances exclude netting adjustments and cash collateral.

(2) In March 2015, the FHLBank of Seattle transferred $323 million of its private-label residential MBS from its HTM portfolio to its AFS portfolio based on its intent to sell its private-label residential MBS in connection with the merger with the FHLBank of Des Moines. The FHLBank of Seattle subsequently sold these private-label residential MBS. The remaining balance relates to certain FHLBanks that elected to transfer certain private-label residential MBS that had credit-related OTTI from its respective held-to-maturity portfolio to its respective available-for-sale portfolio during 2015.

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 entities to display the fair value of those assets and liabilities for which the entity has chosen to use fair value on the face of the statement 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. Interest income and interest expense on advances and consolidated obligations at fair value are recognized solely on the contractual amount of interest due or unpaid. Any transaction fees or costs are immediately recognized into non-interest income or non-interest expense.

The FHLBanks of New York, Cincinnati, Chicago, Des Moines, and San Francisco (Electing FHLBanks) have each elected the fair value option for certain financial instruments when a hedge relationship does 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 when an economic derivative is adjusted for changes in fair value, but the related hedged item is not.

For instruments for which the fair value option has been elected, the related contractual interest income, contractual interest expense, and the discount amortization on fair value option discount notes are recorded as part of net interest income on the Combined Statement of Income. The remaining changes in fair value for instruments for which the fair value option has been elected are recorded as net gains (losses) on financial instruments held under fair value option on the Combined Statement of Income. The net gains on financial instruments held under fair value option was $3 million for the year ended December 31, 2016. The net losses on financial instruments held under fair value option were $31 million and $76 million for the years ended December 31, 2015 and 2014. The change in fair value does not include changes in instrument-specific credit risk. Each of the Electing FHLBanks determined that no adjustments to the fair values of its instruments recorded under fair value option for instrument-specific credit risk were necessary for the years ended December 31, 2016, 2015, and 2014.

Table 19.4 presents the difference between the aggregate fair value and the aggregate unpaid principal balance outstanding for advances, mortgage loans held for sale, and consolidated obligations for which the fair value option has been elected as of December 31, 2016 and 2015.

Table 19.4 - Aggregate Fair Value and Aggregate Unpaid Balance
(dollars in millions)

	December 31, 2016			December 31, 2015		
	Aggregate Fair Value	Aggregate Unpaid Principal Balance	Aggregate Fair Value Over/ (Under) Aggregate Unpaid Principal Balance	Aggregate Fair Value	Aggregate Unpaid Principal Balance	Aggregate Fair Value Over/ (Under) Aggregate Unpaid Principal Balance
Advances(1)	$ 14,279	$ 14,260	$ 19	$ 13,744	$ 13,703	$ 41
Mortgage loans held for sale(2)	44	44	—	54	53	1
Consolidated discount notes	18,597	18,574	23	21,478	21,468	10
Consolidated bonds	16,898	16,938	(40)	20,735	20,756	(21)

(1) At December 31, 2016 and 2015, none of the advances were 90 days or more past due or had been placed on non-accrual status.
(2) Included in other assets on the Combined Statement of Condition at December 31, 2016 and 2015.

Note 20 - Commitments and Contingencies

Off-Balance Sheet Commitments

Table 20.1 - Off-Balance Sheet Commitments
(dollars in millions)

	December 31, 2016			December 31, 2015
Notional amount	Expire Within One Year	Expire After One Year	Total	Total
Standby letters of credit outstanding(1)	$ 104,305	$ 30,318	$ 134,623	$ 123,500
Unsettled consolidated bonds, at par	3,700	—	3,700	808
Unused lines of credit - advances	2,361	—	2,361	2,380
Commitments for standby bond purchases	399	1,684	2,083	2,517
Unsettled consolidated discount notes, at par	1,105	—	1,105	11,414
Commitments to fund additional advances	697	368	1,065	1,990
Commitments to purchase mortgage loans	898	—	898	807
Other(2)	367	—	367	337

(1) Excludes unconditional commitments to issue standby letters of credit of $472 million and $168 million at December 31, 2016 and 2015.
(2) Consists primarily of commitments related to MPF products and commitments to purchase investments not yet traded.

Standby Letters of Credit. A standby letter of credit is a financing arrangement between an FHLBank and its member. Standby letters of credit are executed for members for a fee. If an FHLBank is required to make payment for a beneficiary's draw, the payment amount is converted into a collateralized advance to the member. These standby letters of credit have original expiration periods of up to 20 years, currently expiring no later than 2034. The carrying value of guarantees related to standby letters of credit are recorded in other liabilities and were $184 million and $179 million at December 31, 2016 and 2015.

Each FHLBank monitors the creditworthiness of its members that have standby letters of credit. In addition, standby letters of credit are fully collateralized at the time of issuance. As a result, each FHLBank has deemed it unnecessary to record any additional liability on these commitments.

Standby Bond-Purchase Agreements. Certain FHLBanks have entered into standby bond-purchase agreements with state housing authorities within their district whereby these FHLBanks agree to provide liquidity for a fee. If required, the affected FHLBanks will purchase and hold the state housing authority's bonds until the designated marketing agent can find a suitable investor or the state housing authority repurchases the bond according to a schedule established by the standby bond-purchase agreement. Each standby bond-purchase agreement dictates the specific terms that would require the affected FHLBank to purchase the bond. The standby bond-purchase commitments entered into by these FHLBanks have original expiration periods of up to seven years, currently expiring no later than 2024, although some are renewable at the option of the affected FHLBank. At December 31, 2016 and 2015, the FHLBanks had standby bond-purchase commitments with 11 and 12 state housing authorities. During the years ended December 31, 2016 and 2015, the FHLBanks were not required to purchase any bonds under these agreements.

Pledged Collateral

Certain FHLBanks pledged securities, as collateral, related to derivatives. (See *Note 11 - Derivatives and Hedging Activities* for additional information about the FHLBanks' pledged collateral and other credit-risk-related contingent features.)

Lease Commitments

The FHLBanks charged to operating expenses net rental and related costs of approximately $24 million, $25 million, and $23 million for the years ended December 31, 2016, 2015, and 2014. Total future minimum lease payments were $172 million at December 31, 2016, including both operating and capital leases. Lease agreements for FHLBank premises generally provide for increases in the basic rentals resulting from increases in property taxes and maintenance expenses. These increases are not expected to have a material effect on the FHLBanks.

Lehman Bankruptcy

On September 15, 2008, Lehman Brothers Holdings, Inc. (LBHI), the parent company of Lehman Brothers Special Financing (LBSF) and a guarantor of LBSF's obligations, announced it had filed a petition for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code. This filing precipitated the termination of the FHLBanks' derivatives transactions with LBSF. Each affected FHLBank calculated its resulting settlement amount, including in that calculation any unreturned collateral pledged in connection with those transactions.

Several FHLBanks received a derivatives alternative dispute resolution (ADR) notice from the LBHI bankruptcy estate relating to the unwinding of derivatives transactions between LBSF and individual FHLBanks in 2008. Under the derivatives ADR notice, an FHLBank may agree to the demand, deny the demand, or make a counteroffer and ultimately arrive at a settlement of the demand. All of these FHLBanks, except the FHLBank of New York, have settled their disputes with the LBHI bankruptcy estate. The FHLBank of New York and LBHI are engaged in pre-trial discovery proceedings, and trial is currently scheduled to commence in April 2017. The FHLBank of New York is pursuing its claims against LBSF and LBHI in the LBHI litigation. The FHLBank of New York intends to vigorously defend against LBHI's complaint, which the FHLBank of New York believes to be without merit. In December 2016, the FHLBank of Cincinnati and LBHI bankruptcy estate entered into a settlement agreement and mutual release, whereby the FHLBank of Cincinnati paid $25.25 million in complete settlement of all claims. Each of the FHLBanks of New York and Cincinnati has disclosed information regarding its legal proceedings in connection with LBHI's insolvency in its individual 2016 SEC Form 10-K.

Other Legal Proceedings

The FHLBanks are subject to other legal proceedings arising in the normal course of business. The FHLBanks would record an accrual for a loss contingency when it is probable that a loss has been incurred and the amount can be reasonably estimated. After consultation with legal counsel, management of each FHLBank does not anticipate that the ultimate liability, if any, arising out of these matters will have a material effect on its FHLBank's financial condition, results of operations, or cash flows.

Note 21 - Subsequent Events

Subsequent events have been evaluated from January 1, 2017, through the time of this Combined Financial Report publication. No significant subsequent events were identified, except for the declaration of dividends or repurchase or redemption of excess capital stock, which generally occur in the normal course of business unless there are regulatory or self-imposed restrictions, and the following events:

FHLBank of Des Moines

In 2017, the FHLBank of Des Moines entered into a settlement agreement with a certain defendant in the FHLBank of Des Moines' private-label mortgage-backed securities litigation for $21 million (after netting certain legal fees and expenses). The net settlement will be recorded as additional income in other income (loss) in the FHLBank of Des Moines' statement of income for the quarter ended March 31, 2017.

FHLBank of San Francisco

In 2017, the FHLBank of San Francisco recognized $119 million in gains on litigation settlements, net, in connection with the FHLBank of San Francisco's private-label mortgage-backed securities litigation and settlement agreements with certain defendants.

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CONDITION
DECEMBER 31, 2016

(dollars in millions, except par value)	Combined	Combining Adjustments	Boston	New York
Assets				
Cash and due from banks	$ 7,441	$ (1)	$ 520	$ 152
Investments	292,017	(234)	18,032	30,685
Advances	705,225	—	39,099	109,257
Mortgage loans held for portfolio, net	48,476	2	3,694	2,746
Other assets	3,553	(1,347)	201	766
Total assets	$ 1,056,712	$ (1,580)	$ 61,546	$ 143,606
Liabilities				
Deposits	$ 8,089	$ (17)	$ 482	$ 1,241
Consolidated obligations				
Discount notes	409,815	—	30,054	49,358
Bonds	578,927	(234)	27,171	84,785
Total consolidated obligations	988,742	(234)	57,225	134,143
Mandatorily redeemable capital stock	1,704	1	33	31
Other liabilities	5,718	(1,348)	561	567
Total liabilities	1,004,253	(1,598)	58,301	135,982
Capital				
Capital stock				
Class B putable ($100 par value) issued and outstanding	36,072	(1)	2,412	6,308
Class A putable ($100 par value) issued and outstanding	162	—	—	—
Total capital stock	36,234	(1)	2,412	6,308
Additional capital from merger	52	—	—	—
Retained earnings				
Unrestricted	11,789	15	988	1,029
Restricted	4,541	1	229	383
Total retained earnings	16,330	16	1,217	1,412
Accumulated other comprehensive income (loss)	(157)	3	(384)	(96)
Total capital	52,459	18	3,245	7,624
Total liabilities and capital	$ 1,056,712	$ (1,580)	$ 61,546	$ 143,606

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco
$ 3,588	$ 1,815	$ 9	$ 547	$ 351	$ 223	$ 28	$ 207	$ 2
17,227	36,510	25,334	15,460	28,060	41,218	25,129	13,610	40,986
76,809	99,077	69,882	28,096	45,067	131,601	32,506	23,986	49,845
3,391	523	9,149	9,501	4,967	6,913	124	6,640	826
245	746	261	303	247	650	425	774	282
$ 101,260	$ 138,671	$ 104,635	$ 53,907	$ 78,692	$ 180,605	$ 58,212	$ 45,217	$ 91,941
$ 559	$ 1,118	$ 765	$ 524	$ 496	$ 1,113	$ 1,040	$ 599	$ 169
28,500	41,292	44,690	16,802	35,949	80,947	26,942	21,775	33,506
67,156	88,647	53,191	33,467	36,903	89,898	26,997	20,722	50,224
95,656	129,939	97,881	50,269	72,852	170,845	53,939	42,497	83,730
5	1	35	170	301	664	3	3	457
246	662	976	508	348	582	413	155	2,048
96,466	131,720	99,657	51,471	73,997	173,204	55,395	43,254	86,404
3,755	4,955	4,157	1,493	1,711	5,917	1,930	1,065	2,370
—	—	—	—	—	—	—	162	—
3,755	4,955	4,157	1,493	1,711	5,917	1,930	1,227	2,370
—	—	—	—	—	52	—	—	—
772	1,582	574	735	2,631	1,219	745	611	888
214	310	260	152	389	231	79	125	2,168
986	1,892	834	887	3,020	1,450	824	736	3,056
53	104	(13)	56	(36)	(18)	63	—	111
4,794	6,951	4,978	2,436	4,695	7,401	2,817	1,963	5,537
$ 101,260	$ 138,671	$ 104,635	$ 53,907	$ 78,692	$ 180,605	$ 58,212	$ 45,217	$ 91,941

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CONDITION
DECEMBER 31, 2015

(dollars in millions, except par value)	Combined	Combining Adjustments	Boston	New York
Assets				
Cash and due from banks	$ 14,289	$ —	$ 254	$ 327
Investments	273,684	(287)	18,019	26,167
Advances	634,022	1	36,076	93,874
Mortgage loans held for portfolio, net	44,557	(3)	3,582	2,525
Other assets	2,687	(4)	172	345
Total assets	$ 969,239	$ (293)	$ 58,103	$ 123,238
Liabilities				
Deposits	$ 8,533	$ (10)	$ 483	$ 1,350
Consolidated obligations				
Discount notes	494,045	1	28,479	46,850
Bonds	411,851	(308)	25,427	67,716
Total consolidated obligations	905,896	(307)	53,906	114,566
Mandatorily redeemable capital stock	745	1	42	19
Other liabilities	6,023	(7)	649	584
Total liabilities	921,197	(323)	55,080	116,519
Capital				
Capital stock				
Class B putable ($100 par value) issued and outstanding	34,005	(1)	2,337	5,585
Class A putable ($100 par value) issued and outstanding	180	—	—	—
Total capital stock	34,185	(1)	2,337	5,585
Additional capital from merger	194	—	—	—
Retained earnings				
Unrestricted	10,447	31	934	967
Restricted	3,850	1	195	303
Total retained earnings	14,297	32	1,129	1,270
Accumulated other comprehensive income (loss)	(634)	(1)	(443)	(136)
Total capital	48,042	30	3,023	6,719
Total liabilities and capital	$ 969,239	$ (293)	$ 58,103	$ 123,238

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco
$ 2,377	$ 1,751	$ 10	$ 4,932	$ 499	$ 982	$ 837	$ 683	$ 1,637
16,144	35,175	37,356	10,415	28,324	40,167	16,323	13,606	32,275
74,505	104,168	73,292	26,909	36,778	89,173	24,747	23,580	50,919
3,087	584	7,952	8,146	4,828	6,755	55	6,391	655
217	568	146	206	242	297	120	166	212
$ 96,330	$ 142,246	$ 118,756	$ 50,608	$ 70,671	$ 137,374	$ 42,082	$ 44,426	$ 85,698
$ 685	$ 1,084	$ 804	$ 557	$ 538	$ 1,110	$ 1,046	$ 759	$ 127
42,276	69,434	77,199	19,251	41,564	98,990	20,541	21,813	27,647
48,601	63,953	35,092	27,862	22,582	31,208	18,025	19,866	51,827
90,877	133,387	112,291	47,113	64,146	130,198	38,566	41,679	79,474
6	14	38	14	8	103	9	3	488
261	745	470	538	1,327	338	262	143	713
91,829	135,230	113,603	48,222	66,019	131,749	39,883	42,584	80,802
3,540	5,101	4,429	1,528	1,950	4,714	1,540	1,029	2,253
—	—	—	—	—	—	—	180	—
3,540	5,101	4,429	1,528	1,950	4,714	1,540	1,209	2,253
—	—	—	—	—	194	—	—	—
719	1,585	530	705	2,407	700	699	560	610
162	255	207	130	323	101	63	92	2,018
881	1,840	737	835	2,730	801	762	652	2,628
80	75	(13)	23	(28)	(84)	(103)	(19)	15
4,501	7,016	5,153	2,386	4,652	5,625	2,199	1,842	4,896
$ 96,330	$ 142,246	$ 118,756	$ 50,608	$ 70,671	$ 137,374	$ 42,082	$ 44,426	$ 85,698

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF INCOME
YEARS ENDED DECEMBER 31, 2016 and 2015

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
December 31, 2016				
Interest income				
Advances	$ 5,359	$ (1)	$ 341	$ 920
Investments	3,988	(11)	247	353
Mortgage loans held for portfolio	1,579	—	120	87
Other interest income	4	2	—	—
Total interest income	10,930	(10)	708	1,360
Interest expense				
Consolidated obligations - Discount notes	2,020	2	93	216
Consolidated obligations - Bonds	4,931	5	361	582
Other interest expense	144	(2)	2	6
Total interest expense	7,095	5	456	804
Net interest income	3,835	(15)	252	556
Provision (reversal) for credit losses	6	—	—	2
Net interest income after provision (reversal) for credit losses	3,829	(15)	252	554
Non-interest income (loss)	1,154	(16)	29	7
Non-interest expense	1,183	(17)	89	115
Affordable Housing Program assessments	392	—	19	45
Net income	$ 3,408	$ (14)	$ 173	$ 401
December 31, 2015				
Interest income				
Advances	$ 2,973	$ —	$ 247	$ 628
Investments	3,552	(19)	215	289
Mortgage loans held for portfolio	1,636	(1)	123	81
Other interest income	—	(2)	—	—
Total interest income	8,161	(22)	585	998
Interest expense				
Consolidated obligations - Discount notes	825	1	28	103
Consolidated obligations - Bonds	3,650	8	329	339
Other interest expense	133	—	2	2
Total interest expense	4,608	9	359	444
Net interest income	3,553	(31)	226	554
Provision (reversal) for credit losses	4	(2)	—	1
Net interest income after provision (reversal) for credit losses	3,549	(29)	226	553
Non-interest income (loss)	843	(2)	172	26
Non-interest expense	1,199	(8)	76	118
Affordable Housing Program assessments	332	(1)	33	46
Net income	$ 2,861	$ (22)	$ 289	$ 415

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 612	$ 586	$ 587	$ 219	$ 290	$ 876	$ 217	$ 230	$ 482	$ —
256	489	375	201	751	415	201	145	566	—
117	31	261	274	218	233	4	204	30	—
—	—	—	1	—	—	—	1	—	—
985	1,106	1,223	695	1,259	1,524	422	580	1,078	—
110	249	174	64	359	414	110	93	136	—
524	519	682	425	411	639	144	229	410	—
2	4	4	8	33	22	3	1	61	—
636	772	860	497	803	1,075	257	323	607	—
349	334	363	198	456	449	165	257	471	—
1	(1)	—	—	1	3	—	—	—	—
348	335	363	198	455	446	165	257	471	—
25	111	46	6	71	396	8	(14)	485	—
84	137	111	78	162	118	85	63	158	—
29	31	30	13	37	75	9	18	86	—
$ 260	$ 278	$ 268	$ 113	$ 327	$ 649	$ 79	$ 162	$ 712	$ —
$ 350	$ 141	$ 369	$ 127	$ 181	$ 324	$ 134	$ 145	$ 299	$ 28
225	427	342	153	815	271	83	113	574	64
121	40	251	264	256	245	4	205	33	14
—	—	—	—	—	—	—	2	—	—
696	608	962	544	1,252	840	221	465	906	106
54	59	65	19	294	106	22	22	46	6
324	305	568	328	396	414	77	203	317	42
—	1	2	1	54	3	—	1	66	1
378	365	635	348	744	523	99	226	429	49
318	243	327	196	508	317	122	239	477	57
—	(1)	—	—	5	2	—	(2)	1	—
318	244	327	196	503	315	122	241	476	57
44	225	30	10	21	(30)	29	(80)	388	10
76	135	75	72	136	137	77	58	148	99
29	33	28	13	39	17	7	10	78	—
$ 257	$ 301	$ 254	$ 121	$ 349	$ 131	$ 67	$ 93	$ 638	$ (32)

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF INCOME
YEAR ENDED DECEMBER 31, 2014

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
Interest income				
Advances	$ 2,620	$ 2	$ 236	$ 478
Investments	3,705	(16)	197	286
Mortgage loans held for portfolio	1,715	(3)	126	72
Other interest income	2	—	—	—
Total interest income	8,042	(17)	559	836
Interest expense				
Consolidated obligations - Discount notes	536	2	15	71
Consolidated obligations - Bonds	3,779	27	321	319
Other interest expense	195	1	9	2
Total interest expense	4,510	30	345	392
Net interest income	3,532	(47)	214	444
Provision (reversal) for credit losses	(21)	(1)	—	—
Net interest income after provision (reversal) for credit losses	3,553	(46)	214	444
Non-interest income (loss)	17	(4)	20	7
Non-interest expense	1,046	(8)	66	101
Affordable Housing Program assessments	269	(1)	18	35
Net income	$ 2,255	$ (41)	$ 150	$ 315

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 273	$ 180	$ 318	$ 107	$ 158	$ 239	$ 132	$ 124	$ 305	$ 68
224	448	353	156	877	187	67	98	658	170
129	50	247	231	327	245	5	205	42	39
—	—	—	1	—	—	—	1	—	—
626	678	918	495	1,362	671	204	428	1,005	277
24	29	28	7	269	43	10	9	20	9
319	325	559	303	518	377	73	193	326	119
—	1	4	1	54	—	—	1	120	2
343	355	591	311	841	420	83	203	466	130
283	323	327	184	521	251	121	225	539	147
(4)	(5)	—	(1)	(7)	(2)	—	(2)	—	1
287	328	327	185	528	253	121	227	539	146
76	105	23	13	29	(51)	8	(56)	(154)	1
79	132	68	68	121	67	75	53	144	80
28	30	28	13	44	14	5	12	36	7
$ 256	$ 271	$ 254	$ 117	$ 392	$ 121	$ 49	$ 106	$ 205	$ 60

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF COMPREHENSIVE INCOME
YEARS ENDED DECEMBER 31, 2016, 2015, AND 2014

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
December 31, 2016				
Net income	$ 3,408	$ (14)	$ 173	$ 401
Other comprehensive income				
Net unrealized gains/losses on available-for-sale securities	41	(1)	1	(5)
Net unrealized gains/losses on held-to-maturity securities transferred from available-for-sale securities	1	1	—	—
Net non-credit portion of other-than-temporary impairment losses on available-for-sale securities	114	—	—	—
Net non-credit portion of other-than-temporary impairment losses on held-to-maturity securities	95	1	37	6
Net unrealized gains/losses relating to hedging activities	240	1	23	44
Pension and postretirement benefits	(14)	2	(2)	(5)
Total other comprehensive income (loss)	477	4	59	40
Comprehensive income	$ 3,885	$ (10)	$ 232	$ 441
December 31, 2015				
Net income	$ 2,861	$ (22)	$ 289	$ 415
Other comprehensive income				
Net unrealized gains/losses on available-for-sale securities	(786)	—	(64)	(7)
Net non-credit portion of other-than-temporary impairment losses on available-for-sale securities	(108)	(1)	—	—
Net non-credit portion of other-than-temporary impairment losses on held-to-maturity securities	128	—	46	8
Net unrealized gains/losses relating to hedging activities	123	1	10	(4)
Pension and postretirement benefits	6	(3)	2	4
Total other comprehensive income (loss)	(637)	(3)	(6)	1
Comprehensive income	$ 2,224	$ (25)	$ 283	$ 416
December 31, 2014				
Net income	$ 2,255	$ (41)	$ 150	$ 315
Other comprehensive income				
Net unrealized gains/losses on available-for-sale securities	198	1	28	1
Net non-credit portion of other-than-temporary impairment losses on available-for-sale securities	274	2	—	—
Net non-credit portion of other-than-temporary impairment losses on held-to-maturity securities	134	—	49	9
Net unrealized gains/losses relating to hedging activities	(1)	(1)	(29)	(56)
Pension and postretirement benefits	(40)	—	(3)	(6)
Total other comprehensive income (loss)	565	2	45	(52)
Comprehensive income	$ 2,820	$ (39)	$ 195	$ 263

Pittsburgh		Atlanta		Cincinnati		Indianapolis		Chicago		Des Moines		Dallas		Topeka		San Francisco		Seattle	
$	260	$	278	$	268	$	113	$	327	$	649	$	79	$	162	$	712	$	—
	(21)		—		—		39		(199)		68		141		18		—		—
	—		—		—		—		—		—		—		—		—		—
	(5)		29		—		(3)		—		—		—		—		93		—
	—		—		—		—		40		—		4		2		5		—
	—		—		—		—		151		—		21		—		—		—
	(1)		—		—		(3)		—		(2)		—		(1)		(2)		—
	(27)		29		—		33		(8)		66		166		19		96		—
$	233	$	307	$	268	$	146	$	319	$	715	$	245	$	181	$	808	$	—
$	257	$	301	$	254	$	121	$	349	$	131	$	67	$	93	$	638	$	(32)
	(24)		—		—		(16)		(402)		(208)		(104)		(9)		—		48
	(21)		(23)		—		(8)		—		—		—		—		(45)		(10)
	—		—		—		—		47		—		6		4		6		11
	—		—		—		—		117		—		(1)		—		—		—
	2		3		4		—		(7)		1		—		2		(2)		—
	(43)		(20)		4		(24)		(245)		(207)		(99)		(3)		(41)		49
$	214	$	281	$	258	$	97	$	104	$	(76)	$	(32)	$	90	$	597	$	17
$	256	$	271	$	254	$	117	$	392	$	121	$	49	$	106	$	205	$	60
	64		—		—		16		8		38		23		—		—		19
	16		(7)		—		12		—		—		—		—		199		52
	—		—		—		—		56		—		6		4		7		3
	—		—		—		—		85		—		—		—		—		—
	(2)		(10)		(8)		(3)		1		(2)		—		(2)		(5)		—
	78		(17)		(8)		25		150		36		29		2		201		74
$	334	$	254	$	246	$	142	$	542	$	157	$	78	$	108	$	406	$	134

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CAPITAL
YEARS ENDED DECEMBER 31, 2016, 2015, AND 2014

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
Balance, December 31, 2013	$ 45,048	$ 91	$ 2,837	$ 6,485
Adjustment for cumulative effect of accounting change — change in amortization methodology	(43)	—	—	—
Comprehensive income (loss)	2,820	(39)	195	263
Proceeds from issuance of capital stock	17,305	—	204	3,852
Repurchases/redemptions of capital stock	(16,421)	(3)	(266)	(3,843)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(605)	1	(55)	—
Dividends of capital stock	51	1	—	—
Dividends				
Cash	(1,134)	(1)	(37)	(231)
Stock	(51)	(1)	—	—
Balance, December 31, 2014	46,970	49	2,878	6,526
Comprehensive income (loss)	2,224	(25)	283	416
Proceeds from issuance of capital stock	20,962	2	269	4,173
Capital stock issued from merger	894	—	—	—
Repurchases/redemptions of capital stock	(19,517)	(1)	(345)	(4,159)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(1,038)	(1)	—	(9)
Dividends of capital stock	73	—	—	—
Additional capital from merger	246	—	—	—
Capital stock canceled and other merger activity	(1,258)	—	—	—
Dividends				
Cash	(1,441)	6	(62)	(228)
Stock	(73)	—	—	—
Balance, December 31, 2015	48,042	30	3,023	6,719
Comprehensive income (loss)	3,885	(10)	232	441
Proceeds from issuance of capital stock	25,162	—	456	4,778
Repurchases/redemptions of capital stock	(20,682)	—	(381)	(4,002)
Net shares reclassified (to)/from mandatorily redeemable capital stock	(2,526)	—	—	(53)
Dividends of capital stock	95	—	—	—
Dividends				
Cash	(1,422)	(2)	(85)	(259)
Stock	(95)	—	—	—
Balance, December 31, 2016	$ 52,459	$ 18	$ 3,245	$ 7,624

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 3,693	$ 6,652	$ 5,310	$ 2,362	$ 3,765	$ 3,457	$ 1,747	$ 1,802	$ 5,709	$ 1,138
—	—	(43)	—	—	—	—	—	—	—
334	254	246	142	542	157	78	108	406	134
2,135	5,034	84	174	396	2,666	1,177	782	762	39
(2,048)	(4,760)	(498)	(233)	(160)	(1,858)	(1,079)	(712)	(941)	(20)
(8)	(7)	(17)	—	(4)	(31)	(3)	(394)	(3)	(84)
—	—	—	—	—	—	4	46	—	—
(104)	(182)	(176)	(69)	(14)	(79)	—	—	(240)	(1)
—	—	—	—	—	—	(4)	(46)	—	—
4,002	6,991	4,906	2,376	4,525	4,312	1,920	1,586	5,693	1,206
214	281	258	97	104	(76)	(32)	90	597	17
3,153	5,606	191	217	374	3,664	1,206	1,226	829	52
—	—	—	—	—	894	—	—	—	—
(2,618)	(5,634)	—	(240)	(324)	(3,385)	(887)	(473)	(1,439)	(12)
(36)	(21)	(29)	—	(2)	72	(7)	(586)	(415)	(4)
—	—	—	—	—	—	5	68	—	—
—	—	—	—	—	246	—	—	—	—
—	—	—	—	—	—	—	—	—	(1,258)
(214)	(207)	(173)	(64)	(25)	(102)	(1)	(1)	(369)	(1)
—	—	—	—	—	—	(5)	(68)	—	—
4,501	7,016	5,153	2,386	4,652	5,625	2,199	1,842	4,896	—
233	307	268	146	319	715	245	181	808	—
3,573	5,405	92	148	1,309	6,050	1,133	1,292	926	—
(3,302)	(5,544)	—	—	(1,248)	(4,105)	(757)	(590)	(753)	—
(56)	(7)	(364)	(183)	(300)	(742)	(3)	(762)	(56)	—
—	—	—	—	—	—	17	78	—	—
(155)	(226)	(171)	(61)	(37)	(142)	—	—	(284)	—
—	—	—	—	—	—	(17)	(78)	—	—
$ 4,794	$ 6,951	$ 4,978	$ 2,436	$ 4,695	$ 7,401	$ 2,817	$ 1,963	$ 5,537	$ —

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CASH FLOWS
YEAR ENDED DECEMBER 31, 2016

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
Operating activities				
Net cash provided by (used in) operating activities	$ 3,755	$ 1	$ 166	$ 450
Investing activities				
Net change/net proceeds and payments in				
Loans to FHLBanks	—	1,345	—	(255)
Premises, software, and equipment	(66)	3	(3)	(7)
Investments	(16,438)	1	(12)	(4,404)
Advances	(73,061)	(1)	(3,143)	(15,704)
Mortgage loans held for portfolio	(4,085)	—	(128)	(233)
Proceeds from sales of foreclosed assets	97	1	5	3
Principal collected on other loans	2	—	—	—
Net cash provided by (used in) investing activities	(93,551)	1,349	(3,281)	(20,600)
Financing activities				
Net change in				
Deposits and pass-through reserves	(1,178)	(4)	—	(65)
Loans from FHLBanks	—	(1,345)	—	—
Net proceeds (payments) on derivative contracts with financing element	(381)	(2)	(13)	(49)
Net proceeds from issuance of consolidated obligations				
Discount notes	3,863,143	1	163,426	441,811
Bonds	524,098	(1)	18,313	59,499
Payments for maturing and retiring consolidated obligations				
Discount notes	(3,947,549)	(1)	(161,859)	(439,333)
Bonds	(355,733)	1	(16,467)	(42,364)
Payments for retirement of subordinated notes	(944)	—	—	—
Proceeds from issuance of capital stock	25,162	—	456	4,778
Payments for repurchases/redemptions of mandatorily redeemable capital stock	(1,566)	2	(9)	(41)
Payments for repurchases/redemptions of capital stock	(20,682)	—	(381)	(4,002)
Cash dividends paid	(1,422)	(2)	(85)	(259)
Net cash provided by (used in) financing activities	82,948	(1,351)	3,381	19,975
Net increase (decrease) in cash and due from banks	(6,848)	(1)	266	(175)
Cash and due from banks at beginning of the period	14,289	—	254	327
Cash and due from banks at end of the period	$ 7,441	$ (1)	$ 520	$ 152

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 192	$ 230	$ 322	$ 240	$ 482	$ 660	$ 198	$ 232	$ 582	$ —
—	—	—	—	—	(200)	(290)	(600)	—	—
(2)	(4)	(2)	(5)	(11)	(8)	(4)	(10)	(13)	—
(995)	(1,055)	12,425	(5,152)	31	(1,058)	(8,670)	81	(7,630)	—
(2,497)	4,581	3,336	(1,325)	(8,361)	(42,625)	(7,823)	(483)	984	—
(321)	55	(1,238)	(1,373)	(142)	(192)	(69)	(276)	(168)	—
11	13	—	—	44	13	—	4	3	—
—	—	—	—	—	—	—	2	—	—
(3,804)	3,590	14,521	(7,855)	(8,439)	(44,070)	(16,856)	(1,282)	(6,824)	—
(129)	29	4	22	(43)	5	87	(161)	(923)	—
—	—	—	—	—	—	—	—	1,345	—
(18)	(72)	(23)	(33)	(49)	(7)	(85)	(39)	9	—
106,235	517,233	325,536	331,384	682,913	272,871	351,968	533,157	136,608	—
67,260	75,617	50,923	31,636	36,752	98,684	28,036	17,338	40,041	—
(120,015)	(545,415)	(358,051)	(333,840)	(688,540)	(290,948)	(345,583)	(533,203)	(130,761)	—
(48,569)	(50,763)	(32,787)	(25,998)	(22,297)	(39,576)	(18,941)	(16,458)	(41,514)	—
—	—	—	—	(944)	—	—	—	—	—
3,573	5,405	92	148	1,309	6,050	1,133	1,292	926	—
(57)	(20)	(367)	(28)	(7)	(181)	(9)	(762)	(87)	—
(3,302)	(5,544)	—	—	(1,248)	(4,105)	(757)	(590)	(753)	—
(155)	(226)	(171)	(61)	(37)	(142)	—	—	(284)	—
4,823	(3,756)	(14,844)	3,230	7,809	42,651	15,849	574	4,607	—
1,211	64	(1)	(4,385)	(148)	(759)	(809)	(476)	(1,635)	—
2,377	1,751	10	4,932	499	982	837	683	1,637	—
$ 3,588	$ 1,815	$ 9	$ 547	$ 351	$ 223	$ 28	$ 207	$ 2	$ —

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CASH FLOWS
YEAR ENDED DECEMBER 31, 2015

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
Operating activities				
Net cash provided by (used in) operating activities	$ 3,864	$ (2)	$ 277	$ 682
Investing activities				
Net change/net proceeds and payment in				
Premises, software, and equipment	(57)	(1)	(1)	(2)
Investments	(3,382)	(2)	(1,203)	(210)
Advances	(65,535)	3	(2,694)	3,680
Mortgage loans held for portfolio	(1,167)	(1)	(118)	(404)
Proceeds from sales of foreclosed assets	103	—	8	3
Principal collected on other loans	2	—	—	—
Cash transferred for merger	—	—	—	—
Net cash provided by (used in) investing activities	(70,036)	(1)	(4,008)	3,067
Financing activities				
Net change in				
Deposits and pass-through reserves	(59)	—	114	(453)
Net proceeds (payments) on derivative contracts with financing element	(703)	—	(18)	(221)
Net proceeds from issuance of consolidated obligations				
Discount notes	3,553,414	(2)	142,834	207,883
Bonds	304,426	(1)	11,782	50,340
Bonds transferred from other FHLBanks	—	(123)	88	35
Payments for maturing and retiring consolidated obligations				
Discount notes	(3,421,830)	(1)	(139,670)	(211,089)
Bonds	(378,287)	—	(11,875)	(56,065)
Bonds transferred to other FHLBanks	—	123	—	(88)
Proceeds from issuance of capital stock	20,962	2	269	4,173
Payments for repurchases/redemptions of mandatorily redeemable capital stock	(2,925)	—	(257)	(9)
Payments for repurchases/redemptions of capital stock	(19,517)	(1)	(345)	(4,159)
Cash dividends paid	(1,441)	6	(62)	(228)
Net cash provided by (used in) financing activities	54,040	3	2,860	(9,881)
Net increase (decrease) in cash and due from banks	(12,132)	—	(871)	(6,132)
Cash and due from banks at beginning of the period	26,421	—	1,125	6,459
Cash and due from banks at end of the period	$ 14,289	$ —	$ 254	$ 327

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 135	$ 389	$ 333	$ 251	$ 570	$ 189	$ 195	$ 202	$ 689	$ (46)
(4)	(5)	(2)	(4)	(11)	(9)	(5)	(1)	(12)	—
538	1,388	(11,340)	276	4,019	(1,335)	1,208	(4,094)	(446)	7,819
(11,208)	(4,963)	(2,943)	(6,177)	(4,301)	(14,939)	(5,855)	(5,330)	(12,011)	1,203
20	150	(1,031)	(1,340)	1,220	396	16	(183)	53	55
11	15	—	—	42	14	—	6	4	—
—	—	—	—	—	—	—	2	—	—
—	—	—	—	—	2,341	—	—	—	(2,341)
(10,643)	(3,415)	(15,316)	(7,245)	969	(13,532)	(4,636)	(9,600)	(12,412)	6,736
35	(31)	75	(528)	(125)	226	250	156	262	(40)
(32)	(97)	(28)	(58)	(60)	(8)	(146)	(42)	17	(10)
154,730	657,748	305,975	101,486	277,115	283,542	674,400	309,022	106,536	332,145
35,226	61,513	19,043	22,235	10,283	20,139	18,143	14,136	38,935	2,652
—	—	—	—	—	—	—	—	—	—
(149,530)	(625,495)	(270,028)	(94,809)	(266,620)	(254,806)	(672,993)	(301,433)	(100,717)	(334,639)
(30,285)	(89,515)	(43,118)	(19,862)	(21,962)	(34,866)	(16,199)	(14,468)	(33,968)	(6,104)
—	—	—	—	(35)	—	—	—	—	—
3,153	5,606	191	217	374	3,664	1,206	1,226	829	52
(31)	(26)	(54)	(2)	(3)	(574)	(3)	(587)	(646)	(733)
(2,618)	(5,634)	—	(240)	(324)	(3,385)	(887)	(473)	(1,439)	(12)
(214)	(207)	(173)	(64)	(25)	(102)	(1)	(1)	(369)	(1)
10,434	3,862	11,883	8,375	(1,382)	13,830	3,770	7,536	9,440	(6,690)
(74)	836	(3,100)	1,381	157	487	(671)	(1,862)	(2,283)	—
2,451	915	3,110	3,551	342	495	1,508	2,545	3,920	—
$ 2,377	$ 1,751	$ 10	$ 4,932	$ 499	$ 982	$ 837	$ 683	$ 1,637	$ —

FEDERAL HOME LOAN BANKS
CONDENSED COMBINING SCHEDULES—STATEMENTS OF CASH FLOWS
YEAR ENDED DECEMBER 31, 2014

(dollars in millions)	Combined	Combining Adjustments	Boston	New York
Operating activities				
Net cash provided by (used in) operating activities	$ 3,049	$ 3	$ 65	$ 589
Investing activities				
Net change/net proceeds and payments in				
Premises, software, and equipment	(49)	1	(2)	(2)
Investments	(25,421)	1	(3,753)	(4,738)
Advances	(73,104)	1	(6,057)	(8,481)
Mortgage loans held for portfolio	758	(2)	(130)	(207)
Proceeds from sales of foreclosed assets	163	—	8	2
Principal collected on other loans	2	—	—	—
Net cash provided by (used in) investing activities	(97,651)	1	(9,934)	(13,426)
Financing activities				
Net change in				
Deposits and pass-through reserves	(1,266)	(1)	(147)	171
Net proceeds (payments) on derivative contracts with financing element	(798)	1	(18)	(237)
Net proceeds from issuance of consolidated obligations				
Discount notes	3,969,949	3	127,396	197,930
Bonds	348,749	(1)	11,963	57,185
Bonds transferred from other FHLBanks	—	(66)	—	—
Payments for maturing and retiring consolidated obligations				
Discount notes	(3,900,963)	(1)	(118,149)	(193,757)
Bonds	(337,198)	(1)	(9,860)	(57,013)
Bonds transferred to other FHLBanks	—	66	—	(66)
Proceeds from issuance of capital stock	17,305	—	204	3,852
Payments for repurchases/redemptions of mandatorily redeemable capital stock	(2,973)	—	(733)	(5)
Payments for repurchases/redemptions of capital stock	(16,421)	(3)	(266)	(3,843)
Cash dividends paid	(1,134)	(1)	(37)	(231)
Net cash provided by (used in) financing activities	75,250	(4)	10,353	3,986
Net increase (decrease) in cash and due from banks	(19,352)	—	484	(8,851)
Cash and due from banks at beginning of the period	45,773	—	641	15,310
Cash and due from banks at end of the period	$ 26,421	$ —	$ 1,125	$ 6,459

Pittsburgh	Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco	Seattle
$ 258	$ 237	$ 285	$ 214	$ 620	$ 148	$ 214	$ 190	$ 165	$ 61
(3)	(5)	(1)	(6)	(11)	(3)	(3)	(1)	(12)	(1)
(2,343)	(9,399)	(3,612)	360	3,728	(2,688)	(4,118)	(833)	3,221	(1,247)
(13,413)	(10,001)	(5,202)	(3,499)	(8,878)	(19,592)	(3,000)	(947)	5,358	607
90	158	(190)	(653)	1,647	(21)	20	(297)	196	147
18	24	—	—	88	15	—	5	3	—
—	—	—	—	—	—	—	2	—	—
(15,651)	(19,223)	(9,005)	(3,798)	(3,426)	(22,289)	(7,101)	(2,071)	8,766	(494)
(49)	(688)	(201)	14	122	(265)	(91)	(364)	254	(21)
(33)	(101)	(31)	(61)	(61)	(9)	(191)	(55)	14	(16)
131,730	470,183	270,415	49,396	1,205,177	215,049	399,156	53,853	104,611	745,050
25,984	84,624	41,461	18,700	20,109	24,565	11,386	10,282	31,415	11,076
66	—	—	—	—	—	—	—	—	—
(122,909)	(465,234)	(267,394)	(44,264)	(1,205,214)	(195,416)	(386,010)	(50,524)	(106,991)	(745,100)
(20,042)	(73,337)	(40,359)	(19,840)	(18,178)	(22,449)	(16,863)	(10,155)	(37,446)	(11,655)
—	—	—	—	—	—	—	—	—	—
2,135	5,034	84	174	396	2,666	1,177	782	762	39
(7)	(12)	(70)	(1)	—	(16)	(1)	(395)	(1,355)	(378)
(2,048)	(4,760)	(498)	(233)	(160)	(1,858)	(1,079)	(712)	(941)	(20)
(104)	(182)	(176)	(69)	(14)	(79)	—	—	(240)	(1)
14,723	15,527	3,231	3,816	2,177	22,188	7,484	2,712	(9,917)	(1,026)
(670)	(3,459)	(5,489)	232	(629)	47	597	831	(986)	(1,459)
3,121	4,374	8,599	3,319	971	448	911	1,714	4,906	1,459
$ 2,451	$ 915	$ 3,110	$ 3,551	$ 342	$ 495	$ 1,508	$ 2,545	$ 3,920	$ —

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SUPPLEMENTAL INFORMATION

<u>FHLBank Management and Compensation</u>

FHLBank Directors

A board of at least 13 directors, or such other number as the FHFA determines appropriate, governs each FHLBank. The members of each FHLBank elect all of the FHLBank's directors, each of whom is elected for a four-year term, unless otherwise adjusted by the Director of the FHFA in order to achieve an appropriate staggering of terms (with approximately one-fourth of the directors' terms expiring each year). Directors may not serve more than three consecutive full terms. An FHLBank's board of directors must be comprised of a majority of member directors, who are directors or officers of members, and a minority of non-member independent directors. Non-member independent directors must comprise not less than two-fifths of the members of the board of directors and two of these directors must hold public interest director positions.

To be eligible to serve as a member director, a candidate must be a citizen of the United States and be an officer or director of a member institution that is located in the state to which the Director of the FHFA has allocated the directorship and that meets all of the minimum capital requirements established by its appropriate regulator. For member directors, each eligible institution may nominate representatives from member institutions in its respective state to serve on the board of the directors. After the slate of nominees is finalized, each eligible institution may vote for the number of open member director seats in the state in which its principal place of business is located.

To be eligible to serve as a non-member independent director, an individual must be a citizen of the United States and a bona fide resident of that FHLBank's district. A non-member independent director may not be an officer of any FHLBank, or an officer, director, or employee of an FHLBank member on whose board the individual sits or of any recipient of advances from an FHLBank. Under the Federal Home Loan Bank Act of 1932, as amended (FHLBank Act), there are two types of non-member independent directors:

- *Public interest director.* Each FHLBank is required to have at least two public interest directors. Before names are placed on the ballot, nominee eligibility will be verified through application and eligibility certification forms prescribed by the FHFA. Public interest directors must have more than four years' experience in representing consumer or community interests in banking services, credit needs, housing, or consumer financial protections. The FHFA deemed existing public interest directors who qualified and were designated under previous FHLBank Act provisions to be public interest directors for the remainder of their current terms.

- *Other non-member independent directors.* Non-member independent directors shall have experience in, or knowledge of, one or more of the following areas: auditing and accounting, derivatives, financial management, organizational management, project development, risk management practices, and the law. In order for a non-member independent director candidate to be elected, a candidate must receive at least 20% of the votes that are eligible to be cast unless there are multiple nominees. The FHFA will impose the FHLBank Act's requirements on newly elected non-member independent directors.

The FHFA's regulation includes the following provisions:

- requires each FHLBank's board of directors to annually determine how many of its non-member independent directors should be designated public interest directors (provided that each FHLBank at all times has at least two public interest directors);

- states that where an FHLBank's board of directors acts to fill a member director vacancy that occurs mid-term, the eligible candidates for that position must be officers or directors of a member institution at the time the FHLBank board of directors acts, not as of the prior year-end; and

- permits an FHLBank that nominates more than one nominee for each open non-member independent director position to declare elected the nominee who receives the highest number of votes, even if the total votes received are less than 20% of the eligible votes.

Eligible members nominate representatives from members in their state to serve as member directors and non-member independent directors are nominated by each FHLBank's board of directors. For the election of both member directors and non-member independent directors, each eligible institution is entitled to cast one vote for each share of stock that it was required to hold as of December 31 of the calendar year immediately preceding the election year (the record date). The number of votes that any member may cast for any one directorship shall not exceed the average number of shares of stock required to be held as of the record date by all member institutions located in the member's state as of the record date.

The board of directors of each FHLBank has the responsibility to establish policies and programs that carry out the FHLBank's housing finance mission. Each board of directors adopts and reviews policies governing the FHLBank's credit, investment, and funding activities, and oversees the implementation of these policies. The directors also must adopt policies to manage the FHLBank's exposure to credit, liquidity, and interest-rate risk. In addition, each board of directors is responsible for monitoring that FHLBank's compliance with FHFA regulations.

The following persons are currently serving as Chair or Vice-Chair of an FHLBank and the following information has been provided for each FHLBank primarily based on the information disclosed in its annual report on SEC Form 10-K for the year ended December 31, 2016:

Andrew J. Calamare, 61, is serving as Chair of the board of directors of the FHLBank of Boston. Mr. Calamare has served as president and chief executive officer of The Co-operative Central Bank, located in Boston Massachusetts, since March 2015. Prior to his current position, Mr. Calamare served as executive vice president of The Co-operative Central Bank from January 2011 to March 2015. Prior to that position, Mr. Calamare served as president and chief executive officer of the Life Insurance Association of Massachusetts since 2000. Previously, Mr. Calamare served as of counsel with the law firm Quinn and Morris, as special counsel to the Rhode Island General Assembly, and as Commissioner of Banks for the Commonwealth of Massachusetts. Mr. Calamare has served as a director of the FHLBank of Boston since March 30, 2007, and his current term as a director will conclude on December 31, 2020.

Stephen G. Crowe, 66, is serving as Vice-Chair of the board of directors of the FHLBank of Boston. Mr. Crowe serves as the community engagement officer of MountainOne Bank since April 2016. Mr. Crowe served as a director of MountainOne Bank and a trustee of MountainOne Financial, its holding company, from 2002 to April 2016, and as president and chief executive officer of MountainOne Bank from 2002 to 2012. Mr. Crowe also served as president and chief executive officer of Williamstown Savings Bank from 1994 to 2009 and Hoosac Bank from 2002 to 2009. Mr. Crowe is also a former director of The Savings Bank Life Insurance Company of Massachusetts, which is also a member of the FHLBank of Boston. He was a Massachusetts certified public accountant from 1976 to June 2016. Mr. Crowe served as a treasurer of the American Bankers Association in 2011 and 2012. Mr. Crowe's service as a director of the FHLBank of Boston began on January 1, 2012, and his current term will conclude on December 31, 2019.

Michael M. Horn, 77, is serving as Chair of the board of directors of the FHLBank of New York. Mr. Horn has been a partner in the law firm of McCarter & English, LLP since 1990. He has served as the Commissioner of Banking for the State of New Jersey and as the New Jersey State Treasurer. He was also a member of the New Jersey State Assembly and served as a member of the Assembly Banking Committee. In addition, Mr. Horn served on New Jersey's Executive Commission on Ethical Standards as both its Vice-Chair and Chairman, was appointed as a State Advisory Member of the Federal Financial Institutions Examination Council, and was a member of the Municipal Securities Rulemaking Board. Mr. Horn is counsel to the New Jersey Bankers Association, was Chairman of the Bank Regulatory Committee of the Banking Law Section of the New Jersey State Bar Association, and is a Fellow of the American Bar Foundation. Mr. Horn's legal and regulatory experience, as indicated by his background, supports his qualifications to serve on the FHLBank of New York's board of directors as an independent director.

James W. Fulmer, 65*,* was elected Vice-Chair of the FHLBank of New York effective January 1, 2015. He has been a director of FHLBank of New York member bank The Bank of Castile since 1988 and the chairman since 1992. He also served as chief executive officer of The Bank of Castile from 1996 through 2014 and president from 2002 through 2014. Mr. Fulmer has also served as vice-chairman of Tompkins Financial Corporation ("Tompkins Financial"), the parent company of The Bank of Castile, since 2007, and has served as a director of Tompkins Financial since 2000. Since 2001, he has served as chairman of the board of Tompkins Insurance Agencies, Inc., a subsidiary of Tompkins Financial. In addition, since 1999, Mr. Fulmer has served as a member of the board of directors of FHLBank of New York member bank, Mahopac Bank, a subsidiary of Tompkins Financial. Since 2012, he has served as a member of the board of directors for VIST Bank, a subsidiary of Tompkins Financial. He is an active community leader, serving as a member of the board of directors of the Erie and Niagara Insurance Association,

Williamsville, NY, and Cherry Valley Cooperative Insurance Company, Williamsville, NY. Mr. Fulmer is also Chairman of WXXI Public Broadcasting Council in Rochester, NY. He is a former member of the board of directors of the Catholic Health System of Western New York. He is also former president of the Independent Bankers Association of New York State and former member of the board of directors of the New York Bankers Association.

Patrick A. Bond, 67, joined the Board of Directors of the FHLBank of Pittsburgh in May 2007 and is currently serving as its Chair. He is a Founding General Partner of Mountaineer Capital, LP in Charleston, West Virginia. He graduated with a BS in Industrial Engineering and an MS in Industrial Engineering from West Virginia University. He is a Board member of the West Virginia Symphony Orchestra, Treasurer of the Board of Charleston Area Alliance, Chairman of the Board of Directors of Mid-Atlantic Holdings, Board member of Troy, LLC, and a former member of the Bank's Affordable Housing Advisory Council.

John K. Darr, 72, joined the board of directors of the FHLBank of Pittsburgh in January 2008 and is currently serving as its Vice-Chair. Mr. Darr retired from the FHLBanks Office of Finance at the end of 2007 where he served as Chief Executive Officer and Managing Director for 15 years. He was responsible for issuing debt in the global capital markets on behalf of the FHLBanks, consistent with their mission of providing low-cost liquidity for member-owner financial institutions. He was also responsible for issuing the FHLBank System's Combined Financial Report and was intimately involved in the FHLBank System's SEC Registration process. Mr. Darr has a total of 46 years of business experience, including several years as Treasurer of the FHLBank of San Francisco, serving as a control officer of three member institutions, and as CFO of Sallie Mae, CEO of a registered investment management company, and Managing Director of Mortgage Finance at a securities dealer. In addition to his service on the Board of the FHLBank of Pittsburgh, Mr. Darr is a Trustee of a mutual fund complex serving as a Trustee of Advisors Inner Circle Fund I, Advisors Inner Circle Fund II, and Bishop Street Funds. Mr. Darr also serves as a director of two non-profit entities, including Meals on Wheels, Lewes/Rehoboth and the West Rehoboth Land Trust.

F. Gary Garczynski, 70, has served as Chair of the board of directors of FHLBank of Atlanta since January 1, 2015. He has served as the president of National Capital Land and Development, Inc., a construction and real estate development company in Woodbridge, Virginia, since 1997. Mr. Garczynski served as chairman of the National Housing Endowment from 2004 to 2010 and continues to serve on its executive committee. He previously served as the 2002 President of the National Association of Home Builders (NAHB). Mr. Garczynski serves as a Senior Life Director of NAHB, a Life Director of the Home Builders Association of Virginia, and a Senior Life Director of the Northern Virginia Building Industry Association. He also is a member of the Prince William County, Virginia, Affordable Housing Task Force and a three-term appointee to the Virginia Housing Commission. Mr. Garczynski serves a gubernatorial appointment through 2018 as vice-chairman of the Commonwealth Transportation Board and has previously served as a director on the Northern Virginia Transportation Authority.

Richard A. Whaley, 57, has served as Vice-Chair of the board of directors of FHLBank of Atlanta since January 1, 2015. He has served as president, chief executive officer, and director of Citizens Bank of Americus in Americus, Georgia, since 2001. From 1989 to 2001, he served as market manager and commercial lender for Wachovia Bank. Mr. Whaley served as chairman of the Georgia Bankers Association from October 2010 to June 2012. Mr. Whaley also served as chairman of the South Georgia Technical College Foundation from 2008 to 2010. He has served as a director of the Georgia Bankers Association Insurance Trust, Inc. since June 2013 and is a veteran of the U.S. Army.

Donald J. Mullineaux, 71, has served as Chair of the FHLBank of Cincinnati since January 2015. 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 FHLBank of Cincinnati's Board in areas vital to the operation of financial institutions in today's economy.

William J. Small, 66, has served as Vice-Chair of the FHLBank of Cincinnati since January 2014. Mr. Small has been Chairman of First Defiance Financial Corp. and its subsidiary bank, First Federal Bank of the Midwest, of Defiance, Ohio, since 1999. He also served as Chief Executive Officer of First Defiance Financial Corp. from 1999 to December 2013. In addition, he served as Chief Executive Officer of First Federal Bank of the Midwest from 1999 until 2008.

James D. MacPhee, 69, serves as the Chair of the board of directors of the FHLBank of Indianapolis. He is the Vice-Chair of the board of directors of Kalamazoo County State Bank in Schoolcraft, Michigan, after having served as a director and its Chief Executive Officer from 1991 through his retirement in December 2015. Mr. MacPhee also serves as a director of First State Bank in Decatur, Michigan. Mr. MacPhee has worked in the financial services industry since 1968. During his career, Mr. MacPhee has held leadership positions with the Community Bankers of Michigan (formerly the Michigan Association of Community Bankers) and the Independent Community Bankers of America, is a past chair of the latter organization and currently serves on its Executive Committee. He holds an associate's degree in business from Kalamazoo Valley Community College and attended a two-year accelerated executive management program at the University of Michigan (Ross School of Business).

Dan L. Moore, 66, serves as the Vice-Chair of the board of directors of the FHLBank of Indianapolis. Mr. Moore is the President and Chief Executive Officer of Home Bank SB in Martinsville, Indiana, and has served in that position since 2006. Prior to that time, Mr. Moore served as that bank's Executive Vice President and Chief Operating Officer. Mr. Moore has also served as a director of Home Bank SB since 2000. He has been employed by Home Bank SB since 1978. Mr. Moore holds a bachelor's degree from Indiana State University and a master of science degree in management from Indiana Wesleyan University.

William W. Sennholz, 51, is Chair of the FHLBank of Chicago and has served in that capacity since January 1, 2016. Mr. Sennholz joined Forward Financial Bank (formerly Marshfield Savings Bank) in Marshfield, Wisconsin, in 2005 as President and Chief Executive Officer. Prior to his service with Forward Financial Bank, he served as President, Chief Executive Officer, and Chairman of the Board of Clarke County State Bank in Osceola, Iowa, from 2002 to 2005. From 1997 to 2002, Mr. Sennholz was the Vice President, Senior Lending Officer at Peoples State Bank in Wausau, Wisconsin. He held various positions of increasing responsibility at M&I First American Bank from 1989 to 1997. In addition to his duties as a director of the FHLBank of Chicago, Mr. Sennholz is also the Chairman of the Marshfield Area YMCA, Chairman of the Marshfield Economic Development Board, and a council member of Hope Lodge (a lodging facility for cancer patients and their families).

Michael G. Steelman, 66, is Vice-Chair of the FHLBank of Chicago and has served in that capacity since January 1, 2016. Mr. Steelman has been with the Farmers and Merchants State Bank of Bushnell and its holding company, Prairieland Bancorp., Inc., since 1984. He has served as Chief Executive Officer of Farmers and Merchants State Bank of Bushnell since 1996, and was appointed Chairman in 2001. In addition, Mr. Steelman has served as President and Chairman of the holding company since 2001. Mr. Steelman served as Chairman of the Illinois Bankers Association in 2008-2009, and was actively involved in the legislative and regulatory process at federal and state levels. An attorney practicing in banking law, Mr. Steelman is a member of the Illinois State Bar Association, and a graduate of the University of Wisconsin Graduate School of Banking. Mr. Steelman also serves as Secretary and Director of the Bushnell Economic Development Corporation.

Dale E. Oberkfell, 61, the Chair of the FHLBank of Des Moines, has served in a variety of banking positions during his 30 years in the financial services industry. Mr. Oberkfell currently serves as executive vice president and chief financial officer of Midwest BankCentre and treasurer and board secretary of Midwest BankCentre, Inc. in St. Louis, Missouri, positions he has held since joining Midwest BankCentre in January of 2012. During 2011 and 2010, he served as executive vice president and chief financial officer of Reliance Bancshares, Inc. in Des Peres, Missouri, and as an executive vice president and CFO of Reliance Bank, FSB in Fort Myers, Florida. Mr. Oberkfell was also a partner at the certified public accounting firm of Cummings, Oberkfell & Ristau, P.C. in St. Louis, Missouri. He is a licensed certified public accountant and is a member of the American Institute of Certified Public Accountants. He has held board position for numerous charitable organizations, including Good Shepard Family and Children's Services, the West County YMCA, St. Louis Children's Choir, and Young Audiences. Mr. Oberkfell's position as an officer of a member institution and his involvement in and knowledge of accounting, auditing, internal controls, and financial management, as indicated by his background, support his qualifications to serve on the FHLBank of Des Moines' board of directors. He currently serves as chair of the Executive and Governance Committee.

Michael J. Blodnick, 64, is Vice-Chair of the Board of Directors of the FHLBank of Des Moines, and is currently serving as a director of Glacier Bancorp and Glacier Bank, in Kalispell Montana. Mr. Blodnick previously served as president, CEO, and a director of Glacier Bancorp from 1998 to 2016 and as CEO and director of Glacier Bank from 2012 to 2016. During his tenure he served in a variety of positions at Glacier Bank, Glacier Bancorp, Inc., and a number of bank subsidiaries owned by the company prior to its 2012 organizational restructuring. His performance as president and CEO of Glacier Bancorp, Inc. earned Mr. Blodnick recognition as American Banker’s Community Banker of the Year for 2014. Mr. Blodnick was appointed to the

FHLBank of Seattle's board on April 1, 2015 and served on the FHLBank of Seattle's board until the Merger in 2015. Mr. Blodnick's forty years of financial management experience in all aspects of banking, as indicated by his background, supports his qualifications to serve on the Board of Directors of the FHLBank of Des Moines. He currently serves as the vice-chair of the Executive and Governance Committee of the FHLBank of Des Moines's Board of Directors.

Joseph F. Quinlan, Jr., 69, is Chair of the Board of Directors of the FHLBank of Dallas and has served in that capacity since January 1, 2015. Mr. Quinlan serves as Chairman of First National Bankers Bank (a member of the FHLBank of Dallas) and as Chairman, President and Chief Executive Officer of its privately held holding company, First National Bankers Bankshares, Inc. (Baton Rouge, Louisiana) and has served in such capacities since 1984. From 2000 through March 2011, Mr. Quinlan also served as Chairman of the Mississippi National Bankers Bank, a former member of the FHLBank of Dallas, and from 2003 through March 2011 he served as Chairman of the First National Bankers Bank, Alabama. Further, Mr. Quinlan served as a director of the Arkansas Bankers Bank, a former member of the FHLBank of Dallas, from December 2008 through March 2011 and as its Chairman from February 2009 through March 2011. Mississippi National Bankers Bank, First National Bankers Bank, Alabama, and Arkansas Bankers Bank were merged into First National Bankers Bank on March 31, 2011. In addition, Mr. Quinlan serves as Chairman of FNBB Services Corp. LLC., FNBB Capital Markets LLC, FNBB Insurance Agency LLC and FNBB Holdings LLC, and has served in those capacities since 1998, 2003, 2010, and 2016, respectively. He currently serves on the Council of Federal Home Loan Banks and is a member of the Chair and Vice-Chair Committee of the Council of Federal Home Loan Banks. Mr. Quinlan also serves as Chairman of the Executive and Governance Committee of the FHLBank of Dallas' Board of Directors.

Robert M. Rigby, 70*,* is Vice-Chair of the Board of Directors of the FHLBank of Dallas and has served in that capacity since January 1, 2015. Mr. Rigby serves as Market President of Liberty Bank in North Richland Hills, Texas (a member of the FHLBank of Dallas) and has served in that capacity since August 2008. From 1998 to August 2008, he served as a director, President and Chief Executive Officer of Liberty Bank. Since August 2008, he has served as an advisory director for Liberty Bank. Prior to joining Liberty Bank, Mr. Rigby served as a director and Executive Vice President of First National Bank of Weatherford from 1980 to 1998. He currently serves as an advisory director for the Texas Tech University School of Banking. In addition, Mr. Rigby serves as vice-chairman of the North Richland Hills Economic Development Advisory Committee. He previously served on the BankPac Committee of the American Bankers Association and he is a past chairman of the Texas Bankers Association. Further, Mr. Rigby previously served on the Weatherford College Board of Trustees, the board of directors of the Birdville ISD Education Foundation and as an advisory director for the North Texas Special Needs Assistance Partners. He is also a past chairman of the Northeast Tarrant Chamber of Commerce. Mr. Rigby currently serves on the Council of Federal Home Loan Banks and is a member of the Chair and Vice-Chair Committee of the Council of Federal Home Loan Banks. He also serves as Vice-Chairman of the Executive and Governance Committee of the FHLBank of Dallas' Board of Directors.

G. Bridger Cox, 64, is the Chair of the board of directors of the FHLBank of Topeka and he has been Chairman and President of Citizens Bank & Trust Company, Ardmore, Oklahoma, since 1996. Although the FHLBank of Topeka's Board of Directors did not participate in Mr. Cox's nomination since he is a member director, Mr. Cox is a graduate of the Stonier Graduate School of Banking at Rutgers University, possesses more than 30 years of banking management experience, has served on the board of directors of the Oklahoma Industrial Finance Authority and the Oklahoma Development Finance Authority, and has prior experience as an FHLBank of Topeka director, that assists in his service as a director. Prior to his current term, Mr. Cox served as a member director of the FHLBank of Topeka from January 1998 through December 2006.

Robert E. Caldwell, II, 46, is Vice-Chair of the board of directors of the FHLBank of Topeka and is currently Vice President for Nebco, Inc., a supplier of materials to the construction industry to construct buildings, streets and highways, since August 2014. Prior to his service at Nebco, Inc., Mr. Caldwell was the President and Chief Operating Officer of WRK Real Estate, LLC, a real estate management and development company, since January 2014. He previously served as President and Chief Executive Officer of Hampton Enterprises, Inc., a commercial real estate development, general contracting, construction management and property management firm, from 2006 through 2013. Prior to 2006, he served as General Counsel for Linweld, Inc., a large independent manufacturer and distributor of industrial/medical gases and welding supplies. The board of directors of the FHLBank of Topeka considered Mr. Caldwell's qualifications, skills and attributes, including his B.S. in business administration, his J.D. and MBA, his experience as General Counsel for Linweld, Inc., a subsidiary of a Japanese public company, his service as President and Chief Executive Officer of a commercial real estate and construction company, and his prior service as an FHLBank director, when making his nomination.

Douglas H. (Tad) Lowrey, 64, is the Chair of the board of directors of the FHLBank of San Francisco, and has been non-executive Chairman of Pacific Western Bank since its acquisition of CapitalSource Bank in April 2014. He also served as director of PacWest Bancorp from April 2014 to May 2016. Mr. Lowrey served as the Chief Executive Officer of CapitalSource Bank, Los Angeles, California, from July 2008 to April 2014 and served as its chairman from 2012 until April 2014. Since August 2015 he has served as a senior advisor for Alliance Partners, a bank advisory, lending and asset management firm. Mr. Lowrey has held positions as chief executive officer, president, chairman, director, and chief financial officer for several financial institutions since 1983. He is the past Chair of the California Bankers Association. He also served as vice president of the Thrift Institutions Advisory Council to the Board of Governors of the Federal Reserve Bank, and as a member of the Savings Association Insurance Fund Industry Advisory Committee to the Federal Deposit Insurance Corporation. He previously served on the FHLBank of San Francisco's board of directors from 1996 to 1998 and from 1999 to 2003 and was its vice-chairman in 2003 and 2005. Mr. Lowrey's current position as the chairman of an FHLBank of San Francisco member; his previous positions as principal executive officer, principal financial officer, director, and chairman of FHLBank of San Francisco members and other financial institutions; and his involvement in and knowledge of corporate governance, finance, auditing, accounting, internal controls, risk management, financial reporting, and financial management, as indicated by his background, support Mr. Lowrey's qualifications to serve on the board of directors of the FHLBank of San Francisco.

Melinda Guzman, 53, is the Vice-Chair of the board of directors of the FHLBank of San Francisco, and has been a Chief Executive Officer of Melinda Guzman Professional Corporation, Sacramento, California, since 2009. She was a partner with Freeman & Guzman, LLP, a law firm in Sacramento, California, from 1999 to 2015. Prior to that, she was a partner with Diepenbrock, Wulff, Plant & Hannegan, LLP, also a law firm in Sacramento. Ms. Guzman's practice focuses on tort, labor, insurance, and commercial matters. She previously served on the FHLBank of San Francisco’s board of directors from April 2007 through December 2008. Ms. Guzman's involvement and experience in representing community and consumer interests with respect to banking services, in credit needs, in housing and consumer financial protections, and in corporate governance, as indicated by her background, and her management skills derived from her various legislative appointments and her service from 2002 to 2003 as chair of the Nehemiah Corporation of America (a community development corporation), her service from 2001 to 2004 as chairman of the California Hispanic Chamber of Commerce, and her service with other community-based organizations support Ms. Guzman's qualifications to serve on the FHLBank of San Francisco’s Board.

FHLBank Presidents

Each FHLBank president reports to the board of directors of the respective FHLBank. Each FHLBank president participates in regular meetings with the presidents of the other FHLBanks. The responsibilities of the president include:

- management of the FHLBank;
- administration of the programs of the FHLBank; and
- compliance with the regulations and policies of the FHFA.

The following persons are currently serving as president of an FHLBank and the following information has been provided for each FHLBank primarily based on the information disclosed in its annual report on SEC Form 10-K for the year ended December 31, 2016:

Edward A. Hjerpe III, 58, has served as President and Chief Executive Officer of the FHLBank of Boston since July 2009. Mr. Hjerpe joined the FHLBank of Boston from Strata Bank and Service Bancorp, Inc., where he was Interim Chief Executive Officer from September 2008 until joining the FHLBank of Boston. Mr. Hjerpe was a financial, strategy, and management consultant from August 2007 to September 2008. He was both President and Chief Operating Officer of the Massachusetts/Rhode Island Region of Webster Bank and Senior Vice President of Webster Financial Corporation from May 2004 to June 2007. Prior to those roles, Mr. Hjerpe served as Executive Vice President, Chief Operating Officer, and Chief Financial Officer at FIRSTFED AMERICA BANCORP, Inc. from July 1997 to May 2004. Mr. Hjerpe also worked at the FHLBank of Boston from 1988 to 1997, first as Vice President and Director of Financial Analysis and Economic Research, and ultimately as Executive Vice President and Chief Financial Officer. Mr. Hjerpe has been involved in numerous community, civic, industry, and nonprofit organizations over the course of his career. He currently serves as a member of the board of directors of the Office of Finance and as a member of the FHLBank Presidents Conference. Mr. Hjerpe is also a former member and past chair of the board of Dental Services of Massachusetts, a former member and past chair of the board of trustees of St. Anselm College in Manchester, New Hampshire, and a current member of the board of directors of the Pentegra Defined Benefit Plan for Financial Institutions. Mr. Hjerpe earned a B.A. in Business and Economics from St. Anselm College, and an M.A. and Ph.D. in Economics from the University of Notre Dame.

José R. González, 62, was appointed President and Chief Executive Officer of the FHLBank of New York effective April 2, 2014. Mr. González joined the FHLBank of New York on October 15, 2013, as Executive Vice President. Mr. González served as Vice-Chairman of the Board of Directors of the FHLBank of New York from 2008 through 2013, and as an elected industry director from 2004 through 2013. Prior to joining the FHLBank of New York, he served as Senior Executive Vice President, Banking & Corporate Development for OFG Bancorp (formerly Oriental Financial Group, Inc.). Mr. González has also been a member of the Board of Directors of the Pentegra Defined Benefit Plan for Financial Institutions since July 2014. On August 31, 2016, Mr. González was appointed by President Barack Obama to serve as one of the eight directors of the Oversight Board created by the Puerto Rico Oversight, Management, and Economic Stability Act (“PROMESA”) of 2016. Mr. González was a member of the Board of Directors of Santander BanCorp (“Santander”), a bank holding company, from 2000 to 2010. From 2002 to 2008, he was Vice-Chairman of the Board, President and CEO of Santander. After joining Santander in 1996 as President and CEO of its securities broker dealer, Mr. González was named Senior Executive Vice President and Chief Financial Officer of the holding company in 2001. Mr. González began his career in banking in the early 1980s as Vice President, Investment Banking, for Credit Suisse First Boston (“CSFB”) and, from 1989 through 1995, served as President and CEO of CSFB’s Puerto Rico operations. He served as President and CEO of the Government Development Bank for Puerto Rico, a government instrumentality that acts as the Commonwealth’s fiscal agent, from 1986 to 1989. He is a past President of both the Puerto Rico Bankers Association and the Securities Industry Association of Puerto Rico. Mr. González holds a B.A. in Economics from Yale University and M.B.A. and Juris Doctor degrees from Harvard University.

Winthrop Watson, 62, was appointed as the FHLBank of Pittsburgh's President and Chief Executive Officer effective January 1, 2011. Previously, he was Chief Operating Officer of the Bank, a position that he assumed in November 2009. Prior to joining the FHLBank of Pittsburgh, Mr. Watson worked at J.P. Morgan for 24 years in a variety of capital markets and financial institution roles most recently as Managing Director in its Asia Pacific investment banking business. Earlier, Mr. Watson led the building of the company’s investment and commercial banking franchise for U.S. government-sponsored enterprises. Mr. Watson serves as a director of the Office of Finance of the Federal Home Loan Banks and the Pentegra Defined Benefit Plan. He is involved in the community as a board member of the Pittsburgh Ballet Theater, the Neighborhood Academy, the Pittsburgh Symphony Orchestra, Economics Pennsylvania and the Pennsylvania Economy League of Greater Pittsburgh. Mr. Watson holds an MBA from Stanford University and a BA from the University of Virginia.

W. Wesley McMullan, 53, was appointed as the FHLBank of Atlanta's President and Chief Executive Officer in December 2010. Previously he served as Executive Vice President and Director of Financial Management since 2004, with responsibility for sales, MPP sales, asset-liability management, liquidity management, other mission-related investments, customer systems and operations, and member education. Mr. McMullan joined the FHLBank of Atlanta as a credit analyst in 1988, and later earned promotions to assistant vice president in 1993, vice president in 1995, group vice president in 1998, and senior vice president in 2001. Mr. McMullan also currently serves on the board of Directors of the FHLBanks Office of Finance. He is a Chartered Financial Analyst and earned a B.S. in Finance from Clemson University.

Andrew S. Howell, 55, was appointed as the FHLBank of Cincinnati's President and Chief Executive Officer in June 2012. Previously, he served as Executive Vice President-Chief Operating Officer of the FHLBank of Cincinnati since January 2008. Mr. Howell began his career at the FHLBank of Cincinnati in 1989 as the Credit Department Manager after being in several lending and management positions at Huntington Bank, Bank One, and First National Bank of Cincinnati. Mr. Howell currently serves on the Board of Directors of the FHLBanks Office of Finance and Pentegra Defined Contribution Plan for Financial Institutions. Mr. Howell earned a bachelor's degree of Business Administration from the University of Kentucky, and a Master of Business Administration degree from the University of Cincinnati.

Cindy L. Konich, 60, was selected by the FHLBank of Indianapolis' board of directors to serve as President - Chief Executive Officer of the FHLBank of Indianapolis in July 2013. Prior to that appointment, she served as Acting Co-President - Chief Executive Officer for two periods during 2013. Previously, Ms. Konich had been promoted to Executive Vice President - Chief Operating Officer - Chief Financial Officer in July 2010, after having served as Senior Vice President - Chief Financial Officer, beginning in September 2007. Ms. Konich also currently serves on the Board of Directors of the FHLBanks Office of Finance. Ms. Konich holds an MBA and is a CPA.

Matthew R. Feldman, 63, became President and Chief Executive Officer of the FHLBank of Chicago in May 2008, after serving as Acting President from April 2008 until then. Mr. Feldman was Executive Vice President, Operations and Administration of the FHLBank of Chicago from 2006 to 2008, Senior Vice President, Risk Management of the FHLBank of Chicago from 2004 to 2006 and Senior Vice President, Manager of Operations Analysis of the FHLBank of Chicago from 2003 to 2004. Prior to his employment with the FHLBank of Chicago, Mr. Feldman was co-founder and Chief Executive Officer of Learning Insights, Inc. from 1996 to 2003. Mr. Feldman conceived, established, financed, and directed the operations of this

privately held e-learning company. Mr. Feldman was President of Continental Trust Company, a wholly-owned subsidiary of Continental Bank from 1992 to 1995 and Managing Director-Global Trading and Distribution of Continental Bank from 1988 to 1992. Mr. Feldman currently serves on the Board of Directors of the FHLBank's Office of Finance and as Chairman of the Board of the Pentegra Defined Benefit Plan for Financial Institutions.

Michael L. Wilson, 60, has been President and Chief Executive Officer of the FHLBank of Des Moines since April 2016, and has over 22 years of Federal Home Loan Bank experience. Mr. Wilson joined the FHLBank of Des Moines in June of 2015 as President after the FHLBank of Des Moines and FHLBank of Seattle merger. Previously, Mr. Wilson was President and CEO of the FHLBank of Seattle from 2012 until its merger into the FHLBank of Des Moines in June 2015, and from 2006 to 2012 he was executive vice president and the chief business officer (CBO) of the FHLBank of Des Moines. During his prior role as CBO, Mr. Wilson was responsible for business activities that served the FHLBank of Des Moines' members and their communities. These activities included credit and mortgage sales, member financial services, community investments, and human resources. Before joining the FHLBank of Des Moines in 2006, Mr. Wilson was a senior executive vice president and the chief operating officer (COO) of the FHLBank of Boston, where he worked for 12 years. In addition, he served as the FHLBank of Boston's executive vice president for finance from 1997 to 1999 and senior vice president for planning and research from 1994 to 1997. Prior to his service at the FHLBank of Boston, he was the director of the Office of Policy and Research at the Federal Housing Finance Board in Washington, D.C. Mr. Wilson currently serves on the Board of Directors of the Federal Home Loan Bank Office of Finance, the fiscal agent for the FHLBank System. Mr. Wilson has a B.A. in economics and political science from the University of Wisconsin-Milwaukee and a M.S. in economics from the University of Wisconsin-Madison.

Sanjay Bhasin, 48, serves as President and Chief Executive Officer of the FHLBank of Dallas and has served in that capacity since he joined the FHLBank of Dallas in May 2014. Prior to his employment with the FHLBank of Dallas, Mr. Bhasin served as Executive Vice President, Members and Markets for the FHLBank of Chicago from 2011 until May 2014. He joined the FHLBank of Chicago in 2004 as Vice President, Mortgage Finance and was promoted to Senior Vice President, Mortgage Finance in 2007 and to Executive Vice President, Financial Markets in 2008, a position he held until his appointment as Executive Vice President, Members and Markets. Prior to joining the FHLBank of Chicago, Mr. Bhasin was responsible for managing the interest rate risk associated with Bank One, NA’s mortgage pipeline holdings from 1999 to 2004. Mr. Bhasin currently serves on the Council of Federal Home Loan Banks and as a director of the FHLBanks Office of Finance.

Mark E Yardley, 61, became President and Chief Executive Officer of the FHLBank of Topeka on March 24, 2017, after being named interim President and Chief Executive Officer on January 1, 2017. From May 2010 to January 2017, he was Executive Vice President and Chief Risk Officer. Mr. Yardley previously served as Executive Vice President and Chief Financial Officer from February 2005 to May 2010, First Senior Vice President and Chief Financial Officer from December 1999 through February 2005 and as First Senior Vice President, Director of Finance, from January 1999 to December 1999. Mr. Yardley joined the FHLBank of Topeka in 1984 as Director of Internal Audit and was promoted to Assistant Vice President in 1990 and Vice President in 1991. Mr. Yardley also currently serves on the Board of Directors of the FHLBanks Office of Finance.

J. Gregory Seibly, 53, has been President and Chief Executive Officer of the FHLBank of San Francisco since May 2016. Prior to joining the FHLBank of San Francisco, he served as President of Consumer Banking at Umpqua Bank from its April 2014 merger with Sterling Financial Corporation (Sterling) until May 2016. From October 2009 to April 2014, he served as President and Chief Executive Officer of Sterling and as a member of the board of directors. Before joining Sterling in 2007, he was President of U.S. Bank - California. With 30 years of industry experience, Mr. Seibly has also held executive-level positions in commercial banking at Wells Fargo Bank and in healthcare finance at Bank of America. He currently serves on the board of the Pacific Coast Bankers School. Mr. Seibly also currently serves on the Board of Directors of the FHLBanks Office of Finance.

Chief Executive Officer, FHLBanks Office of Finance

John D. Fisk, 60, began serving as Chief Executive Officer of the Office of Finance on January 1, 2008. Mr. Fisk has over 30 years of experience in the fixed-income and mortgage markets. Prior to joining the Office of Finance in 2004, he was Executive Vice-President for Strategic Planning at MGIC, the nation's largest private mortgage insurer. Previously, Mr. Fisk held a series of increasingly responsible capital market and mortgage positions in his 17 years at Freddie Mac. These included leading the securities sales & trading group and the REMIC Program. By the time of his departure in 2000, he was Executive Vice-President, responsible for all single-family mortgage business. A 1978 graduate of Yale University, Mr. Fisk earned his MBA from the Wharton School at the University of Pennsylvania in 1982.

FHLBanks Office of Finance Board of Directors

The Office of Finance board of directors is comprised of the FHLBank presidents and five independent directors. Jonathan A. Scott is the Chair and W. Wesley McMullan, President and Chief Executive Officer of the FHLBank of Atlanta, is the Vice-Chair. The following persons are currently serving as an independent director:

Jonathan A. Scott, Ph.D., 67, was originally appointed as an independent director for a three-year term ending in 2013. In 2013, he was re-elected to a five-year term ending in 2018. In 2014, he was appointed Chair of the Office of Finance's board of directors. Dr. Scott is a full professor of Finance at Temple University's Fox School of Business and Management, where he has been since 1991. At Temple he is currently the Deputy Department Chair for the Finance Department, and Managing Director of the Owl Fund. He also has six years of experience in academic administration at Temple University and managed initiatives related to information technology, program cost analysis, and performance metrics. Prior to joining the university, Dr. Scott was an executive for seven years at the FHLBank of Dallas, including service as the Chief Financial Officer in 1987-1988. Dr. Scott received a Ph.D. in Economics from Purdue University.

Janice C. Eberly, 54*,* was originally appointed as an independent director for a one-year term ending in 2015. In 2015, she was re-elected to a five-year term ending in 2020. Dr. Eberly is the James R. and Helen D. Russell Distinguished Professor of Finance at the Northwestern University's Kellogg School of Management, where she has been a faculty member since 1998. She served as the Assistant Secretary for Economic Policy and Chief Economist for the United States Treasury from 2011 to 2013, and as an independent director for the FHLBank of Chicago from 2009 to 2011. Dr. Eberly received a Ph.D. in Economics from the Massachusetts Institute of Technology.

Kathleen C. McKinney, 62, was originally appointed as an independent director for a two-year term ending in 2012. In 2017, she was re-elected to a five-year term ending in 2022. Ms. McKinney is a senior shareholder with Haynsworth Sinkler Boyd, P.A. having over 38 years of experience as bond counsel and underwriter's counsel in the public finance, community facilities and economic development sectors. She has served as President of the National Association of Bond Lawyers and is a recognized speaker on public finance legal issues. Her practice includes advising State agencies and local governments on corporate governance matters with respect to debt issuance and investment of public funds. She is past chair of the Furman University Board of Trustees. She is recognized by Chambers in Band 1 for her achievement as an attorney in banking and finance.

Joel W. Motley, 64, in 2016 was appointed as an independent director for a five-year term ending in 2021. Mr. Motley, founder of Carmona Motley Inc., has been Managing Director of Public Capital Advisors LLC since January 2006. Prior to beginning his career in investment banking at Lazard Frères & Co., Mr. Motley worked as an aide to the late Senator Daniel Patrick Moynihan (D-NY), serving as his chief of staff in New York City and surrounding counties. Mr. Motley is active on a number of corporate and not-for-profit boards. He chairs the Governance Committee of the New York board of the Oppenheimer Funds, and he is a member of the Council on Foreign Relations. Mr. Motley is Chairman Emeritus of the board of Human Rights Watch. Mr. Motley holds a JD degree from Harvard Law School and an AB degree (magna cum laude) from Harvard College.

Patricia A. Oelrich, 63, was appointed to serve as an independent director for a five-year term ending in 2019. Ms. Oelrich, Ph.D., CPA, CISA, was formerly a member of the board of directors of Pepco Holdings, Inc. from May 2010 to May 2016, when the utility was sold to Exelon Corporation. She served as chair of the Audit Committee, and as a member of the Nominating/ Governance Committee. She is also on the board of the Association of Audit Committee Members, Inc. From 1995 to 2009, she was with GlaxoSmithKline Pharmaceuticals as Vice President, Internal Audit and then as Vice President, IT Risk Management. Prior to joining GlaxoSmithKline, Ms. Oelrich was an audit partner with Ernst & Young, serving the audit assurance practice from 1975-1995. In 1988, she became a partner and headed the Information Technology Audit and Security Practice in Chicago from 1988 to 1995.

Regulations Governing the Selection and Compensation of FHLBank and Office of Finance Employees

As specified in the FHLBank Act, the selection and compensation of FHLBank officers and employees are subject to the approval of the board of directors and management of each individual FHLBank. However, the Director of the FHFA has the authority to prohibit compensation that is not reasonable and comparable to compensation paid to executives in other similar businesses involving similar duties and responsibilities. The FHFA established several principles for the FHLBanks and the Office of Finance for setting executive compensation policies and practices to ensure sound incentive compensation practices:

- executive compensation must be reasonable and comparable to that offered to executives in similar positions at other comparable financial institutions;
- executive incentive compensation should be consistent with sound risk management and preservation of the par value of the FHLBank's capital stock;
- a significant percentage of an executive's incentive-based compensation should be tied to longer-term performance and outcome-indicators;
- a significant percentage of an executive's incentive-based compensation should be deferred and made contingent upon performance over several years; and
- the board of directors of each FHLBank and the Office of Finance should promote accountability and transparency with respect to the process of setting compensation.

Each FHLBank is responsible for establishing that FHLBank's compensation philosophy and objectives, and each FHLBank includes a compensation discussion and analysis relating to all material elements of the compensation of its named executive officers in its annual report on SEC Form 10-K. (See *Explanatory Statement about Federal Home Loan Banks Combined Financial Report*.)

The FHFA exercises similar supervisory and examination authority over the Office of Finance and its board of directors as it exercises over an FHLBank and its board of directors. FHFA regulations require the Office of Finance board of directors to select, employ, determine the compensation for, and assign the duties of, the Office of Finance chief executive officer. (See *Office of Finance CEO 2016 Compensation Discussion and Analysis* for more information.)

Overview and Objectives of FHLBank and Office of Finance Executive Compensation Programs

Each FHLBank strives to provide total compensation that promotes its mission. Compensation programs at each of the FHLBanks are generally intended to focus executives on achieving their individual FHLBank's mission and to associate executive pay with the FHLBank's corporate goals, performance targets, and strategic plan. Each FHLBank's board of directors determines total compensation for the president and/or CEO of that FHLBank, consisting of base salary, cash incentive compensation, and other benefits as described in Table S-1.

The Office of Finance is only responsible for the compensation policies for its employees. The Office of Finance seeks 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 the Office of Finance's strategic business initiatives. The objectives of the program are to communicate goals and standards of performance for the successful achievement of the Office of Finance's mission. (See *Office of Finance CEO 2016 Compensation Discussion and Analysis* for more information.)

The following information has been provided for each FHLBank primarily based on the information disclosed in its annual report on SEC Form 10-K for the year ended December 31, 2016, which in each case provides detail about the FHLBank's compensation philosophy and objectives. The presentations may not be consistent due to differing FHLBank practices and application and interpretation of the rules.

Table S-1 - FHLBank Presidents and/or CEOs and Office of Finance CEO Summary Compensation
(whole dollars)

FHLBank	President/CEO Name	Year	Salary	Bonus	Non-Equity Incentive Plan Compensation	Change In Pension Value and Nonqualified Deferred Compensation Earnings	All Other Compensation*	Total
Boston	Edward A. Hjerpe III	2016	$ 756,700	$ —	$ 654,149	$ 692,000	$ 103,149	$ 2,205,998
		2015	733,300	29,332	674,487	244,000	90,530	1,771,649
		2014	710,000	—	477,230	700,000	86,490	1,973,720
New York	José R. González(1)	2016	791,779	—	781,402	72,000	45,954	1,691,135
		2015	729,750	—	677,021	60,000	97,968	1,564,739
		2014	700,000	—	428,212	50,000	89,821	1,268,033
Pittsburgh	Winthrop Watson(2)	2016	775,753	—	753,061	360,000	68,737	1,957,551
		2015	725,003	—	738,723	249,000	73,137	1,785,863
		2014	694,980	—	578,406	335,000	62,394	1,670,780
Atlanta	W. Wesley McMullan(3)	2016	800,000	100	799,865	1,871,447	69,688	3,541,100
		2015	751,000	100	757,270	498,478	64,679	2,071,527
		2014	722,000	100	651,166	2,545,955	62,401	3,981,622
Cincinnati	Andrew S. Howell(4)	2016	800,625	—	648,357	1,426,000	27,215	2,902,197
		2015	728,482	—	544,843	889,000	29,536	2,191,861
		2014	692,016	—	479,622	2,431,000	15,600	3,618,238
Indianapolis	Cindy L. Konich	2016	775,242	—	595,086	2,996,000	46,515	4,412,843
		2015	680,030	—	430,624	1,943,000	15,900	3,069,554
		2014	638,477	—	411,903	3,294,000	26,954	4,371,334
Chicago	Matthew R. Feldman	2016	904,250	—	853,624	1,006,000	15,900	2,779,774
		2015	869,450	—	841,280	624,000	15,900	2,350,630
		2014	808,780	—	747,596	1,232,000	15,600	2,803,976
Des Moines	Michael L. Wilson(5)	2016	720,000	—	751,012	664,000	70,610	2,205,622
		2015	420,000	—	329,412	222,250	175,943	1,147,605
	Richard S. Swanson(6)	2016	516,693	1,125	602,034	1,299,000	2,556,170	4,975,022
		2015	720,000	—	565,910	394,000	72,677	1,752,587
		2014	695,000	—	593,780	1,004,000	68,513	2,361,293
Dallas	Sanjay Bhasin(7)	2016	656,625	—	444,751	93,000	39,397	1,233,773
		2015	637,500	100,000	350,849	22,000	37,894	1,148,243
		2014	400,240	150,000	199,531	153,000	237,248	1,140,019
Topeka	Andrew J. Jetter	2016	742,000	—	703,698	665,117	140,573	2,251,388
		2015	711,187	—	684,512	185,015	61,085	1,641,799
		2014	685,721	—	627,386	2,067,470	69,827	3,450,404
San Francisco	J. Gregory Seibly(8)	2016	506,665	—	396,700	335,768	447,105	1,686,238
	Dean Schultz(9)	2016	492,924	—	330,500	490,992	228,893	1,543,309
		2015	852,800	35,533	818,300	—	61,106	1,767,739
		2014	828,000	—	750,100	67,313	61,644	1,707,057
Office of Finance	John D. Fisk	2016	730,800	—	413,694	523,000	19,357	1,686,851
		2015	696,000	—	619,602	241,000	19,649	1,576,251
		2014	669,500	—	640,825	948,000	24,775	2,283,100

* Compensation in this column is further presented in Table S-2 - All Other Compensation.

(1) Mr. González was appointed President and Chief Executive Officer of the FHLBank of New York on April 1, 2014. Mr. González joined the FHLBank of New York on October 15, 2013, as Executive Vice President.

(2) Mr. Watson's 2016 non-equity incentive plan compensation was the incentive plans described in the FHLBank of Pittsburgh's SEC Form 10-K, as well as deferred incentive earned in the 2015 and 2014 Executive Officer Incentive Compensation Plan.

(3) Mr. McMullan's amount under the non-equity incentive plan compensation includes the dollar value of all earnings for services performed during the fiscal years ended December 31, 2016, 2015 and 2014 pursuant to awards under the FHLBank of Atlanta incentive compensation plan, subject to certain mandatory deferral requirements. 50% of the incentive compensation awards for each year were subject to mandatory deferral over three years. Also included is the dollar value of all interest during each year earned on deferred incentives related to incentive compensation awards for prior fiscal years. The $100 bonus amounts for Mr. McMullan in each year reflect an annual $100 employee appreciation bonus provided to all employees of FHLBank of Atlanta. To the extent the FHLBank of Atlanta provided a tax gross-up on such bonus amounts, those amounts are included in All Other Compensation.

(4) Mr. Howell's 2016 salary includes $50,625 of excess accrued vacation benefits automatically paid in accordance with the established policy (applicable to all employees).

(5) Mr. Wilson's 2015 salary, non-equity incentive, and change in accrued pension value, non-qualified deferred compensation earnings and all other compensation are based on the period of his employment with the FHLBank of Des Moines, from June 1, 2015 through December 31, 2015.

(6) Mr. Swanson's employment with the FHLBank of Des Moines was terminated effective June 30, 2016. His salary, non-equity incentive, change in pension value, and non-qualified deferred compensation earnings are based on the period of his employment with the FHLBank of Des Moines from January 1, 2016 through June 30, 2016. All other compensation includes Mr. Swanson's termination of employment compensation.
(7) Mr. Bhasin became President and Chief Executive Officer of the FHLBank of Dallas on May 12, 2014.
(8) Mr. Seibly became President and Chief Executive Officer of the FHLBank of San Francisco effective May 12, 2016.
(9) Mr. Schultz retired effective May 31, 2016 and from May 12, 2016 until his retirement, he served as a non-executive employee of the FHLBank of San Francisco. Mr. Schultz's 2016 salary includes $137,591 for a vacation cash-out payment at retirement. Mr. Schultz's pension value decreased by $167,764 during 2015. In accordance with SEC rules, this negative amount is not included in this table.

FHLBank President Employment Agreements

FHLBank of Boston. The FHLBank of Boston has a change-in-control agreement with Mr. Hjerpe. The FHLBank of Boston's board of directors had determined that having the change in control agreement in place would be an effective recruitment and retention tool since the events under which it provides payment to Mr. Hjerpe would provide a measure of protection to Mr. Hjerpe in the instance of the FHLBank of Boston's relocation in excess of 50 miles or his termination of employment or material diminution in duties or base compensation resulting from merger, consolidation, reorganization, sale of all or substantially all of the FHLBank of Boston's assets, or the liquidation or dissolution of the FHLBank of Boston. Under the terms of the change in control agreement, in the event that either:

- Mr. Hjerpe terminates his employment with the FHLBank of Boston for a good reason (as defined in the change in control agreement) that is not remedied within certain cure periods by the FHLBank of Boston; or
- the FHLBank of Boston (or the FHLBank of Boston's successor in the event of reorganization) terminates Mr. Hjerpe's employment without cause (as defined by the change in control agreement).

The FHLBank of Boston has agreed to pay Mr. Hjerpe an amount equal to his annualized base salary at the time of such termination to be paid in equal installments over the following 12 months according to the FHLBank of Boston's regular payroll cycle during such period. Notwithstanding the foregoing, the FHLBank of Boston's obligation to pay Mr. Hjerpe such amount will be subject to Mr. Hjerpe's execution of the FHLBank of Boston's standard release of claims agreement and the FHLBank of Boston's compliance with applicable statutory and regulatory requirements at the time such payment would otherwise be made. Payments to Mr. Hjerpe under the change in control agreement are in lieu of any severance payments that would be otherwise payable to him.

FHLBank of New York. The FHLBank of New York is an "at will" employer and does not provide written employment agreements to any of its employees except for change in control agreements for certain senior executives as discussed below. However, employees, including the president, receive:

- cash compensation (i.e., base salary, and, for exempt employees, "variable" or "at risk" short-term incentive compensation);
- retirement-related benefits (i.e., qualified defined benefit plan; qualified defined contribution plan; and nonqualified defined benefit portion of the benefit equalization plan); and
- health and welfare programs and other benefits.

Other benefits, which are available to all regular employees, include medical, dental, vision care, life, business travel accident insurance, and short- and long-term disability insurance, flexible spending accounts, an employee assistance program, educational development assistance, voluntary life insurance, long-term care insurance, fitness club reimbursement, and severance pay. An additional benefit offered to all officers who are at vice-president rank or above, is a physical examination every 18 months.

In addition, Mr. González and the FHLBank of New York have entered into an Employee Change in Control Agreement ("CIC Agreement"), which is intended to provide Mr. González with certain severance payments and benefits in the event his employment is terminated in connection with a "change in control" of the FHLBank of New York. Certain other senior officers have also entered into CIC Agreements with the FHLBank of New York. The CIC Agreements are effective commencing December 1, 2015 for three years from the date the CIC Agreement is executed. Under the terms of the CIC Agreements, if the executive’s employment with FHLBank of New York is terminated by FHLBank of New York without "cause" or by the executive for "good reason" (as such terms are defined in the CIC Agreement) during the period beginning on the earliest of (a) twelve months prior to the execution by FHLBank of New York of a definitive agreement regarding a change in control, (b) twelve months prior to change in control mandated by federal statute, rule or directive, (c) twelve months prior to the adoption of a plan or proposal for the liquidation or dissolution of the FHLBank of New York, and ending, in all cases, twenty-four months following the effective date of the change in control, the executive becomes entitled to certain severance payments and benefits.

FHLBank of Pittsburgh. In the event of a merger of the FHLBank of Pittsburgh with another FHLBank, where the merger results in the termination of employment (including resignation for "good reason" as defined under the change in control agreement) for the CEO or any other Executives, each such individual(s) is (are) eligible for severance payments under his/her change in control agreement. Such severance is in lieu of severance under the Severance Policy. The Severance Policy (and in the case of the CEO, his separate severance agreement) continues to apply to employment terminations of the other Executives, other than those resulting from an FHLBank merger. Benefits under the CIC agreement for the CEO and other Executives are as follows:

- 2.99 times base salary (CEO); two times base salary (other Executives);
- For the CEO, a payment of 2.99 times target incentive award opportunity in the year of termination, a pro-rated incentive payment in the year of termination and a payment equal to the additional benefit that the CEO would have received under the Bank's qualified and nonqualified retirement plans calculated as if the CEO had three additional years of both age and service at the time of separation from the Bank;
- For the other Executives, a payment of two times target incentive award opportunity in the year of termination, a pro-rated incentive payment in the year of termination and a payment equal to the additional benefit that the other Executives would have received under the Bank's qualified and nonqualified retirement plans calculated as if the other Executive had two additional years of both age and service at the time of separation from the Bank;
- An amount equal to three (CEO) or two (other Executives) times six percent of the Executive's annual compensation (as defined in the Supplemental Thrift Plan) at the time of separation from the Bank;
- Taxable compensation equivalent to the Bank's monthly contribution to its active employees' medical plan coverage for the benefits continuation period of 18 months; and
- Individualized outplacement service for a maximum of 12 months.

FHLBank of Atlanta. The FHLBank of Atlanta entered into an employment agreement with Mr. McMullan in connection with his employment as president and chief executive officer (McMullan Agreement), effective as of January 1, 2014. Under the McMullan Agreement, Mr. McMullan's employment with the FHLBank of Atlanta may be terminated at any time by the FHLBank of Atlanta, with or without "cause," or by Mr. McMullan, with or without "good reason," each as defined in the McMullan Agreement. Unless earlier terminated by either party as provided therein, the McMullan Agreement has a three-year term and will extend automatically for subsequent one-year periods unless either party elects not to renew. If during the term of his employment Mr. McMullan is terminated without "cause" or resigns for "good reason," the McMullan Agreement provides for severance pay in an amount equal to: (1) his then-current annual base salary, payable in a lump sum within 30 days after Mr. McMullan executes and delivers a general release of claims to the FHLBank of Atlanta, and (2) an amount equal to the amount that would have been payable pursuant to his incentive compensation award for the year in which the termination occurs, prorated based upon the number of days Mr. McMullan was employed that year. The incentive compensation award is based upon the FHLBank of Atlanta's actual performance for the year in which the termination occurs and is payable at the same time that such awards are paid to the FHLBank of Atlanta's senior executives. In addition, Mr. McMullan is entitled to receive certain healthcare replacement costs and other amounts required to be paid or provided under any other FHLBank of Atlanta plan, program, policy or practice or contract or agreement. The McMullan Agreement does not provide for any severance pay in the event of a termination with "cause," a termination on account of his death or disability, or his resignation without "good reason."

FHLBank of Cincinnati. Other than normal pension benefits and eligibility to participate in the FHLBank of Cincinnati's retiree medical and life insurance program, no perquisites, tax gross-ups or other special benefits are provided to the president in the event of a change in control, resignation, retirement or other termination of employment.

FHLBank of Indianapolis. The FHLBank of Indianapolis maintains a key employee severance agreement for Ms. Konich. If a termination occurs under certain circumstances, Ms. Konich is entitled to 2.99 times the average of the three prior calendar years' base salary (less salary deferral), bonus, and other cash compensation, salary deferrals and employer matching contributions to the qualified plans, the taxable portion of an automobile allowance (if any), continued medical and dental insurance coverage for 36 months (subject to Ms. Konich paying the employee portion of the cost of such coverage), a gross-up amount to cover the increased tax liability, an additional three years credit to age and years of service for the supplemental executive retirement plan, and reimbursement for reasonable legal, accounting, financial advisory, and actuarial services. If the FHLBank of Indianapolis is not in compliance with any applicable regulatory capital or regulatory leverage requirement at

the time payment under the agreement becomes due, or if the payment would cause the FHLBank of Indianapolis to fall below applicable regulatory requirements, the payment would be deferred until such time as the FHLBank of Indianapolis achieves compliance with its regulatory requirements. Moreover, if the FHLBank of Indianapolis was insolvent, had a receiver or conservator appointed, or was in "troubled condition" at the time payment under this agreement became due, the FHFA could deem such a payment to be subject to its rules limiting golden parachute payments.

FHLBank of Chicago. The FHLBank of Chicago entered into a new employment agreement with Mr. Feldman effective January 1, 2015, which replaced his prior agreement that was effective January 1, 2011. The new agreement provides for a four-year employment term ending December 31, 2018, unless terminated earlier as provided for in the agreement. The agreement provides for automatic one-year extensions until such date as the FHLBank of Chicago's board of directors or Mr. Feldman elects not to renew the agreement.

Mr. Feldman's employment agreement allows Mr. Feldman to participate in the FHLBank of Chicago's president and executive team incentive compensation plan. In 2016, the long-term incentive plan component of Mr. Feldman's compensation under the FHLBank of Chicago's key employee long term incentive compensation plan was replaced by the deferred award under the FHLBank of Chicago's president and executive team incentive compensation plan. Mr. Feldman is also entitled to participate in the FHLBank of Chicago's health insurance, life insurance, retirement, and other benefit plans that are generally applicable to the FHLBank of Chicago's other senior executives. Under the employment agreement, the FHLBank of Chicago has agreed to indemnify Mr. Feldman with respect to any tax liabilities and penalties and interest under Section 409A of the Internal Revenue Code of 1986.

Under Mr. Feldman's employment agreement, in the event his employment with the FHLBank of Chicago was terminated either by him with good reason (as defined in the agreement), by the FHLBank of Chicago other than for cause (as defined in the agreement), by non-renewal by the FHLBank of Chicago of the agreement, or as a result of the death or disability of Mr. Feldman, Mr. Feldman was entitled to receive the following payments:

- all accrued and unpaid salary for time worked as of the date of termination;
- all accrued but unutilized vacation time as of the date of termination;
- salary continuation (at the base salary in effect at the time of termination) for a one-year period beginning on the date of termination, and pursuant to the FHLBank of Chicago's normal payroll schedule;
- payment in a lump sum of an amount equal to the minimum total incentive compensation that Mr. Feldman would otherwise have been entitled to, for:
  (i) the total incentive award (both annual award and deferred award) under the FHLBank of Chicago's president and executive team incentive compensation plan for the year in which termination occurs, calculated as if all performance targets for the annual and deferral award period had been met at the target award level and prorated based on the number of months Mr. Feldman was employed during the year of termination; and
  (ii) any previously deferred award (50% of the total incentive award) under the FHLBank of Chicago's president and executive team incentive compensation plan not subject to proration or further adjustments based on performance target achievement during the deferral period.
- continued participation in the FHLBank of Chicago's employee health care benefit plans in accordance with the terms of its then-current severance plan that would be applicable to him if his employment had been terminated pursuant to such plan, provided that the FHLBank of Chicago will continue paying the employer's portion of medical and/or dental insurance premiums for one year from the date of termination; and
- an additional amount under the FHLBank of Chicago's post-December 31, 2004 benefit equalization plan equal to the additional annual benefit as if such benefit had been calculated as though (i) Mr. Feldman were 3 years older than his actual age and (ii) Mr. Feldman had 3 additional years of service at the same rate of annual compensation in effect for the 12-month period ending on the December 31 immediately preceding the termination of Mr. Feldman's employment, to be distributed at the same time and in the same manner as Mr. Feldman has elected pursuant to the benefit equalization plan.

If Mr. Feldman's employment with the FHLBank of Chicago is terminated by the FHLBank of Chicago for cause or by Mr. Feldman other than for good reason, Mr. Feldman would be entitled only to all accrued and unpaid salary for time worked as of the date of termination and all accrued but unutilized vacation time as of the date of termination. The employment agreement specifies that the human resources and compensation committee of the FHLBank of Chicago's board of directors may in its discretion reduce or eliminate any incentive compensation amounts described in items (i)-(ii) above for certain circumstances related to the performance of the FHLBank of Chicago or Mr. Feldman, as more fully set forth in the FHLBank's president and executive team incentive compensation plan.

The employment agreement provided that Mr. Feldman would not be entitled to any other compensation, bonus or severance pay from the FHLBank of Chicago other than as specified above and any vested rights which he has under any pension, thrift, or other benefit plan, excluding the severance plan. The right to receive termination payments as outlined above is contingent upon, among other things, Mr. Feldman signing a general release of all claims against the FHLBank of Chicago in such form as the FHLBank of Chicago requires.

FHLBank of Des Moines. The Bank entered into an employment agreement with Michael L. Wilson, effective on consummation of the FHLBank of Des Moines and Seattle Merger on May 31, 2015, in order to establish his duties and compensation and to provide for his employment as President of the Bank. In connection with the termination of Richard S. Swanson on June 30, 2016, Mr. Wilson was also appointed CEO. The employment agreement provides that the Bank will initially pay Mr. Wilson a base salary of $720,000, subject to adjustment as described in the employment agreement. Mr. Wilson's incentive target will generally not be set lower than 75 percent of his base salary. The Bank will pay, or reimburse Mr. Wilson for, all reasonable relocation expenses incurred by Mr. Wilson in relocation to the Des Moines area up to a maximum of $125,000. Mr. Wilson will also be eligible for certain perquisites, including a car allowance in the amount of $750 per month.

Mr. Wilson's employment agreement provides that:

- the FHLBank of Des Moines or Mr. Wilson may terminate employment for any reason (other than Good Reason or Cause) following 60 days' written notice to the other party;

- the FHLBank of Des Moines may terminate for Cause immediately following written notice to Mr. Wilson; and

- Mr. Wilson may terminate for Good Reason following written notice to the Des Moines Bank, in each case, in accordance with the procedures set forth in the employment agreement.

Amounts payable under the employment agreement are subject to reduction in the event the amounts constitute an "excess parachute payment" under Section 280G of the Internal Revenue Code.

Termination for Cause or Without Good Reason

If Mr. Wilson's employment is terminated by the Bank for Cause or by Mr. Wilson without Good Reason, the employment agreement entitles Mr. Wilson to the benefits set forth under the heading "Termination for Cause or without Good Reason".

Termination Without Cause, for Good Reason, Following a Change of Control, or Within a Specified Period of Time Following the Effective Date of the Employment Agreement

If Mr. Wilson's employment is terminated by the Bank without Cause or by Mr. Wilson for Good Reason, in addition to the payouts previously mentioned under "Termination for Cause or Without Good Reason," the employment agreement entitles Mr. Wilson to additional amounts, including the benefits set forth under the heading "Termination without Cause, for Good Reason, or following a Merger/Change in Control".

Termination for Death, Disability, or Retirement

If Mr. Wilson's employment is terminated due to death, disability, or qualifying retirement, in addition to the payouts described in the section entitled "Termination for Cause or Without Good Reason," he would also be entitled to the benefits set forth under the heading "Termination for Death, Disability or Retirement".

FHLBank of Dallas. On March 24, 2015, the FHLBank of Dallas entered into an employment agreement with Mr. Bhasin. This agreement was authorized and approved by the Compensation and Human Resources Committee of the Board of Directors and Board of Directors and resulted from the Board's desire to retain Mr. Bhasin's services for no less than the one-year term of the agreement. On each yearly anniversary thereafter, Mr. Bhasin's employment agreement automatically renews for an additional one-year term unless either the FHLBank of Dallas or Mr. Bhasin gives a notice of non-renewal not less than 30 days prior to the expiration date. On March 24, 2017, Mr. Bhasin's agreement was automatically extended through March 23, 2018. Under the terms of the employment agreement, in the event that Mr. Bhasin's employment with the FHLBank of Dallas is terminated either by Mr. Bhasin for good reason or by the FHLBank of Dallas other than for cause, or in the event that the FHLBank of Dallas gives notice of non-renewal while Mr. Bhasin is willing and able to continue employment on the same terms, Mr. Bhasin shall be entitled to receive the following severance benefits in addition to those payable under any applicable incentive and benefit programs in effect at the time of termination and in accordance with their terms:

- base salary continuation (at the base salary in effect at the time of termination) for 12 months;
- a pro rata portion of his non-equity incentive plan compensation for the year in which his termination occurs, based on actual performance for such year; and
- continuation of any elective group health and dental insurance benefits that are being provided to him as of his termination date for a period of 12 months.

FHLBank of Topeka. The FHLBank of Topeka entered into a change in control agreement with Mr. Yardley on June 19, 2015. A Change in Control means the occurrence of any of the following events, provided it shall not include any reorganization that is mandated by any Federal statute, rule, regulations or directive: (1) the merger, reorganization, or consolidation of FHLBank Topeka with or into another FHLBank or other entity; (2) the sale or transfer of all or substantially all of the business or assets of FHLBank Topeka to another FHLBank of other entity; (3) the purchase by FHLBank Topeka or transfer to FHLBank Topeka of substantially all of the business or assets of another FHLBank; (4) a change in the composition of the Board of Directors, as a result of one or a series of related transactions, that causes the combined number of member directors from states of Colorado, Kansas, Nebraska and Oklahoma to cease to constitute a majority of the directors of FHLBank Topeka; or (5) the liquidation or dissolution of FHLBank Topeka. The agreement provides for a cash lump sum payment that, when combined with any amount payable under an FHLBank Topeka severance policy, equals a compensation multiplier of 2.00 times (i) his then annualized base salary, and (ii) an amount equal to the target Total Base Opportunity as reflected in FHLBank Topeka's Executive Incentive Compensation Plan Targets document for the year in which the change in control occurs. He is also eligible to receive the continuation of certain group health care benefits for a period of years equal to his compensation multiplier.

The FHLBank of Topeka also provides severance benefits to Mr. Yardley pursuant to the FHLBank of Topeka's Named Executive Officer severance policy. The policy's primary objective is to provide a level of protection to Named Executive Officers from loss of income during a period of unemployment. Mr. Yardley is eligible to receive severance pay under the policy if the FHLBank of Topeka terminates his employment with or without cause, subject to certain limitations. Effective January 1, 2017, provided the requirements of the policy are met and Mr. Yardley provides the FHLBank of Topeka an enforceable release, he will receive severance pay equal to 12 months of his final annual base salary, absent a qualifying event that would result in payments under the Change in Control Plan. Through December 31, 2016, Mr. Yardley was eligible to receive severance pay equal to 9 months of his final annual base salary as Chief Risk Officer.

FHLBank of San Francisco. The FHLBank of San Francisco's president is employed on an at-will basis. The president may resign at any time, and the FHLBank of San Francisco may terminate his employment at any time, for any reason or no reason, with or without cause and with or without notice. Effective May 12, 2016, the FHLBank of San Francisco entered into an employment agreement with Mr. Seibly with an initial term of three years and one-year terms thereafter, unless terminated at any time by either the FHLBank of San Francisco or Mr. Seibly. Under the terms of the agreement, Mr. Seibly will initially receive a base annual salary of $800,000 and a sign-on payment of $600,000 to be received in two parts, and subject to clawback in certain circumstances. The agreement provides for a severance payment equal to (i) two times his "Base Salary" (as defined in the agreement); and (ii) two times his "Annual Incentive Amounts" (as defined in the agreement) and continued benefits if Mr. Seibly's employment is terminated under certain circumstances in connection with a "Change in Control" (as defined in the agreement) of the FHLBank of San Francisco.

Mr. Seibly will also be eligible to participate in the FHLBank of San Francisco's various executive incentive and employee benefit plans, including the FHLBank of San Francisco's SERP, 2016 PIP, and the 2014-2016, 2015-2017, and 2016-2018 EPUPs. Under Mr. Seibly's employment agreement, the years of credited service and the amount of FHLBank of San Francisco's

contribution credits under the SERP are as follows: 10% of total annual compensation for less than 4 years of credited service; 15% of total annual compensation for 4 or more years but less than 9 years of credited service; and 20% of total annual compensation for 9 or more years of credited service. In addition, Mr. Seibly's employment agreement provides that he will receive a supplemental SERP contribution credit in the amount of $600,000, to be credited in three equal installments over two years, with the first installment credited at the time his employment begins and the second and third installments on the first and second anniversary of his employment commencement, respectively. These supplemental SERP contribution credits will vest immediately when credited. Mr. Seibly's employment agreement also provides for reimbursement of his relocation cost up to $250,000 and payment to the appropriate taxing authorities of up to $220,000 of any relocation tax obligations.

Table S-2 - All Other Compensation
(whole dollars)

FHLBank*	President/CEO Name	Year	Termination of Employment or Change of Control if Triggered	Contribution or Other Allocations Made by the FHLBank to Vested and/or Unvested Defined Contribution Plans	Dollar Value of any Insurance Premiums Paid by the FHLBank with Respect to Life Insurance for the Benefit of the President/ CEO	Gross-ups or Other Amounts Reimbursed for the Payment of Taxes	Perquisites and Other Personal Benefits*	Other	Total
Boston	Edward A. Hjerpe III(1)	2016	$ —	$ 85,882	$ —	$ —	$ 17,267	$ —	$ 103,149
		2015	—	72,643	—	—	17,887	—	90,530
		2014	—	68,688	—	—	17,802	—	86,490
New York	José R. González(2)	2016	—	15,900	990	—	29,064	—	45,954
		2015	—	15,900	990	—	37,293	43,785	97,968
		2014	—	11,100	907	—	35,814	42,000	89,821
Pittsburgh	Winthrop Watson	2016	—	68,295	—	—	—	442	68,737
		2015	—	62,655	—	—	10,037	445	73,137
		2014	—	61,949	—	—	—	445	62,394
Atlanta	W. Wesley McMullan(3)	2016	—	48,000	41	50	21,597	—	69,688
		2015	—	45,060	—	2	19,617	—	64,679
		2014	—	43,320	—	50	19,031	—	62,401
Cincinnati	Andrew S. Howell(4)	2016	—	15,900	—	—	11,315	—	27,215
		2015	—	15,900	—	—	13,636	—	29,536
		2014	—	15,600	—	—	—	—	15,600
Indianapolis	Cindy L. Konich	2016	—	46,515	—	—	—	—	46,515
		2015	—	15,900	—	—	—	—	15,900
		2014	—	15,600	—	690	10,664	—	26,954
Chicago	Matthew R. Feldman	2016	—	15,900	—	—	—	—	15,900
		2015	—	15,900	—	—	—	—	15,900
		2014	—	15,600	—	—	—	—	15,600
Des Moines	Michael L. Wilson(5)	2016	—	61,518	—	—	9,000	92	70,610
		2015	—	25,200	—	—	150,743	—	175,943
	Richard S. Swanson(6)	2016	2,500,734	43,355	—	—	12,081	—	2,556,170
		2015	—	60,177	—	—	12,500	—	72,677
		2014	—	59,513	—	—	9,000	—	68,513
Dallas	Sanjay Bhasin	2016	—	39,397	—	—	—	—	39,397
		2015	—	37,894	—	—	—	—	37,894
		2014	—	5,353	—	5,615	—	226,280	237,248
Topeka	Andrew J. Jetter(7)	2016	—	66,916	1,622	—	12,889	59,146	140,573
		2015	—	51,664	1,568	—	—	7,853	61,085
		2014	—	50,037	1,486	—	10,648	7,656	69,827
San Francisco	J. Gregory Seibly(8)	2016	—	2,000	576	217,135	225,141	2,253	447,105
	Dean Schultz(9)	2016	—	33,378	1,050	—	1,600	192,865	228,893
		2015	—	50,052	2,520	—	5,669	2,865	61,106
		2014	—	49,680	2,880	—	6,219	2,865	61,644
Office of Finance	John D. Fisk(10)	2016	—	15,813	—	—	3,544	—	19,357
		2015	—	15,900	—	—	3,749	—	19,649
		2014	—	17,274	—	—	7,501	—	24,775

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* Only individual amounts greater than $25,000 are required to be disclosed in the footnotes.

(1) Perquisites and other personal benefits amount for Mr. Hjerpe includes the following: personal use of an FHLBank of Boston-owned vehicle, parking, reimbursement for mass transportation, spousal travel expenses, and airline program memberships.

(2) Perquisites and other personal benefits amount for 2016 for Mr. González includes the following: funds matched in connection with the Pentegra Defined Contribution Plan for Financial Institutions, payment of group term life insurance premium, payment of long term disability insurance premium, payment of employee assistance program premium and payment of officer physical examination. Cost of health insurance premiums, dental insurance premiums, and vision insurance premiums are shared between the FHLBank of New York and employees.

(3) Perquisites and other personal benefits amount for Mr. McMullan includes the following: reimbursement for guest travel to certain business functions, executive health benefits, and a $1,500 per month automobile allowance. Perquisites are valued at the actual amounts paid by the FHLBank of Atlanta and the value of each perquisite was less than $25,000.

(4) Perquisites and other benefits amount for Mr. Howell includes the following: personal use of an FHLBank of Cincinnati-owned vehicle, premiums for an Executive long-term disability plan, spousal travel expenses and an airline program membership.

(5) For 2015, perquisites and other personal benefits amount for Mr. Wilson includes the following: relocation expenses and personal use of an FHLBank of Des Moines-provided vehicle.

(6) Perquisites and other personal benefits amount for Mr. Swanson includes the following: personal use of an FHLBank of Des Moines-provided vehicle and financial planning allowance.

(7) Perquisites and personal benefits amount for Mr. Jetter includes the following: use of an FHLBank of Topeka-provided vehicle, cellular phone reimbursement and expenses for spousal travel. Other compensation includes a $51,490 vacation buyout for unused vacation time that could not be carried forward due to a change in vacation policy.

(8) Perquisites and personal other benefits amount for Mr. Seibly includes the following: reimbursement of relocation costs and related tax gross-ups, as part of his employment terms with the FHLBank of San Francisco.

(9) Perquisites and personal other benefits amount for Mr. Schultz includes the following: personal use of an FHLBank of San Francisco-provided vehicle and its designated parking space. Other includes retention payment of $150,000 for his continued service to the FHLBank of San Francisco through May 31, 2016, and consultation fees of $40,000 from June 1, 2016 to July 31, 2016.

(10) Perquisites and other personal benefits amount for Mr. Fisk include the personal use of an Office of Finance-provided vehicle.

Table S-3 - Grants of Plan-Based Awards
(whole dollars)

				Estimated Future Payouts under Non-Equity Incentive Plan Awards		
FHLBank	**President/CEO Name**		**Grant Date**	**Threshold**	**Target**	**Maximum**
Boston	Edward A. Hjerpe III	(1)	—	$ 189,175	$ 283,763	$ 378,350
New York	José R. González	(2)	1/27/2016	415,684	593,834	771,984
Pittsburgh	Winthrop Watson	(3)	—	232,726	290,907	387,877
		(3)	—	290,907	363,633	484,845
Atlanta	W. Wesley McMullan	(4)	1/28/2016	320,000	600,000	784,000
Cincinnati	Andrew S. Howell	(5)	11/19/2015	187,500	281,250	375,000
		(6)	11/19/2015	187,500	281,250	375,000
Indianapolis	Cindy L. Konich	(7)	12/1/2011	9,691	290,716	387,621
		(8)	12/1/2011	279,814	373,085	466,357
Chicago	Matthew R. Feldman	(9)	1/26/2016	271,275	361,700	452,125
		(10)	1/26/2016	310,101	413,468	516,835
Des Moines	Michael L. Wilson	(11)	12/31/2016	180,000	306,000	360,000
		(12)	12/31/2016	180,000	306,000	360,000
	Richard S. Swanson	(11)	12/31/2016	146,396	219,595	292,793
		(12)	12/31/2016	146,396	219,595	292,793
Dallas	Sanjay Bhasin	(11)	—	121,886	191,694	221,611
		(13)	—	175,552	263,328	333,549
Topeka	Andrew J. Jetter	(14)	1/1/2016	143,600	287,200	430,800
		(15)	1/1/2016	143,600	287,200	430,800
San Francisco	J. Gregory Seibly	(16)	5/12/2016	160,000	320,000	400,000
		(17)	5/12/2016	160,000	320,000	400,000
	Dean Schultz	(16)	2/1/2016	170,600	341,100	426,400
		(17)	2/1/2016	170,600	341,100	426,400
Office of Finance	John D. Fisk	(18)	2/1/2016	219,240	292,320	365,400
		(19)	2/1/2016	219,240	292,320	365,400

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(1) Represents estimate of annual short-term incentive compensation for January 1, 2016 through December 31, 2016, under the FHLBank of Boston 2016 executive incentive compensation plan. The estimated future payout for the long-term component of the 2016 executive incentive compensation plan is based, in part, on the results of the short-term component at year-end 2016. The actual future payout for the long-term component will then be interpolated between threshold and target, or between target and excess, depending on the actual results of achievement for the long-term component goal as determined at year-end 2018. If threshold is not achieved, there will not be a payout.

	Estimated Possible Payouts under Non-Equity Incentive Plan Awards		
If short-term component results in:	**Threshold**	**Target**	**Excess**
Threshold	$ 94,588	$ 189,175	$ 283,763
Target	141,881	283,763	425,644
Excess	189,175	378,350	567,525

(2) The deferred portion of the incentive compensation plan provides that 50% of the total communicated award, if any, under the plan year communicated to the FHLBank of New York management committee participants will ordinarily be paid by the middle of March following the Plan year. The remaining 50% will be deferred (the "Deferred Incentive Award"), subject to certain additional conditions specified in the Plan, such that 33 1/3% of the Deferred Incentive Award will ordinarily be paid by the middle of March following the three years.

(3) Payment of each deferred incentive award installment is contingent on the CEO meeting the required criteria and the FHLBank of Pittsburgh meeting the stated bank performance criteria. For the 2016 Plan, the first year payout is 50% of the award amount and then 33 1/3% of the remaining 50% in each deferral installment over the next three years based on whether or not the stated payment criteria were met. The deferred amount for each of the years 2018, 2019, and 2020 is 125% of the maximum deferred amount if both MV/CS and retained earnings levels are maintained, which the FHLBank of Pittsburgh has assumed is met in each year for purposes of this calculation.

(4) Represents threshold, target, and maximum payment opportunities under FHLBank of Atlanta's incentive compensation plan for the fiscal year ended December 31, 2016. Fifty percent of the actual amount earned is subject to mandatory deferral.

(5) Represents the estimated annual payout under the FHLBank of Cincinnati's 2016 incentive plan for the period of January 1, 2016 through December 31, 2016, which is 50% of the award opportunity.

(6) Represents the estimated mandatorily deferred payout under the FHLBank of Cincinnati's 2016 incentive plan for the period of January 1, 2017 through December 31, 2019, which is 50% of the award opportunity. The final value of the deferred award can be increased, decreased, or remain the same based on the goal achievement level during the three-year deferral period.

(7) Represents the estimated payout range of the annual portion of the incentive compensation plan for January 1, 2016 through December 31, 2016 for the FHLBank of Indianapolis. The Grant Date shown is the original adoption date of the Incentive Plan. There is no guaranteed payout under the deferred award provisions of the incentive plan. Therefore, the minimum that could be paid out under this plan is $0.

(8) Represents the estimated payout under the deferred portion of the incentive compensation plan for the FHLBank of Indianapolis; payout is based upon the annual portion of the incentive compensation plan and is further dependent on attaining the minimum threshold over the 3-year deferral period (2016-2018). The Grant Date shown is the original adoption date of the Incentive Plan.

(9) Represents the potential annual award payouts under FHLBank of Chicago's president and executive team incentive compensation plan for the period from January 1, 2016 through December 31, 2016. Under this plan, 50% of the total incentive award is an annual award payable at the end of a one-year performance period.

(10) Represents the deferred award granted under FHLBank of Chicago's president and executive team incentive compensation plan for the period from January 1, 2017 through December 31, 2019 based on actual performance for 2016. Under this plan, 50% of the total incentive award is a deferred award which will be payable at the end of a three-year deferral period (subject to adjustment based upon achievement of certain performance requirements).

(11) Represents the estimated payout range of the annual short-term incentive compensation plan for January 1, 2016 through December 31, 2016.

(12) Represents estimate of deferred incentive compensation for the FHLBank of Des Moines for the four-year performance cycle beginning January 1, 2016 and ending December 31, 2019.

(13) Represents the estimated payout range of the long-term incentive compensation for the three-year performance cycle beginning January 1, 2016 and ending December 31, 2018.

(14) Represents the estimated payout range of the Cash Incentive of the Executive Incentive Compensation Plan for January 1, 2016 through December 31, 2016 for the FHLBank of Topeka.

(15) Represents the estimated payout range of Deferred Incentive Opportunity of the Executive Incentive Compensation Plan for the FHLBank of Topeka for the three-year performance period beginning January 1, 2017 through December 31, 2019. Payments are calculated using the base salary in effect on January 1 at the beginning of the performance period. Awards, if any, under this plans are payable in the year following the end of the three-year deferral performance period.

(16) Represents the estimated payout range of the annual short-term incentive compensation plan for January 1, 2016 through December 31, 2016 for the FHLBank of San Francisco. Mr. Seibly's actual pay-out is pro-rated as of April 1, 2016. Actual amounts earned under the short-term incentive compensation plan for this period are included in Table S-1 - FHLBank Presidents and/or CEOs and Office of Finance CEO Summary Compensation. Based on Mr. Schultz's retirement date of May 31, 2016, he was not eligible for any incentive award under the 2016 President Incentive Plan.

(17) Represents the estimated payout range of the long-term incentive compensation for the three-year performance cycle beginning January 1, 2016 and ending December 31, 2018. Mr. Seibly's pay-out under the FHLBank of San Francisco's 2016 long-term compensation plan is subject to proration as of April 1, 2016. In addition, Mr. Seibly was also eligible to participate in the FHLBank of San Francisco's 2014 and 2015 long-term compensation plans on a pro-rata basis and actual pay outs under 2014 long-term compensation plan is included in Table S-1. Mr. Schultz's participation in the FHLBanks of San Francisco's 2016 long-term incentive compensation plan will be pro-rated based on his retirement date of May 31, 2016.

(18) Represents estimated payout under the Executive Incentive Plan, approved by the Office of Finance Board of Directors in 2016, which has two components: 50% annual and 50% deferred. These amounts represent the award opportunity for the annual portion payable in 2017.

(19) Represents estimated payout under the Executive Incentive Plan, approved by the Office of Finance Board of Directors in 2016, which has two components: 50% annual and 50% deferred. 50% of the deferred portion is payable in 2018 subject to Office of Finance Board of Directors approval and the remaining 50% is payable in 2019 subject to Office of Finance Board of Directors approval.

Table S-4 - Pension Benefits at December 31, 2016
(whole dollars)

FHLBank	President/CEO Name	Plan Name*	Number of Years Credited Service	Present Value of Accumulated Benefit	Payments During 2016
Boston	Edward A. Hjerpe III(1)	Pentegra DBP	24.7	$ 1,458,000	$ —
		BEP	7.5	1,357,000	—
New York	José R. González(2)	Pentegra DBP	2.8	182,000	—
Pittsburgh	Winthrop Watson(3)	Pentegra DBP	6.6	315,000	—
		SERP	7.1	1,030,000	—
Atlanta	W. Wesley McMullan(4)	Pentegra DBP	28.8	1,692,000	—
		BEP	28.8	7,230,000	—
Cincinnati	Andrew S. Howell(5)	Pentegra DBP	26.5	1,888,000	—
		BEP	26.5	5,851,000	—
Indianapolis	Cindy L. Konich(6)	Pentegra DBP	32.0	2,254,000	—
		SERP	32.0	10,552,000	—
Chicago	Matthew R. Feldman(7)	Pentegra DBP	12.8	1,022,000	—
		BEP	12.8	3,752,000	—
Des Moines	Michael L. Wilson(8)	Pentegra DBP	22.0	1,626,000	—
		BEP	10.3	1,409,000	—
	Richard S. Swanson(8)	Pentegra DBP	9.4	1,014,000	—
		BEP	10.4	3,602,000	—
Dallas	Sanjay Bhasin(9)	Pentegra DBP	12.1	541,000	—
Topeka	Andrew J. Jetter(10)	Pentegra DBP	28.6	2,015,000	—
		BEP	28.6	5,771,000	—
San Francisco	J. Gregory Seibly(11)	BEP	0.1	316	—
		SERP	0.6	330,494	—
		CBP	0.1	4,957	—
	Dean Schultz(11)	BEP	31.2	—	3,280,809
		SERP	13.4	—	1,732,242
		CBP	31.2	—	618,117
		FIRF	11.0	—	1,010,731
		DCP	31.2	—	288,420
Office of Finance	John D. Fisk(12)	Pentegra DBP	12.1	894,000	—
		SERP	12.1	2,552,000	—

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* Pentegra DBP = Pentegra Defined Benefit Plan for Financial Institutions
BEP = Benefit Equalization Plan
SERP = Supplemental Executive Retirement Plan
FIRF = Financial Institutions Retirement Fund
CBP = Cash Balance Plan
DCP = Deferred Compensation Plan

(1) Boston- Prior to January 1, 2016, the benefit formula was 1.5% of the highest consecutive 5-year average compensation multiplied by the participant's years of benefit service. Effective January 1, 2016 the benefit formula was amended to 2.0% of the highest consecutive 3-year average compensation multiplied by the participant's years of benefit service. A benefit offset has been calculated to capture the benefit formula difference for benefits accrued prior to January 1, 2016.
Compensation for the Pension BEP is compensation (salary and incentive) paid in the year. Compensation for Pentegra DBP is defined as base salary excluding the participant's voluntary contribution to the Thrift BEP, subject to the applicable IRS limits on annual earnings ($265,000 for 2016). Mr. Hjerpe's Pension BEP benefit is subject to a maximum annual benefit amount not to exceed 80% of high three-year average compensation.
The regular form of retirement benefits is a straight-life annuity with a 12 times initial death benefit feature.
Mr. Hjerpe's credited years of service for the Pentegra DBP includes 17.6 years of service at the FHLBank of Boston and 7.1 years of service at a previous employer that participated in the Pentegra DBP.

(2) New York- Formula: 2.0% of a participant's highest consecutive 5-year average earnings (as opposed to consecutive 3-year average earnings as previously provided to grandfathered participants), multiplied by the participant's years of benefit service, not to exceed 30 years. Earnings are defined as base salary plus short-term incentives, and overtime, subject to the annual Internal Revenue Code limit. The normal form of payment is a life annuity (i.e., an annuity paid until the death of the participant), as opposed to a guaranteed twelve-year payout as previously provided to grandfathered participants. In addition, to the non-grandfathered participants, the cost of living adjustments ("COLAs") are no longer provided on future accruals (as opposed to a 1% simple interest COLA beginning at age 66 as previously provided).

(3) Pittsburgh- Formula: 1.5% × years of benefit service × high five-year average compensation.
Compensation covered for the Pentegra Defined Benefit Plan includes annual base salary, subject to IRS limitations. Compensation covered for the SERP includes annual base salary and annual incentive compensation, without regard to IRS limitations.
The regular form of retirement benefits provides a single life annuity; a lump sum option is also available.

(4) Atlanta- The "Present Value of Accumulated Benefit" is the present value of the annual pension benefit that was earned as of December 31, 2016, assuming retirement at age 65. Benefits under the Pentegra DBP were calculated using a 4.14% discount rate; 4.17% was used to calculate benefits under the BEP.

(5) Cincinnati- For employees hired prior to January 1, 2006: Formula: 2.5% × years of benefit service × highest three-year average compensation.

Compensation is defined as base salary, excess accrued vacation benefits, and annual incentive compensation, and excludes any long-term or deferred incentive payments. The regular form of retirement benefits is a single-life annuity including a lump-sum retirement death benefit.

(6) Indianapolis- Formula: 2.5% × years of benefit service × high three-year average compensation plus, at age 66, an annual retiree cost of living adjustment of three percent without regard to the IRS limits.

- Eligible compensation includes salary (before any employee contributions to tax qualified plans), short-term incentive , bonus (including annual awards under the Incentive Plan), and any other compensation that is reflected on the IRS Form W-2 (but not including long-term incentive payments or any compensation deferred from a prior year, including deferred awards under the Incentive Plan).
- The regular form of retirement benefits provides for a lump sum payment or annual installments up to 20 years or a combination of lump sum and annual payments.
- Benefit payments commencing before age 65 are reduced by applying an early retirement factor based on the participant's age when payments begin. The allowance payable at age 65 would be reduced by 3% for each year under age 65. If the sum of the age and years of vesting service at termination of employment is at least 70, the retirement allowance would be reduced by 1.5% for each year under age 65.

(7) Chicago- Formula: 2.25% × the number of years credited service × highest five-year compensation.
Compensation is the average annual salary (base and short-term incentive compensation) for the five consecutive years of highest salary. At December 31, 2016, the additional present value of accrued benefits due Mr. Feldman under section (7)(b)(vi) of his employment agreement is $1,495,000. The regular form of retirement benefits is an annuity or a lump-sum retirement death benefit.

(8) Des Moines- Formula: 2.25% × the number of years credited service × highest three consecutive year's average compensation. Average compensation is defined as the total taxable compensation as reported on the IRS Form W-2. In August 2016, the FHLBank of Des Moines' board of directors elected to freeze the Pentegra DB Plans effective January 1, 2017. After January 1, 2017, participants no longer accrue new benefits under the Pentegra DB Plans.

(9) Dallas- Formula: 2% × years of credited service × high 36-month average compensation.
The pension plan limits the maximum years of benefit service to 30 years. Compensation covered by the plan includes taxable compensation as reported on Mr. Bhasin's W-2 (exclusive of any compensation deferred from a prior year) plus any pre-tax contributions to the FHLBank of Dallas' Section 401(k) plan and/or Section 125 cafeteria plan, subject to the 2016 IRS limitation of $265,000 per year. While employed by the Federal Home Loan Bank of Chicago, Mr. Bhasin accrued benefits at a service accrual rate of 2.25%. Mr. Bhasin's credited years of service for the Pentegra DBP includes 2.6 years of service at the FHLBank of Dallas and 9.5 years of service at the FHLBanks of Chicago. The regular form of retirement benefit is a single life annuity that includes a lump-sum death benefit. The normal retirement age is 65, but Mr. Bhasin is eligible to receive an unreduced retirement benefit beginning at age 62. The FHLBank of Dallas does not have a supplemental defined benefit plan that covers compensation in excess of the IRS maximum limit; accordingly, Table S-4 reflects the estimated pension benefits payable to Mr. Bhasin based solely on the IRS compensation limit as his compensation exceeded such limit.

(10) Topeka- Formula: Starting September 2003 Pentegra Defined Plan Benefit = 2.0% × years of benefit service (not to exceed 30 years) × high three-year average compensation. Benefit service begins one year after employment.
Prior to September 2003 FIRF Benefit = 2.25% × years of benefit service (not to exceed 30 years) × high three-year average compensation. Benefit service begins one year after employment.
Compensation covered includes annual base salary plus incentive compensation subject to the 2016 annual IRS limitation of $265,000.
The regular form of retirement benefits provides a single life annuity, a lump sum payment or other additional payment options.

(11) San Francisco- Benefit Equalization Plan
The Benefit Equalization Plan is an unfunded and non-tax-qualified plan that is designed to restore retirement benefits lost under the Cash Balance Plan and the FHLBank of San Francisco's Savings Plan (a defined contribution plan) because of compensation and benefits limitations imposed on the Cash Balance Plan and the Savings Plan under the Internal Revenue Code (IRC). An employee's benefits that would have been credited under the Cash Balance Plan but for the limitations imposed on the plans under the IRC are credited as supplemental cash balance benefits under the BEP and the credits accrue interest at an annual rate of 6% until distributed. The amounts credited or accrued under the BEP vest according to the corresponding provisions of the Cash Balance Plan and the Savings Plan.
Supplemental Executive Retirement Plan
The SERP is an unfunded and non-tax-qualified retirement benefit plan that provides a cash balance benefit to the FHLBank of San Francisco's senior officers that is in addition to the Cash Balance Plan benefits. The SERP supplements the Cash Balance Plan benefits to provide a competitive postretirement compensation package that is intended to help the FHLBank of San Francisco attract and retain key senior officers who are critical to the success of the FHLBank of San Francisco.
Cash Balance Plan and the Financial Institutions Retirement Fund
The FHLBank of San Francisco began offering benefits under the Cash Balance Plan (CBP) on January 1, 1996. The CBP is a tax-qualified defined benefit pension plan that covers employees who have completed six months of service, including the president. Each year, eligible employees accrue benefits equal to 6% of their total annual compensation (which includes base salary and short-term cash incentive compensation) plus interest equal to 6% of their account balances accrued through the prior year, referred to as the annual benefit component of the CBP.
The benefits under the CBP annual benefit component are fully vested after an employee completes three years of service. Vested amounts are generally payable in a lump sum or in an annuity when the employee leaves the FHLBank of San Francisco.
Prior to offering benefits under the CBP, the FHLBank of San Francisco participated in the Financial Institutions Retirement Fund (FIRF). The FIRF is a multiple-employer tax-qualified defined benefit pension plan. The FHLBank of San Francisco withdrew from the FIRF on December 31, 1995 at which time benefits earned under the FIRF were fully vested and the value of those benefits was then frozen. As of December 31, 1995, the FHLBank of San Francisco calculated each participant's FIRF benefit based on the participant's then-highest three consecutive years' average pay multiplied by the participant's years of service multiplied by two percent, referred to as the frozen FIRF benefit. Upon retirement, participants will be eligible to receive their frozen FIRF benefits.
In addition, to preserve the value of the participant's frozen FIRF benefit, the FHLBank of San Francisco maintains the ratio of each participant's frozen FIRF age 65 annuity to the participant's highest three consecutive years' average pay as of December 31, 1995 (annuity ratio), which is referred to as the net transition benefit component of the CBP. Upon retirement, each participant with a frozen FIRF benefit will receive a net transition benefit under the CBP that equals his or her highest three consecutive years' average pay at retirement multiplied by his or her annuity ratio minus the frozen FIRF benefit.
Deferred Compensation Plan
The FHLBank of San Francisco's Deferred Compensation Plan is an unfunded and non-tax-qualified plan, consisting of three components: (1) employee deferral of current compensation; (2) make-up matching contributions that would have been made by the FHLBank of San Francisco under the Savings Plan had the base salary compensation not been deferred; and, (3) make-up pension benefits that would have been earned under the Cash Balance Plan had any amount of total annual compensation (base salary and short-term cash incentive compensation) not been deferred.

(12) Office of Finance- Formula: Starting July 2011 - 2.0% × years of benefit service × high three-year average compensation. Benefits earned from April 2003 to June 2011 are frozen under the prior benefit formula of 2.25%.

Table S-5 - Non-Qualified Deferred Compensation for 2016
(whole dollars)

FHLBank	President/CEO Name	President/CEO Contributions	FHLBank Contributions	Aggregate Withdrawals/ Distributions	Aggregate Earnings	Aggregate Balance at 12/31/16
Boston	Edward A. Hjerpe III	$ 42,939	$ 69,982	$ —	$ 50,359	$ 680,303
Pittsburgh	Winthrop Watson	318,402	62,477	—	148,839	2,128,013
Atlanta	W. Wesley McMullan	419,484	33,231	—	129,705	2,314,122
Indianapolis	Cindy L. Konich	42,579	30,615	—	4,229	77,423
Chicago	Matthew R. Feldman	141,511	—	—	5,881	449,937
Des Moines	Michael L. Wilson	90,621	48,339	—	34,540	795,995
	Richard S. Swanson	257,953	28,235	—	98,055	1,987,689
Dallas	Sanjay Bhasin	60,448	23,497	—	11,476	179,231
Topeka	Andrew J. Jetter	166,942	59,736	—	131,588	2,129,933
Office of Finance	John D. Fisk	56,937	65,124	—	196,882	2,263,848

Office of Finance CEO 2016 Compensation Discussion and Analysis

Compensation Philosophy and Objectives.

The Human Resources and Compensation Committee (HR Committee) serves as the compensation committee of the Office of Finance Board of Directors. The compensation program for the Office of Finance CEO is designed to provide a flexible and market-based approach to compensation that attracts, motivates, and retains an executive with the skills and expertise necessary to enable the Office of Finance to meet or exceed its business goals. To achieve these objectives, the Office of Finance compensates the CEO using a total compensation program approach that combines base salary, short- and long-term variable (incentive-based) compensation, retirement benefits, and modest fringe benefits. The objectives of the compensation program are to establish and communicate short- and long-term standards of performance for the successful achievement of the Office of Finance's mission and to recognize, motivate, and reward the CEO commensurate with his contributions.

The Office of Finance Board of Directors believes that its compensation philosophy is effective in attracting, retaining, and motivating a highly qualified individual. The Office of Finance Board of Directors reviews annually the compensation program to ensure that it is consistent with and supports the Office of Finance's business strategies and objectives. The FHFA's five guiding principles for sound incentive compensation practices were incorporated into the development, implementation, and review of compensation policies and practices for the Office of Finance CEO in 2016.

Regulatory Oversight of Executive Compensation.

The Director of the FHFA has the authority to review the compensation arrangements of executive officers of the FHLBanks and the Office of Finance and to prohibit an FHLBank or the Office of Finance from providing compensation to any executive officer that the Director of the FHFA determines is not reasonable and comparable with compensation for employment in other similar businesses involving similar duties and responsibilities. The Director of the FHFA also has the authority to approve, in advance, agreements or contracts of executive officers that provide compensation in connection with termination of employment.

Competition and Compensation Benchmarking.

Role of the HR Committee and the Office of Finance Board of Directors in Setting Executive Compensation. The HR Committee and the Office of Finance Board of Directors align the executive compensation program with the Office of Finance's business objectives and focus the CEO's efforts on fulfilling these goals. The HR Committee reviews the CEO's performance and researches and recommends the CEO salary to the Office of Finance Board of Directors. The percentage of salary increase that will apply to a base pay merit adjustment for each year is recommended by the HR Committee for approval by the Office of Finance Board of Directors. The retirement benefit plans that are offered, and any changes to those plans from year to year, are approved by the Office of Finance Board of Directors after a recommendation by the HR Committee. The HR Committee also recommends the goals, payout, and qualifications for the annual Executive Incentive Plan for approval by the Office of Finance Board of Directors.

Role of Compensation Consultant in Setting Executive Compensation. The salary and benefit benchmarks used by the Office of Finance to establish reasonable and competitive compensation for its employees are the competitor groups established by Aon Consulting and its affiliate, McLagan Partners, as presented in Table S-6. The benchmarking analysis included the following competitor positions: the FHLBank Presidents; the head of debt capital markets for certain commercial banks; the proxy data for Fannie Mae and Freddie Mac; and the publicly available data for the Federal Farm Credit Banks Funding Corporation.

Table S-6 - Benchmarking Institutions

ABN AMRO	Federal Home Loan Bank of Des Moines	Natixis
Australia & New Zealand Banking Group	Federal Home Loan Bank of Indianapolis	Nomura Securities
Banco Santander	Federal Home Loan Bank of New York	Nord/LB
BBVA Compass	Federal Home Loan Bank of Pittsburgh	PNC Bank
BMO Capital Markets	Federal Home Loan Bank of San Francisco	Rabobank Nederland
BNP Paribas	Federal Home Loan Bank of Seattle	RBS/Citizens Bank
CIBC World Markets	Federal Home Loan Bank of Topeka	Regions Financial Corporation
Commerzbank	Fifth Third Bank	Royal Bank of Canada
Commonwealth Bank of Australia	Freddie Mac	Societe Generale
Crédit Agricole CIB	GE Capital	Standard Chartered Bank
Credit Industriel et Commercial	HSBC	State Street Bank & Trust Company
DZ Bank	ING	TD Securities
Fannie Mae	KeyCorp	The Bank of New York Melon
Federal Home Loan Bank of Atlanta	Lloyds Banking Group	The Bank of Nova Scotia
Federal Home Loan Bank of Boston	Mitsubishi Securities	The Federal Farm Credit Banks Funding Corporation
Federal Home Loan Bank of Chicago	Mizuho Bank	UniCredit
Federal Home Loan Bank of Cincinnati	MUFG Union Bank	U.S. Bancorp
Federal Home Loan Bank of Dallas	National Australia Bank	Wells Fargo Bank

Elements of Total Compensation Program.

Base Salary. Base salary is a key component of the Office of Finance's total CEO compensation program. In setting the base salary for the CEO, the Office of Finance Board of Directors has discretion to consider a wide range of factors, including the CEO's individual performance, the performance of the Office of Finance overall, the CEO's tenure and the amount of the CEO base salary relative to the base salaries paid to executives in similar positions in the 50th percentile of executive salaries in the Office of Finance's peer groups. The Office of Finance Board of Directors also considers the amount and relative percentage of the CEO's total compensation that is derived from base salary.

Effective December 9, 2015, the Office of Finance Board of Directors approved a 5% base salary increase for 2016, resulting in an annual base salary of $730,800.

Executive Incentive Plan. The Office of Finance's CEO 2016 Executive Incentive Plan is an annual cash-based incentive compensation plan designed to promote and reward high levels of performance for accomplishing Office of Finance Board of Directors-approved goals. The annual goals reflect desired performance focused on the Office of Finance mission. Each goal is assigned a weight reflecting its relative importance and potential effect on the Office of Finance's strategic initiatives. The CEO is eligible to receive 50% of the combined plan award as a cash payment and 50% of the award is deferred over a two year period.

The Office of Finance Board of Directors approved three goals consistent with the 2016 Executive Incentive Plan that are intended to reinforce the strategic plan actions and value delivered by the Office of Finance to support the mission of the FHLBanks.

- Customers (40% weight): 1) Office of Finance Performance Survey and 2) IT Application Modifications.
    - Office of Finance Performance Survey consisted of serving the needs of the FHLBanks individually and collectively.
    - IT Application Modifications involved enhancing service either directly or through funding and market access.

- Strategic Plan (40% weight): 1) Funding and Market Access and 2) People.
    - Funding and Market Access consisted of ensuring that management and the Board are engaged in the major structural changes caused by regulatory and economic factors impacting dealers and investors in the agency debt market.
    - People consisted of ensuring the Office of Finance continues to cultivate a high performing organization with engaged staff and management bench strength.

- Operations (20% weight) consisted of continuing to enhance the Office of Finance's Risk Management program and Internal Control environment as well as IT reliability.

The authorization for payment of awards is provided following a review of the year-end performance results by the Office of Finance Board of Directors. The cash incentive payments are typically determined based on the actual performance in comparison to the performance level established for each goal. If actual performance falls below the threshold level of performance, typically 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 interpolation is typically calculated for that goal. The achievement level 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 Office of Finance's CEO.

The CEO is assigned a combined incentive award opportunity, typically stated as a percentage of base salary, which corresponds to the level of organizational responsibility and ability to contribute to and influence overall Office of Finance performance. The CEO’s possible payout under the 2016 Executive Incentive Plan was between the threshold amount of $438,480 and a maximum amount of $730,800. However, the Board has the authority to adjust the combined incentive award opportunity based on various factors including, but not limited to, FHFA exam results and the remediation of the FHFA exam findings. At its December 6, 2016 meeting, the Office of Finance Board of Directors reviewed Mr. Fisk’s actual performance and concluded that the Office of Finance completed many important initiatives and performance measures during 2016, including the highest Office of Finance Performance survey results to date, but ultimately the results from the 2016 FHFA exam warranted a lower 2016 Executive Incentive Plan award. As a result, the Board authorized a 2016 Executive Incentive Plan award of $200,000. In 2017, $100,000 (50%) was paid, and 50% is deferred over a two year period. The deferred award expected to be paid in 2018 is $50,000, and the deferred award expected to be paid in 2019 is $50,000. The deferred awards will be reviewed prior to payment based on established criteria by the Office of Finance Board of Directors.

The Office of Finance Board of Directors approved a deferred award payment to John Fisk of $313,694. The award was comprised of two components, an award of $153,694, which is the deferred component of the 2015 Executive Incentive Plan (25% deferral of the 2015 Executive Incentive Plan) and an award of $160,000, which is the deferred component of the 2014 Executive Incentive Plan (25% deferral of the 2014 Executive Incentive Plan). The Office of Finance Board of Directors approved the payment, which was determined as follows:

Table S-7 - 2015 Executive Incentive Plan Deferred Component
(whole dollars)

Goal	Weight	Overall Award Level	Total Award
Customers	50%	Close to maximum	$ 76,846
Strategic Plan	25%	Close to maximum	38,424
Operations	25%	Close to maximum	38,424
Total	100%		$ 153,694

Table S-8 - 2014 Executive Incentive Plan Deferred Component
(whole dollars)

Goal	Weight	Overall Award Level	Total Award
Customers	45%	Close to maximum	$ 72,000
Strategic Plan	20%	Close to maximum	32,000
Operations	35%	Close to maximum	56,000
Total	100%		$ 160,000

Retirement Benefits. The Office of Finance maintains a comprehensive retirement program for the CEO comprised of a combination of two IRS qualified plans and two non-qualified plans.

- Qualified Defined Benefit Pension Plan - The Pentegra Defined Benefit Plan is a funded tax-qualified plan that is maintained on a non-contributory basis, i.e., no employee contributions. Participants' pension benefits are 100% vested upon completion of six years of service. The pension benefits payable under the Pentegra Defined Benefit Plan are determined under a pre-established formula that provides a single life annuity payable monthly at normal retirement (age 65), or other actuarially equivalent forms of benefit payments, including an early retirement option. The CEO's benefit formula through June 30, 2011 was 2.25% for each year of benefit service multiplied by the highest three-year average compensation. As of July 1, 2011, the CEO's benefit formula was reduced to 2.0% for each year of benefit service multiplied by the highest three-year average compensation.

- Non-qualified Defined Benefit Pension Plan - The CEO is eligible to participate in the Supplemental Retirement Plan, an unfunded, non-qualified pension plan that mirrors the Pentegra Defined Benefit Plan in all material respects. In the event that benefits payable from the Pentegra Defined Benefit Plan have been reduced or otherwise limited by IRS provision, the executive's lost benefits are payable under the terms of the Supplemental Retirement Plan. Because this plan is a non-qualified plan, the benefits received from this plan do not receive the same funding protection associated with the qualified plan.

- Qualified Defined Contribution Plan - The Pentegra Defined Contribution Plan for Financial Institutions is a tax-qualified defined contribution plan to which the Office of Finance makes tenure-based matching contributions. The matching contribution begins upon completion of one year of employment and subsequently increases based on length of employment to a maximum of six percent of base salary. Under the Pentegra Defined Contribution Plan, a participant may elect to contribute up to 50% of base salary on either a before-tax, i.e., 401(k), or after-tax basis up to the IRS limit. The plan permits participants to self-direct investment elections into one or more investment funds, which may be changed daily by the participants. A participant may withdraw vested account balances while employed, subject to certain IRS and plan limitations.

- Non-qualified Defined Contribution Plan - The CEO is eligible to participate in the Supplemental Thrift Plan, an unfunded, non-qualified, contributory plan that mirrors the Pentegra Defined Contribution Plan in all material respects. This plan restores benefits that participants would have received absent IRS limits on contributions to the Pentegra Defined Contribution Plan. Under the Supplemental Thrift Plan, participants may elect to contribute up to 50% of base salary and up to 100% of incentive compensation on a pre-tax basis. As in the Pentegra Defined Contribution Plan, the employer match in the Supplemental Thrift Plan is tenure-based with a six percent maximum. This plan permits participants to self-direct investment elections into a choice of ten investment funds.

Perquisites. The perquisites provided by the Office of Finance represent a small fraction of the CEO's total compensation and are provided in accordance with market practices for executives in similar positions and with similar responsibilities. During 2016, the CEO was provided with an Office of Finance-owned vehicle for his business and personal use. The operating expenses associated with the vehicle were also provided. The CEO's personal use of the Office of Finance-owned vehicle, including use for the daily commute to and from work, is reported as a taxable fringe benefit.

Financial Counseling. The CEO is eligible for an annual reimbursement of personal financial counseling not to exceed $10,000. This benefit was not utilized in 2016.

Director Compensation

In accordance with the regulations of the FHFA under the FHLBank Act, the FHLBanks have established formal policies governing the compensation and travel reimbursement provided to their directors. The goal of the policies is to compensate members of the board of directors for work performed on behalf of the FHLBanks. Under these policies, compensation consists of per-meeting fees. The meeting fees compensate directors for:

- time spent reviewing materials sent to them on a periodic basis by the FHLBanks;
- preparation for meetings;
- participation in any other activities for the FHLBanks; and
- actual time spent attending the meetings of the board or its committee.

Directors are also reimbursed for reasonable FHLBank-related travel expenses, which are not included in Table S-9 - Chair and Vice-Chair Director Compensation for 2016.

An FHFA rule allows each FHLBank to pay its directors reasonable compensation and expenses, subject to the authority of the Director of the FHFA to object to, and to prohibit prospectively, compensation and/or expenses that the Director of the FHFA determines are not reasonable. (See *FHLBank Directors* and *FHLBanks Office of Finance Board of Directors* within this section for biographies.) The following information has been provided for each FHLBank primarily based on the information disclosed in its annual report on SEC Form 10-K for the year ended December 31, 2016.

Table S-9 - Chair and Vice-Chair Director Compensation for 2016
(whole dollars)

FHLBank	Director Name	Position	Fees Earned or Paid in Cash	Change in Pension Value and Nonqualified and Deferred Compensation Earnings	All Other Compensation	Total
Boston	Andrew J. Calamare	Chair	$ 105,000	$ —	$ —	$ 105,000
	Stephen G. Crowe	Vice-Chair	88,750	—	—	88,750
New York	Michael M. Horn	Chair	130,000	—	—	130,000
	James W. Fulmer	Vice-Chair	105,000	—	—	105,000
Pittsburgh	Patrick A. Bond	Chair	125,000	—	23	125,023
	John K. Darr	Vice-Chair	103,750	—	23	103,773
Atlanta	F. Gary Garczynski	Chair	100,000	—	3,041	103,041
	Richard A. Whaley	Vice-Chair	95,000	522	2,041	97,563
Cincinnati	Donald J. Mullineaux	Chair	135,000	—	—	135,000
	William J. Small	Vice-Chair	120,000	—	—	120,000
Indianapolis	James D. MacPhee	Chair	125,000	—	—	125,000
	Dan L. Moore	Vice-Chair	105,000	—	—	105,000
Chicago	William W. Sennholz	Chair	105,000	—	—	105,000
	Michael G. Steelman	Vice-Chair	95,000	—	—	95,000
Des Moines	Dale E. Oberkfell	Chair	125,000	—	—	125,000
	William V. Humphreys	Vice-Chair	115,000	—	—	115,000
Dallas	Joseph F. Quinlan, Jr.	Chair	97,500	—	—	97,500
	Robert M. Rigby	Vice-Chair	92,500	—	—	92,500
Topeka	G. Bridger Cox	Chair	125,000	—	—	125,000
	Robert E. Caldwell, II	Vice-Chair	110,000	—	—	110,000
San Francisco	Douglas H. (Tad) Lowrey	Chair	114,625	—	—	114,625
	Melinda Guzman	Vice-Chair	107,750	—	—	107,750
Office of Finance	Jonathan A. Scott(1)	Chair	130,000	—	—	130,000

(1) W. Wesley McMullan, President and Chief Executive Officer of the FHLBank of Atlanta, serves as the Vice-Chair of the Office of Finance board of directors. Per FHFA regulation, an FHLBank president shall not receive any additional compensation or reimbursement as a result of his service as a director of the Office of Finance board of directors.

Individual Federal Home Loan Bank Selected Financial Data and Financial Ratios

The following individual Federal Home Loan Bank (FHLBank) selected financial data and financial ratios are provided as a convenience to the reader. Effective May 31, 2015, the FHLBank of Seattle merged with and into the FHLBank of Des Moines, with the FHLBank of Des Moines surviving the merger as the continuing FHLBank. As a result of the merger, the selected financial data and financial ratios for the FHLBank of Seattle are not presented in the following table.

Please refer to *Explanatory Statement about Federal Home Loan Banks Combined Financial Report*, which discusses the independent management and operation of the FHLBanks; identifies the availability of other information about the FHLBanks; and describes where to find the periodic reports and other information filed by each FHLBank with the SEC.

Individual FHLBank Selected Financial Data and Financial Ratios

(dollars in millions)	Boston	New York	Pittsburgh
Selected Statement of Condition Data(1)			
At December 31, 2016			
Assets			
Investments(2)	$ 18,032	$ 30,685	$ 17,227
Advances	39,099	109,257	76,809
Mortgage loans held for portfolio	3,695	2,748	3,397
Allowance for credit losses on mortgage loans	(1)	(2)	(6)
Total assets	61,546	143,606	101,260
Consolidated obligations(3)			
Discount notes	30,054	49,358	28,500
Bonds	27,171	84,785	67,156
Total consolidated obligations	57,225	134,143	95,656
Mandatorily redeemable capital stock	33	31	5
Total capital			
Capital stock(4)	2,412	6,308	3,755
Additional capital from merger(5)	—	—	—
Retained earnings	1,217	1,412	986
Accumulated other comprehensive income (loss)	(384)	(96)	53
Total capital	3,245	7,624	4,794
Asset composition (as a percentage of the individual FHLBank's total assets)			
Investments(2)	29.3%	21.4%	17.0%
Advances	63.5%	76.1%	75.9%
Mortgage loans held for portfolio, net	6.0%	1.9%	3.3%
Total retained earnings as a percentage of FHLBank's total assets	2.0%	1.0%	1.0%
FHLBank's total assets as a percentage of FHLBank System's total assets	5.8%	13.6%	9.6%
At December 31, 2015			
Assets			
Investments(2)	$ 18,019	$ 26,167	$ 16,144
Advances	36,076	93,874	74,505
Mortgage loans held for portfolio	3,583	2,525	3,093
Allowance for credit losses on mortgage loans	(1)	—	(6)
Total assets	58,103	123,238	96,330
Consolidated obligations(3)			
Discount notes	28,479	46,850	42,276
Bonds	25,427	67,716	48,601
Total consolidated obligations	53,906	114,566	90,877
Mandatorily redeemable capital stock	42	19	6
Subordinated notes(6)	—	—	—
Total capital			
Capital stock(4)	2,337	5,585	3,540
Additional capital from merger(5)	—	—	—
Retained earnings	1,129	1,270	881
Accumulated other comprehensive income (loss)	(443)	(136)	80
Total capital	3,023	6,719	4,501
Asset composition (as a percentage of the individual FHLBank's total assets)			
Investments(2)	31.0%	21.2%	16.8%
Advances	62.1%	76.2%	77.3%
Mortgage loans held for portfolio, net	6.2%	2.0%	3.2%
Total retained earnings as a percentage of individual FHLBank's total assets	1.9%	1.0%	0.9%
FHLBank's total assets as a percentage of FHLBank System's total assets	6.0%	12.7%	9.9%

(1) The sum or recalculation of individual FHLBank amounts may not agree or may not be recalculated from the Combined Statement of Condition amounts due to combining adjustments.
(2) Investments consist of interest-bearing deposits, deposits with other FHLBanks, securities purchased under agreements to resell, federal funds sold, trading securities, available-for-sale securities, and held-to-maturity securities.
(3) See *Financial Discussion and Analysis - Combined Results of Operations - Interbank Transfers of Consolidated Bonds and Their Effect on Combined Net Income*.
(4) FHLBank capital stock is redeemable at the request of a member subject to the statutory redemption periods and other conditions and limitations. (See *Note 16 - Capital* to the accompanying combined financial statements.)

Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco
$ 36,510	$ 25,334	$ 15,460	$ 28,060	$ 41,218	$ 25,129	$ 13,610	$ 40,986
99,077	69,882	28,096	45,067	131,601	32,506	23,986	49,845
524	9,150	9,502	4,970	6,915	124	6,642	826
(1)	(1)	(1)	(3)	(2)	—	(2)	—
138,671	104,635	53,907	78,692	180,605	58,212	45,217	91,941
41,292	44,690	16,802	35,949	80,947	26,942	21,775	33,506
88,647	53,191	33,467	36,903	89,898	26,997	20,722	50,224
129,939	97,881	50,269	72,852	170,845	53,939	42,497	83,730
1	35	170	301	664	3	3	457
4,955	4,157	1,493	1,711	5,917	1,930	1,227	2,370
—	—	—	—	52	—	—	—
1,892	834	887	3,020	1,450	824	736	3,056
104	(13)	56	(36)	(18)	63	—	111
6,951	4,978	2,436	4,695	7,401	2,817	1,963	5,537
26.3%	24.2%	28.7%	35.7%	22.8%	43.2%	30.1%	44.6%
71.4%	66.8%	52.1%	57.3%	72.9%	55.8%	53.0%	54.2%
0.4%	8.7%	17.6%	6.3%	3.8%	0.2%	14.7%	0.9%
1.4%	0.8%	1.6%	3.8%	0.8%	1.4%	1.6%	3.3%
13.1%	9.9%	5.1%	7.4%	17.1%	5.5%	4.3%	8.7%
$ 35,175	$ 37,356	$ 10,415	$ 28,324	$ 40,167	$ 16,323	$ 13,606	$ 32,275
104,168	73,292	26,909	36,778	89,173	24,747	23,580	50,919
586	7,954	8,147	4,831	6,756	55	6,393	655
(2)	(2)	(1)	(3)	(1)	—	(2)	—
142,246	118,756	50,608	70,671	137,374	42,082	44,426	85,698
69,434	77,199	19,251	41,564	98,990	20,541	21,813	27,647
63,953	35,092	27,862	22,582	31,208	18,025	19,866	51,827
133,387	112,291	47,113	64,146	130,198	38,566	41,679	79,474
14	38	14	8	103	9	3	488
—	—	—	944	—	—	—	—
5,101	4,429	1,528	1,950	4,714	1,540	1,209	2,253
—	—	—	—	194	—	—	—
1,840	737	835	2,730	801	762	652	2,628
75	(13)	23	(28)	(84)	(103)	(19)	15
7,016	5,153	2,386	4,652	5,625	2,199	1,842	4,896
24.7%	31.5%	20.6%	40.1%	29.2%	38.8%	30.6%	37.7%
73.2%	61.7%	53.2%	52.1%	64.9%	58.8%	53.1%	59.4%
0.4%	6.7%	16.1%	6.8%	4.9%	0.1%	14.4%	0.8%
1.3%	0.6%	1.6%	3.9%	0.6%	1.8%	1.5%	3.1%
14.7%	12.3%	5.2%	7.3%	14.2%	4.3%	4.6%	8.8%

(5) Additional capital from merger primarily represents the amount of the FHLBank of Seattle's closing retained earnings balance as of the merger date, adjusted for fair value and other purchase accounting adjustments, and identified intangible assets, and is net of dividends paid by the FHLBank of Des Moines subsequent to the merger date. (See *Note 16 - Capital* to the accompanying combined financial statements.)

(6) The subordinated notes outstanding, issued by the FHLBank of Chicago, matured and were paid in full on June 13, 2016. (See *Note 15 - Subordinated Notes* to the accompanying combined financial statements for additional information on subordinated notes.)

Individual FHLBank Selected Financial Data and Financial Ratios (continued)

(dollars in millions)	Boston	New York	Pittsburgh
Selected Other Data			
December 31, 2016			
Advance concentrations - top five borrowers	39%	64%	80%
Capital stock concentrations - top five stockholders	32%	58%	72%
Regulatory capital-to-assets ratio(7)	5.9%	5.4%	4.7%
Core mission asset ratio(8)	72.6%	82.4%	82.5%
Cash and stock dividends			
Year-to-date December 31, 2016	$ 85	$ 259	$ 155
Year-to-date December 31, 2015	$ 62	$ 228	$ 214
Year-to-date December 31, 2014	$ 37	$ 231	$ 104
Weighted average dividend rate			
Year-to-date December 31, 2016	3.63%	4.98%	4.71%
Year-to-date December 31, 2015	2.54%	4.24%	5.22%
Year-to-date December 31, 2014	1.49%	4.15%	3.65%
Return on average equity(9)			
Year-to-date December 31, 2016	5.49%	5.86%	5.96%
Year-to-date December 31, 2015	9.54%	6.61%	6.16%
Year-to-date December 31, 2014	5.24%	4.88%	6.83%
Return on average assets			
Year-to-date December 31, 2016	0.29%	0.31%	0.28%
Year-to-date December 31, 2015	0.52%	0.34%	0.29%
Year-to-date December 31, 2014	0.29%	0.25%	0.36%
Net interest margin(10)			
Year-to-date December 31, 2016	0.43%	0.43%	0.38%
Year-to-date December 31, 2015	0.41%	0.46%	0.36%
Year-to-date December 31, 2014	0.41%	0.36%	0.40%
Net interest spread			
Year-to-date December 31, 2016	0.38%	0.40%	0.35%
Year-to-date December 31, 2015	0.37%	0.43%	0.34%
Year-to-date December 31, 2014	0.36%	0.33%	0.37%

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(7) The regulatory capital-to-assets ratio is calculated based on the FHLBank's total regulatory capital as a percentage of total assets held at period-end. (See *Note 16 - Capital* to the accompanying combined financial statements.)

(8) The core mission asset ratio is calculated based on the FHLBank's total primary mission assets, which includes advances and mortgage loans acquired from members as a percentage of total consolidated obligations. The core mission asset ratio is calculated annually at year-end as part of the FHFA's examination process, using annual average par values. The FHFA's expectation is that each FHLBank's core mission ratio equal or exceed 70%. If the core mission ratio falls below the 70% preferred ratio, an FHLBank would be expected to include in its strategic plan actions aimed at increasing its mission focus.

(9) Return on average equity is net income expressed as a percentage of average total capital.

(10) Net interest margin is equal to net interest income represented as a percentage of average interest-earning assets.

Atlanta	Cincinnati	Indianapolis	Chicago	Des Moines	Dallas	Topeka	San Francisco
54%	70%	43%	59%	70%	26%	53%	65%
47%	57%	35%	40%	57%	20%	47%	32%
4.9%	4.8%	4.7%	6.4%	4.5%	4.7%	4.3%	6.4%
75.2%	78.5%	72.1%	66.2%	77.9%	60.7%	79.0%	73.7%
$ 226	$ 171	$ 61	$ 37	$ 142	$ 17	$ 78	$ 284
$ 207	$ 173	$ 64	$ 25	$ 102	$ 6	$ 69	$ 369
$ 182	$ 176	$ 69	$ 14	$ 79	$ 4	$ 46	$ 240
4.62%	4.00%	4.25%	2.05%	2.94%	1.06%	5.29%	12.33%
4.47%	4.00%	4.12%	1.32%	2.87%	0.38%	5.26%	12.39%
3.84%	4.00%	4.18%	0.86%	2.82%	0.38%	4.22%	7.02%
4.08%	5.35%	4.92%	7.18%	10.09%	3.16%	7.45%	13.63%
4.63%	5.04%	5.13%	7.65%	2.74%	3.26%	4.78%	11.68%
4.11%	5.16%	4.72%	9.35%	3.17%	2.67%	6.29%	3.58%
0.20%	0.25%	0.22%	0.42%	0.40%	0.15%	0.33%	0.77%
0.23%	0.24%	0.27%	0.49%	0.12%	0.16%	0.21%	0.76%
0.21%	0.25%	0.30%	0.55%	0.14%	0.14%	0.30%	0.24%
0.24%	0.35%	0.39%	0.59%	0.28%	0.31%	0.53%	0.52%
0.19%	0.31%	0.44%	0.72%	0.28%	0.29%	0.55%	0.57%
0.25%	0.32%	0.47%	0.74%	0.30%	0.35%	0.64%	0.64%
0.21%	0.30%	0.34%	0.53%	0.24%	0.28%	0.49%	0.47%
0.17%	0.28%	0.39%	0.65%	0.25%	0.27%	0.52%	0.54%
0.24%	0.29%	0.40%	0.66%	0.28%	0.32%	0.61%	0.61%

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