BOK FINANCIAL CORP ET AL
Form 10-K
March 01, 2019

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the quarterly period ended December 31, 2018

OR

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

For the transition period from _____________ to ______________

Commission File No. 0-19341

BOK FINANCIAL CORPORATION

(Exact name of registrant as specified in its charter)

Oklahoma	73-1373454
(State or other jurisdiction of Incorporation or Organization)	**(IRS Employer Identification No.)**

Bank of Oklahoma Tower Boston Avenue at Second Street Tulsa, Oklahoma	74172
(Address of Principal Executive Offices)	**(Zip Code)**

(918) 588-6000
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12 (b) of the Act: None
Securities registered pursuant to Section 12 (g) of the Act:
Common stock, $0.00006 par value
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ý No ¨
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15 (d) of the Act. Yes ¨ No ý

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter)during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files)Yes ý No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ¨

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definitions of "larger accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ý Accelerated filer ¨ Non-accelerated filer ¨ Smaller reporting company ¨ Emerging growth company ¨
If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with

any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ¨
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ¨ No ý

The aggregate market value of the registrant's common stock ("Common Stock") held by non-affiliates is approximately $2.4 billion (based on the June 30, 2018 closing price of Common Stock of $94.01 per share). As of January 31, 2019, there were 72,251,266 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the Registrant’s Proxy Statement for the2019 Annual Meeting of Shareholders.

BOK Financial Corporation
Form 10-K
Year Ended December 31, 2018

Index

PART I

ITEM 1. BUSINESS

General

Developments relating to individual aspects of the business of BOK Financial Corporation ("BOK Financial" or "the Company") are described below. Additional discussion of the Company's activities during the current year appears within Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Description of Business

BOK Financial is a financial holding company incorporated in the state of Oklahoma in 1990 whose activities are governed by the Bank Holding Company Act of 1956 ("BHCA"), as amended by the Financial Services Modernization Act or Gramm-Leach-Bliley Act and the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"). BOK Financial offers full service banking in Oklahoma, Texas, New Mexico, Northwest Arkansas, Colorado, Arizona, and Kansas/Missouri. At December 31, 2018, the Company reported total consolidated assets of $38 billion.

BOKF, NA is a wholly owned subsidiary bank of BOK Financial. BOKF, NA operates TransFund, Cavanal Hill Investment Management, BOK Financial Asset Management, Inc. and seven banking divisions: Bank of Albuquerque, Bank of Arizona, Bank of Arkansas, Mobank, Bank of Oklahoma, Bank of Texas and Colorado State Bank and Trust. On October 1, 2018, BOK Financial acquired CoBiz Bank as a wholly owned subsidiary, greatly enhancing our market presence in the Colorado and Arizona markets. CoBiz Bank will be merged into BOKF, NA in first quarter of 2019. BOKF, NA and CoBiz Bank are collectively referred to as "the subsidiary banks" in the discussion following. Other wholly owned subsidiaries of BOK Financial include BOK Financial Securities, Inc., a broker/dealer that primarily engages in retail and institutional securities sales and municipal bond underwriting and The Milestone Group, Inc., an investment adviser to high net worth clients. Other non-bank subsidiary operations do not have a significant effect on the Company's financial statements.

Our overall strategic objective is to emphasize growth in long-term value by building on our leadership position in Oklahoma through expansion into other high-growth markets in contiguous states. We operate primarily in the metropolitan areas of Tulsa and Oklahoma City, Oklahoma; Dallas, Fort Worth and Houston, Texas; Albuquerque, New Mexico; Denver, Colorado; Phoenix, Arizona, and Kansas City, Kansas/Missouri. Our acquisition strategy targets fairly priced quality organizations with demonstrated solid growth that would supplement our principal lines of business. We provide additional growth opportunities by hiring talent to enhance competitiveness, adding locations and broadening product offerings. Our operating philosophy embraces local decision-making in each of our geographic markets while adhering to common Company standards.

Our primary focus is to provide a comprehensive range of nationally competitive financial products and services in a personalized and responsive manner. Products and services include loans and deposits, cash management services, fiduciary services, mortgage banking and brokerage and trading services to middle-market businesses, financial institutions and consumers. Commercial banking represents a significant part of our business. Our credit culture emphasizes building relationships by making high quality loans and providing a full range of financial products and services to our customers. We offer derivative products that enable mortgage banking customers to manage their production risks and our energy financing expertise enables us to offer commodity derivatives for customers to use in their risk management. Our diversified base of revenue sources is designed to generate returns in a range of economic situations. Historically, fees and commissions provide 40% to 48% of our total revenue. Approximately 40% of our revenue came from fees and commissions in 2018.

BOK Financial's corporate headquarters is located at Bank of Oklahoma Tower, Boston Avenue at Second Street, Tulsa, Oklahoma 74172.

The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports are available on the Company's website at www.bokf.com as soon as reasonably practicable after the Company electronically files such material with or furnishes it to the Securities and Exchange Commission.

Operating Segments

BOK Financial operates three principal lines of business: Commercial Banking, Consumer Banking and Wealth Management. Commercial Banking includes lending, treasury and cash management services and customer risk management products for small businesses, middle market and larger commercial customers. Commercial Banking also includes the TransFund electronic funds network. Consumer Banking includes retail lending and deposit services, lending and deposit services to small business customers served through the retail branch network and all mortgage banking activities. Wealth Management provides fiduciary services, private bank services and investment advisory services in all markets. Wealth Management also underwrites state and municipal securities and engages in brokerage and trading activities. Discussion of these principal lines of business appears within the Lines of Business section of "Management's Discussion and Analysis of Financial Condition and Results of Operations".

Competition

BOK Financial and its operating segments face competition from other banks, thrifts, credit unions and other non-bank financial institutions, such as investment banking firms, investment advisory firms, brokerage firms, investment companies, financial technology firms, government agencies, mortgage brokers and insurance companies. The Company competes largely on the basis of customer services, interest rates on loans and deposits, lending limits and customer convenience. Some operating segments face competition from institutions that are not as closely regulated as banks, and therefore are not limited by the same capital requirements and other restrictions. All market share information presented below is based upon share of deposits in specified areas according to the Federal Deposit Insurance Corporation ("FDIC") as of June 30, 2018.

We are the largest financial institution in the state of Oklahoma with 13% of the state's total deposits. We have 32% and 10% of the market share in the Tulsa and Oklahoma City areas, respectively. We compete with two banks that have operations nationwide and have greater access to funds at lower costs, higher lending limits, and greater access to technology resources. We also compete with regional and locally-owned banks in both the Tulsa and Oklahoma City areas, as well as in every other community in which we do business throughout the state.

We compete against numerous financial institutions in the state of Texas, including some of the largest in the United States, and have a market share of approximately 2% in the Dallas, Fort Worth area and less than 1% in the Houston area. We have an 11% market share in the Albuquerque area and compete with four large national banks, some regional banks and several locally-owned smaller community banks. Our market share is approximately 4% in the Denver area. We serve Benton and Washington counties in Arkansas with a market share of approximately 2%. Our market share is approximately 2% in the Kansas City, Missouri/Kansas area. We operate as a community bank with locations in Phoenix, Mesa and Scottsdale with approximately 1% market share. The Company's ability to expand into additional states remains subject to various federal and state laws.

Employees

As of December 31, 2018, BOK Financial and its subsidiaries employed 5,313 full-time equivalent employees. None of the Company's employees are represented by collective bargaining agreements. Management considers its employee relations to be good.

Supervision and Regulation

BOK Financial and its subsidiaries are subject to extensive regulations under federal and state laws. Both the scope of the laws and regulations and the intensity of the supervision to which our business is subject have increased in recent years. Regulatory enforcement and fines have also increased across the banking and financial services sector. Many of these changes have occurred as a result of the Dodd-Frank Act and its implementing regulations, most of which are now in place. These regulations and others are designed to promote safety and soundness, protect consumers and ensure the stability of the banking system as a whole. The purpose of these regulations is not necessarily to protect shareholders and creditors. As detailed below, these regulations require the Company and its subsidiaries to maintain certain capital balances and require the Company to provide financial support to its subsidiaries. These regulations may restrict the Company's ability to diversify, to acquire other institutions and to pay dividends on its capital stock. These regulations also include requirements on certain programs and services offered to our customers, including restrictions on fees charged for certain services. President Trump has issued an executive order that sets forth principles for reform of the federal financial regulatory framework; however, the recent change to a Democrat controlled House may limit the opportunity for further regulatory reform. The Company expects that its business will remain subject to extensive regulation and supervision.

The following information summarizes certain existing laws and regulations that affect the Company’s operations. It does not summarize all provisions of these laws and regulations and does not include all laws and regulations that affect the Company presently or in the future.

General

As a financial holding company, BOK Financial is regulated under the BHCA and is subject to regular inspection, examination and supervision by the Board of Governors of the Federal Reserve System (the "Federal Reserve Board"). Under the BHCA, BOK Financial files quarterly reports and other information with the Federal Reserve Board.

BOKF, NA is organized as a national banking association under the National Banking Act, and is subject to regulation, supervision and examination by the Office of the Comptroller of the Currency (the "OCC"), the FDIC, the Federal Reserve Board, the Consumer Financial Protection Bureau ("CFPB") and other federal and state regulatory agencies. The OCC has primary supervisory responsibility for national banks and must approve certain corporate or structural changes, including changes in capitalization, payment of dividends, change of place of business, and establishment of a branch or operating subsidiary. The OCC performs examinations concerning safety and soundness, the quality of management and directors, information technology and compliance with applicable regulations. The National Banking Act authorizes the OCC to examine every national bank as often as necessary.

A financial holding company, and the companies under its control, are permitted to engage in activities considered "financial in nature" as defined by the BHCA, Gramm-Leach-Bliley Act and Federal Reserve Board interpretations. Activities that are "financial in nature" include securities underwriting and dealing, insurance underwriting, merchant banking, operating a mortgage company, performing certain data processing operations, servicing loans and other extensions of credit, providing investment and financial advice, owning and operating savings and loan associations, and leasing personal property on a full pay-out, non-operating basis. A financial holding company is required to notify the Federal Reserve Board within thirty days of engaging in new activities determined to be "financial in nature." BOK Financial is engaged in some of these activities and has notified the Federal Reserve Board.

In order for a financial holding company to commence any new activity permitted by the BHCA, each insured depository institution subsidiary of the financial holding company must be "well capitalized" and "well managed" and have received a rating of at least "satisfactory" in its most recent examination under the Community Reinvestment Act. A financial holding company and its depository institution subsidiaries are considered to be "well capitalized" if they meet the requirements discussed in the section captioned "Capital Adequacy and Prompt Corrective Action" which follows. A financial holding company and its depository institution subsidiaries are considered to be "well managed" if they receive a composite rating and management rating of at least "satisfactory" in their most recent examinations. If a financial holding company fails to meet these requirements, the Federal Reserve Board may impose limitations or conditions on the conduct of its activities and the company may not commence any new financial activities without prior approval.

The BHCA requires the Federal Reserve Board’s prior approval for the direct or indirect acquisition of more than five percent of any class of voting stock of any non-affiliated bank. Under the Federal Bank Merger Act, the prior approval of the OCC is required for a national bank to merge with another bank or purchase the assets or assume the deposits of another bank. In reviewing applications seeking approval of merger and acquisition transactions, the bank regulatory authorities consider, among other things, the competitive effect and public benefits of the transactions, the capital position of the combined organization, the applicant’s performance record under the Community Reinvestment Act and fair housing laws and the effectiveness of the subject organizations in combating money laundering activities.

A financial holding company and its subsidiaries are prohibited under the BHCA from engaging in certain tie-in arrangements in connection with the provision of any credit, property or services. Thus, a subsidiary of a financial holding company may not extend credit, lease or sell property, furnish any services or fix or vary the consideration for these activities on the condition that (1) the customer obtain or provide additional credit, property or services from or to the financial holding company or any subsidiary thereof, or (2) the customer may not obtain some other credit, property or services from a competitor, except to the extent reasonable conditions are imposed to insure the soundness of credit extended.

The Company and other non-bank subsidiaries are also subject to other federal and state laws and regulations. For example, BOK Financial Securities, Inc. is regulated by the Securities and Exchange Commission ("SEC"), the Financial Industry Regulatory Authority ("FINRA"), the Federal Reserve Board, and state securities regulators. Such regulations generally include licensing of certain personnel, customer interactions, and trading operations.

Volcker and Swap Rules

Title VI of the Dodd-Frank Act, commonly known as the Volcker Rule, prohibits the Company from (1) engaging in short-term proprietary trading for our own account, and (2) having certain ownership interests in or relationships with private equity or hedge funds. The fundamental prohibitions of the Volcker Rule apply to banking entities of any size, including the Company and its bank subsidiary. The Company has implemented a compliance program required by the Volcker Rule. Trading activity remains largely unaffected by the Volcker Rule as most of our trading activity is exempted or excluded from the proprietary trading prohibitions.

Title VII of the Dodd-Frank Act, commonly known as the Swap Rule, subjects nearly all derivative transactions to the regulations of the Commodity Futures Trading Commission ("CFTC") or SEC. This includes registration, recordkeeping, reporting, capital, margin and business conduct requirements on swap dealers and major swap participants. Under CFTC and SEC rules, entities transacting in less than $8 billion in notional value of swaps over any 12 month period are exempt from the definition of and registration as a "swap dealer." The Company currently estimates that the nature and volume of its swaps activity will not require it to register as a swap dealer.

Enhanced Prudential Standards

The Dodd-Frank Act directed the Federal Reserve Board to monitor emerging risks to financial institutions and enacted enhanced supervision and prudential standards applicable to bank holding companies with consolidated assets of $50 billion or more and non-bank covered companies designated as systematically important to the Financial Stability Oversight Council (often referred to as systemically important financial institutions). The Dodd-Frank Act mandated that certain regulatory requirements applicable to systemically important financial institutions be more stringent than those applicable to other financial institutions.

In February 2014, the Federal Reserve Board adopted rules to implement certain of these enhanced prudential standards. Beginning in 2015, the rules required publicly traded bank holding companies with $10 billion or more in total consolidated assets to establish risk committees and required bank holding companies with $50 billion or more in total consolidated assets to comply with enhanced capital, liquidity and overall risk management standards. In May 2018, the Economic Growth, Regulatory Relief and Consumer Protection Act ("Regulatory Relief Act") raised the threshold for systemically important financial institutions from $50 billion to $250 billion while providing the Federal Reserve with authority to establish incremental prudential standards for banks between $100 billion and $250 billion. The regulations to implement this change have not been finalized.

Consumer Financial Protection

We are subject to a number of federal and state consumer protection laws that extensively govern our relationship with our customers. These laws include the Equal Credit Opportunity Act, the Fair Credit Reporting Act, the Truth in Lending Act, the Truth in Savings Act, the Electronic Fund Transfer Act, the Expedited Funds Availability Act, the Home Mortgage Disclosure Act, the Fair Housing Act, the Real Estate Settlement Procedures Act, the Fair Debt Collection Practices Act, the Service Members Civil Relief Act and these laws' respective state-law counterparts, as well as state usury laws and laws regarding unfair and deceptive acts and practices. These and other federal laws, among other things, require disclosures of the cost of credit and terms of deposit accounts, provide substantive consumer rights, prohibit discrimination in credit transactions, regulate the use of credit report information, provide financial privacy protections, prohibit unfair, deceptive and abusive practices, restrict our ability to raise interest rates and subject us to substantial regulatory oversight. Violations of applicable consumer protection laws can result in significant potential liability from litigation brought by customers, including actual damages, restitution and attorneys' fees. Federal bank regulators, state attorneys general and state and local consumer protection agencies may also seek to enforce consumer protection requirements and obtain these and other remedies, including regulatory sanctions, customer rescission rights, action by the state and local attorneys general in each jurisdiction in which we operate and civil money penalties. Failure to comply with consumer protection requirements may also damage our reputation and result in our failure to obtain any required bank regulatory approval for merger or acquisition transactions we may wish to pursue or our prohibition from engaging in such transactions even if approval is not required.

The CFPB has broad rulemaking authority for a wide range of consumer financial laws that apply to all banks, including, among other things, the authority to prohibit “unfair, deceptive or abusive” acts and practices. Abusive acts or practices are defined as those that materially interfere with a consumer’s ability to understand a term or condition of a consumer financial product or service or take unreasonable advantage of a consumer’s (i) lack of financial savvy, (ii) inability to protect himself in the selection or use of consumer financial products or services, or (iii) reasonable reliance on a covered entity to act in the consumer’s interests.

The CFPB can issue cease-and-desist orders against banks and other entities that violate consumer financial laws. The CFPB may also institute a civil action against an entity in violation of federal consumer financial law in order to impose a civil penalty or injunction.

Community Reinvestment Act

The Community Reinvestment Act of 1977 ("CRA") requires depository institutions to assist in meeting the credit needs of their market areas consistent with safe and sound banking practice. Under the CRA, each depository institution is required to help meet the credit needs of its market areas by, among other things, providing credit to low- and moderate-income individuals and communities. Depository institutions are periodically examined for compliance with the CRA and are assigned ratings. In order for a financial holding company to commence any new activity permitted by the BHCA, or to acquire any company engaged in any new activity permitted by the BHCA, each insured depository institution subsidiary of the financial holding company must have received a rating of at least “satisfactory” in its most recent examination under the CRA. Furthermore, banking regulators take into account CRA ratings when considering a request for an approval of a proposed transaction. BOKF, NA received a rating of "outstanding" in its most recent CRA examination, which is above "satisfactory."

Financial Privacy

The federal banking regulators adopted rules that limit the ability of banks and other financial institutions to disclose non-public information about consumers to non-affiliated third parties. These limitations require disclosure of privacy policies to consumers and, in some circumstances, allow consumers to prevent disclosure of certain personal information to a non-affiliated third party. These regulations affect how consumer information is transmitted through diversified financial companies and is conveyed to outside parties.

Capital Adequacy and Prompt Corrective Action

The Federal Reserve Board, the OCC and the FDIC have issued substantially similar risk-based and leverage capital guidelines applicable to United States banking organizations to ensure capital adequacy based upon the risk levels of assets and off-balance sheet financial instruments. In addition, these regulatory agencies may from time to time require that a banking organization maintain capital above the minimum levels, whether because of its financial condition or actual or anticipated growth. Capital adequacy guidelines and prompt corrective action regulations involve quantitative measures of assets, liabilities, and certain off-balance sheet items calculated under regulatory accounting practices. Capital amounts and classifications are also subject to qualitative judgments by regulators regarding components, risk weighting and other factors.

Federal Reserve Board risk-based guidelines define a four-tier capital framework based on three categories of regulatory capital. Common equity Tier 1 capital ("CET1") includes common shareholders' equity, less goodwill, most intangible assets and other adjustments. Tier 1 capital consists of CET1 capital plus certain additional capital instruments and related surplus. Supplementary capital ("Tier 2") consists of preferred stock not qualifying as Tier 1 capital, qualifying mandatory convertible debt securities, limited amounts of subordinated debt, other qualifying term debt and allowances for credit losses, subject to limitations. Assets and off-balance sheet exposures are assigned to categories of risk-weights, based primarily upon relative credit risk. Risk-based capital ratios are calculated by dividing CET1, Tier 1 and total capital by risk-weighted assets.

Additional capital rules were effective for banks and bank holding companies, including BOK Financial, on January 1, 2015 as part of a package of regulatory reforms developed by the Basel Committee on Banking Supervision ("BCBS") to strengthen the regulation, supervision and risk management of the banking sector, commonly referred to as the Basel III framework. Implementation of certain components of these rules continues to be deferred.

The leverage ratio is determined by dividing Tier 1 capital by adjusted average total assets. A bank which falls below acceptable levels, including the capital conservation buffer, would be subject to regulatory restrictions on capital distributions (including but not limited to dividends and share repurchases) and executive bonus payments.

The Federal Deposit Insurance Corporation Improvement Act of 1991 (the "FDICIA"), among other things, identifies five capital categories for insured depository institutions from well capitalized to critically under-capitalized and requires the respective federal regulatory agencies to implement systems for prompt corrective action for institutions failing to meet minimum capital requirements within such categories. FDICIA imposes progressively more restrictive covenants on operations, management and capital distributions, depending upon the category in which an institution is classified. The various regulatory agencies have adopted substantially similar regulations that define the five capital categories identified by FDICIA, using the total risk-based capital, Tier 1 risk-based capital and leverage capital ratios as the relevant capital measures. Such regulations establish various degrees of corrective action to be taken when an institution is considered under-capitalized.

Stress Testing

The Regulatory Relief Act eliminated the requirement for periodic company run capital stress tests known as the Dodd-Frank Act Stress Test for banks with assets less than $250 billion. Although the mandate has been lifted, the Company still continues to perform capital stress testing on a regular basis.

Executive and Incentive Compensation

Guidelines adopted by federal banking agencies prohibit excessive compensation as an unsafe and unsound practice and describe compensation as excessive when the amounts paid are unreasonable or disproportionate to the services performed by an executive officer, employee, director or principal shareholder. The Federal Reserve Board has issued comprehensive guidance on incentive compensation intended to ensure that the incentive compensation policies do not undermine safety and soundness by encouraging excessive risk taking. This guidance covers all employees that have the ability to materially affect the risk profile of an organization, either individually or as part of a group, based on key principles that (i) incentives do not encourage risk-taking beyond the organization's ability to identify and manage risk, (ii) compensation arrangements are compatible with effective internal controls and risk management, and (iii) compensation arrangements are supported by strong corporate governance, including active and effective board oversight. Deficiencies in compensation practices may affect supervisory ratings and enforcement actions may be taken if incentive compensation arrangements pose a risk to safety and soundness.

Deposit Insurance

Substantially all of the deposits held by the subsidiary banks are insured up to applicable limits by the Deposit Insurance Fund ("DIF") of the FDIC and are subject to deposit insurance assessments to maintain the DIF. In 2011, the FDIC released a final rule to implement provisions of the Dodd-Frank Act that affect deposit insurance assessments. Among other things, the Dodd-Frank Act raised the minimum designated reserve ratio from 1.15% to 1.35% of estimated insured deposits, removed the upper limit of the designated reserve ratio, required that the designated reserve ratio reach 1.35% by September 30, 2020, and required that the FDIC offset the effect of increasing the minimum designated reserve ratio on depository institutions with total assets of less than $10 billion. The Dodd-Frank Act provided the FDIC flexibility in implementation of the increase in the designated reserve ratio, but it will ultimately result in increased deposit insurance costs to the Company. The Dodd-Frank Act also required that the FDIC redefine the assessment base to average consolidated assets minus average tangible equity.

On June 30, 2016, the DIF rose above the 1.15%, resulting in a reduction of the initial assessment rate for all banks and implementing a 4.5% surcharge on insured depository institutions with total consolidated assets of $10 billion or more. The assessment base for the surcharge was the regular assessment base reduced by $10 billion. On September 30, 2018 the DIF rose above 1.35%. Accordingly, the surcharge for depository institutions with assets of greater than $10 million will cease. Base assessment rates will remain unchanged, but are scheduled to decrease when the reserve ratio exceeds 2%.

Dividends

A key source of liquidity for BOK Financial is dividends from BOKF, NA, which is limited by various banking regulations to net profits, as defined, for the year plus retained profits for the preceding two years. Dividends are further restricted by minimum capital requirements and the Company's internal capital policy. BOKF, NA's dividend limitations are discussed under the heading "Liquidity and Capital" within "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Source of Strength Doctrine

According to Federal Reserve Board policy, a bank holding company is expected to act as a source of financial strength to each subsidiary bank and to commit resources to support each such subsidiary. This support may be required at times when a bank holding company may not be able to provide such support.

Transactions with Affiliates

The Federal Reserve Board regulates transactions between the Company and its subsidiaries. Generally, the Federal Reserve Act and Regulation W, as amended by the Dodd-Frank Act, limit the Company’s banking subsidiary and its subsidiaries, to lending and other "covered transactions" with affiliates. The aggregate amount of covered transactions a banking subsidiary or its subsidiaries may enter into with an affiliate may not exceed 10% of the capital stock and surplus of the banking subsidiary. The aggregate amount of covered transactions with all affiliates may not exceed 20% of the capital stock and surplus of the banking subsidiary.

Covered transactions with affiliates are also subject to collateral requirements and must be conducted on arm’s length terms. Covered transactions include (a) a loan or extension of credit by the banking subsidiary, including derivative contracts, (b) a purchase of securities issued to a banking subsidiary, (c) a purchase of assets by the banking subsidiary unless otherwise exempted by the Federal Reserve, (d) acceptance of securities issued by an affiliate to the banking subsidiary as collateral for a loan, and (e) the issuance of a guarantee, acceptance or letter of credit by the banking subsidiary on behalf of an affiliate.

Bank Secrecy Act and USA PATRIOT Act

The Bank Secrecy Act ("BSA") and The USA PATRIOT Act of 2001 ("PATRIOT Act") impose many requirements on financial institutions in the interest of national security and law enforcement. BSA requires banks to maintain records and file suspicious activity reports that are of use to law enforcement and regulators in combating money laundering and other financial crimes. The PATRIOT Act is intended to deny terrorists and criminals the ability to access the U.S. financial services system and places significantly greater requirements on financial institutions. Financial institutions, such as the Company and its subsidiaries, must have a designated BSA Officer, internal controls, independent testing and training programs commensurate with their size and risk profile. As part of its internal control program, a financial institution is expected to have effective customer due diligence and enhanced due diligence requirements for high-risk customers, as well as processes to prohibit transactions with entities subject to Office of Foreign Asset Control sanctions. Documentation and recordkeeping requirements, as well as system requirements, aimed at identifying and reporting suspicious activity reporting, must increase with the institution's size and complexity. Failure to implement or maintain adequate programs and controls to combat terrorist financing and money laundering may have serious legal, financial, and reputational consequences.

Governmental Policies and Economic Factors

The operations of BOK Financial and its subsidiaries are affected by legislative changes and by the policies of various regulatory authorities and, in particular, the policies of the Federal Reserve Board. The Federal Reserve Board has statutory objectives to maximize employment and maintain price stability. Among the instruments of monetary policy used by the Federal Reserve Board to implement these objectives are: open-market operations in U.S. Government securities, changes in the discount rate and federal funds rate on bank borrowings, and changes in reserve requirements on bank deposits. The effect of future changes in such policies on the business and earnings of BOK Financial and its subsidiaries is uncertain.

In response to the significant recession in business activity which began in 2007, the Federal Reserve took aggressive actions to reduce interest rates and provide liquidity. While many of the crisis-related programs have expired or been closed, government legislation and policies continue to be accommodative, including increases in government spending, reduction of certain taxes and promotion of affordable home programs.

The Federal Reserve completed its bond purchase program designed to reduce longer–term rates in October of 2014. Beginning in October of 2017, the Federal Reserve initiated a balance sheet normalization program that will gradually reduce the reinvestment of principal payments from its securities holdings though the pace and extent of the reduction remains uncertain.

As a result of signs of an improving economy, the Federal Reserve increased its target rate by 25 basis points four times during 2018. We expect the Federal Reserve will slow the frequency of rate increases in 2019 when compared to 2018. Real gross domestic product is forecasted to slow to about 2 percent in 2019 after being around 3 percent in 2018. The inflation rate increased 2 percent in 2018 and is expected to remain close to that pace in 2019. The short–term effectiveness and long–term impact of these programs on the economy in general and on BOK Financial in particular are uncertain.

The Tax Cuts and Jobs Act ("the Tax Reform Act"), signed into law on December 22, 2017, has had a broad impact on the Company and our customers. We believe that the overall impact of lower income tax rates and other provisions of the Tax Reform Act will be beneficial to future economic growth.

Foreign Operations

BOK Financial does not engage in operations in foreign countries, nor does it lend to foreign governments.

ITEM 1A. RISK FACTORS

BOK Financial Corporation and its subsidiaries could be adversely affected by risks and uncertainties that could have a material impact on its financial condition and results of operations, as well as on its common stock and other financial instruments. Risk factors which are significant to the Company include, but are not limited to:

General and Regulatory Risk Factors

Adverse factors could impact BOK Financial's ability to implement its operating strategy.

Although BOK Financial has developed an operating strategy, which it expects to result in continuing improved financial performance, BOK Financial cannot ensure that it will be successful in fulfilling this strategy or that this operating strategy will be successful. Achieving success is dependent upon a number of factors, many of which are beyond BOK Financial's direct control. Factors that may adversely affect BOK Financial's ability to implement its operating strategy include:

- deterioration of BOK Financial's asset quality;
- deterioration in general economic conditions, especially in BOK Financial's core markets;
- inability to control BOK Financial's non-interest expenses;
- inability to increase non-interest income;
- inability to access capital;
- decreases in net interest margins;
- increases in competition; and
- adverse regulatory developments.

Substantial competition could adversely affect BOK Financial.

Banking is a competitive business. BOK Financial competes actively for loan, deposit and other financial services business in the southwest region of the United States. BOK Financial's competitors include a large number of small and large local and national banks, savings and loan associations, credit unions, trust companies, broker-dealers and underwriters, as well as many financial and non-financial firms that offer services similar to those of BOK Financial. Large national financial institutions have substantial capital, technology and marketing resources. Such large financial institutions may have greater access to capital at a lower cost than BOK Financial does, which may adversely affect BOK Financial's ability to compete effectively.

BOK Financial has expanded into markets outside of Oklahoma, where it competes with a large number of financial institutions that have an established customer base and greater market share than BOK Financial. With respect to some of its services, BOK Financial competes with non-bank companies that are not subject to regulation. The absence of regulatory requirements may give non-banks a competitive advantage.

The increasingly competitive environment is in part a result of changes in regulation, changes in technology and product delivery systems and the accelerating pace of consolidation among financial service providers. Our success depends on our ability to respond to the threats and opportunities of financial technology innovations. Developments in "fintech" and crypto-currencies have the potential to disrupt the financial industry and change the way banks do business. Investment in new technology to stay competitive could result in significant costs and increased cybersecurity risk. Our success depends on our ability to adapt to the pace of the rapidly changing technological environment which is important to retention and acquisitions of customers.

Government regulations could adversely affect BOK Financial.

BOK Financial and BOKF, NA are subject to banking laws and regulations that limit the type of acquisitions and investments that we may make. In addition, certain permitted acquisitions and investments are subject to prior review and approval by banking regulators, including the Federal Reserve, OCC and FDIC. Banking regulators have broad discretion on whether to approve proposed acquisitions and investments. In deciding whether to approve a proposed acquisition, federal banking regulators will consider, among other things, the effect of the acquisition on competition; the convenience and needs of the communities to be served, including our record of compliance under the Community Reinvestment Act; and our effectiveness in combating money laundering. They will also consider our financial condition and our future prospects, including projected capital ratios and levels; the competence, experience, and integrity of our management; and our record of compliance with laws and regulations.

The last several years have seen an increase in regulatory costs borne by the banking industry. Laws, regulations or policies currently affecting BOK Financial and its subsidiaries may change. The implementation of the Dodd-Frank Act has and will continue to affect BOK Financial’s businesses, including interchange revenue, mortgage banking, derivative and trading activities on behalf of customers, consumer products and funds management.

Regulatory authorities may change their interpretation of these statutes and regulations, including the OCC, our primary regulator, and the CFPB, our regulator for certain designated consumer laws and regulations. Violations of laws and regulations could limit the growth potential of BOK Financial's businesses. We have made extensive investments in human and technological resources to address enhanced regulatory expectations, including investments in the areas of risk management, compliance, and capital planning. Political developments, including the change in administration in the United States and more recent change in leadership in the House of Representatives, have added additional uncertainty to the implementation, scope and timing of changes in the regulatory environment for the banking industry and for the broader economy.

Political environment could negatively impact BOK Financial’s business.

As a result of the financial crisis and related government intervention to stabilize the banking system, there have been a series of laws and related regulations proposed or enacted in an attempt to ensure the crisis is not repeated. Many of the new regulations have been far-reaching. The intervention by the government also impacted populist sentiment with a negative view of financial institutions. High profile mistakes by the very largest banks in the country have continued to fuel negative sentiment towards the banking industry. This sentiment may increase litigation risk to the Company or have an adverse impact on BOK Financial’s future operations. The passage of recent legislative proposals have eased some of the regulatory burden for BOK Financial; however, legislative outcomes and their durability are inherently uncertain.

Credit Risk Factors

Adverse regional economic developments could negatively affect BOK Financial's business.

At December 31, 2018, loans to businesses and individuals with collateral primarily located in Texas represented approximately 30% of the total loan portfolio, loans to businesses and individuals with collateral primarily located in Oklahoma represented approximately 16% of our total loan portfolio and loans to businesses and individuals with collateral primarily located in Colorado represented approximately 15% of our total loan portfolio. These geographic concentrations subject the loan portfolio to the general economic conditions within these areas. Poor economic conditions in Texas, Oklahoma, Colorado or other markets in the southwest region may cause BOK Financial to incur losses associated with higher default rates and decreased collateral values in BOK Financial's loan portfolio. A regional economic downturn could also adversely affect revenue from brokerage and trading activities, mortgage loan originations and other sources of fee-based revenue.

Extended oil and gas commodity price downturns could negatively affect BOK Financial customers.

At December 31, 2018, 17% of BOK Financial's total loan portfolio is comprised of loans to borrowers in the energy industry. The energy industry is historically cyclical and prolonged periods of low oil and gas commodity prices could negatively impact borrowers' ability to pay. In addition, the Company does business in several major oil and natural gas producing states including Oklahoma, Texas and Colorado. The economies of these states could be negatively impacted by prolonged periods of low oil and gas commodity prices resulting in increased credit migration to classified and nonaccruing categories, higher loan loss provisions and risk of credit losses from both energy borrowers and businesses and individuals in those regional economies.

Other adverse economic factors affecting particular industries could have a negative effect on BOK Financial customers and their ability to make payments to BOK Financial.

Certain industry-specific economic factors also affect BOK Financial. For example, BOK Financial's loan portfolio includes commercial real estate loans. A downturn in the real estate industry in general or in certain segments of the commercial real estate industry in the southwest region could also have an adverse effect on BOK Financial's operations. Regulatory changes in healthcare may negatively affect our customers. Legislation affecting reimbursement rates along with the continued transition to managed care in place of fee for service payments could affect their ability to pay.

Adverse global economic factors could have a negative effect on BOK Financial customers and counterparties.

Economic conditions globally could impact BOK Financial’s customers and counterparties with which we do business. The United Kingdom has not yet found an agreement regarding BREXIT, trade related issues remain between the United States and China, and the turmoil in Venezuela, who holds the world's largest oil reserve, continues without an obvious agreement. We have no direct exposure to European sovereign debt and limited exposure to European and Chinese financial institutions. We have not identified any significant customer exposures to European sovereign debt, European financial institutions or Chinese financial institutions.

Liquidity and Interest Rate Risk Factors

Fluctuations in interest rates could adversely affect BOK Financial's business.

BOK Financial's business is highly sensitive to:

- the monetary policies implemented by the Federal Reserve Board, including the discount rate on bank borrowings and changes in reserve requirements, which affect BOK Financial's ability to make loans and the interest rates we may charge;
- changes in prevailing interest rates, due to the dependency of the subsidiary banks on interest income;
- open market operations in U.S. Government securities.

A significant increase in market interest rates, or the perception that an increase may occur, could adversely affect both BOK Financial's ability to originate new loans and BOK Financial's ability to grow. Conversely, a decrease in interest rates could result in acceleration in the payment of loans, including loans underlying BOK Financial's holdings of residential mortgage-backed securities and termination of BOK Financial's mortgage servicing rights. In addition, changes in market interest rates, changes in the relationships between short-term and long-term market interest rates or changes in the relationships between different interest rate indices, could affect the interest rates charged on interest-earning assets differently than the interest rates paid on interest-bearing liabilities. This difference could result in an increase in interest expense relative to interest income, which would reduce the Company’s net interest revenue. In a rising interest rate environment, the composition of the deposit portfolio could shift resulting in a mix that is more sensitive to changes in interest rates than is the current mix. An increase in market interest rates also could adversely affect the ability of BOK Financial's floating-rate borrowers to meet their higher payment obligations. If this occurred, it could cause an increase in nonperforming assets and net charge-offs, which could adversely affect BOK Financial's business.

We have a significant number of loans, derivative contracts, borrowings and other financial instruments with attributes that are either directly or indirectly dependent on LIBOR. In 2017, the U.K. Financial Conduct Authority announced that it would no longer persuade or compel banks to submit to LIBOR after 2021. U.S. regulatory authorities have voiced similar support for phasing out LIBOR. The Federal Reserve Bank of New York's Alternative Reference Rate Committee has recommended the Secured Overnight Financing Rate ("SOFR") as an alternative to LIBOR. However, for two key reasons, SOFR is a secured rate while LIBOR is an unsecured rate and SOFR is an overnight rate while LIBOR is published for different maturities, SOFR is not the economic equivalent of LIBOR. The impact of SOFR or other alternatives to LIBOR on the valuations, pricing and operation of our financial instruments is not yet known.

Changes in mortgage interest rates could adversely affect mortgage banking operations along with mortgage serving rights as well as BOK Financial's substantial holdings of residential mortgage-backed securities, and brokerage and trading revenue.

BOK Financial derives a substantial amount of revenue from mortgage banking activities, the production and sale of mortgage loans and the servicing of mortgage loans. In addition, as part of BOK Financial's mortgage banking business, BOK Financial has substantial holdings of mortgage servicing rights. Revenue generated from the production and sale of mortgage loans is affected by mortgage interest rates and government policies related to economic stimulus and home ownership. Falling interest rates tend to increase mortgage lending activities and related revenue while rising interest rates have an opposite effect.

Mortgage servicing revenue is a fee earned over the life of the related loan. However, mortgage servicing rights are assets that are carried at fair value which are very sensitive to numerous factors with the primary factor being changes in market interest rates. Falling interest rates tend to increase loan prepayments, which may lead to a decrease in the value of related servicing rights. We attempt to manage this risk by maintaining an active hedging program. The primary objective of the Company's hedging program is to provide an offset to changes in the fair value of these rights due to hedgeable risks, primarily changes in market interest rates. Due to numerous unhedgeable factors, hedging strategies may not offset all changes in the fair value of the asset. Such unhedgeable factors include, but are not limited to, changes in customer prepayment or delinquency behavior that is inconsistent with historical actual performance in a similar market environment; changes in the long-term or short-term primary/secondary mortgage spreads; and changes in survey-driven assumptions such as the cost of servicing and discount rates.

We also hold a substantial portfolio of residential mortgage-backed securities issued by U.S. government agencies. The fair value of residential mortgage-backed securities is highly sensitive to changes in interest rates. A significant decrease in interest rates may lead mortgage holders to refinance the mortgages constituting the pool backing the securities, subjecting BOK Financial to a risk of prepayment and decreased return on investment due to subsequent reinvestment at lower interest rates. A significant decrease in interest rates may also accelerate premium amortization. Conversely, a significant increase in interest rates may cause mortgage holders to extend the term over which they repay their loans, which delays the Company’s opportunity to reinvest funds at higher rates. We mitigate this risk somewhat by investing principally in shorter duration mortgage products, which are less sensitive to changes in interest rates.

In addition, the Company actively engages in trading activities that provide U.S. government agency residential mortgage-backed securities and related derivative instruments to our customers. Trading activities generate net interest revenue, trading revenue and customer hedging revenue. Trading revenue and customer hedging revenue varies in response to customer demand. The value of trading securities will increase in response to decreases in interest rates or decrease in response to increases in interest rates. We mitigate the market risk of holding trading securities through appropriate economic hedging techniques.

Market disruptions could impact BOK Financial’s funding sources.

BOK Financial’s subsidiary bank may rely on other financial institutions and the Federal Home Loan Bank of Topeka as a significant source of funds. Our ability to fund loans, manage our interest rate risk and meet other obligations depends on funds borrowed from these sources. The inability to borrow funds at market interest rates could have a material adverse effect on our operations.

Operating Risk Factors

Dependence on technology increases cybersecurity risk.

As a financial institution, we process a significant number of customer transactions and possess a significant amount of sensitive customer information. As technology advances, the ability to initiate transactions and access data has become more widely distributed among mobile phones, personal computers, automated teller machines, remote deposit capture sites and similar access points. These technological advances increase cybersecurity risk. While the Company maintains programs intended to prevent or limit the effects of cybersecurity risk, there is no assurance that unauthorized transactions or unauthorized access to customer information will not occur. The financial, reputational and regulatory impact of unauthorized transactions or unauthorized access to customer information could be significant.

We depend on third parties for critical components of our infrastructure.

We outsource a significant portion of our information systems, communications, data management and transaction processing to third parties. These third parties are sources of risk associated with operational errors, system interruptions or breaches, unauthorized disclosure of confidential information and misuse of intellectual property. If the service providers encounter any of these issues, we could be exposed to disruption of service, reputation damages, and litigation risk that could be material to our business.

Integration of BOK Financial and CoBiz may be more difficult, costly or time consuming than expected and the anticipated benefits and cost savings of the merger may not be realized.

The success of the merger will depend on a number of factors including:

- Successful integration of the acquired business into current operations;

- Retention of acquired deposits and earning assets;
- Control over incremental non-interest expense;
- Retention of certain key employees; and
- Continued performance of the CoBiz credit portfolio.

The acquisition of CoBiz which represents BOK Financials’s largest transaction to date, includes anticipated benefits and cost savings, that depend, in part, on our ability to successfully combine and integrate the businesses in a manner that permits growth opportunities and does not materially disrupt existing customer relations nor result in decreased revenues due to loss of customers. Business disruptions may cause customers to remove their accounts to competing financial institutions. Disruption of ongoing businesses or inconsistencies in standards, controls, procedures and policies may adversely affect our ability to maintain relationships with clients, customers, depositors and employees or to achieve the anticipated benefits and cost savings of the merger. In addition, the loss of key employees could adversely affect our ability to successfully conduct its business. We may also encounter unexpected difficulties or costs during the integration. Integration efforts may also divert management attention and resources.

Risks Related to an Investment in Our Stock

Although publicly traded, BOK Financial's common stock has substantially less liquidity than the average trading market for a stock quoted on the NASDAQ National Market System.

A relatively small fraction of BOK Financial's outstanding common stock is actively traded. The risks of low liquidity include increased volatility of the price of BOK Financial's common stock. Low liquidity may also limit holders of BOK Financial's common stock in their ability to sell or transfer BOK Financial's shares at the price, time and quantity desired.

BOK Financial's principal shareholder controls a majority of BOK Financial's common stock.

Mr. George B. Kaiser owns approximately 53% of the outstanding shares of BOK Financial's common stock at December 31, 2018. Mr. Kaiser is able to elect all of BOK Financial's directors and effectively control the vote on all matters submitted to a vote of BOK Financial's common shareholders. Mr. Kaiser's ability to prevent an unsolicited bid for BOK Financial or any other change in control could have an adverse effect on the market price for BOK Financial's common stock. A substantial majority of BOK Financial's directors are not officers or employees of BOK Financial or any of its affiliates. However, because of Mr. Kaiser's control over the election of BOK Financial's directors, he could change the composition of BOK Financial's Board of Directors so that it would not have a majority of outside directors.

Possible future sales of shares by BOK Financial's principal shareholder could adversely affect the market price of BOK Financial's common stock.

Mr. Kaiser has the right to sell shares of BOK Financial's common stock in compliance with the federal securities laws at any time, or from time to time. The federal securities laws will be the only restrictions on Mr. Kaiser's ability to sell. Because of his current control of BOK Financial, Mr. Kaiser could sell large amounts of his shares of BOK Financial's common stock by causing BOK Financial to file a registration statement that would allow him to sell shares more easily. In addition, Mr. Kaiser could sell his shares of BOK Financial's common stock without registration under Rule 144 of the Securities Act. Although BOK Financial can make no predictions as to the effect, if any, that such sales would have on the market price of BOK Financial's common stock, sales of substantial amounts of BOK Financial's common stock, or the perception that such sales could occur, could adversely affect market prices. If Mr. Kaiser sells or transfers his shares of BOK Financial's common stock as a block, another person or entity could become BOK Financial's controlling shareholder.

Statutory restrictions on subsidiary dividends and other distributions and debts of BOK Financial's subsidiaries could limit amounts BOK Financial's subsidiaries may pay to BOK Financial.

A substantial portion of BOK Financial's cash flow typically comes from dividends paid by BOKF, NA. Statutory provisions and regulations restrict the amount of dividends BOKF, NA may pay to BOK Financial without regulatory approval. Management also developed, and the BOK Financial board of directors approved, an internal capital policy that is more restrictive than the regulatory capital standards. In the event of liquidation, creditors of the subsidiary banks and other non-bank subsidiaries of BOK Financial are entitled to receive distributions from the assets of that subsidiary before BOK Financial, as holder of an equity interest in the subsidiaries, is entitled to receive any distributions.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

BOK Financial and its subsidiaries own and lease improved real estate that is carried at $196 million, net of depreciation and amortization. The Company's principal offices are located in leased premises in the Bank of Oklahoma Tower in Tulsa, Oklahoma. Banking offices are primarily located in Tulsa and Oklahoma City, Oklahoma; Dallas, Fort Worth and Houston, Texas; Albuquerque, New Mexico; Denver, Colorado; Phoenix, Arizona; and Kansas City, Kansas/Missouri. Primary operations facilities are located in Tulsa and Oklahoma City, Oklahoma; Dallas, Texas and Albuquerque, New Mexico. The Company's facilities are suitable for their respective uses and present needs.

The information set forth in Notes 5 and 14 of the Company's Notes to Consolidated Financial Statements, which appear elsewhere herein, provides further discussion related to properties.

ITEM 3. LEGAL PROCEEDINGS

The information set forth in Note 14 of the Company's Notes to Consolidated Financial Statements, which appear elsewhere herein, provides discussion related to legal proceedings.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

BOK Financial's $0.00006 par value common stock is traded on the NASDAQ Stock Market under the symbol BOKF. As of January 31, 2019, common shareholders of record numbered 755 with 72,251,266 shares outstanding.

The highest and lowest quarterly closing bid price for shares and cash dividends declared per share of BOK Financial common stock follows:

	First	**Second**	**Third**	**Fourth**
2018:				
Low	**$90.62**	**$93.00**	**$93.33**	**$70.61**
High	**100.98**	**105.24**	**104.74**	**96.91**
Cash dividends declared	**0.45**	**0.45**	**0.50**	**0.50**
2017:				
Low	$75.15	$74.34	$77.30	$82.30
High	84.81	85.83	89.08	93.50
Cash dividends declared	0.44	0.44	0.44	0.45

Shareholder Return Performance Graph

Set forth below is a line graph comparing the change in cumulative shareholder return of the NASDAQ Composite Index, the KBW NASDAQ Bank Index and the SNL U.S. Bank NASDAQ Index for the period commencing December 31, 2013 and ending December 31, 2018.*

	Period Ending December 31,					
Index	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
BOK Financial Corporation	100.00	92.79	94.85	135.55	154.01	124.75
NASDAQ Composite	100.00	114.75	122.74	133.62	173.22	168.30
SNL U.S. Bank NASDAQ	100.00	103.57	111.80	155.02	163.20	137.56
KBW NASDAQ Bank Index	100.00	109.37	109.91	141.24	167.50	137.83

* Graph assumes value of an investment in the Company's Common Stock for each index was $100 on December 31, 2013. Cash dividends on Common Stock are assumed to have been reinvested in BOK Financial Common Stock.

The following table provides information with respect to purchases made by or on behalf of the Company or any “affiliated purchaser” (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934), of the Company’s common stock during the three months ended December 31, 2018.

Period	**Total Number of Shares Purchased** [2]	**Average Price Paid per Share**	**Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs** [1]	**Maximum Number of Shares that May Yet Be Purchased Under the Plans**
October 1, 2018 to October 31, 2018	200,000	$ 85.08	200,000	1,749,917
November 1, 2018 to November 30, 2018	235,000	$ 88.68	235,000	1,514,917
December 1, 2018 to December 31, 2018	90,000	$ 80.02	90,000	1,424,917
Total	525,000		525,000	

[1] On October 1, 2015, the Company's board of directors authorized the Company to repurchase up to five million shares of the Company's common stock. As of December 31, 2018, the Company had repurchased 3,575,083 shares under this plan. Future repurchases of the Company's common stock will vary based on market conditions, regulatory limitations and other factors.

[2] The Company may repurchase shares from employees to cover the exercise price and taxes in connection with employee shared-based compensation.

ITEM 6. SELECTED FINANCIAL DATA

The selected financial data is set forth within Table 1 of Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

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

Table 1 – Consolidated Selected Financial Data

(Dollars in thousands, except per share data)

	December 31, 2018	2017	2016	2015	2014
Selected Financial Data					
For the year:					
Interest revenue	**$1,228,426**	$972,751	$829,117	$766,828	$732,239
Interest expense	**243,559**	131,050	81,889	63,474	67,045
Net interest revenue	**984,867**	841,701	747,228	703,354	665,194
Provision for credit losses	**8,000**	(7,000)	65,000	34,000	—
Fees and commissions revenue[5]	**643,642**	642,390	647,726	614,960	588,012
Net income attributable to BOK Financial Corporation shareholders	**445,646**	334,644	232,668	288,565	292,435
Period-end:					
Loans	**21,656,730**	17,153,424	16,989,660	15,941,154	14,208,037
Assets	**38,020,504**	32,272,160	32,772,281	31,476,128	29,089,698
Deposits	**25,263,763**	22,061,305	22,748,095	21,088,158	21,140,859
Shareholders' equity	**4,432,109**	3,495,367	3,274,854	3,230,556	3,302,179
Nonperforming assets[1]	**267,162**	290,305	356,641	251,908	256,617
Profitability Statistics					
Earnings per share (based on average equivalent shares):					
Basic	**$6.63**	$5.11	$3.53	$4.22	$4.23
Diluted	**6.63**	5.11	3.53	4.21	4.22
Percentages (based on daily averages):					
Return on average assets	**1.28 %**	1.02 %	0.72 %	0.94 %	1.04 %
Return on average shareholders' equity	**11.98 %**	9.82 %	7.02 %	8.65 %	9.21 %
Average total equity to average assets	**10.70 %**	10.43 %	10.38 %	11.03 %	11.47 %
Common Stock Performance					
Per Share:					
Book value per common share	**$61.45**	$53.45	$50.12	$49.03	$47.78
Market price: December 31 close	**73.33**	92.32	83.04	59.79	60.04
Market range – High close bid price	**105.24**	93.50	84.13	72.44	70.18
Market range – Low close bid price	**70.61**	74.34	44.72	53.37	57.87
Cash dividends declared	**1.90**	1.77	1.73	1.69	1.62
Dividend payout ratio	**28.55 %**	34.45 %	48.81 %	40.03 %	38.35 %

Table 1 – Consolidated Selected Financial Data

(Dollars in thousands, except per share data)

	December 31, 2018		2017		2016		2015		2014	
Selected Financial Data										
Selected Balance Sheet Statistics										
Period-end:										
Common equity Tier 1 ratio[2]	**10.92**	**%**	12.05	%	11.21	%	12.13	%	N/A	
Tier 1 capital ratio[2]	**10.92**	**%**	12.05	%	11.21	%	12.13	%	13.33	%
Total capital ratio[2]	**12.50**	**%**	13.54	%	12.81	%	13.30	%	14.66	%
Leverage ratio[2]	**8.96**	**%**	9.31	%	8.72	%	9.25	%	9.96	%
Allowance for loan losses to nonaccruing loans[4]	**132.89**	**%**	129.09	%	112.33	%	180.09	%	245.34	%
Allowance for loan losses to loans	**0.96**	**%**	1.34	%	1.45	%	1.41	%	1.33	%
Combined allowances for credit losses to loans [3]	**0.97**	**%**	1.37	%	1.52	%	1.43	%	1.34	%
Miscellaneous (at December 31)										
Number of employees (full-time equivalent)	**5,313**		4,930		4,884		4,789		4,743	
Number of TransFund locations	**2,426**		2,223		2,021		1,972		2,080	
Fiduciary assets	**$44,841,339**		$48,761,477		$42,378,053		$38,333,638		$35,997,877	
Mortgage loans serviced for others	**21,658,335**		22,046,632		21,997,568		19,678,226		16,162,887	

[1] Includes nonaccruing loans, renegotiated loans and assets acquired in satisfaction of loans. Excludes loans past due 90 days or more and still accruing.

[2] Risk-based capital ratios for 2018, 2017, 2016 and 2015 calculated under revised regulatory capital rules issued July 2013 and effective for the Company on January 1, 2015. Previous risk-based ratios presented are calculated in accordance with then current regulatory capital rules.

[3] Includes allowance for loan losses and accrual for off-balance sheet credit risk.

[4] Excludes residential mortgage loans guaranteed by agencies of the U.S. government.

[5] Non-GAAP measure to net interchange charges from prior years between transaction card revenue and data processing and communications expense as a result of the recent revenue recognition standard. This measure has no effect on net income or earnings per share.

Management's Assessment of Operations and Financial Condition

Overview

The following discussion is management's analysis to assist in the understanding and evaluation of the financial condition and results of operations of BOK Financial Corporation ("BOK Financial" or "the Company"). This discussion should be read in conjunction with the Consolidated Financial Statements and footnotes and selected financial data presented elsewhere in this report.

For 2018, the U.S. economy continued to grow, supported by declining unemployment, continued payroll growth and modest inflation. GDP increased 3.5% through the third quarter of 2018 and is expected to remain in the range of 2 to 3 percent in 2019. The national unemployment rate fell to 3.1% at December of 2018 from 4.1% in December of 2017. Inflation also remained low around 2% for 2018. The minutes of the Federal Open Market Committee ("FOMC") of the Federal Reserve for December indicated continued strengthening of labor market conditions and unchanged longer-run inflation expectations.

The Federal Reserve increased the target range for the federal funds rate by 25 basis points four times during 2018. The 10-year U.S. Treasury note finished the year yielding 2.69% versus 2.40% at December 31, 2017. We expect rates to continue to rise in 2019. Global quantitative easing and lack of inflation, combined with continued gradual federal funds rate increases by the Federal Reserve are contributing to a flattening of the yield curve; however, a yield curve inversion is not expected. Higher long-term interest rates are likely in 2019.

Performance Summary

Net income for the year ended December 31, 2018 totaled $445.6 million or $6.63 per diluted share compared with net income of $334.6 million or $5.11 per diluted share for the year ended December 31, 2017.

On October 1, 2018, the Company acquired CoBiz Financial, Inc. ("CoBiz"). CoBiz is headquartered in Denver with a presence in Colorado and Arizona. The Company paid total consideration of $944 million, which included $243 million in cash along with the issuance of 7.2 million shares of BOK Financial stock valued at $701 million, in exchange for all outstanding shares of CoBiz stock. We anticipate a full bank consolidation in the first quarter of 2019.

We incurred $16.6 million of closing and integration costs, which resulted in an $0.18 per share reduction in 2018. A fee earned through the sale of client assets of $15.4 million was recognized in 2018 accounting for a $0.17 per share addition. The fluctuation discussion in the highlights below exclude the impact of these items.

Highlights of 2018 included:

- Net interest revenue totaled $984.9 million for 2018, up from $841.7 million for 2017. CoBiz added $43.1 million to net interest revenue. The remaining increase was driven by both widening spreads and growth in average assets. Net interest margin was 3.20% for 2018 compared to 2.92% for 2017. Average earning assets were $31.0 billion for 2018, up $1.4 billion over 2017 with $950 million due to CoBiz.
- Fees and commissions revenue was $643.6 million for 2018, a decrease of $14.1 million compared to 2017. Brokerage and trading revenue decreased $23.3 million primarily due to the cost of financial instruments used to hedge our trading portfolio. Mortgage banking revenue decreased $6.9 million affected by the impact of rising interest rates on mortgage loan origination volumes. Fiduciary and asset management revenue increased $6.4 million.
- The change in the fair value of mortgage servicing rights, net of economic hedges, decreased other operating revenue by $20.4 million in 2018, compared to $1.9 million in 2017. This increase is due to the combination of unhedgeable factors and significant mortgage rate volatility. This amount does not include hedge-related net interest revenue of $4.8 million.
- Other operating expense totaled $1.0 billion, a $24.9 million increase compared to 2017, including $29.7 million of costs related to CoBiz operations in the fourth quarter of 2018. Excluding CoBiz operating costs, personnel expense decreased $15.2 million. Annual merit increases were offset by a decrease in incentive compensation expense. Non-personnel expense increased $10.4 million. Increases in occupancy and equipment, data processing and communications, and net losses and expenses on repossessed assets were partially offset by a decrease in mortgage banking costs.
- The Company recorded an $8.0 million provision for credit losses in 2018, compared to a $7.0 million negative provision for credit losses in 2017. The 2018 provision reflected loan growth partially offset by continued improvement in credit metrics. Nonaccruing loans not guaranteed by U.S. government agencies decreased $23 million compared to December 31, 2017. Potential problem loans decreased $26 million while other loans especially mentioned increased $64 million. Net charge-offs were $33 million or 0.18% of average loans for 2018, compared to net charge-offs of $16 million or 0.09% of average loans for 2017. The combined allowance for credit losses totaled $209 million or 0.97% of outstanding loans and 1.12%, excluding loans from CoBiz, at December 31, 2018.
- Period-end outstanding loan balances were $21.7 billion at December 31, 2018, a $4.5 billion increase over the prior year. CoBiz added $2.9 billion of loans during 2018. Excluding acquired loans, commercial loan balances grew by $1.1 billion or 10% and commercial real estate loans grew by $447 million or 13%.
- Period-end deposits totaled $25.3 billion at December 31, 2018, a $3.2 billion increase compared to December 31, 2017. Excluding $3.3 billion of acquired deposits, interest-bearing transaction deposits increased $244 million, while demand deposit balances decreased $330 million.

Common equity Tier 1 capital ratio was 10.92% at December 31, 2018. In addition, the Tier 1 capital ratio was 10.92%, total capital ratio was 12.50% and leverage ratio was 8.96% at December 31, 2018. At December 31, 2017, the Tier 1 capital ratio was 12.05%, the total capital ratio was 13.54% and the leverage ratio was 9.31%.

- The Company repurchased 615,840 shares at an average price of $86.82 per share during 2018 and 80,000 shares at an average price of $92.54 during 2017.
- The Company paid cash dividends of $1.90 per common share during 2018 and $1.77 per common share in 2017.

Net income for the fourth quarter of 2018 totaled $108 million or $1.50 per diluted share, up from $72.5 million or $1.11 per diluted share for the fourth quarter of 2017. The fourth quarter earnings per share included a $0.15 per share reduction as a result of CoBiz closing and integration costs of $14.5 million. The highlights below exclude this amount.

Income tax expense was $20.1 million or 15.7% of net income before taxes for the fourth quarter of 2018 and $54.3 million or 42.9% of net income before taxes for the fourth quarter of 2017. The Tax Reform Act enacted in 2017 added $11.7 million of expense to the fourth quarter of 2017 largely due to the revaluation of net deferred taxes. The 2017 tax returns were finalized in the fourth quarter of 2018. This resolved several uncertainties caused by last year's Tax Cuts and Jobs Act. Resolution of these uncertainties and other routine adjustments reduced tax expense for the quarter by $8.6 million.

Highlights of the fourth quarter of 2018 included:

- Net interest revenue totaled $285.7 million for the fourth quarter of 2018, up $68.8 million over the fourth quarter of 2017. CoBiz added $43.1 million to net interest revenue in the fourth quarter of 2018. Net interest margin was 3.40% for the fourth quarter of 2018, up from 2.97% for the fourth quarter of 2017. Net interest revenue increased primarily due to four 25 basis point increases in the federal funds rate by the Federal Reserve during 2018 and growth in average loan balances.
- Fees and commissions revenue totaled $160.1 million, up $2.2 million over the fourth quarter of 2017. Increases in trust fees and commissions, service charges, and other revenue were partially offset by decreases in brokerage and trading and mortgage banking revenue. This amount does not include hedge-related net interest revenue of $695 thousand.
- The loss in the fair value of mortgage servicing rights, net of economic hedges, was $12.4 million in the fourth quarter of 2018 compared to $1.4 million in the fourth quarter of 2017. This increase is due primarily to the combination of unhedgeable factors and significant mortgage volatility in the fourth quarter of 2018.
- Operating expenses in the fourth quarter totaled $270.1 million, a $15.6 million increase compared to the prior year, including $29.7 million related to CoBiz operations. Excluding these costs, personnel expense decreased $9.6 million primarily due to changes in vesting assumptions related to share-based compensation. Non-personnel expenses decreased $4.5 million. An increase in occupancy and equipment and net losses and expenses of repossessed assets was offset by a decrease in mortgage banking costs and professional fees and services.

Critical Accounting Policies & Estimates

The Consolidated Financial Statements and accompanying notes are prepared in accordance with generally accepted accounting principles in the United States of America (“GAAP”). The Company's accounting policies are more fully described in Note 1 of the Consolidated Financial Statements. Management makes significant assumptions and estimates in the preparation of the Consolidated Financial Statements and accompanying notes in conformity with GAAP that may be highly subjective, complex and subject to variability. Actual results could differ significantly from these assumptions and estimates. The following discussion addresses the most critical areas where these assumptions and estimates could affect the financial condition, results of operations and cash flows of the Company. These critical accounting policies and estimates have been discussed with the appropriate committees of the Board of Directors.

Allowance for Loan Losses and Accrual for Off-Balance Sheet Credit Risk

The appropriateness of the allowance for loan losses and accrual for off-balance sheet credit risk is assessed quarterly by management based on an ongoing evaluation of the probable estimated losses inherent in the loan portfolio and probable estimated losses on unused commitments to provide financing. A consistent, well-documented methodology has been developed and is applied by an independent Credit Administration department to ensure consistency across the Company. The allowance for loan losses consists of specific allowances attributed to certain impaired loans that have not yet been charged down to amounts we expect to recover, general allowances for unimpaired loans that are based on estimated loss rates by loan class and nonspecific allowances for risks beyond factors specific to a particular portfolio segment or loan class. There have been no material changes in the approach or techniques utilized in developing the allowance for loan losses and accrual for off-balance sheet credit risk during 2018.

Loans are considered impaired when it is probable that we will not collect all amounts due according to the contractual terms of the loan agreements, including loans modified in a troubled debt restructuring. Internally risk graded loans are evaluated individually for impairment. Substantially all commercial and commercial real estate loans and certain residential mortgage and personal loans are risk graded through a quarterly evaluation of the borrower's ability to repay.

Specific allowances for impaired loans that have not yet been charged down to amounts we expect to recover are measured by an evaluation of estimated future cash flows discounted at the loan's initial effective interest rate or the fair value of collateral for certain collateral dependent loans. Collateral value of real property is generally based on third party appraisals that conform to Uniform Standards of Professional Appraisal Practice, less estimated selling costs. Appraised values are on an “as-is” basis and generally are not adjusted by the Company. Updated appraisals are obtained at least annually or more frequently if market conditions indicate collateral values may have declined. Collateral value of mineral rights is determined by our internal staff of engineers based on projected cash flows under current market conditions. The value of other collateral is generally determined by our special assets staff based on liquidation cash flows under current market conditions. Collateral values and available cash resources that support impaired loans are evaluated quarterly. Historical statistics may be used as a practical way to estimate impairment in limited situations, such as when a collateral dependent loan is identified as impaired near the end of a reporting period until an updated appraisal of collateral value is received or a full assessment of future cash flows is completed. Estimates of future cash flows and collateral values require significant judgments and may be volatile.

General allowances for unimpaired loans are based on estimated loss rates by loan class. The appropriate historical gross loss rate for each loan class is determined by the greater of the current loss rate based on the most recent twelve months or a ten-year average gross loss rate. Recoveries are not directly considered in the estimation of historical loss rates. Recoveries generally do not follow predictable patterns and are not received until well-after the charge-off date as a result of protracted legal proceedings. For risk graded loans, historical loss rates are adjusted for changes in risk rating. For each loan class, the weighted average current risk grade is compared to the weighted average long-term risk grade. This comparison determines whether the risk in each loan class is increasing or decreasing. Historical loss rates are adjusted upward or downward in proportion to changes in weighted average risk grading. General allowances for unimpaired loans also consider inherent risks identified for a given loan class. Inherent risks include consideration of the loss rates that most appropriately represent the current credit cycle and other factors attributable to a specific loan class which have not yet been represented in the historical gross loss rates or risk grading. Examples of these factors include changes in commodity prices or engineering imprecision, which may affect the value of reserves that secure our energy loan portfolio, construction risk that may affect commercial real estate loans, changes in regulations and public policy that may disproportionately impact health care loans and changes in loan product types.

Nonspecific allowances are maintained for risks beyond factors specific to a particular portfolio segment or loan class. These factors include trends in the economy in our primary lending areas, concentrations in loans with large balances and other relevant factors.

Fair Value Measurement

Certain assets and liabilities are recorded at fair value in the Consolidated Financial Statements. Fair value is defined by applicable accounting guidance as the price to sell an asset or transfer a liability in an orderly transaction between market participants in the principal markets for the given asset or liability at the measurement date based on market conditions at that date. An orderly transaction assumes exposure to the market for a customary period for marketing activities prior to the measurement date and not a forced liquidation or distressed sale.

A hierarchy for fair value has been established that prioritizes the inputs of valuation techniques used to measure fair value into three broad categories: unadjusted quoted prices in active markets for identical assets or liabilities (Level 1), other observable inputs that can be observed either directly or indirectly (Level 2) and unobservable inputs for assets or liabilities (Level 3). Fair value may be recorded for certain assets and liabilities every reporting period on a recurring basis or under certain circumstances on a non-recurring basis. Fair value adjustments of significant assets or liabilities that are based on unobservable inputs (Level 3) are considered Critical Accounting Policies and Estimates. Additional discussion of fair value measurement and disclosure is included in Notes 7 and 19 of the Consolidated Financial Statements.

Mortgage Servicing Rights

We have a significant investment in mortgage servicing rights. Our mortgage servicing rights are primarily retained from sales in the secondary market of residential mortgage loans we have originated or purchased from correspondent lenders. Occasionally, mortgage servicing rights may be purchased from other lenders. Both originated and purchased mortgage servicing rights are initially recognized at fair value. We carry all mortgage servicing rights at fair value. Changes in fair value are recognized in earnings as they occur.

Mortgage servicing rights are not traded in active markets. The fair value of mortgage servicing rights is determined by discounting the projected cash flows. Certain significant assumptions and estimates used in valuing mortgage servicing rights are based on current market sources including projected prepayment speeds, assumed servicing costs, earnings on escrow deposits, ancillary income and discount rates. Assumptions used to value our mortgage servicing rights are considered significant unobservable inputs and represent our best estimate of assumptions that market participants would use to value this asset. A separate third party model is used to estimate prepayment speeds based on interest rates, housing turnover rates, estimated loan curtailment, anticipated defaults and other relevant factors. The prepayment model is updated periodically for changes in market conditions and adjusted to better correlate with actual performance of our servicing portfolio. The discount rate is based on benchmark rates for mortgage loans plus a market spread expected by investors in servicing rights. Significant assumptions used to determine the fair value of our mortgage servicing rights are presented in Note 7 to the Consolidated Financial Statements. At least annually, we request estimates of fair value from outside sources to corroborate the results of the valuation model.

The assumptions used in this model are primarily based on mortgage interest rates. Evaluation of the effect of a change in one assumption without considering the effect of that change on other assumptions is not meaningful. Considering all related assumptions, we expect a 50 basis point increase in primary mortgage interest rates to increase the fair value of our servicing rights by $19 million. We expect a $27 million decrease in the fair value of our mortgage servicing rights from a 50 basis point decrease in primary mortgage interest rates.

Valuation of Impaired Loans and Real Estate and Other Repossessed Assets

The fair value of collateral for certain impaired loans and real estate and other repossessed assets is measured on a non-recurring basis. The fair value of real estate is generally based on unadjusted third-party appraisals derived principally from or corroborated by observable market data. Fair value measurements based on these appraisals are considered to be based on Level 2 inputs. Fair value measurements based on appraisals that are not based on observable inputs or that require significant adjustments by us or fair value measurements that are not based on third-party appraisals are considered to be based on Level 3 inputs. Significant unobservable inputs include listing prices for comparable assets, uncorroborated expert opinions or management's knowledge of the collateral or industry.

The fair value of mineral rights is generally determined by our internal staff of engineers based on projected cash flows from proven oil and gas reserves under existing economic and operating conditions. Proven oil and gas reserves are estimated quantities that geological and engineering data demonstrate, with reasonable certainty, to be recoverable in future years from known reservoirs using existing prices and costs. Projected cash flows incorporate assumptions related to a number of factors including production, sales prices, operating expenses, severance, ad valorem taxes, capital costs and appropriate discount rate. Fair values determined through this process are considered to be based on Level 3 inputs.

Income Taxes

Determination of income tax expense and related assets and liabilities is complex and requires estimates and judgments when applying tax laws, rules, regulations and interpretations. It also requires judgments as to future earnings and the timing of future events. Accrued income taxes represent an estimate of net amounts due to or from taxing jurisdictions based upon these estimates, interpretations and judgments.

Management evaluates the Company's current tax expense or benefit based upon estimates of taxable income, tax credits and statutory tax rates. Annually, we file tax returns with each jurisdiction where we conduct business and adjust recognized income tax expense or benefit to filed tax returns.

We recognize deferred tax assets and liabilities based upon the differences between the values of assets and liabilities as recognized in the financial statements and their related tax basis using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. A valuation allowance is provided when it is more likely than not that some portion of the entire deferred tax asset may not be realized.

We also recognize the benefit of uncertain tax positions when based upon all relevant evidence, it is more-likely-than-not that our position would prevail upon examination, including resolution of related appeals or litigation, based upon the technical merits of the position. Unrecognized tax benefits, including estimated interest and penalties, are part of our current accrued income tax liability. Estimated penalties and interest are recognized in income tax expense. Income tax expense in future periods may decrease if an uncertain tax position is favorably resolved, generally upon completion of an examination by the taxing authorities, expiration of a statute of limitations, or changes in facts and circumstances.

Results of Operations
Net Interest Revenue and Net Interest Margin

Net interest revenue is the interest earned on debt securities, loans and other interest-earning assets less interest paid for interest-bearing deposits and other borrowings. The net interest margin is calculated by dividing tax-equivalent net interest revenue by average interest-earning assets. Net interest spread is the difference between the average rate earned on interest-earning assets and the average rate paid on interest-bearing liabilities. Net interest margin is typically greater than net interest spread due to interest income earned on assets funded by non-interest bearing liabilities such as demand deposits and equity.

Tax-equivalent net interest revenue totaled $993.8 million for 2018, up from $858.9 million for 2017. Tax-equivalent net interest revenue increased $134.9 million over the prior year. The acquisition of CoBiz in the fourth quarter of 2018 added $43.1 million to net interest revenue, including $6.4 million of net purchase accounting discount accretion. Net interest revenue increased $55.5 million due to rates and $79.4 million from growth in earning assets. The benefit of an increase in short-term interest rates on floating-rate earning assets was partially offset by higher borrowing costs. Table 2 shows the effects on net interest revenue due to changes in average balances and interest rates for the various types of earning assets and interest-bearing liabilities. In addition, see the Annual and Quarterly Financial Summary of consolidated daily average balances, yields and rates following the Consolidated Financial Statements.

Net interest margin was 3.20% for 2018 and 2.92% for 2017. The tax-equivalent yield on earning assets was 3.98% for 2018, up from 3.36% in 2017, primarily due to increases in short-term interest rates resulting from four 25 basis point increases in the federal funds rate by the Federal Reserve during the year. Loan yields increased 67 basis points to 4.80%. The available for sale securities portfolio yield increased 22 basis points to 2.35%. The yield on interest-bearing cash and cash equivalents increased 70 basis points to 1.80%. Funding costs increased 52 basis points over 2017. The cost of interest-bearing deposits increased 30 basis points. The cost of other borrowed funds increased 86 basis points. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 41 basis points for 2018, up from 23 basis points for 2017.

Average earning assets for 2018 increased $1.4 billion or 5% over 2017 with $950 million due to CoBiz. Average loans, net of allowance for loan losses, increased $1.6 billion led by growth in average commercial and commercial real estate loans. Average trading securities balances increased $1.0 billion primarily related to expanded U.S. mortgage-backed securities trading activity. Average interest-bearing cash and cash equivalents decreased $768 million as we reduced our balances held at the Federal Reserve, including cash used in our purchase of CoBiz. The average balance of available for sale securities, which consists largely of residential and commercial mortgage-backed securities guaranteed by U.S. government agencies, decreased $144 million. We purchase securities to supplement earnings and to manage interest rate risk. We have reduced the size of our bond portfolio during the past four years through normal monthly runoff to better position the balance sheet for an environment of rising longer-term rates.

Total average deposits grew by $624 million over the prior year, including $859 million from the CoBiz acquisition. Excluding acquired deposits, average demand deposit balances decreased $131 million, average interest-bearing transaction account balances decreased $62 million and average time deposit balances decreased $81 million. Average borrowed funds increased $709 million over the prior year. Borrowings from the Federal Home Loan Banks increased $325 million and average funds purchased and repurchase agreement balances increased $392 million over the prior year.

Our overall objective is to manage the Company’s balance sheet to be relatively neutral to changes in interest rates as is further described in the Market Risk section of this report. As shown in Table 21, approximately 79% of our commercial and commercial real estate loan portfolios are either variable rate loans or fixed rate loans that will re-price within one year. These loans are funded primarily by deposit accounts that are either non-interest bearing, or that re-price more slowly than the loans. The result is a balance sheet that would be asset sensitive, which means that assets generally re-price more quickly than liabilities. Among the strategies that we use to manage toward a relatively rate-neutral position, we purchase fixed rate residential mortgage-backed securities issued primarily by U.S. government agencies and fund them with market rate sensitive liabilities. The liability-sensitive nature of this strategy provides an offset to the asset-sensitive characteristics of our loan portfolio. We also may use derivative instruments to manage our interest rate risk.

The effectiveness of these strategies is reflected in the overall change in net interest revenue due to changes in interest rates as shown in Table 2 and in the interest rate sensitivity projections as shown in the Market Risk section of this report.

Fourth Quarter 2018 *Net Interest Revenue*

Tax-equivalent net interest revenue totaled $288.8 million for the fourth quarter of 2018, an increase of $67.8 million over the fourth quarter of 2017. CoBiz added $43.1 million to net interest revenue, including $6.4 million of net purchase accounting discount accretion. Net interest revenue increased $18.3 million primarily due to four 25 basis point increases in the federal funds rate by the Federal Reserve during 2018 and $49.4 million primarily due to the growth in average loan balances.

Net interest margin was 3.40% for the fourth quarter of 2018 compared to 2.97% for the fourth quarter of 2017. The tax-equivalent yield on earning assets was 4.33% for the fourth quarter of 2018, up 84 basis points over the fourth quarter of 2017. Loan yields increased 80 basis points to 5.09%, including 12 basis points from net purchase accounting discount accretion. The remaining increase is due mainly to short-term market interest rates related to the Federal Reserve's four 25 basis point increases in 2018. The available for sale securities portfolio yield increased 30 basis points to 2.51%. The yield on interest-bearing cash and cash equivalents increased 96 basis points to 2.23%. Yield on trading securities increased 72 basis points to 4.10%. Funding costs were up 63 basis points over the fourth quarter of 2017. The cost of interest-bearing deposits increased 39 basis points over the fourth quarter of 2017. The cost of other borrowed funds increased 105 basis points. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 49 basis points in the fourth quarter of 2018, up from 27 basis points in the fourth quarter of 2017.

Average earning assets for the fourth quarter of 2018 increased $4.0 billion over the fourth quarter of 2017. Average loans, net of allowance for loan losses, increased $4.4 billion, including acquired loans. The legacy BOKF loan portfolio grew $1.3 billion. Commercial and commercial real estate loan balances were the primary drivers.

Average deposits increased $2.9 billion over the fourth quarter of 2017, including $3.4 billion related to Cobiz. Excluding acquired deposits, average demand deposit balances decreased $387 million, average interest-bearing transaction accounts decreased $48 million and average time deposits decreased $72 million. Average borrowed funds increased $868 million.

2017 *Net Interest Revenue*

Tax-equivalent net interest revenue for 2017 was $858.9 million, up from $764.8 million for 2016. Tax-equivalent net interest revenue increased $94.1 million over the prior year. Net interest revenue increased $61.2 million due to rates and $32.9 million from growth in earning assets. The benefit of an increase in short-term interest rates during 2017 on the loan portfolio and interest-bearing cash and cash equivalents yields was offset by higher borrowing costs.

Net interest margin was 2.92% for 2017 compared to 2.66% for 2016. The tax-equivalent yield on average earning assets increased 41 basis points over 2016. Loan yields increased 50 basis points primarily due an increase in short-term interest rates. The yield on interest-bearing cash and cash equivalents increased 57 basis points. The available for sale securities portfolio yield increased 10 basis points. The cost of interest-bearing liabilities increased 25 basis points. The cost of interest-bearing deposits increased 9 basis points due to a lack of market pricing pressure. The cost of other borrowed funds increased 55 basis points, primarily due to increases in federal funds rates by the Federal Reserve. The cost of subordinated debentures increased 275 basis points due to the full year impact of higher fixed rate debt issued in the second quarter of 2016. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 23 basis points for 2017, compared to 13 basis points for 2016.

Average earning assets increased $646 million or 2% during 2017. Average loans, net of allowance for loan losses, increased $812 million. Growth in average commercial, residential and personal loans was partially offset by a decrease in average commercial real estate loan balances. The average balance of available for sale securities, which consists largely of residential and commercial mortgage-backed securities guaranteed by U.S. government agencies, decreased $414 million. We reduced the size of our bond portfolio through normal monthly runoff to better position the balance sheet for an environment of rising longer-term rates. Growth in average assets was funded by growth in demand and interest-bearing deposits, partially offset by decreased repurchase agreements and borrowings from the Federal Home Loan Banks. Average demand deposit account balances grew by $839 million and average interest-bearing transaction deposits increased $475 million. Average borrowed funds balances decreased $275 million compared to 2016. Funds purchased and repurchase agreements decreased $176 million compared to 2016.

Table 2 –Volume/Rate Analysis
(In thousands)

	Year Ended December 31, 2018 / 2017			Year Ended December 31, 2017 / 2016		
		Change Due To[1]			Change Due To[1]	
	Change	Volume	Yield / Rate	Change	Volume	Yield / Rate
Tax-equivalent interest revenue:						
Interest-bearing cash and cash equivalents	**$205**	**$(11,155)**	**$11,360**	$11,402	$(252)	$11,654
Trading securities	**40,311**	**37,008**	**3,303**	8,424	8,122	302
Investment securities	**(2,944)**	**(2,504)**	**(440)**	(1,043)	(1,763)	720
Available for sale securities	**19,404**	**581**	**18,823**	1,443	(7,895)	9,338
Fair value option securities	**(1,550)**	**(3,541)**	**1,991**	10,032	5,886	4,146
Restricted equity securities	**3,065**	**1,880**	**1,185**	1,252	(257)	1,509
Residential mortgage loans held for sale	**(583)**	**(1,645)**	**1,062**	(3,952)	(4,389)	437
Loans	**189,518**	**68,882**	**120,636**	115,678	29,407	86,271
Total tax-equivalent interest revenue	**247,426**	**89,506**	**157,920**	143,236	28,859	114,377
Interest expense:						
Transaction deposits	**37,232**	**1,748**	**35,484**	14,721	851	13,870
Savings deposits	**80**	**35**	**45**	(27)	27	(54)
Time deposits	**4,402**	**(769)**	**5,171**	(1,385)	(728)	(657)
Funds purchased and repurchase agreements	**8,351**	**2,369**	**5,982**	422	(213)	635
Other borrowings	**60,856**	**5,023**	**55,833**	33,270	(1,001)	34,271
Subordinated debentures	**1,588**	**1,665**	**(77)**	2,160	(2,892)	5,052
Total interest expense	**112,509**	**10,071**	**102,438**	49,161	(3,956)	53,117
Tax-equivalent net interest revenue	**134,917**	**79,435**	**55,482**	94,075	32,815	61,260
Change in tax-equivalent adjustment	**(8,249)**			(398)		
Net interest revenue	**$143,166**			$94,473		

[1] Changes attributable to both volume and yield/rate are allocated to both volume and yield/rate on an equal basis.

Table 2 –Volume/Rate Analysis (continued)
(In thousands)

	Three Months Ended December 31, 2018 / 2017		
		Change Due To[1]	
	Change	Volume	Yield / Rate
Tax-equivalent interest revenue:			
Interest-bearing cash and cash equivalents	$(3,141)	$(6,234)	$3,093
Trading securities	15,007	12,843	2,164
Investment securities	(719)	(760)	41
Available for sale securities	9,462	2,391	7,071
Fair value option securities	(3,192)	(4,103)	911
Restricted equity securities	842	438	404
Residential mortgage loans held for sale	(594)	(751)	157
Loans	91,097	52,006	39,091
Total tax-equivalent interest revenue	108,762	55,830	52,932
Interest expense:			
Transaction deposits	14,429	2,310	12,119
Savings deposits	61	12	49
Time deposits	2,013	29	1,984
Funds purchased and repurchase agreements	3,795	1,486	2,309
Other borrowings	18,978	748	18,230
Subordinated debentures	1,727	1,816	(89)
Total interest expense	41,003	6,401	34,602
Tax-equivalent net interest revenue	67,759	49,429	18,330
Change in tax-equivalent adjustment	(1,064)		
Net interest revenue	$68,823		

[1] Changes attributable to both volume and yield/rate are allocated to both volume and yield/rate on an equal basis.

Other Operating Revenue

Other operating revenue was $616.8 million for 2018, a decrease of $39.5 million or 6% compared 2017. The change in the fair value of mortgage servicing rights, net of economic hedges, decreased other operating revenue by $20.4 million in 2018 and $1.9 million in 2017. This increase is primarily as a result of mortgage rate volatility.

A $15.4 million fee earned through the sale of client assets was recognized as fiduciary and asset management revenue in 2018. This fee is excluded from the fluctuation discussion below.

Table 3 – Other Operating Revenue
(In thousands)

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Brokerage and trading revenue	**$108,323**	$131,601	$138,377	$129,556	$134,437
Transaction card revenue[1]	**84,025**	81,143	78,347	73,650	71,671
Fiduciary and asset management revenue	**184,703**	162,889	135,387	126,034	115,529
Deposit service charges and fees	112,153	112,079	111,589	109,592	109,783
Mortgage banking revenue	**97,787**	104,719	133,914	126,002	109,093
Other revenue	**56,651**	49,959	50,112	50,126	47,499
Total fees and commissions revenue	**643,642**	642,390	647,726	614,960	588,012
Other gains (losses), net	**(2,731)**	11,213	4,947	5,459	2,991
Gain (loss) on derivatives, net	**(422)**	779	(15,685)	430	2,776
Gain (loss) on fair value option securities, net	**(25,572)**	(2,733)	(10,555)	(3,684)	10,189
Change in fair value of mortgage servicing rights	**4,668**	172	(2,193)	(4,853)	(16,445)
Gain (loss) on available for sale securities, net	**(2,801)**	4,428	11,675	12,058	1,539
Total other-than-temporary impairment	**—**	—	—	(2,443)	(373)
Portion of loss recognized in (reclassified from) other comprehensive income	**—**	—	—	624	—
Net impairment losses recognized in earnings	**—**	—	—	(1,819)	(373)
Total other operating revenue	**$616,784**	$656,249	$635,915	$622,551	$588,689
Non-GAAP Reconciliation:[1]					
Transaction card revenue on income statement	**84,025**	119,988	116,452	109,579	104,940
Netting adjustment	**—**	(38,845)	(38,105)	(35,929)	(33,269)
Transaction card revenue after netting adjustment	**84,025**	81,143	78,347	73,650	71,671

1 Non-GAAP measure to net interchange charges from prior years between transaction card revenue and data processing and communications expense as a result of the recent revenue recognition standard. This measure has no effect on net income or earnings per share.

Fees and commissions revenue

Diversified sources of fees and commissions revenue are a significant part of our business strategy and represented 40% of total revenue for 2018, excluding provision for credit losses and gains and losses on asset sales, securities and derivatives and the change in the fair value of mortgage servicing rights. We believe that a variety of fee revenue sources provides an offset to changes in interest rates, values in the equity markets, commodity prices and consumer spending, all of which can be volatile. As an example of this strength, many of the economic factors such as rising interest rates resulting in growth in net interest revenue or fiduciary and asset management revenue, may also decrease mortgage banking production volumes. We expect growth in other operating revenue to come through offering new products and services and by further development of our presence in other markets. However, current and future economic conditions, regulatory constraints, increased competition and saturation in our existing markets could affect the rate of future increases.

Brokerage and trading revenue, which includes revenues from trading, customer hedging, retail broker and investment banking, decreased $23.3 million or 18% compared to the prior year.

Trading revenue includes net realized and unrealized gains and losses primarily related to sales of U.S. government securities, residential mortgage-backed securities guaranteed by U.S. government agencies and municipal securities to institutional customers and related derivative instruments. Trading revenue also includes gains and losses on instruments we hold as economic hedges of changes in the fair value of trading securities. During 2018, we significantly expanded our U.S. government residential mortgage-backed securities trading activities. Average trading securities increased $1.0 billion over the previous year. Net interest revenue earned on our trading portfolio grew $37.0 million. However, trading revenue decreased $15.5 million to $28.1 million in 2018 primarily due to an $18.3 million increase in hedging costs.

Customer hedging revenue is based primarily on realized and unrealized changes in the fair value of derivative contracts held for customer risk management programs. As more fully discussed under Customer Derivative Programs in Note 3 of the Consolidated Financial Statements, we offer commodity, interest rate, foreign exchange and equity derivatives to our customers. Derivative contracts executed with customers are offset with contracts between selected counterparties and exchanges to minimize market risk from changes in commodity prices, interest rates or foreign exchange rates. Customer hedging revenue totaled $38.8 million for 2018, a decrease of $5.3 million or 12% compared to 2017. The volume of derivative contracts sold to our mortgage banking customers used to hedge their pipelines of mortgage loan originations decreased as average mortgage rates rose during 2018.

Revenue earned from retail brokerage transactions totaled $22.2 million for 2018, a decrease of $766 thousand or 3% compared to the prior year. Retail brokerage revenue is primarily based on fees and commissions earned on sales of fixed income securities, annuities, mutual funds and other financial instruments to retail customers. Revenue is primarily based on the volume of customer transactions and applicable commission rate for each type of product. We expect retail brokerage revenue to continue to decline as more relationships are transitioned to managed accounts, which are included in fiduciary and asset management revenue.

Investment banking, which includes fees earned upon completion of underwriting, financial advisory services and loan syndication fees, totaled $19.3 million for 2018, a decrease of $1.7 million or 8% compared to 2017, related to the timing and volume of completed transactions.

Transaction card revenue depends largely on the volume and amount of transactions processed, the number of TransFund automated teller machine (“ATM”) locations and the number of merchants served. Transaction card revenue totaled $84.0 million for 2018, a $2.9 million or 4% increase over 2017. Revenues from the processing of transactions on behalf of the members of our TransFund electronic funds transfer ("EFT") network totaled $76.2 million, up $2.7 million or 4% over 2017. The number of TransFund ATM locations totaled 2,426 at December 31, 2018 compared to 2,223 at December 31, 2017. Merchant services fees paid by customers for account management and electronic processing of card transactions totaled $7.8 million, relatively consistent with the prior year.

Fiduciary and asset management revenue is earned through managing or holding of assets for customers and executing transactions or providing related services. Approximately 80% of fiduciary and asset management revenue is primarily based on the fair value of assets. Rates applied to those asset values vary based on the nature of the relationship. Fiduciary and managed asset relationships generally have a higher fee rate than non-fiduciary and/or managed relationships.

Fiduciary and asset management revenue grew $6.4 million or 4% over 2017 primarily due to growth in managed fiduciary assets.

30

A distribution of assets under management or administration and related fiduciary and asset management revenue follows:

Table 4 -- Assets Under Management or Administration

	Year Ended December 31,					
	2018			2017		
	Balance	Revenue[1]	Margin[2]	Balance	Revenue[1]	Margin[2]
Managed fiduciary assets:						
Personal	**$8,115,503**	**$92,633**	**1.14 %**	$7,801,968	$85,328	1.09 %
Institutional	**13,119,497**	**22,488**	**0.17 %**	13,192,969	21,630	0.16 %
Total managed fiduciary assets	**21,235,000**	**115,121**	**0.54 %**	20,994,937	106,958	0.51 %
Non-managed assets:						
Fiduciary	**23,606,339**	**67,460**	**0.22 %** [3]	27,766,540	53,511	0.19 %
Non-fiduciary	**15,964,854**	**2,122**	**0.01 %**	16,969,222	2,420	0.01 %
Safekeeping and brokerage assets under administration	**15,473,584**	**—**	**— %**	16,097,098	—	— %
Total non-managed assets	**55,044,777**	**69,582**	**0.10 %**	60,832,860	55,931	0.09 %
Total assets under management or administration	**$76,279,777**	**$184,703**	**0.22 %** [3]	$81,827,797	$162,889	0.20 %

[1] Fiduciary and asset management revenue includes asset-based and other fees associated with the assets.

[2] Revenue divided by period-end balance.

[3] Excludes $15.4 million fee earned through client asset management.

A summary of changes in assets under management or administration for the year ended December 31, 2018 and 2017 follows:

Table 5 -- Changes in Assets Under Management or Administration

	Year Ended December 31,	
	2018	2017
Beginning balance	**$81,827,797**	$75,407,863
Net inflows (outflows)	**(6,812,199)**	(406,469)
Change in assets from acquisitions	**998,705**	—
Net change in fair value	**265,474**	6,826,403
Ending balance	**$76,279,777**	$81,827,797

The Tax Cuts and Jobs Act eliminated the ability for bond issuers to use tax-exempt bonds to advance refund their outstanding debt; thus putting downward pressure on our Corporate Trust asset balance through most of the year. This, combined with larger than expected departures in our retirement plan space, led to higher asset outflows in 2018.

Mortgage banking revenue totaled $97.8 million for 2018, a $6.9 million or 7% decrease compared to 2017. Production volume is down $666 million as primary interest rates increased 56 basis points compared to 2017. While increased market competition has negatively impacted our gain on sale margins, this was more than offset by improved hedging performance and better pricing discipline. Mortgage servicing revenue was $66.1 million, consistent with the prior year. The outstanding principal balance of mortgage loans serviced for others totaled $21.7 billion at December 31, 2018, a $388 million decrease compared to December 31, 2017.

Table 6 – Mortgage Banking Revenue
(In thousands)

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Mortgage production revenue	**$31,690**	$38,498	$69,628	$69,587	$61,061
Mortgage loans funded for sale	**$2,587,297**	$3,286,873	$6,117,417	$6,372,956	$4,484,394
Add: Current year end outstanding commitments	**160,848**	222,919	318,359	601,147	627,505
Less: Prior year end outstanding commitments	**222,919**	318,359	601,147	627,505	258,873
Total mortgage production volume	**2,525,226**	3,191,433	5,834,629	6,346,598	4,853,026
Gain on sale margin	**1.25 %**	1.21 %	1.19 %	1.10 %	1.26 %
Mortgage loan refinances to mortgage loans funded for sale	**28 %**	40 %	51 %	42 %	30 %
Primary mortgage interest rates:					
Average	**4.54 %**	3.99 %	3.65 %	3.85 %	4.17 %
Period end	**4.55 %**	3.99 %	4.32 %	3.96 %	3.83 %
Mortgage servicing revenue	**$66,097**	$66,221	$64,286	$56,415	$48,032
Average outstanding principal balance of mortgage loans serviced for others	**21,891,749**	22,055,002	20,837,897	17,920,557	14,940,915
Average mortgage servicing fee rates	**0.30 %**	0.30 %	0.31 %	0.31 %	0.32 %

Primary rates disclosed in Table 6 above represent rates generally available to borrowers on 30 year conforming mortgage loans.

Net gains on securities, derivatives and other assets

As discussed in the Market Risk section following, the fair value of our mortgage servicing rights ("MSRs") changes in response to changes in primary mortgage loan rates and other assumptions. We attempt to mitigate the earnings volatility caused by changes in the fair value of MSRs by designating certain financial instruments as an economic hedge. Changes in the fair value of these instruments are generally expected to partially offset changes in the fair value of MSRs.

The net economic cost of the changes in fair value of mortgage servicing rights and related economic hedges was $15.6 million in 2018, including a $4.7 million increase in the fair value of mortgage servicing rights, offset by a $25.0 million decrease in the fair value of securities and derivative contracts held as an economic hedge and $4.8 million of related net interest revenue. This increase is due to the combination of unhedgeable factors and significant mortgage rate volatility during the year, particularly in the fourth quarter.

The net economic cost of changes in the fair value of mortgage servicing rights and related economic hedges was $6.6 million for 2017. The fair value of mortgage servicing rights increased $172 thousand. The fair value of securities and interest rate derivative contracts held as an economic hedge decreased $2.1 million. Net interest earned on securities held as an economic hedge was $8.4 million.

Table 7 – Gain (Loss) on Mortgage Servicing Rights, Net of Economic Hedge
(In thousands)

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Gain (loss) on mortgage hedge derivative contracts, net	**$551**	$681	$(15,696)	$634	$2,776
Gain (loss) on fair value option securities, net	**(25,572)**	(2,733)	(10,555)	(3,684)	10,003
Gain (loss) on economic hedge of mortgage servicing rights	**(25,021)**	(2,052)	(26,251)	(3,050)	12,779
Gain (loss) on change in fair value of mortgage servicing rights	**4,668**	172	(2,193)	(4,853)	(16,445)
Gain (loss) on changes in fair value of mortgage servicing rights, net of economic hedges included in other operating revenue	**(20,353)**	(1,880)	(28,444)	(7,903)	(3,666)
Net interest revenue on fair value option securities[1]	**4,798**	8,435	4,356	8,001	3,253
Total economic benefit (cost) of changes in the fair value of mortgage servicing rights, net of economic hedges	**$(15,555)**	$6,555	$(24,088)	$98	$(413)

[1] Actual interest earned on fair value option securities less internal transfer-priced cost of funds.

Fourth Quarter 2018 *Other Operating Revenue*

Other operating revenue was $136.5 million for the fourth quarter of 2018, a decrease of $20.9 million compared to the fourth quarter of 2017. CoBiz added $5.8 million to other operating revenue in the fourth quarter of 2018. Excluding Cobiz, other operating revenue decreased $29.4 million. The fourth quarter of 2018 included a $12.4 million decrease in the fair value of mortgage servicing rights, net of economic hedges, while the fourth quarter of 2017 included a $1.4 million decrease. Other gains and losses, net, decreased $9.6 million primarily due to changes in the fair value of assets related to the deferred compensation plan and equity securities not held for trading purposes.

Brokerage and trading revenue was $28.1 million for the fourth quarter of 2018, a decrease of $8.4 million, excluding CoBiz. Trading revenue decreased $4.1 million largely due to increased cost of hedging a larger trading portfolio. Net interest revenue on the trading portfolio increased $12.0 million over the same period of 2017. Investment banking revenue decreased $3.4 million primarily related to the timing and volume of completed transactions.

Mortgage banking revenue was $21.9 million for the fourth quarter of 2018, a decrease of $2.5 million compared to the fourth quarter of 2017 due primarily to a decrease in mortgage loan production volume as a result of higher interest rates and increased market competition. Mortgage loan production volumes were $460 million for the fourth quarter of 2018, compared to $729 million in the fourth quarter of 2017.

2017 *Other Operating Revenue*

Other operating revenue totaled $656.2 million for 2017, up $20.3 million or 3% over 2016. The change in the fair value of mortgage servicing rights, net of economic hedges, decreased operating revenue in 2017 by $1.9 million and decreased operating revenue by $28.4 million in 2016.

Transaction card revenue grew by $2.8 million over 2016 primarily due to growth in transaction volumes. Fiduciary and asset management fees increased $27.5 million primarily due to growth in assets under management, improved pricing discipline and decreased fee waivers.

Mortgage banking revenue decreased by $29.2 million compared 2016 mainly due to a decrease in production volume. This was largely related to the Company's strategic decision to exit the correspondent lending channel during 2016.

Brokerage and trading revenue for 2017 decreased $6.8 million compared to 2016. Excluding a $5.0 million decrease in the value of trading securities due to the unexpected increase in interest rates in 2016, brokerage and trading revenue decreased $11.8 million or 9%. The revenue decrease generally resulted from customer reaction to rising interest rates along with changes in regulations.

Other gains, net totaled $11.2 million for 2017 mainly due to the sale of certain merchant banking investments during the year.

Other Operating Expense

Other operating expense for 2018 totaled $1.0 billion, a $41.5 million or 4% increase over the prior year. CoBiz added $16.6 million in closing and integration costs during 2018, primarily affecting professional fees and services and personnel expenses. Operations related to CoBiz added $29.7 million to other operating expense. Excluding those costs, operating expense decreased $4.8 million, largely consistent with 2017. The fluctuation discussion below excludes closing and integration costs.

Table 8 – Other Operating Expense
(In thousands)

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Regular compensation	**$358,280**	$333,226	$332,740	$313,403	$298,420
Incentive compensation:					
Cash-based compensation	**132,593**	127,964	128,077	114,305	111,748
Share-based compensation	**3,572**	23,602	10,464	12,358	10,875
Deferred compensation	**(419)**	4,091	1,687	361	(13,692)
Total incentive compensation	**135,746**	155,657	140,228	127,024	108,931
Employee benefits	**89,105**	84,525	80,151	74,871	69,580
Total personnel expense	**583,131**	573,408	553,119	515,298	476,931
Business promotion	**30,523**	28,877	26,582	27,851	26,649
Charitable contributions to BOKF Foundation	**2,846**	2,000	2,000	796	4,267
Professional fees and services	**59,099**	51,067	56,783	40,123	44,440
Net occupancy and equipment	**97,981**	86,477	80,024	76,016	77,232
Insurance	**23,318**	19,653	32,489	20,375	18,578
Data processing & communications[1]	**114,796**	108,125	93,736	86,454	81,956
Printing, postage and supplies	**17,169**	15,689	15,584	13,498	13,518
Net losses & operating expenses of repossessed assets	**17,052**	9,687	3,359	1,446	6,019
Amortization of intangible assets	**9,620**	6,779	6,862	4,359	3,965
Mortgage banking costs	**46,298**	52,856	61,387	38,813	31,705
Other expense	**26,333**	32,054	47,560	35,233	28,993
Total other operating expense	**$1,028,166**	$986,672	$979,485	$860,262	$814,253
Average number of employees (full-time equivalent)	**4,993**	4,900	4,872	4,797	4,679
Non-GAAP Reconciliation:[1]					
Data processing and communications expense on income statement	**114,796**	146,970	131,841	122,383	115,225
Netting adjustment	**—**	(38,845)	(38,105)	(35,929)	(33,269)
Data processing and communications expense after netting adjustment	**114,796**	**108,125**	**93,736**	**86,454**	**81,956**

[1] Non-GAAP measure to net interchange charges from prior quarters between transaction card revenue and data processing and communications expense as a result of the recent revenue recognition standard. This measure has no effect on net income or earnings per share.

Personnel expense

Personnel expense increased $4.0 million in 2018. An increase in regular compensation expense largely as a result of the addition of CoBiz employees in the fourth quarter was partially offset by a decrease in incentive compensation due to changes in vesting assumptions.

Regular compensation expense, which consists of salaries and wages, overtime pay and temporary personnel costs, increased $24.9 million or 7% over 2017, which included $13.5 million related to the addition of CoBiz employees. The remaining increase is primarily due to standard annual merit increases, which were effective for the majority of our staff on March 1. The average number of employees increased with the addition of CoBiz employees in the fourth quarter of 2018.

Incentive compensation decreased $24.6 million or 16% compared to 2017. Cash-based incentive compensation plans, which are either intended to provide current rewards to employees who generate long-term business opportunities for the Company based on growth in loans, deposits, customer relationships and other measurable metrics or intended to compensate employees with commissions on completed transactions, remained consistent compared to 2017.

Share-based compensation expense represents expense for equity awards based on the grant-date fair value. Non-vested shares generally cliff vest in 3 years and are subject to a two year holding period after vesting. The number of shares that will ultimately vest is determined by BOKF's change in earnings per share relative to a defined group of peer banks. In addition, compensation costs related to certain shares is variable based on changes in the fair value of BOK Financial common shares. Share-based compensation expense for equity awards decreased $20.0 million or 85% compared to 2017, primarily due to a decrease in the vesting probability of certain performance-based share awards.

The Company currently offers a deferred compensation plan for certain executive and senior officers. Deferred compensation expense decreased $4.5 million compared to the prior year. Deferred compensation expense is largely offset by changes in the fair value of assets held in rabbi trusts for the benefit of participants, which is included other gains (losses), net in the Consolidated Statements of Earnings.

Non-personnel operating expense

Non-personnel expense increased $20.9 million or 5% over the prior year.

Occupancy and equipment expense increased $11.4 million or 13%, including $3.2 million related to CoBiz operations. The remaining increase is largely due to our new Oklahoma City headquarters. Data processing and communications expense increased $6.3 million or 6% primarily due to technology project costs.

Insurance expense increased $3.7 million or 19%. The Company received $5.1 million in credits during 2017 related to the revision of certain inputs to the assessment calculation filed for years 2013 through 2016. This was partially offset by the elimination of a large bank deposit insurance surcharge assessed by the FDIC in the fourth quarter of 2018.

Mortgage banking expense decreased $6.6 million or 12%, primarily due to a decrease in accruals related to default servicing and loss mitigation costs on loans serviced for others.

Net losses and operating expenses of repossessed assets increased $7.4 million over the prior year mainly due to write-downs on a set of oil and gas properties and a healthcare property in 2018.

Other expense decreased $5.7 million compared to the prior year primarily due to reductions in litigation expenses and expenses related to merchant banking investments that were sold in 2017.

Fourth Quarter 2018 *Operating Expenses*

Other operating expense for the fourth quarter of 2018 totaled $284.6 million, an increase of $30.2 million compared to the fourth quarter of 2017. The fourth quarter of 2018 included $14.5 million of CoBiz closing and acquisition costs. The discussion following excludes these costs.

Personnel expense increased $9.7 million over the fourth quarter of 2017. Regular compensation expense increased $17.8 million compared to the fourth quarter of 2017. The addition of CoBiz employees added $13.5 million. The remaining increase is due primarily to annual merit increases. Incentive compensation decreased $13.4 million. Share-based compensation expense decreased $8.1 million mainly due to changes in vesting assumptions related to the Company's earnings per share growth relative to a defined peer group. Deferred compensation expense decreased $4.8 million, which is largely offset by changes in the fair value of assets held in rabbi trusts for the benefit of participants.

Non-personnel expense increased $5.9 million compared to the fourth quarter of 2017. Occupancy and equipment costs increased $5.3 million due primarily to our new Oklahoma City headquarters. Net losses and operating expenses of repossessed assets increased $2.2 million mainly due to gains in the fourth quarter of 2017. Intangible amortization increased $3.9 million primarily related to fourth quarter 2018 amortization of the CoBiz identifiable intangible assets. Professional fees and services decreased $3.0 million largely as a result of one-time technology assessments and a large project that was implemented in the fourth quarter of 2017. Mortgage banking costs decreased $2.8 million primarily due to a decrease in accruals related to default servicing and loss mitigation costs on loans serviced for others. Insurance expense decreased $2.3 million primarily due to the elimination of a large bank deposit insurance surcharge assessed by the FDIC.

2017 *Operating Expenses*

Other operating expense totaled $986.7 million for 2017, a $7.2 million or 1% increase over 2016.

Personnel expense increased $20.3 million or 4%. Incentive compensation expense increased $15.4 million or 11%, mainly due to the the increase in the vesting probability of certain performance-based share awards and increase in the fair value of BOK Financial common shares. Employee benefit expense increased $4.4 million primarily due to employee medical costs.

Non-personnel expense decreased $13.1 million or 3% compared to 2016. Insurance expense decreased $12.8 million due to a credit received in 2017 related to the revision of certain inputs to the assessment calculation along with the benefit from decreased criticized and classified asset levels. Mortgage banking expense decreased $8.5 million primarily related to actual mortgage loan prepayments. Professional fees and services expense decreased $5.7 million due to Mobank integration costs incurred in 2016. Other expense decreased $15.5 million due primarily to higher litigation and settlement expenses in 2016.

Data processing and communications expense increased $14.4 million and net occupancy and equipment expense increased $6.5 million primarily related to continued upgrades of our information technology infrastructure and cybersecurity. Net losses and operation expenses of repossessed assets increased $6.3 million mainly due to a write-down of a set of oil and gas properties.

Income Taxes

Income tax expense was $119.1 million or 21.1% of net income before taxes for 2018, $182.6 million or 35.2% of net income before taxes for 2017 and $106.4 million or 31.4% of net income before taxes for 2016. Tax Reform enacted in 2017 added $11.7 million of expense in 2017 largely due to the revaluation of net deferred tax assets. Excluding the effect of adjustments for tax reform, the 2017 income tax expense would have been 33.0% of net income before taxes.

In 2018, we completed our accounting for uncertainties that resulted from the Tax Reform Act. Resolution of these uncertainties and revaluation of deferred taxes decreased 2018 tax expense by $1.7 million. Excluding these adjustments, the 2018 effective tax rate would have been 21.4%.

Net deferred tax assets totaled $35 million at December 31, 2018 compared to net deferred tax assets of $15 million at December 31, 2017. We have evaluated the recoverability of our deferred tax assets based on the generation of future taxable income during the periods in which those temporary differences become deductible and determined that no valuation allowance was required in 2018 and 2017.

Unrecognized tax benefits totaled $19 million at December 31, 2018 compared to $18 million at December 31, 2017. BOK Financial operates in numerous jurisdictions, which requires judgment regarding the allocation of income, expense, and earnings under various laws and regulations of each of these taxing jurisdictions. Each jurisdiction may audit our tax returns and may take different positions with respect to these allocations.

Income tax expense was $20.1 million or 15.7% of net income before taxes for the fourth quarter of 2018 compared to $54.3 million or 42.9% of net income before taxes for the fourth quarter of 2017. The 2017 tax returns were finalized in the fourth quarter resolving uncertainties caused by last year's Tax Cuts and Jobs Act. Resolution of these uncertainties and other routine adjustments reduced tax expense for the quarter by $8.6 million.

Table 9 – Selected Quarterly Financial Data (Unaudited)

(In thousands, except per share data)

	2018			
	First	**Second**	**Third**	**Fourth**
Interest revenue	**$265,407**	**$294,180**	**$303,247**	**$365,592**
Interest expense	**45,671**	**55,618**	**62,364**	**79,906**
Net interest revenue	**219,736**	**238,562**	**240,883**	**285,686**
Provision for credit losses	**(5,000)**	**—**	**4,000**	**9,000**
Net interest revenue after provision for credit losses	**224,736**	**238,562**	**236,883**	**276,686**
Fees and commissions revenue	**159,913**	**157,331**	**166,265**	**160,133**
Gain (loss) on financial instruments and other assets, net	**(25,130)**	**(2,655)**	**(4,296)**	**555**
Change in fair value of mortgage servicing rights	**21,206**	**1,723**	**5,972**	**(24,233)**
Other operating revenue	**155,989**	**156,399**	**167,941**	**136,455**
Personnel expense	**139,947**	**138,947**	**143,531**	**160,706**
Other non-personnel expense	**104,483**	**107,529**	**109,086**	**123,937**
Total other operating expense	**244,430**	**246,476**	**252,617**	**284,643**
Net income before taxes	**136,295**	**148,485**	**152,207**	**128,498**
Federal and state income taxes	**30,948**	**33,330**	**34,662**	**20,121**
Net income	**105,347**	**115,155**	**117,545**	**108,377**
Net income (loss) attributable to non-controlling interests	**(215)**	**783**	**289**	**(79)**
Net income attributable to shareholders of BOK Financial Corp. shareholders	**$105,562**	**$114,372**	**$117,256**	**$108,456**
Earnings per share:				
Basic	**$1.61**	**$1.75**	**$1.79**	**$1.50**
Diluted	**$1.61**	**$1.75**	**$1.79**	**$1.50**
Average shares:				
Basic	**64,847,334**	**64,901,975**	**64,901,095**	**71,808,029**
Diluted	**64,888,033**	**64,937,226**	**64,934,351**	**71,833,334**

37

Table 9 – Selected Quarterly Financial Data (Unaudited) (continued)
(In thousands, except per share data)

	2017			
	First	**Second**	**Third**	**Fourth**
Interest revenue	$226,390	$235,181	$255,413	$255,767
Interest expense	25,208	29,977	36,961	38,904
Net interest revenue	201,182	205,204	218,452	216,863
Provision for credit losses	—	—	—	(7,000)
Net interest revenue after provision for credit losses	201,182	205,204	218,452	223,863
Fees and commissions revenue[1]	154,712	166,617	163,163	157,900
Gain (loss) on financial instruments and other assets, net	4,525	12,359	3,271	(6,470)
Change in fair value of mortgage servicing rights	1,856	(6,943)	(639)	5,898
Other operating revenue	161,093	172,033	165,795	157,328
Personnel expense	136,425	143,744	147,910	145,329
Other non-personnel expense[1]	99,083	96,922	108,109	109,150
Total other operating expense	235,508	240,666	256,019	254,479
Net income before taxes	126,767	136,571	128,228	126,712
Federal and state income taxes	38,103	47,705	42,438	54,347
Net income	$88,664	$88,866	$85,790	$72,365
Net income (loss) attributable to non-controlling interests	308	719	141	(127)
Net income attributable to shareholders of BOK Financial Corp. shareholders	$88,356	$88,147	85,649	72,492
Earnings per share:				
Basic	$1.35	$1.35	$1.31	$1.11
Diluted	$1.35	$1.35	$1.31	$1.11
Average shares:				
Basic	64,715,964	64,729,752	64,742,822	64,793,005
Diluted	64,783,737	64,793,134	64,805,172	64,843,179

1 Non-GAAP measure to net interchange charges from prior years between transaction card revenue and data processing and communications expense as a result of the recent revenue recognition standard. This measure has no effect on net income or earnings per share.

Lines of Business

We operate three principal lines of business: Commercial Banking, Consumer Banking and Wealth Management. Commercial Banking includes lending, treasury and cash management services and customer risk management products for small businesses, middle market and larger commercial customers. Commercial Banking also includes the TransFund EFT network. Consumer Banking includes retail lending and deposit services, lending and deposit services to small businesses served through our consumer branch network and all mortgage banking activities. Wealth Management provides fiduciary services, private bank services and investment advisory services in all markets. Wealth Management also underwrites state and municipal securities and engages in brokerage and trading activities.

In addition to our lines of business, we have a Funds Management unit. The primary purpose of this unit is to manage our overall liquidity needs and interest rate risk. Each line of business borrows funds from and provides funds to the Funds Management unit as needed to support their operations. Operating results for Funds Management and other include the effect of interest rate risk positions and risk management activities, securities gains and losses including impairment charges, the provision for credit losses in excess of net loans charged off, tax planning strategies and certain executive compensation costs that are not attributed to the lines of business. The Funds Management unit also initially recognizes accruals for loss contingencies when losses become probable. Actual losses are recognized by the lines of business if the accruals are settled.

We allocate resources and evaluate the performance of our lines of business using the net direct contribution which includes the allocation of funds, actual net credit losses and capital costs. In addition, we measure the performance of our business lines after allocations of certain direct expenses and taxes based on statutory rates.

The cost of funds borrowed from the Funds Management unit by the operating lines of business is transfer priced at rates that approximate market rates for funds with similar interest rate and liquidity risk characteristics. Market rates are generally based on the applicable LIBOR or interest rate swap rates, adjusted for prepayment risk. This method of transfer-pricing funds that support assets of the operating lines of business tends to insulate them from interest rate risk.

The value of funds provided by the operating lines of business to the Funds Management unit is also based on rates which approximate wholesale market rates for funds with similar duration and re-pricing characteristics. Market rates are generally based on LIBOR or interest rate swap rates. The funds credit formula applied to deposit products with indeterminate maturities is established based on their re-pricing characteristics reflected in a combination of the short-term LIBOR rate and a moving average of an intermediate term swap rate, with an appropriate spread applied to both. Shorter duration products are weighted towards the short term LIBOR rate and longer duration products are weighted towards the intermediate swap rates. The expected duration ranges from 30 days for certain rate-sensitive deposits to five years.

Economic capital is assigned to the business units by a capital allocation model that reflects management’s assessment of risk. This model assigns capital based upon credit, operating, interest rate and market risk inherent in our business lines and recognizes the diversification benefits among the units. The level of assigned economic capital is a combination of the risk taken by each business line, based on its actual exposures and calibrated to its own loss history where possible. Average invested capital includes economic capital and amounts we have invested in the lines of business.

As shown in Table 10 following, net income attributable to our lines of business increased $102.3 million or 29% over the prior year. Net interest revenue grew by $89.5 million over the prior year. Other operating revenue decreased $57.5 million and other operating expenses decreased $44.5 million. Net charge-offs were up $17.2 million over the prior year.

The operations of CoBiz, acquired on October 1, 2018, were not yet allocated to the operating segments at December 31, 2018. Accordingly, the operations, assets and liabilities of CoBiz were included in Funds Management and other for 2018.

Table 10 – Net Income by Line of Business
(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Commercial Banking	**$336,376**	$270,504	$204,140

Consumer Banking	**26,581**	16,886	(5,323)
Wealth Management	**86,544**	59,849	31,681
Subtotal	**449,501**	347,239	230,498
Funds Management and other	**(3,855)**	(12,595)	2,170
Total	**$445,646**	$334,644	$232,668

Commercial Banking

Commercial Banking contributed $336.4 million to consolidated net income in 2018, up $65.9 million or 24% over the prior year, primarily due to the positive impact of the Tax Cuts and Jobs Act. Income before taxes was unchanged from the previous year. Growth in net interest revenue from improved loan yields and growth in average balances of loans attributed to Commercial Banking was offset by increased credit costs and higher corporate expense allocations.

Table 11 – Commercial Banking
(Dollars in thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net interest revenue from external sources	**$726,856**	$618,325	$501,042
Net interest expense from internal sources	**(156,254)**	(89,106)	(62,655)
Total net interest revenue	**570,602**	529,219	438,387
Net loans charged off	**30,358**	13,877	32,961
Net interest revenue after net loans charged off	**540,244**	515,342	405,426
Fees and commissions revenue[1]	**161,949**	163,107	158,664
Other gains, net	**752**	7,192	1,393
Other operating revenue	**162,701**	170,299	160,057
Personnel expense	**121,686**	116,684	113,192
Non-personnel expense[1]	**71,125**	73,330	65,956
Other operating expense	**192,811**	190,014	179,148
Net direct contribution	**510,134**	495,627	386,335
Gain on financial instruments, net	**26**	52	10
Gain (loss) on repossessed assets, net	**(6,532)**	(2,681)	669
Corporate expense allocations	**45,818**	34,253	36,134
Income before taxes	**457,810**	458,745	350,880
Federal and state income taxes	**121,434**	188,241	146,740
Net income	**$336,376**	$270,504	$204,140
Average assets	**$18,431,411**	$17,730,654	$17,175,325
Average loans	**15,073,484**	14,373,830	13,757,245
Average deposits	**8,517,137**	8,725,920	8,477,829
Average invested capital	**1,525,077**	1,312,438	1,256,211

1 Fees and commission revenue for 2017 and 2016 has been adjusted on a comparable basis with 2018 (Non-GAAP measure) to net interchange fees paid to issuing banks on card transactions processed by our TransFund merchant processing services for the twelve months ended December 31, 2017 and December 31, 2016 as a result of the recent revenue recognition standard. The discussion following is based on this comparable basis.

Net interest revenue increased $41 million or 8% over 2017. Growth in net interest revenue was due to improved yields and a $700 million increase in average loan balances as discussed further in the Loans section of Management's Discussion and Analysis of Financial Condition. Commercial and commercial real estate loans are primarily attributed to the Commercial Banking segment.

Average deposits attributed to Commercial Banking were $8.5 billion for 2018, a decrease of $209 million or 2% compared to 2017. See additional discussion concerning changes in Commercial Banking deposits in the Liquidity and Capital section of Management's Discussion and Analysis following.

40

Fees and commissions revenue were relatively unchanged compared to 2017. Transaction card revenue generated by the TransFund EFT network increased $2.3 million or 3% largely due to a $2.7 million increase in revenues from the processing of transactions on behalf of the members of our TransFund EFT network as well as a 9% increase in TransFund ATM locations. Other revenue decreased $3.8 million or 14% as a result of a sale of a merchant banking investment in 2017.

Operating expense increased $2.8 million or 1% compared to 2017. Personnel costs increased $5.0 million or 4% primarily due to an increase in incentive compensation expense. Non-personnel expense decreased $2.2 million or 3% compared to the prior year. Decreases in miscellaneous expenses and intangible asset amortization were partially offset by an increase in net repossession expense.

Corporate expense allocations increased $11.6 million compared to the prior year primarily due to enhancements of activity based costing drivers to better reflect services being utilized by the Commercial Banking line of business.

Consumer Banking

Consumer Banking services are provided through four primary distribution channels: traditional branches, the 24-hour ExpressBank call center, Internet banking and mobile banking. Consumer Banking also conducts mortgage banking activities through offices located outside of our consumer banking markets and through HomeDirect Mortgage, an online origination channel.

Net income attributed to Consumer Banking totaled $26.6 million for 2018, compared to $16.9 million in the prior year. Increased net income was largely due to net interest revenue partially offset by changes in the fair value of our mortgage servicing rights, net of economic hedges.

Table 12 –Consumer Banking
(Dollars in thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net interest revenue from external sources	**$83,231**	$84,286	$77,283
Net interest revenue from internal sources	**73,448**	53,916	43,156
Total net interest revenue	**156,679**	138,202	120,439
Net loans charged off	**5,143**	4,786	4,925
Net interest revenue after net loans charged off	**151,536**	133,416	115,514
Fees and commissions revenue	**178,174**	185,030	216,324
Other losses, net	**(51)**	(152)	(39)
Other operating revenue	**178,123**	184,878	216,285
Personnel expense	**95,427**	99,889	101,295
Other non-personnel expense	**114,760**	121,790	146,183
Total other operating expense	**210,187**	221,679	247,478
Net direct contribution	**119,472**	96,615	84,321
Loss on financial instruments, net	**(25,021)**	(2,054)	(26,252)
Change in fair value of mortgage servicing rights	**4,668**	172	(2,193)
Gain on repossessed assets, net	**247**	223	979
Corporate expense allocations	**63,700**	67,320	65,567
Net income before taxes	**35,666**	27,636	(8,712)
Federal and state income taxes	**9,085**	10,750	(3,389)
Net income	**$26,581**	$16,886	$(5,323)
Average assets	**$8,303,262**	$8,544,117	$8,254,666
Average loans	**1,731,894**	1,734,836	1,736,260
Average deposits	**6,560,145**	6,610,134	6,607,816
Average invested capital	**285,521**	298,243	351,750

Net interest revenue from Consumer Banking activities grew by $18.5 million or 13% over 2017, primarily related to increased yields on deposit balances sold to the Funds Management unit. Average loans were largely unchanged while average deposits decreased $50 million.

Fees and commissions revenue decreased $6.9 million or 4% compared to the prior year. Mortgage banking revenue decreased$6.8 million or 6% compared the prior year due to rising mortgage rates that have slowed production. Mortgage loan production volumes decreased $666 million compared to 2017.

Operating expense decreased $11.5 million or 5% compared to 2017. Personnel expense was down $4.5 million or 4%, primarily due to incentive compensation expense and efforts to right size the business as mortgage production volume is down. Non-personnel expense decreased $7.0 million or 6%. Mortgage banking costs were down $6.6 million compared to the prior year.

Corporate expense allocations decreased $3.6 million compared to 2017.

Changes in the fair value of our mortgage servicing rights, net of economic hedges as more fully presented in Table 7, resulted in a $20.4 million decrease to pre-tax net income for 2018 compared to a $1.9 million decrease to pre-tax net income in 2017.

Wealth Management

Wealth Management contributed $86.5 million to consolidated net income in 2018, up $26.7 million or 45% over the prior year, including a $15.4 million fee on the sale of client assets in 2018. The fluctuation discussion below excludes this fee. The remaining increase was primarily due to growth in net interest revenue and favorable impact of the Tax Cut and Jobs Act.

Table 13 – Wealth Management
(Dollars in thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net interest revenue from external sources	**$81,527**	$45,024	$33,006
Net interest revenue from internal sources	**31,505**	38,344	29,043
Total net interest revenue	**113,032**	83,368	62,049
Net loans charged off (recovered)	**(288)**	(696)	(801)
Net interest revenue after net loans charged off (recovered)	**113,320**	84,064	62,850
Fees and commissions revenue	**296,465**	301,485	282,710
Other gains (losses), net	**(96)**	(51)	512
Other operating revenue	**296,369**	301,434	283,222
Personnel expense	**184,144**	183,727	190,756
Other non-personnel expense	**64,815**	62,899	60,239
Other operating expense	**248,959**	246,626	250,995
Net direct contribution	**160,730**	138,872	95,077
Loss on financial instruments, net	**7**	—	(42)
Gain (loss) on repossessed assets, net	**—**	387	—
Corporate expense allocations	**44,190**	40,562	42,378
Net income before taxes	**116,547**	98,697	52,657
Federal and state income tax	**30,003**	38,848	20,976
Net income	**$86,544**	$59,849	$31,681
Average assets	**$8,446,006**	$7,072,622	$7,373,080
Average loans	**1,423,126**	1,314,441	1,352,694
Average deposits	**5,617,325**	5,516,214	5,457,566
Average invested capital	**252,961**	236,815	351,750

Net interest revenue increased $30 million or 36% over the prior year driven by growth in trading securities and loans along with net interest margin expansion. Average trading securities increased $1.0 billion over 2017. Average loan balances were up $109 million or 8% over the prior year and average deposit balances increased $101 million or 2%.

Fees and commissions revenue decreased $20.4 million or 7% compared to the prior year. Fiduciary and asset management revenue increased $4.8 million compared to 2017. Brokerage and trading revenue decreased $29.7 million compared to the prior year due to an increase in the cost of hedging the larger trading portfolio.

Operating expenses increased $2.3 million or 1% compared to the prior year. Personnel expense was relatively consistent with 2017 and non-personnel expense was well controlled, up $1.9 million or 3% over 2017.

Corporate expense allocations increased $3.6 million or 9% over the prior year due to enhancements of activity based costing drivers to better reflect services being utilized by the Wealth Management line of business.

Financial Condition
Securities

We maintain a securities portfolio to enhance profitability, manage interest rate risk, provide liquidity and comply with regulatory requirements. Securities are classified as trading, held for investment, or available for sale.

Table 14 – Securities
(In thousands)

	December 31,					
	2018		2017		2016	
	Amortized Cost	Fair Value	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Trading:						
U.S. government agency debentures	**$63,511**	**$63,765**	$21,188	$21,196	$6,238	$6,234
U.S. government agency residential mortgage-backed securities	**1,781,618**	**1,791,584**	393,190	392,673	309,432	310,067
Municipal and other tax-exempt securities	**34,508**	**34,507**	13,476	13,559	14,377	14,427
Asset-backed securities	**41,971**	**42,656**	23,911	23,885	—	—
Other trading securities	**24,346**	**24,411**	11,359	11,363	6,843	6,900
Total trading securities	**$1,945,954**	**$1,956,923**	$463,124	$462,676	$336,890	$337,628
Investment:						
Municipal and other tax-exempt securities	**$137,296**	**$138,562**	$228,186	230,349	$320,364	$321,225
U.S. government agency residential mortgage-backed securities	**12,612**	**12,770**	15,891	16,242	20,777	21,473
Other debt securities	**205,279**	**215,966**	217,716	233,444	205,004	222,795
Total investment securities	**$355,187**	**$367,298**	$461,793	$480,035	$546,145	$565,493
Available for sale:						
U.S. Treasury securities	**$496**	**$493**	$1,000	$1,000	$1,000	$999
Municipal and other tax-exempt securities	**2,782**	**2,864**	27,182	27,080	41,050	40,993
Residential mortgage-backed securities:						
U.S. government agencies	**5,886,323**	**5,804,708**	5,355,148	5,309,152	5,475,351	5,460,386
Private issue	**40,948**	**59,736**	74,311	93,221	101,192	115,535
Total residential mortgage-backed securities	**5,927,271**	**5,864,444**	5,429,459	5,402,373	5,576,543	5,575,921
Commercial mortgage-backed securities guaranteed by U.S. government agencies	**2,986,297**	**2,953,889**	2,858,885	2,834,961	3,035,750	3,017,933
Other debt securities	**35,545**	**35,430**	25,500	25,481	4,400	4,152
Perpetual preferred stock[1]	—	—	12,562	15,767	15,561	18,474
Equity securities and mutual funds[1]	—	—	14,487	14,916	17,424	18,357
Total available for sale securities	**$8,952,391**	**$8,857,120**	$8,369,075	$8,321,578	$8,691,728	$8,676,829
Fair value option securities:						
U.S. government agency residential mortgage-backed securities	**$280,469**	**$283,235**	$756,931	$755,054	$78,823	$77,046

1 As a result of the recent measurement accounting standard effective January 1, 2018, equity securities are no longer considered part of the available for sale portfolio and have been moved to other assets.

We maintain an inventory of trading securities in support of sales to a variety of customers, including banks, corporations, insurance companies, money managers and others. As discussed in the Market Risk section of this report, trading activities involve risk of loss from adverse price movement. We mitigate this risk within board-approved limits through the use of derivative contracts, short-sales and other techniques. These limits remain unchanged from levels set before our expanded trading activities.

Investment securities consist primarily of intermediate and long-term, fixed rate Oklahoma and Texas municipal bonds and taxable Texas school construction bonds. The investment security portfolio is diversified among issuers.

Available for sale securities, which may be sold prior to maturity, are carried at fair value. Unrealized gains or losses, net of deferred taxes, are recorded as accumulated other comprehensive income in shareholders' equity. The amortized cost of available for sale securities totaled $9.0 billion at December 31, 2018, an increase of $583 million compared to December 31, 2017. Available for sale securities consist primarily of U.S. government agency residential mortgage-backed securities and U.S. government agency commercial mortgage-backed securities. Both residential and commercial mortgage-backed securities have credit risk from delinquency or default of the underlying loans. We mitigate this risk by primarily investing in securities issued by U.S. government agencies. Principal and interest payments on the underlying loans are fully guaranteed. Commercial mortgage-backed securities have prepayment penalties similar to commercial loans. At December 31, 2018, residential mortgage-backed securities represented 66% of total available for sale securities.

A primary risk of holding residential mortgage-backed securities comes from extension during periods of rising interest rates or prepayment during periods of falling interest rates. We evaluate this risk through extensive modeling of risk both before making an investment and throughout the life of the security. Our best estimate of the effective duration of the combined residential mortgage-backed securities portfolio held in investment and available for sale securities portfolios at December 31, 2018 is 3.2 years. Management estimates the combined portfolios' duration extends to 3.8 years assuming an immediate 200 basis point upward shock. The estimated duration contracts to 2.6 years assuming a 100 basis point decline in the current low rate environment.

The aggregate gross amount of unrealized losses on available for sale securities totaled $138 million at December 31, 2018, a $49 million increase compared to December 31, 2017. On a quarterly basis, we perform an evaluation on debt securities to determine if the unrealized losses are temporary as more fully described in Note 2 of the Consolidated Financial Statements. No other-than-temporary impairment charges were recognized in earnings in 2018.

Certain residential mortgage-backed securities issued by U.S. government agencies and included in Fair value option securities on the Consolidated Balance Sheets, have been segregated and designated as economic hedges of changes in the fair value of our mortgage servicing rights. We have elected to carry these securities at fair value with changes in fair value recognized in current period income. These securities are held with the intent that gains or losses will offset changes in the fair value of mortgage servicing rights and related derivative contracts.

Bank-Owned Life Insurance

We have approximately $382 million of bank-owned life insurance at December 31, 2018. This investment is expected to provide a long-term source of earnings to support existing employee benefit programs. Approximately $295 million is held in separate accounts. Our separate account holdings are invested in diversified portfolios of investment-grade fixed income securities and cash equivalents, including U.S. Treasury and Agency securities, residential mortgage-backed securities, corporate debt, asset-backed and commercial mortgage-backed securities. The portfolios are managed by unaffiliated professional managers within parameters established in the portfolio's investment guidelines. The cash surrender value of certain life insurance policies is further supported by a stable value wrap, which protects against changes in the fair value of the investments. At December 31, 2018, the fair value of investments held in separate accounts was approximately $294 million. As the underlying fair value of the investments held in a separate account at December 31, 2018 was less than the aggregate book value of the investments, approximately $813 thousand cash surrender value was supported by the stable value wrap. The stable value wrap is provided by a domestic financial institution. The remaining cash surrender value of $87 million primarily represents the cash surrender value of policies held in general accounts and other amounts due from various insurance companies.

Loans

The aggregate loan portfolio before allowance for loan losses totaled $21.7 billion at December 31, 2018, an increase of $4.5 billion over December 31, 2017. Excluding $2.9 billion of loans, net of fair value adjustments, added by the CoBiz acquisition, loans grew by $1.6 billion or 9%, primarily due to commercial and commercial real estate loans. CoBiz added $1.8 billion to our commercial loan portfolio, primarily in the services and public finance loan classes, and $838 million to our commercial real estate portfolio. Substantially all CoBiz loans are attributed to Colorado and Arizona.

Table 15 – Loans
(In thousands)

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Commercial:					
Energy	**$3,590,333**	$2,930,156	$2,497,868	$3,097,328	$2,860,428
Services	**3,252,146**	2,522,025	2,632,036	2,480,361	2,033,082
Healthcare	**2,733,537**	2,243,487	2,120,722	1,867,172	1,397,912
Wholesale/retail	**1,621,158**	1,471,256	1,576,818	1,418,024	1,435,650
Public finance	**876,336**	541,775	568,214	324,922	428,302
Manufacturing	**730,521**	496,774	514,975	556,729	532,594
Other commercial and industrial	**832,047**	528,502	480,191	507,995	407,702
Total commercial	**13,636,078**	10,733,975	10,390,824	10,252,531	9,095,670
Commercial real estate:					
Multifamily	**1,288,065**	980,017	903,272	751,085	704,298
Office	**1,072,920**	831,770	798,888	637,707	415,544
Retail	**919,082**	691,532	761,888	796,499	666,889
Industrial	**778,106**	573,014	871,749	563,169	428,817
Residential construction and land development	**148,584**	117,245	135,533	160,426	143,591
Other commercial real estate	**558,056**	286,409	337,716	350,147	369,011
Total commercial real estate	**4,764,813**	3,479,987	3,809,046	3,259,033	2,728,150
Residential mortgage:					
Permanent mortgage	**1,320,165**	1,043,435	1,006,820	945,336	969,951
Permanent mortgages guaranteed by U.S. government agencies	**190,866**	197,506	199,387	196,937	205,950
Home equity	**719,002**	732,745	743,625	734,620	773,611
Total residential mortgage	**2,230,033**	1,973,686	1,949,832	1,876,893	1,949,512
Personal	**1,025,806**	965,776	839,958	552,697	434,705
Total	**$21,656,730**	$17,153,424	$16,989,660	$15,941,154	$14,208,037

Commercial

Commercial loans represent loans for working capital, facilities acquisition or expansion, purchases of equipment and other needs of commercial customers primarily located within our geographical footprint. Commercial loans are underwritten individually and represent ongoing relationships based on a thorough knowledge of the customer, the customer’s industry and market. While commercial loans are generally secured by the customer’s assets including real property, inventory, accounts receivable, operating equipment, interests in mineral rights and other property and may also include personal guarantees of the owners and related parties, the primary source of repayment of the loans is the on-going cash flow from operations of the customer’s business. Inherent lending risks are centrally monitored on a continuous basis from underwriting throughout the life of the loan for compliance with commercial lending policies.

Commercial loans totaled $13.6 billion or 63% of the loan portfolio at December 31, 2018, growing $1.1 billion or 10% over December 31, 2017, excluding the impact of acquired loans. This growth was led by a $640 million or 22% increase in energy sector loans. Healthcare sector loans were up $174 million or 8%. Service sector loans increased $126 million or 5% and other commercial and industrial loans increased $107 million or 20%.

Table 16 presents our commercial loan portfolio distributed primarily by collateral location. Loans for which the collateral location is less relevant, such as unsecured loans and reserve-based energy loans, are distributed by the borrower's primary operating location.

Table 16 – Commercial Loans by Collateral Location
(In thousands)

	Oklahoma	Texas	New Mexico	Arkansas	Colorado	Arizona	Kansas/Missouri	Other	Total
Energy	$803,550	$1,935,449	$35,021	$2,615	$368,819	$6,517	$ 82,914	$355,448	$3,590,333
Services	637,835	695,096	167,297	14,281	656,504	405,450	282,613	393,070	3,252,146
Healthcare	221,520	362,984	123,372	80,046	331,458	217,383	202,688	1,194,086	2,733,537
Wholesale/retail	204,660	615,880	36,299	30,711	179,976	113,878	70,220	369,534	1,621,158
Public finance	98,705	185,817	42,908	—	165,320	113,427	55,207	214,952	876,336
Manufacturing	95,539	166,072	189	5,115	187,979	126,634	71,362	77,631	730,521
Other commercial and industrial	94,259	184,290	3,585	67,413	142,692	54,483	62,265	223,060	832,047
Total commercial loans	$2,156,068	$4,145,588	$408,671	$200,181	$2,032,748	$1,037,772	$ 827,269	$2,827,781	$13,636,078

The majority of our commercial portfolio is located within our geographic footprint. At December 31, 2018, the Other category is composed primarily of California totaling $524 million or 4% of the commercial portfolio, Florida totaling $302 million or 2% of the commercial portfolio, Pennsylvania totaling $153 million or 1% of the commercial portfolio, Ohio totaling $150 million or 1% of the commercial portfolio and Louisiana totaling $142 million or 1%. All other states individually represent less than one percent of the total commercial loan portfolio.

Supporting the energy industry with loans to producers and other energy-related entities has been a hallmark of the Company since its founding and represents a large portion of our commercial loan portfolio. In addition, energy production and related industries have a significant impact on the economy in our primary markets. Loans collateralized by oil and gas properties are subject to a semi-annual engineering review by our internal staff of petroleum engineers. This review is utilized as the basis for developing the expected cash flows supporting the loan amount. The projected cash flows are discounted according to risk characteristics of the underlying oil and gas properties. Loans are evaluated to demonstrate with reasonable certainty that crude oil, natural gas and natural gas liquids can be recovered from known oil and gas reservoirs under existing economic and operating conditions at current pricing levels and with existing conventional equipment and operating methods and costs. As part of our evaluation of credit quality, we analyze rigorous stress tests over a range of commodity prices and take proactive steps to mitigate risk when appropriate.

Outstanding energy loans totaled $3.6 billion or 17% of total loans at December 31, 2018. Unfunded energy loan commitments increased by $335 million during the year to $3.2 billion at December 31, 2018. Approximately $2.9 billion or 82% of energy loans were to oil and gas producers, a $454 million increase over December 31, 2017. The majority of this portfolio is first lien, senior secured, reserve-based lending, which we believe is the lowest risk form of energy lending. Approximately 57% of the committed production loans are secured by properties primarily producing oil and 43% of the committed production loans are secured by properties primarily producing natural gas. Loans to borrowers in the midstream sector of the industry totaled $420 million or 12% of energy loans, an increase of $159 million over the prior year. Loans to borrowers that provide services to the energy industry totaled $176 million or 5% of energy loans, an increase of $46 million during 2018. Loans to other energy borrowers, including those engaged in wholesale or retail energy sales totaled $62 million or 2% of energy loans, an increase of

$987 thousand compared to the prior year.

The services sector of the loan portfolio totaled $3.3 billion or 15% of total loans and consists of a large number of loans to a variety of businesses, including commercial services, Native American tribal governments, financial services, entertainment and recreation and education. Approximately $2.3 billion of the services category is made up of loans with individual balances of less than $10 million. Service sector loans are generally secured by the assets of the borrower with repayment coming from the cash flows of ongoing operations of the customer's business.

The healthcare sector of the loan portfolio totaled $2.7 billion or 13% of total loans and consists primarily of loans for the development and operation of senior housing and care facilities, including independent living, assisted living and skilled nursing. Healthcare also includes loans to hospitals and other medical service providers.

We participate in shared national credits when appropriate to obtain or maintain business relationships with local customers. Shared national credits are defined by banking regulators as credits of more than $100 million and with three or more non-affiliated banks as participants. At December 31, 2018, the outstanding principal balance of these loans totaled $4.1 billion. Approximately 86% of these loans are to borrowers with local market relationships. We serve as the agent lender in approximately 17% of our shared national credits, based on dollars committed. We hold shared credits to the same standard of analysis and perform the same level of review as internally originated credits. Our lending policies generally avoid loans in which we do not have the opportunity to maintain or achieve other business relationships with the customer. In addition to management's quarterly assessment of credit risk, banking regulators annually review a sample of shared national credits for proper risk grading.

Commercial Real Estate

Commercial real estate represents loans for the construction of buildings or other improvements to real estate and property held by borrowers for investment purposes. The majority of commercial real estate loans are secured by properties within our geographic footprint, with the larger concentrations in Texas and Colorado, which represent 26% and 16% of the total commercial real estate portfolio at December 31, 2018, respectively. We require collateral values in excess of the loan amounts, demonstrated cash flows in excess of expected debt service requirements, equity investment in the project and a portion of the project already sold, leased or permanent financing already secured. The expected cash flows from all significant new or renewed income producing property commitments are stress tested to reflect the risks in varying interest rates, vacancy rates and rental rates. As with commercial loans, inherent lending risks are centrally monitored on a continuous basis from underwriting throughout the life of the loan for compliance with applicable lending policies.

Commercial real estate loans totaled $4.8 billion or 22% of the loan portfolio at December 31, 2018. The outstanding balance of commercial real estate loans increased $447 million over 2017, excluding the impact of acquired loans. Loans secured by multifamily residential properties were up $180 million or 18%. Loans secured by industrial facilities increased $126 million or 22%. Loans secured by retail facilities and office buildings also grew over the prior year. The commercial real estate loan balance as a percentage of our total loan portfolio has ranged from 19% to 22% over the past five years. The commercial real estate segment of our loan portfolio distributed by collateral location follows in Table 17.

Table 17 – Commercial Real Estate Loans by Collateral Location
(In thousands)

	Oklahoma	Texas	New Mexico	Arkansas	Colorado	Arizona	Kansas/ Missouri	Other	Total
Multifamily	$ 138,803	$ 491,322	$ 30,288	$ 57,008	$ 134,394	$ 121,218	$ 166,680	$ 148,352	$ 1,288,065
Office	107,725	278,001	86,370	15,000	153,545	91,913	55,395	284,971	1,072,920
Retail	56,863	258,957	133,155	5,524	146,038	80,349	14,560	223,636	919,082
Industrial	81,096	168,792	21,048	97	79,733	33,830	40,027	353,483	778,106
Residential construction and land development	8,592	17,449	14,974	555	63,818	11,564	12,152	19,480	148,584
Other commercial real estate	47,992	36,574	11,722	1,484	180,151	106,195	26,282	147,656	558,056
Total commercial real estate loans	$ 441,071	$ 1,251,095	$ 297,557	$ 79,668	$ 757,679	$ 445,069	$ 315,096	$ 1,177,578	$ 4,764,813

The Other category includes California with $291 million or 6% of total commercial real estate loans, Utah with $109 million or 2% of total commercial real estate loans, Florida with $98 million or 2% of total commercial real estate loans and Nevada with $92 million or 2% of total commercial real estate loans. All other states individually represent less than 2% of the total commercial real estate loan population.

While recent changes nationally in consumer purchasing trends from brick-and-mortar stores to online has created concern with regards to retail lending, our credit quality remains very good. The portfolio is highly diversified with no material exposure to a single borrower or tenant.

Residential Mortgage and Personal

Residential mortgage loans provide funds for our customers to purchase or refinance their primary residence or to borrow against the equity in their home. Residential mortgage loans are secured by a first or second-mortgage on the customer's primary residence. Personal loans consist primarily of loans to Wealth Management clients secured by the cash surrender value of insurance policies and marketable securities. It also includes direct loans secured by and for the purchase of automobiles, recreational and marine equipment as well as unsecured loans. Residential mortgage and personal loans are made in accordance with underwriting policies we believe to be conservative and are fully documented. Credit scoring is assessed based on significant credit characteristics including credit history, residential and employment stability.

Residential mortgage loans totaled $2.2 billion, a $33 million or 2% increase over December 31, 2017, excluding the impact of purchased loans. In general, we sell the majority of our fixed rate loan originations that conform to U.S. government agency standards in the secondary market and retain the majority of our non-conforming and adjustable-rate mortgage loans. We have no concentration in sub-prime residential mortgage loans. Our mortgage loan portfolio does not include payment option adjustable rate mortgage loans or adjustable rate mortgage loans with initial rates that are below market. Collateral for 95% of our residential mortgage portfolio is located within our geographic footprint.

The majority of our permanent mortgage loan portfolio is primarily composed of various non-conforming mortgage programs to support customer relationships including jumbo mortgage loans, non-builder construction loans and special loan programs for high net worth individuals or certain professionals. Jumbo loans may be fixed or variable rate and are fully amortizing. The size of jumbo loans exceed maximums set under government sponsored entity standards, but otherwise generally conform to those standards. These loans generally require a minimum FICO score of 720 and a maximum debt-to-income ratio ("DTI") of 38%. Loan-to-value ratios ("LTV") are tiered from 60% to 100%, depending on the market. Special mortgage programs include fixed and variable rate fully amortizing loans tailored to the needs of certain healthcare professionals. Variable rate loans are fully indexed at origination and may have fixed rates for three to ten years, then adjust annually thereafter.

At December 31, 2018, $191 million of permanent residential mortgage loans are guaranteed by U.S. government agencies. We have minimal credit exposure on loans guaranteed by the agencies. This amount includes residential mortgage loans previously sold into GNMA mortgage pools that are eligible to be repurchased. We may repurchase these loans when certain defined delinquency criteria are met. Because of this repurchase right, the Company is deemed to have regained effective control over these loans and must include them in the Consolidated Balance Sheets. Permanent residential mortgage loans guaranteed by U.S. government agencies decreased $6.6 million or 3% compared to December 31, 2017.

Home equity loans totaled $719 million at December 31, 2018, a $40 million or 5% decrease compared to December 31, 2017, excluding $26 million of loans added by CoBiz. Our home equity portfolio is primarily composed of first-lien, fully amortizing home equity loans. Home equity loans generally require a minimum FICO score of 700 and a maximum DTI of 50%. The maximum loan amount available for our home equity loan products is generally $400 thousand. Revolving loans have a 10 year revolving period followed by 15 year term of amortizing repayments. Interest-only home equity loans have a 5 year revolving period followed by a 15 year term of amortizing repayments and may not be extended for any additional revolving time. All other home equity loans may be extended at management's discretion for an additional 5 year revolving term subject to an update of certain credit information.

A summary of our home equity loan portfolio at December 31, 2018 by lien position and amortizing status follows in Table 18.

Table 18 – Home Equity Loans
(In thousands)

	Revolving	Amortizing	Total
First lien	$ 87,866	$ 337,234	$ 425,100
Junior lien	175,728	118,174	293,902
Total home equity	$ 263,594	$ 455,408	$ 719,002

Personal loans totaled $1.0 billion, growing by $38 million or 4% over the prior year, excluding the impact of acquired loans. This growth is primarily due to loans to Wealth Management customers for investment in businesses that will be repaid from personal income.

The distribution of residential mortgage and personal loans at December 31, 2018 is presented in Table 19. Residential mortgage loans are distributed by collateral location. Personal loans are generally distributed by borrower location.

Table 19 – Residential Mortgage and Personal Loans by Collateral Location
(In thousands)

	Oklahoma	Texas	New Mexico	Arkansas	Colorado	Arizona	Kansas/ Missouri	Other	Total
Residential mortgage:									
Permanent mortgage	$ 173,991	$ 448,594	$ 60,396	$ 13,565	$ 353,510	$ 146,173	$ 67,010	$ 56,926	$ 1,320,165
Permanent mortgages guaranteed by U.S. government agencies	47,810	30,524	33,534	9,350	4,924	1,233	15,355	48,136	190,866
Home equity	364,838	135,486	81,985	6,430	63,692	14,478	49,308	2,785	719,002
Total residential mortgage	$ 586,639	$ 614,604	$ 175,915	$ 29,345	$ 422,126	$ 161,884	$ 131,673	$ 107,847	$ 2,230,033
Personal	$ 313,077	$ 418,214	$ 11,844	$ 12,360	$ 79,475	$ 61,840	$ 62,064	$ 66,932	$ 1,025,806

The Company secondarily evaluates loan portfolio performance based on the primary geographical market managing the loan. Loans attributed to a geographical market may not represent the location of the borrower or the collateral. All permanent mortgage loans serviced by our mortgage banking unit and held for investment by BOKF, NA are centrally managed by the Bank of Oklahoma division.

Table 20 – Loans Managed by Primary Geographical Market

(In thousands)

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Oklahoma:					
Commercial	**$3,491,117**	$3,238,720	$3,370,259	$3,782,687	$3,142,689
Commercial real estate	**700,756**	682,037	684,381	739,829	603,610
Residential mortgage	**1,440,566**	1,435,432	1,407,197	1,409,114	1,467,096
Personal	**375,543**	342,212	303,823	255,387	206,115
Total Oklahoma	**6,007,982**	5,698,401	5,765,660	6,187,017	5,419,510
Texas:					
Commercial	**5,438,133**	4,520,401	4,022,455	3,908,425	3,549,128
Commercial real estate	**1,341,783**	1,261,864	1,415,011	1,204,202	1,027,817
Residential mortgage	**266,805**	233,675	233,981	219,126	235,948
Personal	**394,743**	375,084	306,748	203,496	154,363
Total Texas	**7,441,464**	6,391,024	5,978,195	5,535,249	4,967,256
New Mexico:					
Commercial	**340,489**	343,296	399,256	375,839	383,439
Commercial real estate	**383,670**	341,282	284,603	313,422	296,358
Residential mortgage	**87,346**	98,018	108,058	120,507	127,999
Personal	**10,662**	11,721	11,483	11,557	10,899
Total New Mexico	**822,167**	794,317	803,400	821,325	818,695
Arkansas:					
Commercial	**111,338**	95,644	86,577	92,359	95,510
Commercial real estate	**141,898**	87,393	73,616	69,320	88,301
Residential mortgage	**7,537**	6,596	7,015	8,169	7,261
Personal	**11,955**	9,992	6,524	819	5,169
Total Arkansas	**272,728**	199,625	173,732	170,667	196,241
Colorado:					
Commercial	**2,275,069**	1,130,714	1,018,208	987,076	977,961
Commercial real estate	**963,575**	174,201	265,264	223,946	194,553
Residential mortgage	**251,849**	63,350	59,631	53,782	57,119
Personal	**72,916**	63,115	50,372	23,384	27,918
Total Colorado	**3,563,409**	1,431,380	1,393,475	1,288,188	1,257,551
Arizona:					
Commercial	**1,320,139**	687,792	686,253	606,733	547,524
Commercial real estate	**889,903**	660,094	747,409	507,523	355,140
Residential mortgage	**97,959**	41,771	36,265	44,047	35,872
Personal	**68,546**	57,140	52,553	31,060	12,883
Total Arizona	**2,376,547**	1,446,797	1,522,480	1,189,363	951,419

Kansas/Missouri:					
Commercial	**659,793**	717,408	807,816	499,412	399,419
Commercial real estate	**343,228**	273,116	338,762	200,791	162,371
Residential mortgage	**77,971**	94,844	97,685	22,148	18,217
Personal	**91,441**	106,512	108,455	26,994	17,358
Total Kansas/Missouri	**1,172,433**	1,191,880	1,352,718	749,345	597,365
Total BOK Financial loans	**$21,656,730**	$17,153,424	$16,989,660	$15,941,154	$14,208,037

Table 21 – Loan Maturity and Interest Rate Sensitivity at December 31, 2018
(In thousands)

	Total	Remaining Maturities of Selected Loans Within 1 Year	1-5 Years	After 5 Years
Loan maturity:				
Commercial	$13,636,078	$1,094,732	$7,760,989	$4,780,357
Commercial real estate	4,764,813	639,755	2,956,080	1,168,978
Total	$18,400,891	$1,734,487	$10,717,069	$5,949,335
Interest rate sensitivity for selected loans with:				
Predetermined interest rates	$3,929,368	$156,147	$1,186,339	$2,586,882
Floating or adjustable interest rates	14,471,523	1,578,340	9,530,730	3,362,453
Total	$18,400,891	$1,734,487	$10,717,069	$5,949,335

Loan Commitments

We enter into certain off-balance sheet arrangements in the normal course of business as shown in Table 22. Loan commitments may be unconditional obligations to provide financing or conditional obligations that depend on the borrower’s financial condition, collateral value or other factors. Standby letters of credit are unconditional commitments to guarantee the performance of our customer to a third party. Since some of these commitments are expected to expire before being drawn upon, the total commitment amounts do not necessarily represent future cash requirements. None of the outstanding standby letters of credit were issued on behalf of customers whose loans are nonperforming at December 31, 2018.

Table 22 – Off-Balance Sheet Credit Commitments
(In thousands)

	December 31, 2018	2017	2016	2015	2014
Loan commitments	**$11,944,525**	$9,958,080	$9,404,665	$8,455,037	$8,328,416
Standby letters of credit	**582,196**	647,653	585,472	507,988	447,599
Mortgage loans sold with recourse	**98,623**	125,127	139,486	155,489	179,822

We have off-balance sheet commitments related to certain residential mortgage loans originated under community development loan programs that were sold to a U.S. government agency with full recourse. These mortgage loans were underwritten to standards approved by the agencies, including full documentation and originated under programs available only for owner-occupied properties. We no longer sell residential mortgage loans with recourse other than obligations under standard representations and warranties. We are obligated to repurchase these loans for the life of these loans in the event of foreclosure for the unpaid principal and interest at the time of foreclosure. Substantially all of these loans are to borrowers in our primary markets including $61 million to borrowers in Oklahoma and $11 million to borrowers in Arkansas. At December 31, 2018, approximately 2% of these loans were nonperforming and 7% were past due 30 to 89 days. A separate accrual for credit risk of $2.9 million is available to absorb losses on these loans.

We also have an off-balance sheet obligation to repurchase residential mortgage loans sold to government sponsored entities through our mortgage banking activities due to standard representations and warranties made under contractual agreements and to service loans in accordance with investor guidelines. The Company has established accruals for losses related to these obligations that are included in Other liabilities in the Consolidated Balance Sheets and in Mortgage banking costs in the Consolidated Statements of Earnings.

In 2018, the Company repurchased 7 loans from the agencies for $1.9 million and paid indemnification for 5 loans. Losses on both repurchases and indemnifications were insignificant. For the period from 2010 through 2018, approximately 21% of repurchase requests have currently resulted in actual repurchases or indemnification by the Company.

A summary of unresolved deficiency requests from U.S. government agencies follows (in thousands, except for number of unresolved deficiency requests):

Table 23 - Summary of Unresolved Deficiency Requests
(In thousands, except number of unresolved deficiency requests)

	December 31,	
	2018	**2017**
Number of unresolved deficiency requests	**169**	191
Aggregate outstanding principal balance subject to unresolved deficiency requests	**$5,896**	$9,737
Unpaid principal balance subject to indemnification by the Company	**6,916**	4,519

The accrual for credit losses related to potential loan repurchases under representations and warranties totaled $1.6 million at December 31, 2018 and $1.4 million at December 31, 2017.

Customer Derivative Programs

We offer programs that permit our customers to hedge various risks, including fluctuations in energy, cattle and other agricultural product prices, interest rates and foreign exchange rates. Each of these programs work essentially the same way. Derivative contracts are executed between the customers and the Company. Offsetting contracts are executed between the Company and selected counterparties or exchanges to minimize market risk to us from changes in commodity prices, interest rates or foreign exchange rates. The counterparty contracts are identical to the customer contracts, except for a fixed pricing spread or a fee paid to us as compensation for administrative costs, credit risk and profit.

The customer derivative programs create credit risk for potential amounts due to the Company from our customers and from the counterparties. Customer credit risk is monitored through existing credit policies and procedures. The effects of changes in commodity prices, interest rates or foreign exchange rates are evaluated across a range of possible options to determine the maximum exposure we are willing to have individually to any customer. Customers may also be required to provide cash margin or other collateral in conjunction with our credit agreements to further limit our credit risk.

Counterparty credit risk is evaluated through existing policies and procedures. This evaluation considers the total relationship between BOK Financial and each of the counterparties. Individual limits are established by management, approved by Credit Administration and reviewed by the Asset/Liability Committee. Margin collateral is required if the exposure between the Company and any counterparty exceeds established limits. Based on declines in the counterparties’ credit ratings, these limits may be reduced and additional margin collateral may be required.

A deterioration of the credit standing of one or more of the customers or counter-parties to these contracts may result in BOK Financial recognizing a loss as the fair value of the affected contracts may no longer move in tandem with the offsetting contracts. This occurs if the credit standing of the customer or counterparty deteriorated such that either the fair value of underlying collateral no longer supports the contract or the customer or counterparty’s ability to provide margin collateral was impaired. Credit losses on customer derivatives reduce brokerage and trading revenue in the Consolidated Statements of Earnings.

Derivative contracts are carried at fair value. At December 31, 2018, the net fair values of derivative contracts, before consideration of cash margin, reported as assets under these programs totaled $427 million compared to $225 million at December 31, 2017. Derivative contracts carried as assets include foreign exchange contracts with fair values of $184 million, energy contracts with fair values of $145 million, to-be-announced residential mortgage-backed securities with fair values of $65 million and interest rate swaps primarily sold to loan customers with fair values of $29 million. Before consideration of cash margin paid to counterparties, the aggregate net fair values of derivative contracts held under these programs reported as liabilities totaled $413 million.

At December 31, 2018, total derivative assets were reduced by $115 million of cash collateral received from counterparties and total derivative liabilities were reduced by $69 million of cash collateral paid to counterparties related to instruments executed with the same counterparty under a master netting agreement.

A table showing the notional and fair value of derivative assets and liabilities on both a gross and net basis is presented in Note 3 to the Consolidated Financial Statements.

The fair value of derivative contracts reported as assets under these programs, net of cash margin held by the Company, by category of debtor at December 31, 2018 follows in Table 24.

Table 24 – Fair Value of Derivative Contracts
(In thousands)

Customers	$ 140,973
Banks and other financial institutions	128,526
Exchanges and clearing organizations	41,891
Fair value of customer hedge asset derivative contracts, net	$ 311,390

The largest exposure to a single counterparty was to an exchange organization for energy swaps which totaled $36 million at December 31, 2018.

Our customer derivative program also introduces liquidity and capital risk. We are required to provide cash margin to certain counterparties when the net negative fair value of the contracts exceeds established limits. Also, changes in commodity prices affect the amount of regulatory capital we are required to hold as support for the fair value of our derivative assets. These risks are modeled as part of the management of these programs. Based on current prices, the fair value of derivative assets would not be materially impacted by either a decrease in market prices equivalent to $20.88 per barrel of oil nor an increase in prices equivalent to $55.34 per barrel of oil as the Company generally is in a derivative asset position with counterparties fully offset by cash margin received from those counterparties. Liquidity requirements of this program are also affected by our credit rating. A decrease in credit rating to below investment grade would increase our obligation to post cash margin on existing contracts by approximately $10 million. The fair value of our to-be-announced residential mortgage-backed securities and interest rate swap derivative contracts is affected by changes in interest rates. Based on our assessment as of December 31, 2018, changes in interest rates would not materially impact regulatory capital or liquidity needed to support this portion of our customer derivative program.

Summary of Loan Loss Experience

We maintain an allowance for loan losses and an accrual for off-balance sheet credit risk. At December 31, 2018, the combined allowance for loan losses and accrual for off-balance sheet credit risk totaled $209 million or 0.97% of outstanding loans and 134.03% of nonaccruing loans, excluding loans guaranteed by U.S. government agencies. Excluding acquired loans measured at acquisition date fair value, the combined allowance for loan losses was 1.12% of outstanding loans and 145.66% of nonaccruing loans. The allowance for loan losses was $207 million and the accrual for off-balance sheet credit risk was $1.8 million. At December 31, 2017, the combined allowance for credit losses was $234 million or 1.37% of outstanding loans and 131% of nonaccruing loans, excluding loans guaranteed by U.S. government agencies. The allowance for loan losses was $231 million and the accrual for off-balance sheet credit risk was $3.7 million.

The provision for credit losses is the amount necessary to maintain the allowance for loan losses and an accrual for off-balance sheet credit risk at an amount determined by management to be appropriate based on its evaluation. The provision includes the combined charge or credit to expense for both the allowance for loan losses and the accrual for off-balance sheet credit risk. All losses incurred from lending activities will ultimately be reflected in charge-offs against the allowance for loan losses following funds advanced against outstanding commitments. Based on an evaluation of all credit factors, including sustained improvement in nonaccruing and potential problem loans during the year, net charge-offs and growth in the loan portfolio during the year, the Company determined that an $8.0 million provision for credit losses was appropriate for 2018. The Company recorded a $7.0 million negative provision for loan losses for 2017.

54

Table 25 – Summary of Loan Loss Experience
(In thousands)

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Allowance for loan losses:					
Beginning balance	**$230,682**	$246,159	$225,524	$189,056	$185,396
Loans charged off:					
Commercial	**(37,880)**	(19,810)	(35,828)	(6,734)	(3,569)
Commercial real estate	**—**	(76)	—	(944)	(2,047)
Residential mortgage	**(378)**	(649)	(1,312)	(2,205)	(4,448)
Personal	**(5,325)**	(5,064)	(5,448)	(5,288)	(6,168)
Total	**(43,583)**	(25,599)	(42,588)	(15,171)	(16,232)
Recoveries of loans previously charged off:					
Commercial	**3,316**	4,461	1,727	2,729	5,703
Commercial real estate	**3,552**	1,940	1,283	11,079	7,003
Residential mortgage	**1,047**	760	1,999	1,260	2,000
Personal	**2,499**	2,451	2,747	3,052	4,328
Total	**10,414**	9,612	7,756	18,120	19,034
Net loans recovered (charged off)	**(33,169)**	(15,987)	(34,832)	2,949	2,802
Provision for loan losses	**9,944**	510	55,467	33,519	858
Ending balance	**$207,457**	$230,682	$246,159	$225,524	$189,056
Accrual for off-balance sheet credit risk:					
Beginning balance	**$3,734**	$11,244	$1,711	$1,230	$2,088
Provision for off-balance sheet credit risk	**(1,944)**	(7,510)	9,533	481	(858)
Ending balance	**$1,790**	$3,734	$11,244	$1,711	$1,230
Total combined provision for credit losses	**$8,000**	$(7,000)	$65,000	$34,000	$—
Allowance for loan losses to loans outstanding at period end	**0.96%**	1.34%	1.45%	1.41%	1.33%
Net charge-offs (recoveries) to average loans	**0.18%**	0.09%	0.21%	(0.02)%	(0.02)%
Total provision for credit losses to average loans	**0.04%**	(0.04)%	0.40%	0.23%	—%
Recoveries to gross charge-offs	**23.89%**	37.55%	18.21%	119.44%	117.26%
Allowance for loan losses as a multiple of net charge-offs	**6.25x**	14.43x	7.07x	(76.47)x	(67.47)x
Accrual for off-balance sheet credit risk to off-balance sheet credit commitments	**0.01%**	0.04%	0.11%	0.02%	0.01%
Combined allowance for credit losses to loans outstanding at period-end	**0.97%**	1.37%	1.52%	1.43%	1.34%

Allowance for Loan Losses

The appropriateness of the allowance for loan losses is assessed by management based on an ongoing quarterly evaluation of the probable estimated losses inherent in the portfolio. The allowance consists of specific allowances attributed to certain impaired loans, general allowances based on estimated loss rates by loan class and non-specific allowances based on general economic conditions, concentration in loans with large balances and other relevant factors.

Loans are considered to be impaired when it is probable that we will not collect all amounts due according to the original contractual terms of the loan agreements. This includes all nonaccruing loans, all loans modified in trouble debt restructurings and all government guaranteed loans repurchased from GNMA pools. A specific allowance is required when the outstanding principal balance of the loan is not supported by either the discounted cash flows expected to be received from the borrower or the fair value of collateral for collateral dependent loans. At December 31, 2018, impaired loans totaled $347 million, including $35 million with specific allowances of $8.7 million and $312 million with no specific allowances because the loan balances represent the amounts we expect to recover. At December 31, 2017, impaired loans totaled $376 million, including $51 million of impaired loans with specific allowances of $8.8 million and $325 million with no specific allowances.

General allowances for unimpaired loans are based on an estimated loss rate by loan class. Estimated loss rates for risk-graded loans are either increased or decreased based on changes in risk grading for each loan class. Estimated loss rates for both risk-graded and non-risk graded loans may be further adjusted for inherent risks identified for the given loan class which have not yet been captured in the loss rate.

The aggregate amount of general allowances for all unimpaired loans totaled $181 million at December 31, 2018, compared to $200 million at December 31, 2017. The decrease was primarily due to improved risk grading and inherent risk factors related to energy loans.

Nonspecific allowances are maintained for risks beyond factors specific to a particular portfolio segment or loan class. These factors include trends in the economy in our primary lending areas, concentrations in loans with large balances and other relevant factors. Nonspecific allowances totaled $18 million at December 31, 2018, down from $22 million at December 31, 2017.

An allocation of the allowance for loan losses by loan category follows in Table 26.

Table 26 – Allowance for Loan Losses Allocation
(Dollars in thousands)

	December 31,									
	2018		**2017**		**2016**		**2015**		**2014**	
	Allowance	**% of Loans[1]**	**Allowance**	**% of Loans[1]**	**Allowance**	**% of Loans[1]**	**Allowance**	**% of Loans[1]**	**Allowance**	**% of Loans[1]**
Loan category:										
Commercial	**$102,226**	**62.96 %**	$124,269	62.58 %	$140,213	61.16 %	$130,334	64.32 %	$90,875	64.02 %
Commercial real estate	**60,026**	**22.00 %**	56,621	20.29 %	50,749	22.42 %	41,391	20.44 %	42,445	19.20 %
Residential mortgage	**17,964**	**10.30 %**	18,451	11.50 %	18,224	11.48 %	19,509	11.77 %	23,458	13.72 %
Personal	**9,473**	**4.74 %**	9,124	5.63 %	8,773	4.94 %	4,164	3.47 %	4,233	3.06 %
Nonspecific allowance	**17,768**		22,217		28,200		30,126		28,045	
Total	**$207,457**	**100.00 %**	$230,682	100.00 %	$246,159	100.00 %	$225,524	100.00 %	$189,056	100.00 %

[1] Represents ratio of loan category balance to total loans.

Our loan monitoring process also identified certain accruing substandard loans, based on regulatory guidelines, that possess more than the normal amount of risk due to deterioration in the financial condition of the borrower or the value of the collateral. Because the borrowers are still performing in accordance with the original terms of the loan agreements, and no loss of principal or interest is anticipated, these loans were not included in nonperforming assets. Known information does, however, cause management concern as to the borrowers’ continued ability to comply with current repayment terms. These potential problem loans totaled $215 million at December 31, 2018 composed primarily of $87 million or 2% of energy loans, $38 million or 1% of healthcare loans, $33 million or 1% of services loans and $22 million or 3% of manufacturing loans. Potential problem loans totaled $241 million at December 31, 2017.

Based on regulatory guidelines, other loans especially mentioned are in compliance with the original terms of the agreement, but may have a weakness that deserves management's close attention. Other loans especially mentioned totaled $182 million at December 31, 2018 and were composed primarily of $50 million or 2% of service sector loans, $42 million or 1% of energy loans, $31 million or 4% of manufacturing sector loans, $19 million or 1% of wholesale/retail sector loans and $15 million or 1% of healthcare sector loans. Other loans especially mentioned totaled $118 million at December 31, 2017.

Net Loans Charged Off

Loans are charged off against the allowance for loan losses when the loan balance or a portion of the loan balance is no longer covered by the paying capacity of the borrower based on an evaluation of available cash resources and collateral value. Internally risk graded loans are evaluated quarterly and charge-offs are taken in the quarter in which the loss is identified. Non-risk graded loans are generally charged off when payments are between 60 days and 180 days past due, depending on loan class. In addition, non-risk graded loans are generally charged-down to collateral value within 60 days of being notified of a borrower's bankruptcy filing, regardless of payment status.

BOK Financial had net loans charged off of $33 million or 0.18% of average loans for 2018, compared to net loans charged off of $16 million or 0.09% of average loans in 2017.

Net commercial loans charged off totaled $35 million, primarily from $16 million of net charge-offs from energy loans, $12 million from wholesale sector loans and $6.6 million of net charge-offs from healthcare loans. Net commercial real estate loan recoveries totaled $3.6 million. Net recoveries of residential mortgage loans totaled $669 thousand for the year and net charge-offs of personal loans were $2.8 million.

Table 27 - Nonperforming Assets
(Dollars in Thousands)

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Nonaccruing loans:					
Commercial	**$99,841**	$137,303	$178,953	$76,424	$13,527
Commercial real estate	**21,621**	2,855	5,521	9,001	18,557
Residential mortgage	**41,555**	47,447	46,220	61,240	48,121
Personal	**230**	269	290	463	566
Total nonaccruing loans	**163,247**	187,874	230,984	147,128	80,771
Accruing renegotiated loans guaranteed by U.S. government agencies	**86,428**	73,994	81,370	74,049	73,985
Real estate and other repossessed assets:					
Guaranteed by U.S. government agencies[1]	**—**	—	—	—	49,898
Other	**17,487**	28,437	44,287	30,731	51,963
Real estate and other repossessed assets	**17,487**	28,437	44,287	30,731	101,861
Total nonperforming assets	**$267,162**	$290,305	$356,641	$251,908	$256,617
Total nonperforming assets excluding those guaranteed by U.S. government agencies	**$173,602**	$207,132	$263,425	$155,959	$129,022
Nonaccruing loans by loan class:					
Commercial:					
Energy	**$47,494**	$92,284	$132,499	$61,189	$1,416
Healthcare	**16,538**	14,765	825	1,072	1,380
Manufacturing	**8,919**	5,962	4,931	331	450
Services	**8,567**	2,620	8,173	10,290	5,201
Wholesale/retail	**1,316**	2,574	11,407	2,919	4,149
Public finance	**—**	—	—	—	—
Other commercial and industrial	**17,007**	19,098	21,118	623	931
Total commercial	**99,841**	137,303	178,953	76,424	13,527
Commercial real estate:					
Retail	**20,279**	276	326	1,319	3,926
Residential construction and land development	**350**	1,832	3,433	4,409	5,299
Multifamily	**301**	—	38	274	—
Office	**—**	275	426	651	3,420
Industrial	**—**	—	76	76	—
Other commercial real estate	**691**	472	1,222	2,272	5,912
Total commercial real estate	**21,621**	2,855	5,521	9,001	18,557
Residential mortgage:					
Permanent mortgage	**23,951**	25,193	22,855	28,984	34,845
Permanent mortgages guaranteed by U.S. government agencies	**7,132**	9,179	11,846	21,900	3,712
Home equity	**10,472**	13,075	11,519	10,356	9,564
Total residential mortgage	**41,555**	47,447	46,220	61,240	48,121
Personal	**230**	269	290	463	566
Total nonaccruing loans	**$163,247**	$187,874	$230,984	$147,128	$80,771

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Allowance for loan losses to nonaccruing loans[2]	**132.89 %**	129.09 %	112.73 %	180.09 %	245.34 %
Accruing loans 90 days or more past due[2]	**$ 1,338**	$ 633	$ 5	$ 1,207	$ 125
Foregone interest on nonaccruing loans[3]	**15,502**	16,496	15,990	7,432	8,170

1 Approximately $50 million was reclassified from Real estate and other repossessed assets to Receivables on the balance sheet on January 1, 2015 with the adoption of Financial Accounting Standards Board Update No. 2014-14, *Classification of Certain Government-Guaranteed Mortgage Loans Upon Foreclosure* ("ASU 2014-14"). With the implementation of ASU 2014-14, upon foreclosure of loans for which the loan balance is expected to be recovered from the guarantee by a U.S. government agency, the loan balance is directly reclassified to other receivables without including such foreclosed assets in real estate and other repossessed assets.

2 Excludes residential mortgages guaranteed by agencies of the U.S. government.

3 Interest collected and recognized on nonaccruing loans was not significant in 2018 and previous years.

Nonperforming assets totaled $267 million or 1.23% of outstanding loans and repossessed assets at December 31, 2018, a $23 million decrease compared to the prior year. Nonaccruing loans totaled $163 million, accruing renegotiated residential mortgage loans totaled $86 million and real estate and other repossessed assets totaled $17 million. All accruing renegotiated residential mortgage loans and $7.1 million of nonaccruing loans are guaranteed by U.S. government agencies. Excluding assets guaranteed by U.S. government agencies, nonperforming assets decreased $34 million to $174 million or 0.81% of outstanding non-guaranteed loans and repossessed assets. The acquisition of CoBiz Financial in 2018 added $18 million to nonperforming assets, net of fair value adjustments. The remaining decrease was primarily due to nonaccruing energy loans and real estate and other repossessed assets, partially offset by an increase in nonaccruing commercial real estate loans secured by retail facilities. The Company generally retains nonperforming assets to maximize potential recovery, which may cause future nonperforming assets to decrease more slowly.

Loans are generally classified as nonaccruing when it becomes probable that we will not collect the full contractual principal and interest. As more fully discussed in Note 4 to the Consolidated Financial Statements, we may modify loans in a troubled debt restructuring. Modifications may include extension of payment terms and rate concessions. We generally do not forgive principal or accrued but unpaid interest. All loans modified in troubled debt restructurings, except residential mortgage loans guaranteed by U.S. government agencies, are classified as nonaccruing. We may renew matured nonaccruing loans. All nonaccruing loans, including those renewed or modified in troubled debt restructurings, are charged off when the loan balance is no longer covered by the paying capacity of the borrower based on a quarterly evaluation of available cash resources and collateral value. Nonaccruing loans generally remain on nonaccruing status until full collection of principal and interest in accordance with the original terms, including principal previously charged off, is probable. We generally do not voluntarily modify personal loans to troubled borrowers. Personal loans modified at the direction of bankruptcy court orders are identified as troubled debt restructurings and classified as nonaccruing.

As of December 31, 2018, renegotiated loans consist solely of accruing residential mortgage loans guaranteed by U.S. government agencies that have been modified in troubled debt restructurings. Generally, we modify residential mortgage loans primarily by reducing interest rates and extending the number of payments in accordance with U.S. government agency guidelines. No unpaid principal or interest is forgiven. Interest continues to accrue based on the modified terms of the loan. Modified loans guaranteed by U.S. government agencies under residential mortgage loan programs may be sold once they become eligible according to U.S. government agency guidelines.

A rollforward of nonperforming assets for the year ended December 31, 2018 follows in Table 28.

Table 28 – Rollforward of Nonperforming Assets
(In thousands)

	Year Ended December 31, 2018			
	Nonaccruing Loans	**Renegotiated Loans**	**Real Estate and Other Repossessed Assets**	**Total Nonperforming Assets**
Balance, December 31, 2017	$ 187,874	$ 73,994	$ 28,437	$ 290,305
Additions	116,372	55,521	—	171,893
Payments	(94,755)	(3,055)	—	(97,810)
Charge-offs	(43,583)	—	—	(43,583)
Net losses and write-downs	—	—	(6,009)	(6,009)
Foreclosure of nonaccruing loans	(9,880)	—	9,880	—
Foreclosure of loans guaranteed by U.S. government agencies	(5,403)	(8,684)	—	(14,087)
Proceeds from sales	—	(31,075)	(20,676)	(51,751)
Acquisitions	12,687	—	5,155	17,842
Net transfers to nonaccruing loans	1,793	(1,793)	—	—
Return to accrual status	(1,858)	—	—	(1,858)
Other, net	—	1,520	700	2,220
Balance, December 31, 2018	$ 163,247	$ 86,428	$ 17,487	$ 267,162

We foreclose on loans guaranteed by U.S. government agencies in accordance with agency guidelines. Generally these loans are not eligible for modification programs or have failed to comply with modified loan terms. Principal is guaranteed by agencies of the U.S. government, subject to limitations and credit risk is minimal. At foreclosure, these amounts are transferred to claims receivable accounts. These properties will be conveyed to the agencies and receivables collected once applicable criteria have been met.

Nonaccruing loans totaled $163 million or 0.75% of outstanding loans at December 31, 2018, compared to $188 million or 1.10% of outstanding loans at December 31, 2017. Nonaccruing loans decreased $25 million compared to December 31, 2017. Newly identified nonaccruing loans totaled $116 million and the acquisition of CoBiz Financial added $13 million of nonaccruing loans in 2018. This was offset by $95 million of payments, $44 million of charge-offs and $10 million of foreclosures during the year.

Commercial

Nonaccruing commercial loans totaled $100 million or 0.73% of total commercial loans at December 31, 2018, down from $137 million or 1.28% of total commercial loans at December 31, 2017. Newly identified nonaccruing commercial loans totaled $76 million and acquired nonaccruing commercial loans totaled $13 million, offset by $81 million in payments, $38 million of charge-offs and $5.3 million of repossessions.

Nonaccruing commercial loans at December 31, 2018 were primarily composed of $47 million or 1.32% of total energy loans, $17 million or 2.04% of other commercial and industrial loans and $17 million or 0.61% of healthcare sector loans.

Commercial Real Estate

Nonaccruing commercial real estate loans were $22 million or 0.45% of outstanding commercial real estate loans at December 31, 2018, compared to $2.9 million or 0.08% of outstanding commercial real estate loans at December 31, 2017. The $19 million increase was primarily due to $22 million of newly identified commercial real estate loans during the year, partially offset by $3.6 million of cash payments received.

Nonaccruing commercial real estate loans were primarily composed of $20 million or 2.21% of commercial real estate loans secured by retail facilities.

Residential Mortgage and Personal

Nonaccruing residential mortgage loans totaled $42 million or 1.86% of outstanding residential mortgage loans at December 31, 2018, compared to $47 million or 2.40% of outstanding residential mortgage loans at December 31, 2017. Newly identified nonaccruing residential mortgage loans of $13 million were offset by $10 million of cash payments, $4.5 million of foreclosures and $378 thousand of loans charged off during the year. Nonaccruing residential mortgage loans primarily consisted of $24 million or 1.81% of non-guaranteed permanent residential mortgage loans and $10 million or 1.46% of total home equity loans.

Payments on accruing residential mortgage loans and personal loans may be delinquent. The composition of residential mortgage loans and personal loans past due but still accruing is included in the following Table 29. Substantially all non-guaranteed residential loans past due 90 days or more are nonaccruing. At December 31, 2018, residential mortgage loans 30 to 59 days past due was $4.3 million, down $1.3 million compared to the prior year. Residential mortgage loans 60 to 89 days past due increased $59 thousand from December 31, 2017. Personal loans 30 to 59 days past due decreased $202 thousand and personal loans 60 to 89 days past due increased $605 thousand compared to December 31, 2017. Personal loans 90 days or more past due decreased $258 thousand.

Table 29 –Residential Mortgage and Personal Loans Past Due
(In thousands)

	December 31, 2018			**December 31, 2017**		
	90 Days or More	**60 to 89 Days**	**30 to 59 Days**	**90 Days or More**	**60 to 89 Days**	**30 to 59 Days**
Residential mortgage:						
Permanent mortgage[1]	**$—**	**$ 366**	**$ 3,196**	$—	$ 219	$ 3,435
Home equity	**59**	**352**	**1,102**	17	440	2,206
Total residential mortgage	**$ 59**	**$ 718**	**$ 4,298**	$ 17	$ 659	$ 5,641
Personal	**$ 3**	**$ 796**	**$ 479**	$ 261	$ 191	$ 681

1 Excludes past due residential mortgage loans guaranteed by agencies of the U.S. government.

Real Estate and Other Repossessed Assets

Real estate and other repossessed assets are assets acquired in partial or total forgiveness of loans. The assets are carried at the lower of cost as determined by fair value at date of foreclosure or current fair value, less estimated selling costs.

Real estate and other repossessed assets totaled $17 million at December 31, 2018, composed primarily $6.1 million of oil and gas properties, $4.4 million of 1-4 family residential properties, $3.5 million of developed commercial real estate and $3.4 million of undeveloped land primarily zoned for commercial development. The residential properties and undeveloped land are widely disbursed across our geographical footprint. Real estate and other repossessed assets decreased $11 million compared to December 31, 2017.

Liquidity and Capital

Based on the average balances for 2018, approximately 65% of our funding was provided by deposit accounts, 20% from borrowed funds, less than 1% from long-term subordinated debt and 11% from equity. Our funding sources, which primarily include deposits and borrowings from the Federal Home Loan Banks, provide adequate liquidity to meet our operating needs.

Subsidiary Banks

Deposits and borrowed funds are the primary sources of liquidity for the subsidiary banks. Deposit accounts represent our largest funding source. We compete for retail and commercial deposits by offering a broad range of products and services and focusing on customer convenience. Retail deposit growth is supported through personal and small business checking, online bill paying services, mobile banking services, an extensive network of branch locations and ATMs and our ExpressBank call center. Commercial deposit growth is supported by offering treasury management and lockbox services. We also acquire brokered deposits when the cost of funds is advantageous to other funding sources.

Table 30 - Average Deposits by Line of Business
(In thousands)

	Year Ended December 31,	
	2018	**2017**
Commercial Banking	**$8,517,137**	$8,725,920
Consumer Banking	**6,560,145**	6,610,134
Wealth Management	**5,617,325**	5,516,214
Subtotal	**20,694,607**	20,852,268
Funds Management and other	**2,114,604**	1,332,513
Total	**$22,809,211**	$22,184,781

Average deposits for 2018 totaled $22.8 billion and represented approximately 65% of total liabilities and capital compared with $22.2 billion and 67% of total liabilities and capital for 2017. Average deposits increased $624 million over the prior year, including $859 million related to the fourth quarter impact of the CoBiz acquisition. CoBiz deposits are currently located in Funds Management and other. These will be allocated to the reporting segments in 2019. Demand deposits grew by $277 million, including $408 million of acquired deposits. Interest-bearing transaction deposit account balances increased by $362 million, including $423 million of acquired deposits. This growth was partially offset by a $60 million decrease in time deposits.

Average deposits attributed to Commercial Banking were $8.5 billion for 2018, a $209 million or 2% decrease compared to 2017. Demand deposit balances decreased $110 million or 2% and interest-bearing transaction account balances decreased $98 million or 4%. Despite the series of federal funds rate increases from the Federal Reserve, as well as a modest increase in our earnings credit, Commercial Banking continues to retain large cash reserves primarily due to a combination of factors including uncertainty about the economic environment and potential for growth, lack of preferable liquid alternatives and a desire to minimize deposit charges through the earnings credit. The earnings credit is a non-cash method that enables commercial customers to offset deposit service charges based on account balances. Commercial deposit balances may continue to decrease as the economic outlook continues to improve and if short-term rates continue to move higher, enhancing their investment alternatives. As short-term rates move higher, related increases to the earnings credit rate may be appropriate, which will reduce the amount of deposits required to offset service charges.

Average Consumer Banking deposit balances were largely unchanged compared to the prior year. Average demand deposit balances grew by $113 million or 6% while average interest-bearing transaction accounts decreased $163 million or 3%. Higher costing time deposit balances decreased $106 million or 10%.

Average Wealth Management deposit balances grew by $101 million or 2% over the prior year. Interest-bearing transaction balances increased $170 million or 5%. Non-interest-bearing demand deposits decreased $107 million or 8%, and time deposit balances were up $37 million or 5%.

Table 31 - Maturity of Domestic CDs and Public Funds in Amounts of $100,000 or More
(In thousands)

	December 31,	
	2018	**2017**
Months to maturity:		
3 or less	**$380,315**	$368,584
Over 3 through 6	**298,692**	278,607
Over 6 through 12	**299,346**	253,277
Over 12	**618,413**	661,074
Total	**$1,596,766**	$1,561,542

Brokered deposits included in time deposits averaged $251 million for 2018, compared to $588 million for 2017. Brokered deposits included in time deposits totaled $247 million at December 31, 2018 and $573 million at December 31, 2017.

Average interest-bearing transaction accounts for 2018 included $821 million of brokered deposits compared to $1.4 billion for 2017. Brokered deposits included in interest-bearing transaction accounts totaled $832 million at December 31, 2018 and $1.5 billion at December 31, 2017.

The decrease in average brokered deposits balances was largely driven by a change in the regulatory definition of brokered deposits in the second quarter of 2018.

The distribution of our period end deposit account balances among principal markets follows in Table 32.

Table 32 - Period End Deposits by Principal Market Area
(In thousands)

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Oklahoma:					
Demand	**$3,610,593**	$3,885,008	$3,993,170	$4,133,520	$3,828,819
Interest-bearing:					
Transaction	**6,445,831**	5,901,293	6,345,536	5,971,819	6,117,886
Savings	**288,210**	265,870	241,696	226,733	206,357
Time	**1,118,643**	1,092,133	1,118,355	1,202,274	1,301,194
Total interest-bearing	**7,852,684**	7,259,296	7,705,587	7,400,826	7,625,437
Total Oklahoma	**11,463,277**	11,144,304	11,698,757	11,534,346	11,454,256
Texas:					
Demand	**3,289,659**	3,239,098	3,137,009	2,627,764	2,639,732
Interest-bearing:					
Transaction	**2,294,740**	2,397,071	2,388,812	2,132,099	2,065,723
Savings	**99,624**	93,620	83,101	77,902	72,037
Time	**423,880**	502,879	535,642	549,740	547,316
Total interest-bearing	**2,818,244**	2,993,570	3,007,555	2,759,741	2,685,076
Total Texas	**6,107,903**	6,232,668	6,144,564	5,387,505	5,324,808
New Mexico:					
Demand	**691,692**	663,353	627,979	487,286	487,819
Interest-bearing:					
Transaction	**571,347**	552,393	590,571	563,723	519,544
Savings	**58,194**	55,647	49,963	43,672	37,471
Time	**224,515**	216,743	238,408	267,821	295,798
Total interest-bearing	**854,056**	824,783	878,942	875,216	852,813
Total New Mexico	**1,545,748**	1,488,136	1,506,921	1,362,502	1,340,632
Arkansas:					
Demand	**36,800**	30,384	26,389	27,252	35,996
Interest-bearing:					
Transaction	**91,593**	85,095	105,232	202,857	158,115
Savings	**1,632**	1,881	2,192	1,747	1,936
Time	**8,726**	14,045	16,696	24,983	28,520
Total interest-bearing	**101,951**	101,021	124,120	229,587	188,571
Total Arkansas	**138,751**	131,405	150,509	256,839	224,567

	December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
Colorado:					
Demand	**1,658,473**	633,714	576,000	497,318	445,755
Interest-bearing:					
Transaction	**1,899,203**	657,629	616,679	616,697	631,874
Savings	**57,289**	35,223	32,866	31,927	29,811
Time	**274,877**	224,962	242,782	296,224	353,998
Total interest-bearing	**2,231,369**	917,814	892,327	944,848	1,015,683
Total Colorado	**3,889,842**	1,551,528	1,468,327	1,442,166	1,461,438
Arizona:					
Demand	**709,176**	334,701	366,755	326,324	369,115
Interest-bearing:					
Transaction	**575,996**	274,846	305,099	358,556	347,214
Savings	**10,545**	3,343	2,973	2,893	2,545
Time	**43,051**	20,394	27,765	29,498	36,680
Total interest-bearing	**629,592**	298,583	335,837	390,947	386,439
Total Arizona	**1,338,768**	633,284	702,592	717,271	755,554
Kansas/Missouri:					
Demand	**418,199**	457,080	508,418	197,424	259,121
Interest-bearing:					
Transaction	**327,866**	382,066	513,176	153,203	273,999
Savings	**13,721**	13,574	12,679	1,378	1,274
Time	**19,688**	27,260	42,152	35,524	45,210
Total interest-bearing	**361,275**	422,900	568,007	190,105	320,483
Total Kansas/Missouri	**779,474**	879,980	1,076,425	387,529	579,604
Total BOK Financial deposits	**$25,263,763**	$22,061,305	$22,748,095	$21,088,158	$21,140,859

See Note 9 to the Consolidated Financial Statements for a summary of other borrowings.

In addition to deposits, liquidity for the subsidiary banks is provided primarily by federal funds purchased, securities repurchase agreements and Federal Home Loan Bank borrowings. Federal funds purchased consist primarily of unsecured, overnight funds acquired from other financial institutions. Funds are primarily purchased from bankers' banks and Federal Home Loan Banks from across the country. The largest source of wholesale federal funds purchased totaled $300 million at December 31, 2018. There were no wholesale federal funds purchased outstanding at December 31, 2017. Securities repurchase agreements generally mature within 90 days and are secured by certain available for sale securities. Federal Home Loan Bank borrowings are generally short term and are secured by a blanket pledge of eligible collateral (generally unencumbered U.S. Treasury and mortgage-backed securities, 1-4 family residential mortgage loans, multifamily and other qualifying commercial real estate loans). Amounts borrowed from the Federal Home Loan Bank of Topeka averaged $6.2 billion during 2018 and $5.9 billion during 2017.

At December 31, 2018, the estimated unused credit available to BOKF, NA from collateralized sources was approximately $7.1 billion.
BOKF, NA also has a liability related to the repurchase of certain delinquent residential mortgage loans previously sold in GNMA mortgage pools. Interest is payable monthly at rates contractually due to investors.

Parent Company and Other Non-Bank Subsidiaries

The primary sources of liquidity for BOK Financial are cash on hand and dividends from the subsidiary banks. Cash and cash equivalents totaled $167 million at December 31, 2018. Dividends from the subsidiary banks are limited by various banking regulations to net profits, as defined, for the year plus retained profits for the two preceding years. Dividends are further restricted by minimum capital requirements. At December 31, 2018, based on the most restrictive limitations as well as management’s internal capital policy, BOKF, NA could declare up to $71 million of dividends without regulatory approval. Dividend constraints may be alleviated through increases in retained earnings, capital issuances or changes in risk weighted assets. Future losses or increases in required regulatory capital could also affect its ability to pay dividends to the parent company.

On June 27, 2016, the parent company issued $150 million of subordinated debt that will mature on June 30, 2056. This debt bears interest at the rate of 5.375%, payable quarterly. On June 30, 2021, we will have the option to redeem the debt at the principal amount plus accrued interest, subject to regulatory approval.

As a result of the acquisition of CoBiz Financial, we obtained $60 million of subordinated debt issued in June 2015 that will mature on June 25, 2030. This debt bears interest at the rate of 5.625% through June 25, 2025 and thereafter, the notes will bear an annual floating rate equal to 3-month LIBOR plus 317 basis points. We also acquired $72 million of junior subordinated debentures. Interest is based on spreads over 3 month LIBOR ranging from 145 basis points to 295 basis points and mature September 17, 2033 through September 30, 2035. The junior subordinated debentures are subject to early redemption prior to maturity.

Shareholders' equity at December 31, 2018 was $4.4 billion, an increase of $937 million over December 31, 2017. The Company issued 7.2 million shares in conjunction with the acquisition of CoBiz Financial. Net income less cash dividends paid increased equity $318 million during 2018. Changes in interest rates resulted in an increase in the accumulated other comprehensive loss to $73 million at December 31, 2018, compared to $36 million at December 31, 2017. Capital is managed to maximize long-term value to the shareholders. Factors considered in managing capital include projections of future earnings including expected benefits from lower federal income tax rates, asset growth and acquisition strategies, and regulatory and debt covenant requirements. Capital management may include subordinated debt issuance, share repurchase and stock and cash dividends.

On October 27, 2015, the Board of Directors authorized the Company to purchase up to five million common shares, subject to market conditions, securities laws and other regulatory compliance limitations. As of December 31, 2018, a cumulative total of 3,575,083 shares have been repurchased under this authorization. The Company repurchased 615,840 shares during 2018 at an average price of $86.82 per share.

BOK Financial and the subsidiary banks are subject to various capital requirements administered by federal agencies. Failure to meet minimum capital requirements, including capital conservation buffer, can result in certain mandatory and additional discretionary actions by regulators that could have a material impact on operations including restrictions on capital distributions from dividends and share repurchases and executive bonus payments. These capital requirements include quantitative measures of assets, liabilities and off-balance sheet items. The capital standards are also subject to qualitative judgments by the regulators.

A summary of minimum capital requirements, including capital conservation buffer, follows for BOK Financial on a consolidated basis in Table 33.

Table 33 – Capital Ratios

	Minimum Capital Requirement	Capital Conservation Buffer	Minimum Capital Requirement Including Capital Conservation Buffer	December 31, 2018	December 31, 2017
Risk-based capital:					
Common equity Tier 1	4.50 %	2.50 %	7.00 %	**10.92 %**	12.05 %
Tier 1 capital	6.00 %	2.50 %	8.50 %	**10.92 %**	12.05 %
Total capital	8.00 %	2.50 %	10.50 %	**12.50 %**	13.54 %
Tier 1 Leverage	4.00 %	N/A	4.00 %	**8.96 %**	9.31 %
Average total equity to average assets				**10.70 %**	10.43 %
Tangible common equity ratio				**8.82 %**	9.50 %

At March 31, 2018, the Company exceeded the $1 billion regulatory capital rules threshold for trading assets plus liabilities. This subjected the Company to the market risk rule, which imposed additional modeling, systems, oversight and reporting requirements effective beginning the second quarter of 2018 and resulted in an increase in risk weighted assets associated with trading.

Capital resources of financial institutions are also regularly measured by the tangible common shareholders' equity ratio. Tangible common shareholders' equity is shareholders' equity as defined by generally accepted accounting principles in the United States of America ("GAAP"), including unrealized gains and losses on available for sale securities, less intangible assets and equity which does not benefit common shareholders. Equity that does not benefit common shareholders includes preferred equity. This non-GAAP measure is a valuable indicator of a financial institution's capital strength since it eliminates intangible assets from shareholders' equity and retains the effect of unrealized losses on securities and other components of accumulated other comprehensive income in shareholders' equity.

Table 34 following provides a reconciliation of the non-GAAP measures with financial measures defined by GAAP.

Table 34 – Non-GAAP Measures
(Dollars in thousands)

	December 31, 2018	December 31, 2017
Tangible common equity ratio:		
Total shareholders' equity	**$4,432,109**	$3,495,367
Less: Goodwill and intangible assets, net	**1,184,112**	476,088
Tangible common equity	**3,247,997**	3,019,279
Total assets	**38,020,504**	32,272,160
Less: Goodwill and intangible assets, net	**1,184,112**	476,088
Tangible assets	**$36,836,392**	$31,796,072
Tangible common equity ratio	**8.82 %**	9.50 %

Off-Balance Sheet Arrangements

See Note 14 to the Consolidated Financial Statements for a discussion of the Company's significant off-balance sheet commitments.

Aggregate Contractual Obligations

BOK Financial has numerous contractual obligations in the normal course of business. These obligations include time deposits and other borrowed funds, premises used under various operating leases, commitments to extend credit to borrowers and to purchase securities, derivative contracts and contracts for services such as data processing that are integral to our operations. Table 35 following summarizes payments due on contractual obligations with initial terms in excess of one year.

Table 35 – Contractual Obligations as of December 31, 2018
(In thousands)

	Less Than 1 Year	1 to 3 Years	4 to 5 Years	More Than 5 Years	Total
Time deposits	$980,971	$367,887	$257,811	$258,112	$1,864,781
Other borrowings	575	1,150	1,200	7,557	10,482
Subordinated debentures	15,068	30,136	30,136	581,255	656,595
Lease obligations	25,794	46,121	28,147	78,598	178,660
Derivative contracts	132,147	35,837	6,563	6,511	181,058
Data processing services	15,561	21,128	16,941	21,224	74,854
Total	$1,170,116	$502,259	$340,798	$953,257	$2,966,430

Loan commitments	$11,944,525
Standby letters of credit	582,196
Mortgage loans sold with recourse	98,623
Alternative investment commitments	73,885

Payments on time deposits, other borrowed funds and subordinated debentures include interest which has been calculated from rates at December 31, 2018. These obligations may have variable interest rates and actual payments will differ from the amounts shown on this table.

Payments on time deposits are based on contractual maturity dates. These funds may be withdrawn prior to maturity. We may charge the customer a penalty for early withdrawal.

Lease commitments generally represent real property we rent for branch offices, corporate offices and operations facilities. Payments presented represent the minimum lease payments and exclude related costs such as utilities and property taxes.

Obligations under derivative contracts are used in customer hedging programs. As previously discussed, we have entered into derivative contracts which are expected to substantially offset the cash payments due on these obligations.

Data processing and communications contracts represent the minimum obligations under the contracts. Additional payments that are based on the volume of transactions processed are excluded.

Loan commitments represent legally binding obligations to provide financing to our customers. Some of these commitments are expected to expire before being drawn upon and the total commitment amounts do not necessarily represent future cash requirements. Approximately $2.3 billion of the loan commitments expire within one year.

The Company has funded $253 million and has commitments to fund an additional $74 million for various alternative investments. Alternative investments primarily consist of limited partnership interests in entities that invest in low income housing projects. Legally binding commitments to fund alternative investments are recognized as liabilities in the Consolidated Financial Statements.

Recently Issued Accounting Standards

See Note 1 of the Consolidated Financial Statements for disclosure of newly adopted and pending accounting standards.

Forward-Looking Statements

This 10-K contains forward-looking statements that are based on management's beliefs, assumptions, current expectations, estimates and projections about BOK Financial, the financial services industry and the economy generally. Words such as “anticipates,” “believes,” “estimates,” “expects,” “forecasts,” “plans,” “projects,” “will,” “intends,” v such words and similar expressions are intended to identify such forward-looking statements. Management judgments relating to and discussion of the provision and allowance for credit losses, allowance for uncertain tax positions, accruals for loss contingencies and valuation of mortgage servicing rights involve judgments as to expected events and are inherently forward-looking statements. Assessments that BOK Financial's acquisitions, including its latest acquisition of CoBiz Financial, Inc., and other growth endeavors will be profitable are necessary statements of belief as to the outcome of future events based in part on information provided by others which BOK Financial has not independently verified. These statements are not guarantees of future performance and involve certain risks, uncertainties, and assumptions which are difficult to predict with regard to timing, extent, likelihood and degree of occurrence. Therefore, actual results and outcomes may materially differ from what is expected, implied or forecasted in such forward-looking statements. Internal and external factors that might cause such a difference include, but are not limited to changes in commodity prices, interest rates and interest rate relationships, inflation, demand for products and services, the degree of competition by traditional and nontraditional competitors, changes in banking regulations, tax laws, prices, levies and assessments, the impact of technological advances, and trends in customer behavior as well as their ability to repay loans. There may also be difficulties and delays in integrating CoBiz Financial Inc.'s business or fully realizing cost savings and other benefits including, but not limited to, business disruption and customer acceptance of BOK Financial Corporation's products and services. BOK Financial and its affiliates undertake no obligation to update, amend or clarify forward-looking statements, whether as a result of new information, future events, or otherwise.

Legal Notice

As used in this report, the term “BOK Financial” and such terms as “the Company,” “the Corporation,” “our,” “we” and “us” n refer to one or more of the consolidated subsidiaries or all of them taken as a whole. All these terms are used for convenience only and are not intended as a precise description of any of the separate companies, each of which manages its own affairs.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market Risk

Market risk is a broad term for the risk of economic loss due to adverse changes in the fair value of a financial instrument. These changes may be the result of various factors, including interest rates, foreign exchange rates, commodity prices or equity prices. Financial instruments that are subject to market risk can be classified either as held for trading or held for purposes other than trading. Market risk excludes changes in fair value due to credit of the individual issuers of financial instruments.

BOK Financial is subject to market risk primarily through the effect of changes in interest rates on both its assets held for purposes other than trading and trading assets. The effects of other changes, such as foreign exchange rates, commodity prices or equity prices do not pose significant market risk to BOK Financial. BOK Financial has no material investments in assets that are affected by changes in foreign exchange rates or equity prices. Energy and agricultural product derivative contracts, which are affected by changes in commodity prices, are matched against offsetting contracts as previously discussed.

The Asset/Liability Committee is responsible for managing market risk in accordance with policy limits established by the Board of Directors. The Committee monitors projected variation in net interest revenue, net income and economic value of equity due to specified changes in interest rates. These limits also set maximum levels for short-term borrowings, short-term assets, public funds and brokered deposits and establish minimum levels for un-pledged assets, among other things. Further, the Board approved market risk limits for fixed income trading, mortgage pipeline and mortgage servicing assets inclusive of economic hedge benefits. Exposure is measured daily and compliance is reviewed monthly. Deviations from the Board approved limits, which periodically occur throughout the reporting period, may require management to develop and execute plans to reduce exposure. These plans are subject to escalation to and approval by the Board.

The simulations used to manage market risk are based on numerous assumptions regarding the effects of changes in interest rates on the timing and extent of repricing characteristics, future cash flows and customer behavior. These assumptions are inherently uncertain and, as a result, models cannot precisely estimate or precisely predict the impact of higher or lower interest rates. Actual results will differ from simulated results due to timing, magnitude and frequency of interest rate changes, market conditions and management strategies, among other factors.

Interest Rate Risk – Other than Trading

As previously noted in the Net Interest Revenue section of this report, management has implemented strategies to manage the Company’s balance sheet to have relatively limited exposure to changes in interest rates over a twelve-month period. The effectiveness of these strategies in managing the overall interest rate risk is evaluated through the use of an asset/liability model. BOK Financial performs a sensitivity analysis to identify more dynamic interest rate risk exposures, including embedded option positions, on net interest revenue. A simulation model is used to estimate the effect of changes in interest rates on our performance across multiple interest rate scenarios. Our current internal policy limit for net interest revenue variation due to a 200 basis point parallel change in market interest rates over twelve months is a maximum decline of 5%. The results of a 200 basis point decrease in interest rates in the current low-rate environment are not meaningful. Until such time as it becomes meaningful, we will instead report the effect of a 100 basis point decrease in interest rates.

The Company’s primary interest rate exposures include the Federal Funds rate, which affects short-term borrowings, and the prime lending rate and LIBOR, which are the basis for much of the variable rate loan pricing. Additionally, residential mortgage rates directly affect the prepayment speeds for residential mortgage-backed securities and mortgage servicing rights. Derivative financial instruments and other financial instruments used for purposes other than trading are included in this simulation. In addition, the impact on the level and composition of demand deposit accounts and other core deposit balances resulting from a significant increase in short-term market interest rates and the overall interest rate environment is likely to be material. The simulation incorporates assumptions regarding the effects of such changes based on a combination of historical analysis and expected behavior. The impact of planned growth and new business activities is factored into the simulation model.

Table 36 – Interest Rate Sensitivity
(Dollar in thousands)

	200 bp Increase		100 bp Decrease	
	2018	**2017**	**2018**	**2017**
Anticipated impact over the next twelve months on net interest revenue	**$(4,248)**	$(2,692)	**$(42,483)**	$(37,072)
	(0.36)%	(0.30)%	**(3.57)%**	(4.16)%

BOK Financial is also subjected to market risk through changes in the fair value of mortgage servicing rights. Changes in the fair value of mortgage servicing rights are highly dependent on changes in primary mortgage rates offered to borrowers, intermediate-term interest rates that affect the value of custodial funds, and assumptions about servicing revenues, servicing costs and discount rates. As primary mortgage rates increase, prepayment speeds slow and the value of our mortgage servicing rights increases. As primary mortgage rates fall, prepayment speeds increase and the value of our mortgage servicing rights decreases.

We maintain a portfolio of financial instruments, which may include debt securities issued by the U.S. government or its agencies and interest rate derivative contracts held as an economic hedge of the changes in the fair value of our mortgage servicing rights. Composition of this portfolio will change based on our assessment of market risk. Changes in the fair value of residential mortgage-backed securities are highly dependent on changes in secondary mortgage rates required by investors, and interest rate derivative contracts are highly dependent on changes in other market interest rates. While primary and secondary mortgage rates generally move in the same direction, the spread between them may widen and narrow due to market conditions and government intervention. Changes in the forward-looking spread between the primary and secondary rates can cause significant earnings volatility.

Management performs a stress test to measure market risk due to changes in interest rates inherent in its MSR portfolio and hedges. The stress test shocks applicable interest rates up and down 50 basis points and calculates an estimated change in fair value, net of economic hedging activity, that may result. The Board has approved a $20 million market risk limit for mortgage servicing rights, net of economic hedges.

Table 37 - MSR Asset and Hedge Sensitivity Analysis
(In thousands)

	December 31,			
	2018		**2017**	
	Up 50 bp	**Down 50 bp**	**Up 50 bp**	**Down 50 bp**
MSR Asset	**$18,619**	**$(27,154)**	$25,818	$(32,856)
MSR Hedge	**(21,838)**	**21,922**	(29,501)	25,021
Net Exposure	**(3,219)**	**(5,232)**	(3,683)	(7,835)

Trading Activities

The Company bears market risk by originating residential mortgages held for sale ("RMHFS"). RMHFS are generally outstanding for 60 to 90 days, which represents the typical period from commitment to originate a loan to sale of the closed loan to an investor. Primary mortgage interest rate changes during this period affect the value of RMHFS commitments and loans. We use forward sale contracts to mitigate market risk on all closed mortgage loans held for sale and on an estimate of mortgage loan commitments that are expected to result in closed loans.

A variety of methods are used to monitor market risk of mortgage origination activities. These methods include daily marking of all positions to market value, independent verification of inventory pricing, and revenue sensitivity limits.

Management performs a stress test to measure market risk due to changes in interest rates inherent in the mortgage production pipeline. The stress test shocks applicable interest rates up and down 50 basis points and calculates an estimated change in fair value, net of economic hedging activity that may result. The Board has approved a $7 million market risk limit for the mortgage production pipeline, net of forward sale contracts.

Table 38 - Mortgage Pipeline Sensitivity Analysis
(In thousands)

	Year Ended December 31, 2018		2017	
	Up 50 bp	**Down 50 bp**	**Up 50 bp**	**Down 50 bp**
Average[1]	**$223**	**$(697)**	$23	$(1,040)
Low[2]	**2,077**	**699**	1,314	789
High[3]	**(1,015)**	**(2,447)**	(1,979)	(2,377)
Period End	**(16)**	**(420)**	(263)	(114)

[1] Average represents the simple average of each daily value observed during the reporting period.
[2] Low represents least risk of loss in fair value measured as the smallest negative value or the largest positive value observed daily during the reporting period.
[3] High represents the greatest risk of loss in fair value measured as the largest negative value or the smallest positive value observed daily during the reporting period.

BOK Financial enters into trading activities both as an intermediary for customers and for its own account. As an intermediary, we take positions in securities, generally residential mortgage-backed securities, government agency securities and municipal bonds. These securities are purchased for resale to customers, which include individuals, corporations, foundations and financial institutions. On a limited basis, we may also take trading positions in U.S. Treasury securities, residential mortgage-backed securities, and municipal bonds to enhance returns on securities portfolios. Both of these activities involve interest rate, liquidity and price risk. BOK Financial has an insignificant exposure to foreign exchange risk and does not take positions in commodity derivatives.

A variety of methods are used to monitor the interest rate risk of trading activities. These methods include daily marking of all positions to market value, independent verification of inventory pricing, and position limits for each trading activity. Economic hedges in either the futures or cash markets may be used to reduce the risk associated with some trading programs.

Management performs a stress test to measure market risk from changes in interest rates on its trading portfolio. The stress test shocks applicable interest rates up and down 50 basis points and calculates an estimated change in fair value, net of economic hedging activity that may result. The Board has approved an $8 million market risk limit for the trading portfolio, net of economic hedges.

Table 39 –Trading Securities Sensitivity Analysis
(In thousands)

	Year Ended December 31, 2018		2017	
	Up 50 bp	**Down 50 bp**	**Up 50 bp**	**Down 50 bp**
Average[1]	**$(1,133)**	**$649**	$(1,702)	$1,799
Low[2]	**2,041**	**4,423**	668	5,210
High[3]	**(4,534)**	**(3,463)**	(4,386)	(1,046)
Period End	**1,470**	**(1,081)**	(488)	539

[1] Average represents the simple average of each daily value observed during the reporting period.
[2] Low represents least risk of loss in fair value measured as the smallest negative value or the largest positive value observed daily during the reporting period.
[3] High represents the greatest risk of loss in fair value measured as the largest negative value or the smallest positive value observed daily during the reporting period.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Management on Internal Control over Financial Reporting

Management of BOK Financial Corporation is responsible for establishing and maintaining adequate internal control over financial reporting and for assessing the effectiveness of internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f), as amended. Management has assessed the effectiveness of the Company’s internal control over financial reporting based on the criteria established in “Internal Control – Integrated Framework,” issued by the Committee of Sponsoring Organizations (“COSO”) of the Treadway Commission in 2013. Based on that assessment and criteria, management has determined that the Company maintained effective internal control over financial reporting as of December 31, 2018.

As permitted, management excluded from its assessment the operations of CoBiz Financial, which was acquired on October 1, 2018. As described in Note 6 to the Consolidated Financial Statements, assets acquired and excluded from management's assessment of internal control over financial reporting comprised approximately 12% and 20% of consolidated total and net assets, respectively, at December 31, 2018. Operations of CoBiz Financial comprised approximately 3% and 3% of revenues and net income, respectively, for the year ended December 31, 2018.

Ernst & Young LLP, the independent registered public accounting firm that audited the Consolidated Financial Statements of the Company included in this annual report has issued an audit report on the effectiveness of the Company’s internal control over financial reporting as of December 31, 2018. Their report, which expresses unqualified opinion on the effectiveness of the Company’s internal control over financial reporting as of December 31, 2018, is included in this annual report.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of BOK Financial Corporation

Opinion on Internal Control over Financial Reporting

We have audited BOK Financial Corporation's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, BOK Financial Corporation (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria**.**

As indicated in the accompanying Report of Management on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of CoBiz Financial, which is included in the 2018 consolidated financial statements of the Company and constituted 12% and 20% of total and net assets, respectively, as of December 31, 2018 and 3% and 3% of revenues and net income, respectively, for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of CoBiz Financial.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of BOK Financial Corporation as of December 31, 2018 and 2017, and the related consolidated statements of earnings, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and our report dated March 1, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Report of Management on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ Ernst & Young LLP

Tulsa, Oklahoma

March 1, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of BOK Financial Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of BOK Financial Corporation (the Company) as of December 31, 2018 and 2017, and the related consolidated statements of earnings, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on the criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated March 1, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

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

Tulsa, Oklahoma

March 1, 2019

Consolidated Statements of Earnings

(In thousands, except share and per share data)

	Year Ended December 31,		
Interest and dividend revenue	**2018**	**2017**	**2016**
Loans	**$ 891,587**	$ 696,479	$ 581,030
Residential mortgage loans held for sale	**8,123**	8,706	12,658
Trading securities	**57,531**	17,002	8,527
Investment securities	**14,775**	16,121	16,894
Available for sale securities	**197,317**	177,070	175,321
Fair value option securities	**15,205**	16,755	6,723
Restricted equity securities	**21,555**	18,490	17,238
Interest-bearing cash and cash equivalents	**22,333**	22,128	10,726
Total interest and dividend revenue	**1,228,426**	972,751	829,117
Interest expense			
Deposits	**95,517**	53,803	40,494
Borrowed funds	**138,215**	69,124	35,099
Subordinated debentures	**9,827**	8,123	6,296
Total interest expense	**243,559**	131,050	81,889
Net interest and dividend revenue	**984,867**	841,701	747,228
Provision for credit losses	**8,000**	(7,000)	65,000
Net interest and dividend revenue after provision for credit losses	**976,867**	848,701	682,228
Other operating revenue			
Brokerage and trading revenue	**108,323**	131,601	138,377
Transaction card revenue	**84,025**	119,988	116,452
Fiduciary and asset management revenue	**184,703**	162,889	135,387
Deposit service charges and fees	**112,153**	112,079	111,589
Mortgage banking revenue	**97,787**	104,719	133,914
Other revenue	**56,651**	49,959	50,112
Total fees and commissions	**643,642**	681,235	685,831
Other gains (losses), net	**(2,731)**	11,213	4,947
Gain (loss) on derivatives, net	**(422)**	779	(15,685)
Loss on fair value option securities, net	**(25,572)**	(2,733)	(10,555)
Change in fair value of mortgage servicing rights	**4,668**	172	(2,193)
Gain (loss) on available for sale securities, net	**(2,801)**	4,428	11,675
Total other operating revenue	**616,784**	695,094	674,020
Other operating expense			
Personnel	**583,131**	573,408	553,119
Business promotion	**30,523**	28,877	26,582
Charitable contributions to BOKF Foundation	**2,846**	2,000	2,000
Professional fees and services	**59,099**	51,067	56,783
Net occupancy and equipment	**97,981**	86,477	80,024
Insurance	**23,318**	19,653	32,489
Data processing and communications	**114,796**	146,970	131,841
Printing, postage and supplies	**17,169**	15,689	15,584
Net losses and operating expenses of repossessed assets	**17,052**	9,687	3,359
Amortization of intangible assets	**9,620**	6,779	6,862
Mortgage banking costs	**46,298**	52,856	61,387
Other expense	**26,333**	32,054	47,560
Total other operating expense	**1,028,166**	1,025,517	1,017,590

Net income before taxes	**565,485**	518,278	338,658
Federal and state income taxes	**119,061**	182,593	106,377
Net income	**446,424**	335,685	232,281
Net income (loss) attributable to non-controlling interests	**778**	1,041	(387)
Net income attributable to BOK Financial Corporation shareholders	**$ 445,646**	$ 334,644	$ 232,668
Earnings per share:			
Basic	**$ 6.63**	$ 5.11	$ 3.53
Diluted	**$ 6.63**	$ 5.11	$ 3.53
Average shares used in computation:			
Basic	**66,628,640**	64,745,364	65,085,627
Diluted	**66,662,273**	64,806,284	65,143,898
Dividends declared per share	**$ 1.90**	$ 1.77	$ 1.73

See accompanying notes to Consolidated Financial Statements.

Consolidated Statements of Comprehensive Income
(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net income	**$446,424**	$335,685	$232,281
Other comprehensive loss before income taxes:			
Net change in unrealized gain (loss)	**(48,010)**	(26,152)	(41,521)
Reclassification adjustments included in earnings:			
Interest revenue, Investment securities, Taxable securities	**—**	—	(112)
Loss (gain) on available for sale securities, net	**2,801**	(4,428)	(11,675)
Other comprehensive loss, before income taxes	**(45,209)**	(30,580)	(53,308)
Federal and state income taxes	**(11,507)**	(11,923)	(20,754)
Other comprehensive loss, net of income taxes	**(33,702)**	(18,657)	(32,554)
Comprehensive income	**412,722**	317,028	199,727
Comprehensive income (loss) attributable to non-controlling interests	**778**	1,041	(387)
Comprehensive income attributable to BOK Financial Corp. shareholders	**$411,944**	$315,987	$200,114

See accompanying notes to Consolidated Financial Statements.

Consolidated Balance Sheets

(In thousands, except share data)

	December 31, 2018	December 31, 2017
Assets		
Cash and due from banks	**$741,749**	$602,510
Interest-bearing cash and cash equivalents	**401,675**	1,714,544
Trading securities	**1,956,923**	462,676
Investment securities (fair value: **2018 – $367,298;** 2017 – $480,035)	**355,187**	461,793
Available for sale securities	**8,857,120**	8,321,578
Fair value option securities	**283,235**	755,054
Restricted equity securities	**344,447**	320,189
Residential mortgage loans held for sale	**149,221**	221,378
Loans	**21,656,730**	17,153,424
Allowance for loan losses	**(207,457)**	(230,682)
Loans, net of allowance	**21,449,273**	16,922,742
Premises and equipment, net	**330,033**	317,335
Receivables	**204,960**	178,800
Goodwill	**1,049,263**	447,430
Intangible assets, net	**134,849**	28,658
Mortgage servicing rights	**259,254**	252,867
Real estate and other repossessed assets, net of allowance (**2018 – $13,665**; 2017 – $12,648)	**17,487**	28,437
Derivative contracts	**320,929**	220,502
Cash surrender value of bank-owned life insurance	**381,608**	316,498
Receivable on unsettled securities sales	**336,400**	340,077
Other assets	**446,891**	359,092
Total assets	**$38,020,504**	$32,272,160
Liabilities and Equity		
Liabilities:		
Noninterest-bearing demand deposits	**$10,414,592**	$9,243,338
Interest-bearing deposits:		
Transaction	**12,206,576**	10,250,393
Savings	**529,215**	469,158
Time	**2,113,380**	2,098,416
Total deposits	**25,263,763**	22,061,305
Funds purchased and repurchase agreements	**1,018,411**	574,963
Other borrowings	**6,124,390**	5,134,897
Subordinated debentures	**275,913**	144,677
Accrued interest, taxes and expense	**192,826**	164,895
Derivative contracts	**362,306**	171,963
Due on unsettled securities purchases	**156,370**	338,745
Other liabilities	**183,480**	162,381
Total liabilities	**33,577,459**	28,753,826
Shareholders' equity:		
Common stock ($.00006 par value; 2,500,000,000 shares authorized; shares issued and outstanding: **2018 – 75,711,492;** 2017 – 75,147,686)	**5**	4
Capital surplus	**1,334,030**	1,035,895

Retained earnings	**3,369,654**	3,048,487
Treasury stock (shares at cost: **2018 – 3,588,560**; 2017 – 9,752,749)	**(198,995)**	(552,845)
Accumulated other comprehensive loss	**(72,585)**	(36,174)
Total shareholders' equity	**4,432,109**	3,495,367
Non-controlling interests	**10,936**	22,967
Total equity	**4,443,045**	3,518,334
Total liabilities and equity	**$ 38,020,504**	$ 32,272,160

See accompanying notes to Consolidated Financial Statements.

Consolidated Statements of Changes in Equity

(In thousands)

	Common Stock		Capital Surplus	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity	Non-Controlling Interests	Total Equity
	Shares	Amount			Shares	Amount				
Balance, December 31, 2015	74,530	$ 4	$ 982,009	$ 2,704,121	8,636	$ (477,165)	$ 21,587	$ 3,230,556	$ 37,083	$ 3,267,639
Net income	—	—	—	232,668	—	—	—	232,668	(387)	232,281
Other comprehensive loss	—	—	—	—	—	—	(32,554)	(32,554)	—	(32,554)
Repurchase of common stock					1,005	(66,792)	—	(66,792)	—	(66,792)
Share-based compensation plans:										
Stock options exercised	214	—	12,465	—	—	—	—	12,465	—	12,465
Non-vested shares awarded, net	249	—	1,590	—	—	—	—	1,590	—	1,590
Vesting of non-vested shares	—	—	—	—	15	(95)	—	(95)	—	(95)
Share-based compensation	—	—	10,471	—	—	—	—	10,471	—	10,471
Cash dividends on common stock	—	—	—	(113,455)	—	—	—	(113,455)	—	(113,455)
Capital calls and distributions, net	—	—	—	—	—	—	—	—	(5,193)	(5,193)
Balance, December 31, 2016	74,993	4	1,006,535	2,823,334	9,656	(544,052)	(10,967)	3,274,854	31,503	3,306,357
Net income	—	—	—	334,644	—	—	—	334,644	1,041	335,685
Other comprehensive loss	—	—	—	—	—	—	(18,657)	(18,657)	—	(18,657)
Repurchase of common stock	—	—	—	—	80	(7,403)	—	(7,403)	—	(7,403)
Share-based compensation plans:										
Stock options exercised	100	—	5,758	—	—	—	—	5,758	—	5,758
Non-vested shares awarded, net	55	—	—	—	—	—	—	—	—	—
Vesting of non-vested shares	—	—	—	—	17	(1,390)	—	(1,390)	—	(1,390)
Share-based compensation	—	—	23,602	—	—	—	—	23,602	—	23,602
Cash dividends on common stock	—	—	—	(116,041)	—	—	—	(116,041)	—	(116,041)
Capital calls and distributions, net	—	—	—	—	—	—	—	—	(9,577)	(9,577)
Reclassification of stranded accumulated other comprehensive loss related to tax reform				6,550			(6,550)	—	—	—
Balance, December 31, 2017	75,148	$ 4	$ 1,035,895	$ 3,048,487	9,753	$ (552,845)	$ (36,174)	$ 3,495,367	$ 22,967	$ 3,518,334

Consolidated Statements of Changes in Equity

(In thousands)

	Common Stock		Capital Surplus	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity	Non-Controlling Interests	Total Equity
	Shares	Amount			Shares	Amount				
Balance, December 31, 2017	75,148	$ 4	$ 1,035,895	$ 3,048,487	9,753	$ (552,845)	$ (36,174)	$ 3,495,367	$ 22,967	$ 3,518,334
Transition adjustment of net unrealized gains on equity securities	—	—	—	2,709	—	—	(2,709)	—	—	—
Balance, December 31, 2017, Adjusted	75,148	4	1,035,895	3,051,196	9,753	(552,845)	(38,883)	3,495,367	22,967	3,518,334
Net income	—	—	—	445,646	—	—	—	445,646	778	446,424
Other comprehensive loss	—	—	—	—	—	—	(33,702)	(33,702)	—	(33,702)
Repurchase of common stock	—	—	—	—	616	(53,465)	—	(53,465)	—	(53,465)
Share-based compensation plans:										
Stock options exercised	54	—	2,781	—	—	—	—	2,781	—	2,781
Non-vested shares awarded, net	109	—	—	—	—	—	—	—	—	—
Vesting of non-vested shares	—	—	—	—	31	(2,870)	—	(2,870)	—	(2,870)
Share-based compensation	—	—	4,229	—	—	—	—	4,229	—	4,229
Cash dividends on common stock	—	—	—	(127,188)	—	—	—	(127,188)	—	(127,188)
Issuance of shares for CoBiz acquisition	400	1	291,125	—	(6,811)	410,185	—	701,311		701,311
Capital calls and distributions, net	—	—	—	—	—	—	—	—	(12,809)	(12,809)
Balance, December 31, 2018	75,711	$ 5	$ 1,334,030	$ 3,369,654	3,589	$ (198,995)	$ (72,585)	$ 4,432,109	$ 10,936	$ 4,443,045

See accompanying notes to Consolidated Financial Statements.

Consolidated Statements of Cash Flows

(In thousands)

	Year Ended		
	2018	**2017**	**2016**
Cash Flows From Operating Activities:			
Net income	**$446,424**	$335,685	$232,281
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Provision for credit losses	**8,000**	(7,000)	65,000
Change in fair value of mortgage servicing rights due to market changes	**(4,668)**	(172)	2,193
Change in fair value of mortgage servicing rights due to principal payments	**33,528**	33,527	40,744
Net unrealized losses from derivative contracts	**4,686**	3,704	11,234
Share-based compensation	**4,229**	23,602	10,471
Depreciation and amortization	**60,843**	54,466	47,016
Net amortization of securities discounts and premiums	**30,945**	28,693	41,643
Net losses (gains) on financial instruments and other losses(gains), net	**9,585**	(2,828)	(13,011)
Net gain on mortgage loans held for sale	**(35,705)**	(47,159)	(63,636)
Mortgage loans originated for sale	**(2,587,297)**	(3,286,873)	(6,117,417)
Proceeds from sale of mortgage loans held for sale	**2,691,144**	3,405,890	6,193,587
Capitalized mortgage servicing rights	**(35,247)**	(39,149)	(71,405)
Change in trading and fair value option securities	**(1,023,097)**	(804,204)	149,921
Change in receivables	**(38,346)**	321,880	(603,861)
Change in other assets	**27,507**	(5,506)	(49,565)
Change in accrued interest, taxes and expense	**(5,191)**	18,191	44,269
Change in other liabilities	**(139,346)**	182,184	(11,413)
Net cash provided by (used in) operating activities	**(552,006)**	214,931	(91,949)
Cash Flows From Investing Activities:			
Proceeds from maturities or redemptions of investment securities	**124,864**	112,022	86,847
Proceeds from maturities or redemptions of available for sale securities	**1,122,680**	1,841,217	1,740,226
Purchases of investment securities	**(4,468)**	(32,972)	(41,590)
Purchases of available for sale securities	**(1,955,172)**	(2,845,557)	(2,333,740)
Proceeds from sales of available for sale securities	**745,643**	1,309,215	899,381
Change in amount receivable on unsettled available for sale securities transactions	**38,347**	(68,792)	33,005
Loans originated, net of principal collected	**(1,553,033)**	(78,232)	(621,605)
Net payments on derivative asset contracts	**(114,417)**	479,409	(103,668)
Acquisitions, net of cash acquired	**(175,755)**	—	56,017
Proceeds from disposition of assets	**308,762**	274,029	198,922
Purchases of assets	**(345,082)**	(250,783)	(199,802)
Net cash provided by (used in) investing activities	**(1,807,631)**	739,556	(286,007)
Cash Flows From Financing Activities:			
Net change in demand deposits, transaction deposits and savings accounts	**(13,870)**	(563,406)	1,277,285
Net change in time deposits	**(73,089)**	(123,384)	(216,084)
Net change in other borrowed funds	**1,295,484**	(10,909)	(606,476)
Repayment of subordinated debentures	**—**	—	(226,550)
Issuance of subordinated debentures, net of issuance costs	**—**	—	144,615
Change in amount due on unsettled security purchases	**(41,319)**	144,690	(10,389)
Issuance of common and treasury stock, net	**(88)**	4,368	12,455
Net change in derivative margin accounts	**85,466**	(17,726)	(28,806)

Net payments or proceeds on derivative liability contracts	**114,076**	(485,119)	106,051
Repurchase of common stock	**(53,465)**	(7,403)	(66,792)
Dividends paid	**(127,188)**	(116,041)	(113,455)
Net cash provided by (used in) financing activities	**1,186,007**	(1,174,930)	271,854
Net increase (decrease) in cash and cash equivalents	**(1,173,630)**	(220,443)	(106,102)
Cash and cash equivalents at beginning of period	**2,317,054**	2,537,497	2,643,599
Cash and cash equivalents at end of period	**$1,143,424**	$2,317,054	$2,537,497
Supplemental Cash Flow Information:			
Cash paid for interest	**$243,121**	$127,513	$82,876
Cash paid for taxes	**$92,291**	$121,697	$79,883
Net loans and bank premises transferred to repossessed real estate and other assets	**$9,880**	$7,367	$36,391
Increase in U.S. government guaranteed loans eligible for repurchase	**$100,238**	$148,107	$120,406
Increase in receivables from conveyance of GNMA OREO	**$38,216**	$40,528	$68,873

See accompanying notes to Consolidated Financial Statements.

Notes to Consolidated Financial Statements

(1) Significant Accounting Policies

Basis of Presentation

The Consolidated Financial Statements of BOK Financial Corporation (“BOK Financial” or “the Company”) have been prepared in conformity with accounting principles generally accepted in the United States ("U.S. GAAP"), including interpretations of U.S. GAAP issued by federal banking regulators and general practices of the banking industry. The Consolidated Financial Statements include the accounts of BOK Financial and its subsidiaries, principally BOKF, NA, CoBiz Bank, BOK Financial Securities, Inc., The Milestone Group, Inc. and Cavanal Hill Distributors, Inc. All significant intercompany transactions are eliminated in consolidation.

The Consolidated Financial Statements include the assets, liabilities, non-controlling interests and results of operations of variable interest entities (“VIEs”) when BOK Financial is determined to be the primary beneficiary. Variable interest entities are generally defined as entities that either do not have sufficient equity to finance their activities without support from other parties or whose equity investors lack a controlling financial interest. Determination that the Company is the primary beneficiary considers the power to direct the activities that most significantly impact the variable interest's economic performance and the obligation to absorb losses of the variable interest or the right to receive benefits of the variable interest that could be significant to the variable interest.

Certain prior year amounts have been reclassified to conform to current year presentation.

Nature of Operations

BOK Financial, through its subsidiaries, provides a wide range of financial services to commercial and industrial customers, other financial institutions, municipalities, and consumers. These services include depository and cash management; lending and lease financing; mortgage banking; securities brokerage, trading and underwriting; and personal and corporate trust.

BOKF, NA operates as Bank of Oklahoma primarily in the Tulsa and Oklahoma City metropolitan areas of the state of Oklahoma and Bank of Texas primarily in the Dallas, Fort Worth and Houston metropolitan areas of the state of Texas. In addition, BOKF, NA does business as Bank of Albuquerque in Albuquerque, New Mexico; Colorado State Bank and Trust in Denver, Colorado; Bank of Arizona in Phoenix, Arizona; Mobank in Kansas City, Missouri/Kansas and Bank of Arkansas in Northwest Arkansas. BOKF, NA also operates the TransFund electronic funds network, Cavanal Hill Investment Management, and BOK Financial Asset Management, Inc.

On October 1, 2018, BOK Financial acquired CoBiz Financial, Inc. and CoBiz Bank, its wholly owned subsidiary. CoBiz Financial has been merged into BOK Financial. CoBiz Bank will be merged into BOKF, NA in the first quarter of 2019.

Use of Estimates

Preparation of BOK Financial's Consolidated Financial Statements requires management to make estimates of future economic activities, including loan collectability, prepayments and cash flows from customer accounts. These estimates are based upon current conditions and information available to management. Actual results may differ significantly from these estimates.

Acquisitions

Assets and liabilities acquired, including identifiable intangible assets, are recorded at fair value on the acquisition date. The purchase price includes consideration paid at closing and the estimated fair value of contingent consideration that will be paid in the future, subject to achieving defined performance criteria. Premiums and discounts assigned to interest-earning assets and interest-bearing liabilities are amortized over the lives of the acquired assets and liabilities on either an individual instrument or pool basis. Provision for credit losses is recognized for changes in credit quality after the acquisition date. Goodwill is recognized as the excess of the purchase price over the net fair value of assets acquired and liabilities assumed. The Consolidated Statements of Earnings include the results of operations from the acquisition date.

Goodwill and Intangible Assets

Goodwill and intangible assets generally result from business combinations and are evaluated for each of BOK Financial's reporting units for impairment annually or more frequently if conditions indicate impairment. The evaluation of possible impairment of goodwill and intangible assets involves significant judgment based upon short-term and long-term projections of future performance.

Reporting units are defined by the Company as significant lines of business within each operating segment. This definition is consistent with the manner in which the chief operating decision maker assesses the performance of the Company and makes decisions concerning the allocation of resources. The Company qualitatively assesses whether it is more likely than not that the fair value of the reporting units are less than their carrying value, including goodwill. Reporting unit carrying value includes sufficient capital to exceed regulatory requirements. This assessment includes consideration of relevant events and circumstances including but not limited to macroeconomic conditions, industry and market conditions, the financial and stock performance of the Company and other relevant factors.

If the Company concludes based on the qualitative assessment that goodwill may be impaired, a quantitative one-step impairment test will be applied to goodwill at all reporting units. The quantitative analysis compares the fair value of the reporting unit with its carrying value, including goodwill. The fair value of each reporting unit is estimated by the discounted future earnings method. Goodwill is considered impaired if the fair value of the reporting unit is less than the carrying value of the reporting unit, including goodwill.

Intangible assets are generally composed of customer relationships, naming rights, non-compete agreements and core deposit premiums. They are amortized using accelerated or straight-line methods, as appropriate, over the estimated benefit periods. These periods range from 3 years to 20 years. The net book values of identifiable intangible assets are evaluated for impairment when economic conditions indicate impairment may exist.

Cash Equivalents

Due from banks, funds sold (generally federal funds sold for one day), resell agreements (which generally mature within one day to 30 days) and investments in money market funds are considered cash equivalents.

Securities

Securities are identified as trading, investment (held to maturity) or available for sale at the time of purchase based upon the intent of management, liquidity and capital requirements, regulatory limitations and other relevant factors. Trading securities, which are acquired for profit through resale, are carried at fair value with unrealized gains and losses included in current period earnings. Investment securities are carried at amortized cost. Amortization is computed by methods that approximate level yield and is adjusted for changes in prepayment estimates. Securities identified as available for sale are carried at fair value. Unrealized gains and losses are recorded, net of deferred income taxes, as accumulated other comprehensive income in shareholders' equity. Available for sale securities are separately identified as pledged to creditors if the creditor has the right to sell or re-pledge the collateral.

The purchase or sale of securities is recognized on a trade date basis. Realized gains and losses on sales of securities are based upon specific identification of the security sold. A receivable or payable is recognized for subsequent transaction settlement. Securities meeting certain criteria may also be transferred from the available for sale classification to the investment securities portfolio at fair value on the date of transfer. The unrealized gain or loss at the date of transfer is retained in accumulated other comprehensive income and in the carrying value of the investment securities portfolio. Such amounts are amortized over the estimated remaining life of the security as an adjustment to yield, offsetting the related amortization of the premium or accretion of the discount on the transferred securities.

On a quarterly basis, the Company performs separate evaluations of impaired debt investment and available for sale securities to determine if the decline in fair value below the amortized cost is other-than-temporary.

Management determines whether it intends to sell or if it is more likely than not that it will be required to sell impaired securities. This determination considers current and forecasted liquidity requirements and securities portfolio management. If the Company intends to sell or it is more likely than not that it will be required to sell the impaired debt security, a charge is recognized against earnings for the entire unrealized loss. For all impaired debt securities for which there is no intent or expected requirement to sell, the evaluation considers all available evidence to assess whether it is more likely than not that all amounts due would not be collected according to the security's contractual terms. Impairment of debt securities rated investment grade by nationally-recognized rating agencies is considered temporary unless specific contrary information is identified. Impairment of debt securities rated below investment grade by at least one of the nationally recognized rating agencies is evaluated based on projections of estimated cash flows. Any expected credit loss due to the inability to collect all amounts due according to the security's contractual terms is recognized as a charge against earnings. Any remaining unrealized loss related to other factors would be recognized in other comprehensive income, net of taxes.

BOK Financial may elect to carry certain securities at fair value with changes in fair value recognized in current period income. These securities are held with the intent that gains or losses will offset changes in the fair value of mortgage servicing rights or certain derivative instruments.

Restricted equity securities represent equity interests the Company is required to hold in the Federal Reserve Banks and Federal Home Loan Banks. Restricted equity securities are carried at cost as these securities do not have a readily determined fair value because ownership of these shares is restricted and they lack a market.

The fair value of our securities portfolio is generally based on a single price for each financial instrument provided to us by a third-party pricing service determined by one or more of the following:

- Quoted prices for similar, but not identical, assets or liabilities in active markets;
- Quoted prices for identical or similar assets or liabilities in inactive markets;
- Inputs other than quoted prices that are observable, such as interest rate and yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates; and
- Other inputs derived from or corroborated by observable market inputs.

The underlying methods used by the third-party pricing services are considered in determining the primary inputs used to determine fair values. We evaluate the methodologies employed by the third-party pricing services by comparing the price provided by the pricing service with other sources, including brokers' quotes, sales or purchases of similar instruments and discounted cash flows to establish a basis for reliance on the pricing service values. Significant differences between the pricing service provided value and other sources are discussed with the pricing service to understand the basis for their values. Based on all observable inputs, management may adjust prices obtained from third-party pricing services to more appropriately reflect the prices that would be received to sell assets or paid to transfer liabilities in orderly transactions in the current market.

Derivative Instruments

Derivative instruments may be used by the Company as part of its internal risk management programs or may be offered to customers. All derivative instruments are carried at fair value and changes in fair value are generally reported in income as they occur. The determination of fair value of derivative instruments considers changes in interest rates, commodity prices and foreign exchange rates. Fair values for exchange-traded contracts are based on quoted prices in an active market for identical instruments. Fair values for over-the-counter contracts are generated internally using third-party valuation models. Inputs used in third-party valuation models to determine fair values are considered significant other observable inputs. Credit risk is also considered in determining fair value. Deterioration in the credit rating of customers or other counterparties reduces the fair value of asset contracts. Deterioration of our credit rating could decrease the fair value of our derivative liabilities.

When bilateral netting agreements or similar agreements exist between the Company and its counterparties that create a single legal claim or obligation to pay or receive the net amount in settlement of the individual derivative contracts, the Company reports derivative assets and liabilities on a net by derivative contract by counterparty basis.

Derivative contracts may also require the Company to provide or receive cash margin as collateral for derivative assets and liabilities. Derivative assets and liabilities are reported net of cash margin when certain conditions are met. In addition, derivative contracts executed with customers under Customer Risk Management Programs may be secured by non-cash collateral in conjunction with a credit agreement with that customer. Access to collateral in the event of default is reasonably assured.

Derivative instruments may be designated as cash flow hedges of variable rate assets or liabilities, or of anticipated transactions. Changes in the fair value of derivative instruments designated as cash flow hedges are recorded in accumulated other comprehensive income to the extent they are effective. The amount recorded in other comprehensive income is reclassified to earnings in the same periods as the hedged cash flows impact earnings. The ineffective portion of changes in fair value is reported in current earnings.

BOK Financial may use derivative instruments in managing its interest rate sensitivity, as part of its economic hedge of the changes in the fair value of mortgage servicing rights and to mitigate the market risk of holding trading securities. Changes in the fair value of derivative instruments used in managing interest rate sensitivity and as part of its economic hedge of changes in the fair value of mortgage servicing rights are included in Other Operating Revenue - Gain (loss) on derivatives, net in the Consolidated Statements of Earnings. Changes in the fair value of derivative instruments used to mitigate the market risk of holding trading securities are included in Operating Revenue - Brokerage and trading revenue.

BOK Financial also enters into mortgage loan commitments that are considered derivative contracts. Forward sales contracts that have not been designated as hedging instruments are used to economically hedge these mortgage loan commitments as well as mortgage loans held for sale. Mortgage loan commitments are carried at fair value based upon quoted prices. Changes in the fair value of mortgage loan commitments, mortgage loans held for sale and forward sales contracts are reported in Other Operating Revenue - Mortgage banking revenue.

BOK Financial offers programs that permit its customers to manage various risks, including fluctuations in energy, cattle and other agricultural products, interest rates and foreign exchange rates with derivative contracts. Customers may also manage interest rate risk through interest rate swaps used by the borrower to modify interest rate terms of their loans or to-be-announced securities used by our mortgage banking customers to hedge their loan production. Derivative contracts are executed between the customers and BOK Financial. Offsetting contracts are executed between BOK Financial and other selected counterparties to minimize market risk from changes in commodity prices, interest rates or foreign exchange rates. The counterparty contracts are identical to customer contracts, except for a fixed pricing spread or fee paid to BOK Financial as profit and compensation for administrative costs and credit risk which is recognized over the life of the contracts and included in other Operating Revenue - Brokerage and trading revenue in the Consolidated Statements of Earnings.

Loans

Loans are either secured or unsecured based on the type of loan and the financial condition of the borrower. Repayment is generally expected from cash flow or proceeds from the sale of selected assets of the borrower. BOK Financial is exposed to risk of loss on loans due to the borrower's financial difficulties, which may arise from any number of factors, including problems within the respective industry or local economic conditions. Access to collateral, in the event of borrower default, is reasonably assured through adherence to applicable lending laws and through sound lending standards and credit review procedures. Accounting policies for all loans, excluding residential loans guaranteed by U.S. government agencies, are as follows.

Interest is accrued at the applicable interest rate on the outstanding principal amount. Loans are placed on nonaccruing status when, in the opinion of management, full collection of principal or interest is uncertain. Internally risk graded loans are individually evaluated for nonaccruing status quarterly. Non-risk graded loans are generally placed on nonaccruing status when 90 days or more past due or within 60 days of being notified of the borrower's bankruptcy filing. Interest previously accrued but not collected is charged against interest income when the loan is placed on nonaccruing status. Payments received on nonaccruing loans are applied to principal or recognized as interest income, according to management's judgment as to the collectability of principal. Loans may be returned to accruing status when, in the opinion of management, full collection of principal and interest, including principal previously charged off, is probable based on improvements in the borrower's financial condition or a sustained period of performance.

For loans acquired with no evidence of credit deterioration, discounts are accreted on either an individual basis for loans with unique characteristics or on a pool basis for groups of homogeneous loans. Accretion is discontinued when a loan with an individually attributed discount is placed on nonaccruing status.

Loans to borrowers experiencing financial difficulties may be modified in troubled debt restructurings ("TDRs"). All TDRs are generally classified as nonaccruing, excluding loans guaranteed by U.S. government agencies. Modifications generally consist of extension of payment terms or interest rate concessions and may result either voluntarily through negotiations with the borrower or involuntarily through court order. Generally, principal and accrued but unpaid interest is not voluntarily forgiven.

Performing loans may be renewed under the current collateral, debt service ratio and other underwriting standards. Nonaccruing loans may also be renewed and will remain classified as nonaccruing.

Occasionally, loans, other than residential mortgage loans, may be held for sale in order to manage credit concentration. These loans are carried at the lower of cost or fair value with gains or losses recognized in gain (loss) on assets.

All loans are charged-off when the loan balance or a portion of the loan balance is no longer supported by the paying capacity of the borrower or when the required cash flow is reduced in a TDR. The charge-off amount is determined through an evaluation of available cash resources and collateral value. Internally risk graded loans are evaluated quarterly and charge-offs are taken in the quarter in which the loss is identified. Non-risk graded loans that are past due between 60 days and 180 days, based on the loan product type, are charged off. Loans to borrowers whose personal obligation has been discharged through Chapter 7 bankruptcy proceedings are charged off within 60 days of notice of the bankruptcy filing, regardless of payment status.

Loan origination and commitment fees and direct loan acquisition and origination costs are deferred and amortized as an adjustment to yield over the life of the loan or over the commitment period, as applicable. Amortization does not anticipate loan prepayments. Net unamortized fees are recognized in full at time of payoff.

Qualifying residential mortgage loans guaranteed by U.S. government agencies have been sold into GNMA pools. Under certain performance conditions specified in government programs, the Company has the right, but not the obligation to repurchase loans from GNMA pools. These loans no longer qualify for sale accounting and are recognized in the Consolidated Balance Sheets. Guaranteed loans are considered to be impaired because we do not expect to receive all principal and interest based on the loan's contractual terms. The principal balance continues to be guaranteed, however, interest accrues at a curtailed rate as specified in the programs. The carrying value of these loans is reduced based on an estimate of expected cash flows discounted at the original note rate plus a liquidity spread. Guaranteed loans may be modified in TDRs in accordance with U.S. government agency guidelines. Interest continues to accrue at the modified rate. Guaranteed loans may either be resold into GNMA pools after a performance period specified by the programs or foreclosed and conveyed to the guarantors.

Loans are disaggregated into portfolio segments and further disaggregated into classes. The portfolio segment is the level at which the Company develops and documents a systematic method for determining its Allowance for Credit Losses. Classes are based on the risk characteristics of the loans and the Company's method for monitoring and assessing credit risk.

Allowance for Loan Losses and Accrual for Off-Balance Sheet Credit Risk

The appropriateness of the allowance for loan losses and accrual for off-balance sheet credit risk (collectively "Allowance for Credit Losses") is assessed by management based on an ongoing quarterly evaluation of the probable estimated losses inherent in the portfolio, including probable losses on both outstanding loans and unused commitments to provide financing. A consistent well-documented methodology has been developed and is applied by an independent Credit Administration department to assure consistency across the Company.

The allowance for loan losses consists of specific allowances attributed to impaired loans that have not yet been charged down to amounts we expect to recover, general allowances based on estimated loss rates by loan class and nonspecific allowances based on factors that affect more than one portfolio segment. There were no changes to the methodology for estimating general allowances during 2018 or 2017.

Loans are considered to be impaired when it becomes probable that BOK Financial will be unable to collect all amounts due according to the contractual terms of the loan agreements. Internally risk graded loans are evaluated individually for impairment. Substantially all commercial and commercial real estate loans and certain residential mortgage and personal loans are risk graded based on a quarterly evaluation of the borrowers' ability to repay. Certain commercial loans and most residential mortgage and personal loans are small balance, homogeneous pools of loans that are not risk graded. Non-risk graded loans are identified as impaired based on performance status. Generally, non-risk graded loans 90 days or more past due, modified in a troubled debt restructuring or in bankruptcy are considered to be impaired.

Specific allowances for impaired loans are measured by an evaluation of estimated future cash flows discounted at the loan's initial effective interest rate or the fair value of collateral for certain collateral dependent loans. The fair value of real property held as collateral is generally based on third party appraisals that conform to Uniform Standards of Professional Appraisal Practice, less estimated selling costs. Appraised values are on an “as-is” basis and generally are not adjusted by the Company. Updated appraisals are obtained at least annually or more frequently if market conditions indicate collateral values may have declined. Collateral value of mineral rights is generally determined by our internal staff of engineers based on projected cash flows from proven oil and gas reserves under existing economic and operating conditions. The value of other collateral is generally determined by our special assets staff based on projected liquidation cash flows under current market conditions. Collateral values and available cash resources that support impaired loans are evaluated quarterly. Historical statistics may be used as a practical way to estimate impairment in limited situations, such as when a collateral dependent loan is identified as impaired at the end of a reporting period until an appraisal of collateral value is received or a full assessment of future cash flows is completed. Estimates of future cash flows and collateral values require significant judgments and may be volatile.

General allowances for unimpaired loans are based on an estimated loss rate by loan class. The appropriate historical gross loss rate for each loan class is determined by the greater of the current loss rate based on the most recent twelve months or a ten-year average gross loss rate. Recoveries are not directly considered in the estimation of historical loss rates. Recoveries generally do not follow predictable patterns and are not received until well-after the charge-off date as a result of protracted legal actions. For risk graded loans, historical gross loss rates are adjusted for changes in risk grading. For each loan class, the current weighted average risk grade is compared to the long-term weighted average risk grade. This comparison determines whether credit risk in each loan class is increasing or decreasing. Historical loss rates are adjusted upward or downward in proportion to changes in average risk grading. General allowances for unimpaired loans also consider inherent risks identified for each loan class. Inherent risks consider loss rates that most appropriately represent the current credit cycle and other factors attributable to a specific loan class which have not yet been represented in the historical gross loss rates or risk grading. These factors include changes in commodity prices or engineering imprecision which may affect the value of reserves that secure our energy loan portfolio, construction risk that may affect commercial real estate loans, changes in regulations and public policy that may disproportionately impact health care loans and changes in loan products.

Nonspecific allowances are maintained for risks beyond factors specific to a particular portfolio segment or loan class. These factors include trends in the economy in our primary lending areas, concentration in large-balance loans and other relevant factors.

An accrual for off-balance sheet credit risk is included in Other liabilities in the Consolidated Balance Sheets. The appropriateness of the accrual is determined in the same manner as the allowance for loan losses.

A provision for credit losses is charged against or credited to earnings in amounts necessary to maintain an appropriate Allowance for Credit Losses. Recoveries of loans previously charged off are added to the allowance when received.

Real Estate and Other Repossessed Assets

Real estate and other repossessed assets are acquired in partial or total forgiveness of loans. These assets are initially recognized at cost, which is determined by fair value at date of foreclosure less estimated disposal costs. They are subsequently carried at the lower of cost or current fair value less estimated disposal costs. Decreases in fair value below cost are recognized as asset-specific valuation allowances which may be reversed when supported by future increases in fair value. Subsequent increases in fair value may be used to reduce the allowance but not below zero.

Fair values of real estate are based on “as is” appraisals which are updated at least annually or more frequently for certain asset types or assets located in certain distressed markets. Fair values based on appraisals are generally considered to be based on significant other observable inputs. The Company also considers decreases in listing price and other relevant information in quarterly evaluations and reduces the carrying value of real estate and other repossessed assets when necessary. Fair values based on list prices and other relevant information are generally considered to be based on significant unobservable inputs. Additional costs incurred to complete real estate and other repossessed assets may increase the carrying value, up to current fair value based on “as completed” appraisals. The fair value of mineral rights included in repossessed assets are generally determined by our internal staff of engineers based on projected cash flows from proven oil and gas reserves under existing economic and operating conditions. The value of other repossessed assets is generally determined by our special assets staff based on projected liquidation cash flows under current market conditions.

Income generated by these assets is recognized as received. Operating expenses are recognized as incurred. Gains or losses on sales of real estate and other repossessed assets are based on the cash proceeds received less the cost basis of the asset, net of any valuation allowances. The estimated disposal costs of real estate and other repossessed assets are evaluated by the Company on an annual basis based on actual results.

Transfers of Financial Assets

BOK Financial regularly transfers financial assets as part of its mortgage banking activities and periodically may transfer other financial assets. Transfers are recorded as sales when the criteria for surrender of control are met.

The Company has elected to carry certain residential mortgage loans held for sale at fair value under the fair value option. Changes in fair value are recognized in net income as they occur. These loans are reported separately in the Consolidated Balance Sheets and changes in fair value are recorded in Other Operating Revenue - Mortgage banking revenue in the Consolidated Statements of Earnings.

Fair value of conforming residential mortgage loans that will be sold to U.S. government agencies is based on sales commitments or market quotes considered Level 2 inputs. Fair value of mortgage loans that are unable to be sold to U.S. government agencies is based on Level 3 inputs using quoted prices of loans that are sold in securitization transactions with a liquidity discount applied. The fair value is corroborated with an independent third party on at least an annual basis.
BOK Financial retains a repurchase obligation under underwriting representations and warranties related to residential mortgage loans transferred and generally retains the right to service the loans. The Company may incur a recourse obligation in limited circumstances. Separate accruals are recognized in Other liabilities in the Consolidated Balance Sheets for repurchase and recourse obligations. These reserves reflect the estimated amount of probable loss the Company will incur as a result of repurchasing a loan, indemnifications, and other settlement resolutions.

Repurchases of loans with an origination defect that are also credit impaired are considered collateral dependent and are initially recognized at net realizable value (appraised value less the cost to sell). The difference between unpaid principal balance and net realizable value is not accreted. Repurchases of loans with an origination defect that are not credit impaired are carried at fair value as of the repurchase date. Interest income continues to accrue on these loans and the discount is accreted over the estimated life of the loan.

The Company may also choose to purchase GNMA loans once certain mandated delinquency criteria are met. The loans that are eligible and are chosen to be repurchased are initially recognized at fair value based on expected cash flow discounted using the average agency guaranteed debenture rates, average actual principal loss rates and liquidity premium.

Mortgage Servicing Rights

Mortgage servicing rights may be purchased or may be recognized when mortgage loans are originated and sold with servicing rights retained. All mortgage servicing rights are carried at fair value. Changes in the fair value are recognized in earnings as they occur.

Mortgage servicing rights are not traded in active markets. A cash flow model is used to determine fair value. Key assumptions and estimates, including projected prepayment speeds and assumed servicing costs, earnings on escrow deposits, ancillary income and discount rates, used by this model are based on current market sources. Assumptions used to value mortgage servicing rights are considered significant unobservable inputs. A separate third-party model is used to estimate prepayment speeds based on interest rates, housing turnover rates, estimated loan curtailment, anticipated defaults and other relevant factors. The prepayment model is updated daily for changes in market conditions and adjusted to better correlate with actual performance of BOK Financial's servicing portfolio. Fair value estimates from outside sources are received at least annually to corroborate the results of the valuation model.

Premises and Equipment

Premises and equipment are carried at cost, including capitalized interest when appropriate, less accumulated depreciation and amortization. Depreciation and amortization are computed on a straight-line basis over the estimated useful lives of the assets or, for leasehold improvements, over the shorter of the estimated useful lives or remaining lease terms. Useful lives range from 5 years to 40 years for buildings and improvements, 3 years to 10 years for software and related implementation costs, and 3 years to 10 years for furniture and equipment. Construction in progress represents facilities construction and data processing systems projects underway that have not yet been placed into service. Depreciation and amortization begin once the assets are placed into service.

Repair and maintenance costs, including software maintenance and enhancement costs, are charged to expense as incurred. Software licensing costs are generally charged to expense as incurred. Software licensing costs are capitalized if the contractual right to take possession of the software exists and it is feasible to take possession without significant penalty. Capitalized costs are amortized over the shorter of the estimated useful life of the software or remaining contractual life of the license.

Premises no longer used by the Company are transferred to real estate and other repossessed assets. The transferred amount is the lower of cost less accumulated depreciation or fair value less estimated disposal costs as of the transfer date.

Rent expense for leased premises is recognized as incurred over the lease term. The effects of rent holidays, significant rent escalations and other adjustments to rent payments are recognized on a straight-line basis over the lease term.

Ongoing technology projects of significant size or length are reviewed at least annually for impairment. Accumulated costs are reviewed for projects or components of projects that do not support the value of the asset being developed. Findings of obsolescence, duplicate effort or other conditions that do not support the recorded value are impaired, with the cost of the impaired components being charged to current-year earnings.

Federal and State Income Taxes

BOK Financial and its subsidiaries file consolidated tax returns. The subsidiaries provide for income taxes on a separate return basis and remit to BOK Financial amounts determined to be currently payable. BOK Financial is agent for its subsidiaries under the Company's tax sharing agreements and has no ownership rights to any refunds received for the benefit of its subsidiaries.

Current income tax expense or benefit is based on an evaluation that considers estimated taxable income, tax credits, and statutory federal and state income tax rates. The amount of current income tax expense or benefit recognized in any period may differ from amounts reported to taxing authorities. Annually, tax returns are filed with each jurisdiction where the Company conducts business and recognized current income tax expense or benefit is adjusted to the filed tax returns.

Deferred tax assets and liabilities are based upon the temporary differences between the values of assets and liabilities as recognized in the financial statements and their related tax basis using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. The effect of changes in statutory tax rates on the measurement of deferred tax assets and liabilities is recognized through income tax expense in the period the change is enacted. A valuation allowance is provided when it is more likely than not that some portion of the entire deferred tax asset may not be realized.

BOK Financial has unrecognized tax benefits, which are included in accrued current income taxes payable, for the uncertain portion of recorded tax benefits and related interest. These uncertainties result from the application of complex tax laws, rules, regulations and interpretations, primarily in state taxing jurisdictions. Unrecognized tax benefits are assessed quarterly and may be adjusted through current income tax expense in future periods based on changing facts and circumstances, completion of examinations by taxing authorities or expiration of a statute of limitations. Estimated penalties and interest on uncertain tax positions are recognized in income tax expense.

Employee Benefit Plans

BOK Financial sponsors a defined contribution plan ("Thrift Plan") and a defined benefit cash balance pension plan ("Pension Plan"). Employer contributions to the Thrift Plan, which matches employee contributions subject to percentage and years of service limits, are expensed when incurred. Pension Plan costs, which are based upon actuarial computations of current costs, are expensed annually. Pension Plan benefits were curtailed as of April 1, 2006. No participants may be added to the Pension Plan and no additional service benefits will be accrued. BOK Financial recognizes the funded status of its employee benefit plans. Adjustments required to recognize the Pension Plan's net funded status are made through accumulated other comprehensive income, net of deferred income taxes.

Share-Based Compensation Plans

BOK Financial awards stock options and non-vested common shares as compensation to certain officers. Compensation cost is generally fixed based on the grant date fair value of the award. The grant date fair value of stock options is based on the Black-Scholes option pricing model. Stock options generally have graded vesting over 7 years. Each tranche is considered a separate award for valuation and compensation cost recognition. Grant date fair value of non-vested shares is based on the then-current market value of BOK Financial common stock. Non-vested shares generally cliff vest in 3 years and are subject to a holding period after vesting of 2 years. Compensation cost of non-vested shares granted under the Executive Incentive Plan varies based on changes in the fair value of BOKF common shares.

Compensation cost is recognized as expense over the service period, which is generally the vesting period. Expense is reduced for estimated forfeitures over the vesting period and adjusted for actual forfeitures as they occur. Stock-based compensation awarded to certain officers has performance conditions that affect the number of awards granted. Compensation cost is adjusted based on the probable outcome of the performance conditions.

Tax effects of share-based payments are recognized through tax expense. Dividends on non-vested shares that are not subject to forfeiture are charged to retained earnings.

Other Operating Revenue

Fees and commissions revenue is generated through the sales of products, consisting primarily of financial instruments, and the performance of services for customers under contractual obligations. Revenue from providing services for customers is recognized at the time services are provided in an amount that reflects the consideration we expect to be entitled to for those services. Revenue is recognized based on the application of five steps:

- Identify the contract with a customer
- Identify the performance obligations in the contract
- Determine the transaction price
- Allocate the transaction price to the performance obligations in the contract
- Recognize revenue when (or as) the Company satisfies a performance obligation

For contracts with multiple performance obligations, individual performance obligations are accounted for separately if the customer can benefit from the good or service on its own or with other resources readily available to the customer and the promise to transfer goods and services to the customer is separately identifiable in the contract. The transaction price is allocated to the performance obligations based on relative standalone selling prices.

Revenue is recognized on a gross basis whenever we have primary responsibility and risk in providing the services or products to our customers and have discretion in establishing the price for the services or products. Revenue is recognized on a net basis whenever we act as an agent for products or services of others.

Brokerage and trading revenue includes revenues from trading, customer hedging, retail brokerage and investment banking. Trading revenue includes net realized and unrealized gains primarily related to sales of securities to institutional customers and related derivative contracts. Customer hedging revenue includes realized and unrealized changes in the fair value of derivative contracts held for customer risk management programs including credit valuation adjustments, as necessary. We offer commodity, interest rate, foreign exchange and equity derivatives to our customers. These customer contracts are offset with contracts with selected counterparties and exchanges to minimize changes in market risk from changes in commodity prices, interest rates or foreign exchange rates. Retail brokerage revenue represents fees and commissions earned on sales of fixed income securities, annuities, mutual funds and other financial instruments to retail customers. Investment banking revenue includes fees earned upon completion of underwriting and financial advisory services. Investment banking revenue also includes fees earned in conjunction with loan syndications.

Transaction card revenue includes merchant discount fees and electronic funds transfer network fees, net of interchange fees paid to card issuers and assessments paid to card networks. Merchant discount fees represent fees paid by customers for account management and electronic processing of card transactions. Merchant discount fees are recognized at the time the customer’s transactions are processed or other services are performed. The Company also maintains the TransFund electronic funds transfer network for the benefit of its members, which includes the BOKF, NA. Electronic funds transfer fees are recognized as electronic transactions processed on behalf of its members.

Fiduciary and asset management revenue includes fees from asset management, custody, recordkeeping, investment advisory and administration services. Revenue is recognized on an accrual basis at the time the services are performed and may be based on either the fair value of the account or the service provided.

Deposit service charges and fees include commercial account service charges, overdraft fees, check card fee revenue and automated service charge and other deposit service fees. Fees are recognized at least quarterly in accordance with published deposit account agreements and disclosure statements for retail accounts or contractual agreements for commercial accounts. Item charges for overdraft or non-sufficient funds items are recognized as items are presented for payment. Account balance charges and activity fees are accrued monthly and collected in arrears. Commercial account activity fees may be offset by an earnings credit based on account balances. Check card fees represent interchange fees paid by a merchant bank for transactions processed from cards issued by the Company. Check card fees are recognized when transactions are processed.

Mortgage banking revenue includes revenues recognized in conjunction with the origination, marketing and servicing of conventional and government-sponsored residential mortgage loans. Mortgage production revenue includes net realized gains (losses) on sales of residential mortgage loans in the secondary market and the net change in unrealized gains (losses) on residential mortgage loans held for sale. Mortgage production revenue also includes changes in the fair value of derivative contracts not designated as hedging instruments related to residential mortgage loan commitments and forward sales contracts. Mortgage servicing revenue includes servicing fee income and late charges on loans serviced for others.

Newly Adopted and Pending Accounting Pronouncements

The following is a summary of newly adopted and pending accounting pronouncements that may have a more than insignificant effect on the Company's financial statements.

Financial Accounting Standards Board ("FASB")

FASB Accounting Standards Update No. 2014-09, *Revenue from Contracts with Customers* ("ASU 2014-09")

On May 28, 2014, the FASB issued ASU 2014-09 to clarify the principles for recognizing revenue by providing a more robust framework that will give greater consistency and comparability in revenue recognition practices. In the new framework, an entity recognizes revenue in an amount that reflects the consideration to which the entity expects to be entitled in exchange for goods or services. The new model requires the identification of performance obligations included in contracts with customers, a determination of the transaction price and an allocation of the price to those performance obligations. The entity recognizes revenue when performance obligations are satisfied. Revenue from financial assets and liabilities is explicitly excluded from the scope of ASU 2014-09. Management adopted the standard in the first quarter of 2018 using the modified retrospective transition method. There were no significant cumulative effect adjustments as a result of implementation as of January 1, 2018 as our current revenue recognition policies generally conformed with the principals in ASU 2014-09.

FASB Accounting Standards Update No. 2016-08, *Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net) ("ASU 2016-08")*

On March 17, 2016, the FASB Issued ASU 2016-08 to amend the principal versus agent implementation guidance in ASU 2014-09. The ASU clarifies that an entity should evaluate whether it is the principal or the agent for each specified good or service promised in a contract with a customer. Management adopted the standard in the first quarter of 2018. Interchange fees paid to issuing banks for card transactions processed related to its merchant processing services previously included in data processing and communication expense are now netted against the amounts charged to the merchant in transaction card processing revenue.

FASB Accounting Standards Update No. 2016-01, *Financial Instruments - Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities ("ASU 2016-01")*

On January 5, 2016, the FASB issued ASU 2016-01 over the recognition and measurement of financial assets and liabilities. The update requires equity investments, in general, to be measured at fair value with changes in fair value recognized in earnings. It also eliminates the requirement to disclose the methods and significant assumptions used to estimate the fair value for financial instruments measured at amortized cost, requires entities to use the exit price notion when measuring fair value, requires an entity to present separately in other comprehensive income the portion of the total change in fair value of a liability resulting from a change in the instrument-specific credit risk when the fair value option has been elected, requires separate presentation of financial assets and liabilities by measurement category and form on the balance sheet or accompanying notes, clarifies that an entity should evaluate the need for a valuation allowance on a deferred tax asset related to available-for-sale securities in combination with the entity's other deferred tax assets, and simplifies the impairment assessment of equity investments without readily determinable fair values. Management adopted the standard in the first quarter of 2018. Upon adoption, net unrealized gains of $2.7 million from equity securities were reclassified from other comprehensive income to retained earnings.

FASB Accounting Standards Update No. 2016-02, *Leases (Topic 842) ("ASU 2016-02")*

On February 25, 2016, the FASB issued ASU 2016-02 to increase transparency and comparability by recognizing lease assets and liabilities on the balance sheet and disclosing key information about leasing arrangements. Lessees will be required to recognize an obligation for future lease payments measured on a discounted basis and a right-of-use asset. The ASU is effective for the Company for interim and annual periods beginning after December 15, 2018. As originally issued, ASU 2016-02 required implementation through the modified transition method applied as of the earliest period presented in the financial statements. In 2018 an additional and optional transition method that allows entities to apply the standard as of the adoption date was approved. BOKF elected this optional transition method. BOKF elected all practical expedients other than the lessee's practical expedient to combine lease and non-lease components which would further gross up the lease liability and related right of use asset. The implementation of ASU 2016-02 increased the reported right of use assets and liabilities by approximately $137 million. The effect on retained earnings was immaterial.

FASB Accounting Standards Update No. 2016-13, *Financial Instruments - Credit Losses (Topic 326): Assets Measured at Amortized Cost ("ASU 2016-13")*

On June 16, 2016, the FASB issued ASU 2016-13 in order to provide more timely recording of credit losses on loans and other financial instruments. The ASU adds an impairment model (known as the current expected credit loss ("CECL") model) that is based on expected credit losses rather than incurred credit losses. It requires measurement of all expected credit losses for financial assets carried at amortized cost, including loans and related off-balance sheet credit exposure and investment securities, based on historical experience, current conditions, and reasonable and supportable forecasts. ASU 2016-13 also changes the recognition of other-than-temporary impairment of available for sale securities to an allowance methodology from a direct write-down methodology. ASU 2016-13 will be effective for the Company for annual reporting periods beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted for annual reporting periods beginning after December 15, 2018. ASU 2016-13 will be applied through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective.

The Company has established a CECL implementation team in order to evaluate the impact the adoption of ASU 2016-13 will have on the Company's financial statements. The CECL implementation team, overseen by the Chief Credit Officer, Chief Financial Officer, and Chief Risk Officer, has developed a project plan that incorporates input from various departments within the bank including Credit, Financial Reporting, Risk, and Information Technology among others. Key implementation activities for 2018 included portfolio segmentation, credit risk driver identification, model development, as well as process and information systems enhancements. Key implementation initiatives for 2019 include model validation and development of governance and control and disclosure frameworks. The Company will adopt the standard on January 1, 2020.

FASB Accounting Standards Update No. 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments ("ASU 2016-15")*

On August 26, 2016, the FASB issued ASU 2016-15, which amends guidance in ASC 230 on the classification of certain cash receipts and payments in the statement of cash flows. The amendments address eight cash flow issues. Management adopted the standard in first quarter of 2018. Adoption of ASU 2016-15 did not have a material impact on the Company's financial statements.

FASB Accounting Standards Update No. 2017-12, *Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities ("ASU 2017-12")*

On August 28, 2017, the FASB issued ASU 2017-12, which amends the hedge accounting recognition and presentation requirements in ASC 815 in order to improve transparency and understandability of information and reduce the complexity. The update expands the types of transactions eligible for hedge accounting, eliminates the requirement to separately measure and present hedge ineffectiveness, simplifies hedge effectiveness assessments and updates documentation and presentation requirements. The update allows the reclassification of certain debt securities from held to maturity to available for sale if the debt security is eligible to be hedged under the last-of-layer method. ASU 2017-12 is effective for the Company for fiscal years beginning after December 15, 2018, and interim periods therein; however, early adoption was permitted. Adoption of ASU 2017-12 had no material impact on the Company's financial statements.

FASB Accounting Standards Update No. 2018-05, *Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118 (SAB 118).*

On March 13, 2018, the FASB issued ASU 2018-05, which adds SEC guidance related to SAB 118 - *Income Tax Accounting Implications of the Tax Cuts and Jobs Act*. ASU 2018-05 was effective upon issuance. The adoption of ASU 2018-05 has not had a significant impact in 2018.

FASB Accounting Standards Update No. 2018-15, *Intangibles - Goodwill and Other Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract ("ASU 2018-15")*

On August 29, 2018, the FASB issued ASU 2018-15, which requires a customer in a cloud hosting arrangement that is a service contract to follow the internal use software requirements in ASC 350-40 to determine which implementation costs to capitalize or expense as incurred. Internal use software guidance requires the capitalization of costs incurred during the development phase. Capitalized costs will be amortized over the term of the hosting arrangement beginning when the arrangement is ready for its intended use. ASU 2018-15 is effective for the Company for fiscal years beginning after December 15, 2019; however, early adoption is permitted. The Company elected to early adopt the update prospectively in third quarter of 2018. The adoption of ASU 2018-15 has not had a significant impact in 2018.

(2) Securities
Trading Securities

The fair value and net unrealized gain (loss) included in trading securities is as follows (in thousands):

	December 31, 2018		December 31, 2017	
	Fair Value	Net Unrealized Gain (Loss)	Fair Value	Net Unrealized Gain (Loss)
U.S. government agency debentures	**$63,765**	**$ 254**	$21,196	$ 8
U.S. government agency residential mortgage-backed securities	**1,791,584**	**9,966**	392,673	(517)
Municipal and other tax-exempt securities	**34,507**	**(1)**	13,559	83
Asset-backed securities	**42,656**	**685**	23,885	(26)
Other trading securities	**24,411**	**65**	11,363	4
Total trading securities	**$1,956,923**	**$ 10,969**	$462,676	$ (448)

Investment Securities

The amortized cost and fair values of investment securities are as follows (in thousands):

	December 31, 2018			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
Municipal and other tax-exempt securities	**$137,296**	**$138,562**	**$1,858**	**$(592)**
U.S. government agency residential mortgage-backed securities	**12,612**	**12,770**	**293**	**(135)**
Other debt securities	**205,279**	**215,966**	**12,257**	**(1,570)**
Total investment securities	**$355,187**	**$367,298**	**$14,408**	**$(2,297)**

	December 31, 2017			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
Municipal and other tax-exempt securities	$228,186	$230,349	$2,967	$(804)
U.S. government agency residential mortgage-backed securities	15,891	16,242	446	(95)
Other debt securities	217,716	233,444	17,095	(1,367)
Total investment securities	$461,793	$480,035	$20,508	$(2,266)

The amortized cost and fair values of investment securities at December 31, 2018, by contractual maturity, are as shown in the following table (dollars in thousands):

	Less than One Year	One to Five Years	Six to Ten Years	Over Ten Years	Total	Weighted Average Maturity[2]
Municipal and other tax-exempt securities:						
Carrying value	$41,475	$46,363	$35,077	$14,381	$137,296	4.73
Fair value	41,371	46,123	36,471	14,597	138,562	
Nominal yield[1]	2.25 %	3.94 %	6.00 %	4.32 %	4.00 %	
Other debt securities:						
Carrying value	$16,282	$61,830	$115,606	$11,561	$205,279	5.50
Fair value	16,327	63,923	125,050	10,666	215,966	
Nominal yield	3.88 %	4.69 %	5.76 %	4.33 %	5.21 %	
Total fixed maturity securities:						
Carrying value	$57,757	$108,193	$150,683	$25,942	$342,575	5.19
Fair value	57,698	110,046	161,521	25,263	354,528	
Nominal yield	2.71 %	4.37 %	5.82 %	4.32 %	4.73 %	
Residential mortgage-backed securities:						
Carrying value					$12,612	[3]
Fair value					12,770	
Nominal yield[4]					2.77 %	
Total investment securities:						
Carrying value					$355,187	
Fair value					367,298	
Nominal yield					4.65 %	

[1] Calculated on a taxable equivalent basis using a 25 percent effective tax rate.

[2] Expected maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without penalty.

[3] The average expected lives of residential mortgage-backed securities were 4.7 years based upon current prepayment assumptions.

[4] The nominal yield on residential mortgage-backed securities is based upon prepayment assumptions at the purchase date. Actual yields earned may differ significantly based upon actual prepayments. See Quarterly Financial Summary - Unaudited for current yields on the investment securities portfolio.

Available for Sale Securities

The amortized cost and fair value of available for sale securities are as follows (in thousands):

	December 31, 2018				
	Amortized	Fair	Gross Unrealized		
	Cost	Value	Gain	Loss	OTTI
U.S. Treasury securities	$ 496	$ 493	$ —	$ (3)	$ —
Municipal and other tax-exempt securities	2,782	2,864	82	—	—
Residential mortgage-backed securities:					
U.S. government agencies:					
FNMA	3,414,573	3,367,124	10,559	(58,008)	—
FHLMC	1,723,399	1,699,779	5,189	(28,809)	—
GNMA	748,351	737,805	401	(10,947)	—
Total U.S. government agencies	5,886,323	5,804,708	16,149	(97,764)	—
Private issue	40,948	59,736	18,788		