2020 Annual Report

BOK FINANCIAL CORPORATION

Credit Ratings

	S&P	Moody's	Fitch Ratings
BOK Financial Corporation Long-term Issuer	BBB+ (ON)	A3 (ON)	A (ON)
BOKF, NA Long-term Issuer	A- (ON)	A3 (ON)	A (ON)

2020 Highlights

30th consecutive year of profitability

Wealth Management revenue tops $500 million for the first time in company history

Record $786 million in pre-tax, pre-provision revenue

Robust deposit growth with year-end deposits up more than 30% year-over-year

Mortgage adds record $182 million in revenue

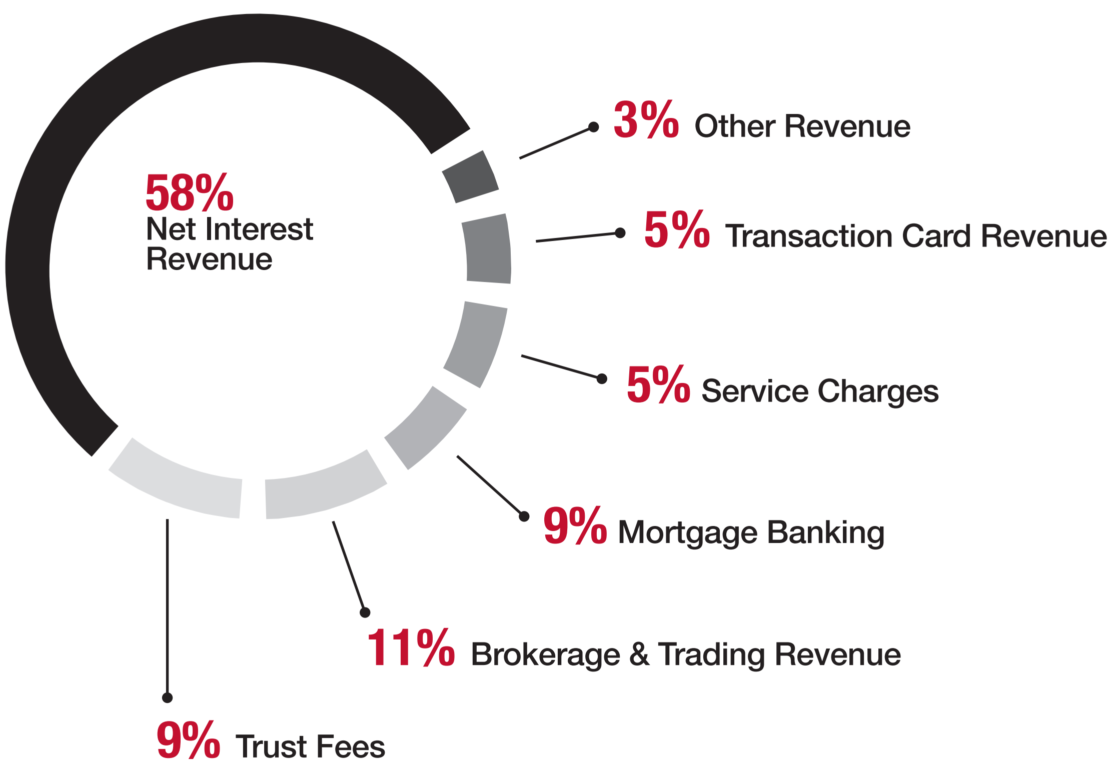
15th consecutive year of dividend increases

Key Statistics

At December 31, 2020

Assets	Loans	Deposits	Assets Under Management	Fiduciary Assets
$47 Billion	$23 Billion	$36 Billion	$92 Billion	$60 Billion

Diversified Revenue



Dear Shareholders,

2020 was dominated by national news headlines—a 100-year pandemic, an energy industry downturn, near-zero interest rates and political uncertainty. This quartet of headwinds acted as the ultimate test of our business model, core values and the resiliency of our employees. I'm proud to say that we delivered a differentiated outcome on all fronts:
for our customers, our employees, our shareholders and our communities.

In a year many have characterized as "worth forgetting," BOK Financial Corporation, in my opinion, had a year that will be worth remembering.

Our Customers

Despite the challenges of conducting business almost wholly through virtual mediums, we stayed closely connected to customers. As a relationship-oriented institution, we saw the need for advice and counsel elevate substantially in all areas of our organization due to the extreme economic pressure brought by COVID-19.

We were there for our business customers the day the Paycheck Protection Program went live on Friday, April 3. We redeployed more than 500 employees from many different areas of our company to help clients secure much-needed funding to keep their businesses and employee payrolls intact. In the end, we came together to help more than 5,000 customers receive over $2 billion in PPP funds. And we are poised to continue that assistance as new stimulus programs unfold in the new year.

We helped evaluate investment portfolios and objectives with our many wealth management customers in light of extreme market volatility. As these clients sought ways to reduce risk and gain an advantage as market stability returned, we provided the crucial counsel sought in times of economic crisis.

We also took swift action for our consumer banking customers, eliminating certain fees and loosening policies surrounding overdrafts. Additionally, quick access to forbearance relief for our mortgage customers provided financial flexibility and resiliency for families most impacted.

Our Employees

In mid-March, we swiftly undertook a massive initiative to move more than 75% of our employees to a work from home status. This involved a severe test of the many technology infrastructure and business resiliency investments we have made in the last several years. Candidly, it went better than we even anticipated. We quickly deployed a substantial inventory of laptops to employees who needed them, enabling us to maintain connectivity with customers and one another. For those critical employees who needed to stay on-site, we created proper cleaning and spacing protocol while using multiple sites where possible to reduce employee density. As part of the work from home process, we differentiated pay for the critical workforce and provided incremental funds for the technology needed at home for employees with school-age children. We also provided tutoring services and additional funds for employees to retain child care services for those who needed it. Our employee engagement's defining characteristic was flexibility, as many were navigating unique challenges for themselves and their family.

Pandemic response aside, 2020 was also a year of advancing our commitment to building an even stronger and more diverse workforce in the second full year for our Diversity and Inclusion Council. We made great strides implementing an educational program focused on leveraging inclusion and mitigating unconscious bias for our employees, as well as a formal mentoring program as part of our talent development focus. We see a tremendous opportunity to gain greater diversity of thought and experience across our company as we see leadership transitions over the next 3-5 years in many vital areas. To address this, we continue to build a prepared slate of diverse candidates for those roles. In fact, we have made strides in increasing both the gender and racial diversity of our succession slates. Of note, this year we have doubled our percentage of internal female successor candidates for senior leadership team roles. We believe that a diverse workforce isn't merely a desire; it's necessary to drive business growth in the years ahead.

Our commitment to cultivate a diverse and inclusive workplace did not stop within our walls. In 2020, we signed the CEO Action for Diversity & Inclusion™ Pledge, the largest CEO-driven business commitment to advance diversity and inclusion in the workplace. We are proud to join the more than 1,000 CEOs of the world's leading companies who have agreed to take action to cultivate a workplace where different points of view are welcomed, and employees feel encouraged to discuss challenging issues at work. I fully expect BOK Financial Corporation to be a leader in our industry and our communities when advancing diversity and inclusion efforts. There is still much work to do, but I am incredibly proud of the progress made in 2020.

Our Shareholders

We often discuss with our investors that we have intentionally built the bank to mitigate downside risk and earnings volatility. Remaining disciplined in our credit underwriting throughout the cycle and investing in growth for our fee-based businesses has been our company's hallmark for decades.

That dual strategy was on full display in 2020 as we saw a precipitous drop in energy pricing, a key segment of our loan portfolio. Even though the economic outlook component of CECL drove a quick and significant increase to loan loss reserves in the first half of 2020, our asset quality has remained incredibly resilient. In fact, we expect to continue our outperformance related to charge-offs in our energy portfolio compared to peers in the space, while maintaining sub-historic charge-offs across all other lending functions.

The 150 basis points of emergency Federal Reserve rate cuts in March made the outlook for incremental quarterly earnings growth difficult for most banks. But having the ability to serve client needs across the spectrum of financial services is a competitive advantage for BOK Financial Corporation—and the income diversity rewards shareholders. Our fee income streams produced more than $800 million in revenue in 2020, a testament to our resiliency during economic distress. Unprecedented demand due to the low rate environment and lack of industry capacity was a historic force that vaulted margins in our mortgage business to all-time highs. Our mortgage team produced record revenues in 2020, earning more than $180 million for the company.

Additionally, our wealth management division put together a record revenue year with its host of complementary business units. We have considerable expertise related to mortgage backed securities trading and commodity hedging, and together, these two units increased revenue by a combined $67.9 million from 2019. Combined with significant deposit growth and growing investment management and investment banking revenue, our wealth management division is a diversified business within itself that provides stable shareholder value in both good times and bad.

Despite the headwinds for the banking sector, our ability to generate revenue has never been more impressive with record annual pre-tax, pre-provision earnings of $786.4 million. Throughout 2020 we continued to accumulate capital and, once the immediate storm had passed, opportunistically bought back shares of our common equity to support EPS growth into the future.

Our Communities

As the pandemic accelerated, so too did the deployment of our financial and employee volunteer resources to help those suffering most in the communities we serve. With a focus on organizations helping displaced workers from the hard-hit hospitality and restaurant industries, we embraced our leadership role in our communities by providing a record $6.8 million in funding to nonprofits serving critical needs. Our employees volunteered nearly 16,000 hours of their time and expertise, including 271 employees engaged in 465 meaningful leadership roles with organizations within our communities. As witnessed by our top ranking in the 2020 American Banker reputation survey, community engagement isn't casual at BOKF; it's a significant core value for all of our employees.

Like many across the country, we were outraged by the multiple incidents that resulted from income inequality and racial injustice that were only made worse by the disparate impact of the pandemic. We feel that it's critical to back up our words with actions, so we have identified opportunities to address the root causes of income inequality and racial injustice by partnering with Tulsa and Dallas agencies focused on improving outcomes, especially in low to moderate income communities. Our focus has been to provide incremental funding and employee direct engagement to assist these agencies. As we monitor progress and outcome, we expect to broaden our focus to include all of the BOKF footprint markets.

Our Future

2020 was a year that tested our core strengths and revealed our core values in a meaningful way. While the pandemic will ultimately be resolved through medical advancement, the impact on our company culture, our customer relationships, and our role in our communities will be forever changed—for the better.

Looking ahead, we remain optimistic about the resiliency of our customers and employees, and we expect upside growth across many of our business segments. We see a future that includes more robust digital capabilities, but also one where the value of a personal relationship with BOK Financial Corporation is significantly enhanced. The complexity of decision-making arising from the pandemic and its consequences has been a tremendous challenge for our customers. Like never before, we embrace our role as a foundation of experience, advice and counsel to create the best possible outcomes. This is a sweet spot for BOKF. Our operating model provides a credible and sustainable alternative to the national banks and investment firms that almost exclusively rely on technology to deliver impersonal, "in the box" solutions. While digital solutions are important for day to day transactional needs, we believe that having experienced, well-prepared and fully supported professionals to assist clients with their most meaningful decisions is critical to their success—as well as ours.

As shareholders, we appreciate the confidence and trust you have placed in our company and our leadership team. We are grateful that you allow us to execute disciplined strategies that pay off in times of uncertainty, and you can see the fruits of that labor today. We pledge to keep the company firmly focused on long-term shareholder value and growth—while achieving that in tandem with a highly energized and committed workforce—and being a leader in the communities we serve. 2020 was a year like no other, but the growth story of BOK Financial Corporation has been enhanced from the challenges we have faced successfully.

Sincerely,

Steven G. Bradshaw
President and Chief Executive Officer

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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2020

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 CORP
(Exact name of registrant as specified in its charter)

OK	73-1373454
(State or other jurisdiction of Incorporation or Organization)	**(IRS Employer Identification No.)**
Bank of Oklahoma Tower	
Boston Avenue at Second Street	
Tulsa, OK	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 ☒ No ☐
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15 (d) of the Act. Yes ☐ No ☒

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

Indicate by check mark whether the registrant has submitted electronically 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 ☒ 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 ☒ 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 ☒

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

The aggregate market value of the registrant's common stock ("Common Stock") held by non-affiliates is approximately $1.8 billion (based on the June 30, 2020 closing price of Common Stock of $56.44 per share). As of January 31, 2021, there were 69,577,615 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the Registrant’s Proxy Statement for the 2021 Annual Meeting of Shareholders.

BOK Financial Corporation
Form 10-K
Year Ended December 31, 2020

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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, 2020, the Company reported total consolidated assets of $47 billion.

BOKF, NA is a wholly owned subsidiary bank of BOK Financial. BOKF, NA operates TransFund, Cavanal Hill Investment Management and BOK Financial Asset Management, Inc. BOKF, NA operates banking divisions across eight states: Bank of Albuquerque, Bank of Oklahoma, Bank of Texas and BOK Financial in Arizona, Arkansas, Colorado, Kansas and Missouri; as well as having limited purpose offices in Nebraska, Wisconsin and Connecticut. 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; BOK Financial Private Wealth, Inc., an investment adviser to high net worth clients; and BOK Financial Insurance, Inc., a broker providing insurance services. 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 and insurance 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 39% to 48% of our total revenue. Approximately 42% of our revenue came from fees and commissions in 2020.

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 commodity 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 loan origination and servicing activities. Wealth Management engages in brokerage and trading activities, mainly related to providing liquidity to the mortgage markets through trading of U.S. government agency mortgage-backed securities and related derivative contracts. Wealth Management also provides fiduciary services, private bank services, investment advisory services and insurance services in all markets. Additionally, Wealth Management underwrites state and municipal securities. 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, 2020.

We are the largest financial institution in the state of Oklahoma with 16% of the state's total deposits. We have 38% 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 1% 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 1% 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.

Human Capital Management and Practices

In order to continue leading the financial industry as a provider of sophisticated solutions to businesses, institutions and individuals across the country, it is crucial that we attract, develop and retain top talent. To facilitate talent attraction and retention, we strive to make BOK Financial an inclusive workplace with opportunities for our employees to grow and develop in their careers. We support our employees with strong compensation, benefits, and wellness programs. We also work to build connections between our employees and our communities. "Actively advancing the communities we serve" is one of our core values. Those familiar with BOK Financial will recognize the generosity of our employees in our communities as one of the hallmarks of our culture, and a source of pride as we live out our purpose statement of "Achieving More Together".

As of December 31, 2020, BOK Financial and its subsidiaries employed approximately 4,915 full-time and part-time employees, the majority of which are full-time employees. None of the Company's employees are represented by collective bargaining agreements. Management considers its employee relations to be good. Our employees are distributed over our eight state footprint, to include: Oklahoma, Texas, Arkansas, Kansas, Missouri, Colorado, New Mexico and Arizona. As of year-end 2020, our voluntary turnover rate was 10.5%, well below the financial services industry benchmark of 14%+ for voluntary turnover.

Response to COVID-19

Related to the COVID-19 pandemic, we implemented protocols that we determined were in the best interest of our employees to ensure operational continuity and employee safety. We moved a majority of our employees to a work-from-home status and implemented additional safety measures for employees continuing critical on-site operations. In addition, we implemented enhanced compensation and benefits offerings for employees and their families throughout the year.

Diversity and Inclusion Efforts

We believe that our organization should reflect the diversity of the communities we serve. We also recognize that in order for a diverse workforce to thrive, we must prioritize inclusion efforts. The following categories represent areas of focus for Diversity & Inclusion: community engagement, senior leader engagement, Communities of Practice, diverse recruiting practices and education.

Community Engagement

In 2020, the company and our BOKF Foundation gave a combined $6.2 million to organizations making a difference in our communities. Our employees donated more than 12,000 volunteer hours and more than 250 employees served on 320 nonprofit boards. Over the past ten years, we have committed nearly $565 million in loan funding to support affordable housing projects and nearly $305 million in affordable housing investments.

Senior Leader Engagement

Our Diversity & Inclusion Council is led by our CEO and President, Steve Bradshaw, and includes other members of the executive leadership team, as well as senior leaders throughout our footprint. As an organization, we joined the ‘CEO Action for Diversity and Inclusion’ Pledge. The pledge outlines our commitment to cultivating a trusting environment where all ideas are welcomed, and employees feel comfortable and empowered to have discussions about diversity and inclusion.

Mentorship Program

Our mentorship program launched in the fourth quarter of 2020. We believe that mentorship programs are a valuable tool for helping employees successfully shape their long-term career trajectory. Mentor matches are prioritized for availability for females and people of color.

Communities of Practice

Earlier this year, we introduced a concept called ‘Communities of Practice’ ("CoP") as a way for our organization to build inclusive groups to harness the collective power of diverse skills, styles, strengths and experiences – and leverage those strengths into advancing our business. Six groups connecting employees from different disciplines, markets and lines of business were launched in 2020. More CoPs are set to launch in 2021, to include: Advancing Minority Owned Businesses, Practicing Inclusion, and Diverse Recruiting Practices. Any person from across the organization can join any Community of Practice; these groups highlight our enterprise focus on inclusivity.

Diverse Recruiting Practices

All members of the recruiting team have completed the Alliance of Information & Referral Systems ("AIRS") Certified Diversity Recruiter certification as well as a custom-developed training program for BOKF talent and attraction specialists. University recruiting has been a focal point for our diversity efforts. Our 2020 class of interns and early career associates saw significant increases both in number of females and people of color.

Diversity Education

Unconscious bias education was introduced for all managers in order to provide tools to adjust automatic patterns of thinking related to hiring practices. At the beginning of 2020, we also introduced a partnership with a well-known learning vendor to ensure all employees across the company had equal access to development opportunities in a virtual setting. The concept of ‘inclusion’ is woven into many of the learning opportunities offered by our Talent and Organizational Development team; examples would include: ‘Communicating Across Generations’ and ‘Crucial Conversations’.

Benefits and Compensation Offerings

BOKF is committed to the health and wellness of our employees. We provide our employees and their families with access to a variety of flexible and convenient health and wellness programs. We encourage engagement in healthy behaviors and offer options, where possible, to customize benefits to meet the needs of employees and their families. We provide robust compensation and benefits programs to help meet the needs of our employees. In addition to base salaries, these programs may include incentive compensation, discretionary bonuses, equity, 401(k), health and wellness benefits, health savings and flexible spending accounts, paid time off, family leave, flexible work schedules, employee assistance programs, and tuition reimbursement.

Talent Development

Our talent development programs provide employees with the resources they need to achieve their career goals, build management skills and lead within BOKF. We provide ‘boot camps’ that support professional development. We have programs that prepare high-potential talent for the leadership roles of tomorrow.

Connecting with Our Communities

Since our employees are passionate about many causes, our corporate giving and volunteering programs support and encourage employees by engaging with those causes. Our employee-led giving program allows employees to nominate and vote for nonprofit organizations across our footprint to receive financial benefit from our Foundation. This year, over 2,100 employees nominated and voted on 212 nonprofit organizations to receive funding.

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. 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. 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.

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 four capital metrics 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. In addition to the risk-based capital ratios, the Company is also subject to the leverage ratio. The leverage ratio is determined by dividing Tier 1 capital by adjusted average total 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. Several components, which had previously been deferred, were finalized in 2019. These have been implemented with no material capital impact.

Failure to meet minimum capital requirements 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 (DRR) 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 ultimately resulted 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 September 30, 2018 the DRR rose above 1.35%. Accordingly, the surcharge for depository institutions with assets of greater than $10 billion ceased. On September 15, 2020, the FDIC Board of Directors waived the provision of the FDIC's assessment regulations requiring that the reserve ratio must be at least 1.35% for the FDIC to remit the full nominal value of an insured depository institution's remaining assessment credits. All remaining small bank credits were refunded on the September 30, 2020 assessment invoice, ending the application of small bank credits.

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.

The spread of COVID-19 and related economic shutdowns that occurred during 2020 resulted in significant economic instability. In response, Congress and the Federal Reserve took aggressive actions. Congress passed an emergency $2.2 trillion relief package, the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act"), designed to alleviate some of the worst effects of the swift economic downturn. The Federal Reserve lowered the federal funds rate by 150 basis points to near zero and has initiated additional programs to infuse liquidity and stimulate economic activity. The Federal Reserve increased its purchasing position, purchasing about $120 billion in securities a month in the final half of 2020. The Federal Open Market Committee is committed to keeping the federal funds rate at the current level until the labor market has recovered consistent with their assessment of maximum employment and inflation has risen to 2 percent, and is on track to exceed that for some time. In December, 2020, Congress passed an additional $900 billion in stimulus to the U.S. economy. The newest package included the extension of federal pandemic unemployment compensation, funds for healthcare and vaccination distributions, an extended stay on evictions, stimulus check for qualifying Americans, employee tax credits, additional Paycheck Protection Program relief, among other provisions.

The drastic decline in economic conditions in March and April was partially offset by a steep incline in May and June and moderated in the subsequent months. Real GDP grew 33% in the third quarter and demand for durable goods increased to pre-pandemic levels. The housing market completely bounced back due to continued low mortgage interest rates. See "Summary of Credit Loss Experience" section on Management's Discussion and Analysis for further discussion around our economic forecast.

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;
- a breach in the security of BOK Financial's systems 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 acquisition of customers.

Government regulations and political environment 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.

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 recent Federal executive and legislative changes, add additional uncertainty to the implementation, scope and timing of changes in the regulatory environment for the banking industry and for the broader economy.

BOK Financial has a long-standing relationship with the energy industry and the local economies within BOKF's geographical footprint have a concentration in energy-related industries. The energy industry is facing increased pressure from investors and the government to mitigate greenhouse emissions, which could significantly increase costs, hinder financial results and shrink the industry.

Our business, financial condition, liquidity and results of operations have been, and will likely continue to be, adversely affected by the COVID-19 pandemic.

The Coronavirus Disease 2019 ("COVID-19") pandemic has created economic and financial disruptions that have adversely affected, and are likely to continue to adversely affect, BOKF's business, financial condition, liquidity and results of operations. The extent to which the COVID-19 pandemic will continue to affect our business, financial condition, liquidity and results of operations will depend on future developments, which are highly uncertain and cannot be predicted, including the scope and duration of the pandemic, the continued effectiveness of our business continuity plan, the direct and indirect impact of the pandemic on our employees, customers, clients, counterparties and service providers, as well as other market participants, and the effectiveness of actions taken by governmental authorities and other third parties in response to the pandemic.

The spread of the COVID-19 virus and the resulting "Stay at Home" orders, travel restrictions, and closed schools and work places caused severe disruptions in the U.S. economy, which has in turn disrupted the business activities and operations of our customers, as well as our business and operations. The COVID-19 outbreak was first reported in Wuhan, Hubei Province, China in December 2019, and has resulted in millions of confirmed cases identified around the world, many in the U.S. As a result of the pandemic, many businesses were shut down or continue to be shut down, supply chains were interrupted, slowed, or rendered inoperable, and many individuals have become ill, quarantined, or otherwise unable to work and/or travel due to health reasons or governmental restrictions. While multiple vaccines have been developed, the timing of administration of the vaccines to the full population, number of people who will take the vaccines, and the efficacy on new variants of the virus remains unknown.

Specific to our operations, we face the following risks:

- The pandemic, combined with pre-existing factors, including, but not limited to, international trade disputes, inflation risks, and oil price volatility, could further destabilize the financial markets and markets in which the Company operates. The resulting impacts on consumers, including the sudden increase in the unemployment rate, could cause changes in consumer and business spending, borrowing needs, and saving habits, which will likely affect the demand for loans and other products or services the Company offers, as well as the creditworthiness of potential and current borrowers.

- Governmental mandates forced shutdowns of many of our customers' and vendors' facilities. While some have reopened, others may extend for indefinite periods. This may cause customers, third-party service providers, and counterparties to be unable to meet existing payment or other obligations to the Company.

- The COVID-19 virus may have an adverse effect on customer deposits, the ability of our borrowers to satisfy their obligations, the demand for our loans or other products and services, or on financial markets, real estate markets, or economic growth, which could adversely affect our liquidity, financial condition and results of operations.

- The Federal Reserve reduced the target federal funds rate to 0.00% to 0.25% on March 15, 2020 and announced a significant quantitative easing program in response to the economic downturn caused by COVID-19. These reductions, especially if prolonged, could adversely affect our net interest income and margins, the value of mortgage servicing rights, and our profitability.

- Widespread outbreaks of the COVID-19 virus in our primary geographies could adversely affect our workforce resulting in serious health issues and absenteeism. Social distancing measures enacted for working employees such as working from home, working in different locations, and working different shifts could further disrupt the workforce and normal internal control environment. This could lead to the inability to adequately meet customer needs, maintain adequate financial controls and cybersecurity controls, and meet regulatory deadlines.

- The determination of the appropriate level of allowance for credit losses involves a high degree of subjectivity and requires management to make significant estimates of current expected credit losses. The COVID-19 pandemic and the unprecedented governmental response could make these subjective judgments even more difficult. The economic impact of the pandemic and government responses may have an adverse effect on current and forward prices for oil and natural gas, which could result in significant credit losses. The value of real estate and other collateral securing loans may also be adversely affected.

As a result of the preceding and other risks, if the COVID-19 virus continues to spread and the response to contain the pandemic is unsuccessful, the Company could experience a material adverse effect on its business, financial condition, and results of operations. These adverse impacts could lead to a material impairment of goodwill and other intangible assets assigned to our reporting units.

Credit Risk Factors

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

At December 31, 2020, loans to businesses and individuals with collateral primarily located in Texas represented approximately 31% of the total loan portfolio, loans to businesses and individuals with collateral primarily located in Oklahoma represented approximately 17% of our total loan portfolio and loans to businesses and individuals with collateral primarily located in Colorado represented approximately 12% 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, 2020, 15% 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 ongoing COVID-19 pandemic has affected economies around the world, the United Kingdom continues to work through issues regarding BREXIT, trade related issues remain between the United States and China, and tension exists amongst the United States and OPEC Plus countries, including Russia and countries in the Middle East, over oil production levels. 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.

BOK Financial, its customers and counterparties may also be negatively affected by global events, such as natural disasters, and other external events beyond our control, including public health issues, terrorist attacks and acts of war. These global events may significantly affect long-term and short-term interest rates, energy prices, the value of financial assets and ultimately economic activity in our primary markets. The adverse effect of these events on the Company may include narrowing of the spread between interest income and interest expense, a reduction in fee income, an increase in credit losses and a decrease in demand for loans and other products and services.

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;
- changes in depositor behavior;
- 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.

In 2017, the U.K. Financial Conduct Authority announced its lack of confidence in LIBOR as a market benchmark rate, and that it would no longer persuade or compel banks to submit to LIBOR after 2021. U.S. regulatory authorities 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.

In November of 2020, the ICE Benchmark Administration (IBA), the FCA-regulated and authorized administrator of LIBOR, announced its intention to cease USD LIBOR for one-week and two-month tenors at the end of 2021, but extend the anticipated cessation date for the remaining USD LIBOR tenors to the end of June 2023. U.S. regulators released a joint inter-agency statement about their expectations that banks cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and in any event by December 31, 2021.

We have a significant number of loans, securities, derivative contracts, borrowings and other financial instruments with attributes that are either directly or indirectly dependent on LIBOR. Given these uncertainties, it is not possible at this time to determine the impact of the transition away from LIBOR on the valuations, pricing and operation of our financial instruments. However, the proposed extension of our primary LIBOR tenors to June of 2023 reduces our exposure to the LIBOR transition significantly, as a large portion of our legacy financial instruments that matured after 2021 will mature before June of 2023.

In order to be well prepared for the transition, the Company has established formal governance for the LIBOR transition, including a LIBOR Transition Working Group ("the Group") whose purpose is to guide the overall transition process for the Company. The Group is an internal, cross-functional team with representatives from all business lines, support and control functions, and legal counsel. Its responsibilities include, but are not limited to, monitoring industry developments; tracking direct and indirect exposures; developing and implementing remediation plans; and communication with internal and external stakeholders.

Key loan provisions have been modified so that new and renewed loans include LIBOR fallback language designed to ensure the smoothest possible transition from LIBOR to the new benchmark when such transition occurs. All existing financial contracts with direct exposure to LIBOR have been inventoried and are being tracked. Indirect exposures in the form of LIBOR-related systems, models, and processes have been inventoried, evaluated, and prioritized and remediation is underway.

Changes in mortgage interest rates could adversely affect mortgage banking operations along with mortgage servicing 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, data privacy and technology failure risk.

The Company is dependent on its technological ability to process, record and monitor a large number of customer transactions and store and protect a significant amount of sensitive customer information. Our customers’ use of our internet-based services, and our customer and regulatory expectations regarding operational and information security and reliability, have increased over time. We face compliance risks and costs relating to the data privacy laws existing in multiple jurisdictions. Congress and the legislatures of states in which we operate regularly consider legislation that would impose more stringent data privacy requirements, resulting in increased compliance costs.

Cybersecurity risks for financial institutions have increased significantly in recent years in part because of the proliferation of new technologies, the increased use of the internet and mobile technologies to conduct financial transactions, and the increased sophistication and ever changing cyberattack techniques used by organized crime, hackers, terrorists, hostile foreign governments and other external parties to obtain confidential customer information and misappropriate customer funds. Such parties may seek to gain access to our systems directly or use equipment or security passwords belonging to employees, customers, third party services providers or other users of our systems. Accordingly, our operational systems and infrastructure must continue to be safeguarded and monitored for potential failures, disruptions, breakdowns and cyber attacks.

Our business, financial, accounting, data processing systems and other operating systems and facilities may stop operating properly or become disabled as a result of a number of factors that may be wholly or partially beyond our control. In addition to cyber attacks, there could be sudden increases in customer transaction volume, electrical or telecommunications outages, natural disasters, pandemics, events arising from political or social matters, including terrorist attacks. Third parties with whom we do business or that facilitate our business activities including exchanges, clearing houses, financial intermediaries or vendors that provide services or security solutions for our operations, could also be sources of operational or information security risk to the Company, including breakdowns or failures of their own systems, capacity constraints or cyber attacks.

Cybersecurity risk management programs are expensive to maintain and will not protect the Company from all risks associated with maintaining the security of customer data from external and internal intrusions, disaster recovery and failures in controls used by our vendors. A material breach of customer data security or operational or system failure may negatively impact our business reputation and cause a loss of customers, result in increased expense to contain the event and/or require that we provide credit monitoring services for or reimburse affected customers, result in regulatory fines, penalties or intervention, or result in litigation, all of which could have a materially adverse effect on our results of operations and financial condition.

Although to date we have not experienced any material losses relating to cyber attacks or other information security breaches or operational failures, there can be no assurance that we will not suffer such losses in the future. Our risk and exposure to these matters remains heightened and as a result the continued development and enhancement of our controls, processes and practices designed to protect and facilitate the recovery of our systems, computers, software, data and networks from attack, damage or unauthorized access remains a high priority for us. As an additional layer of protection, we have purchased network and privacy liability risk insurance coverage. Our cybersecurity insurance may not provide sufficient coverage in the event of a breach, or may not be available in the future on acceptable terms.

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.

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 55% of the outstanding shares of BOK Financial's common stock at December 31, 2020. 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 $377 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 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.

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

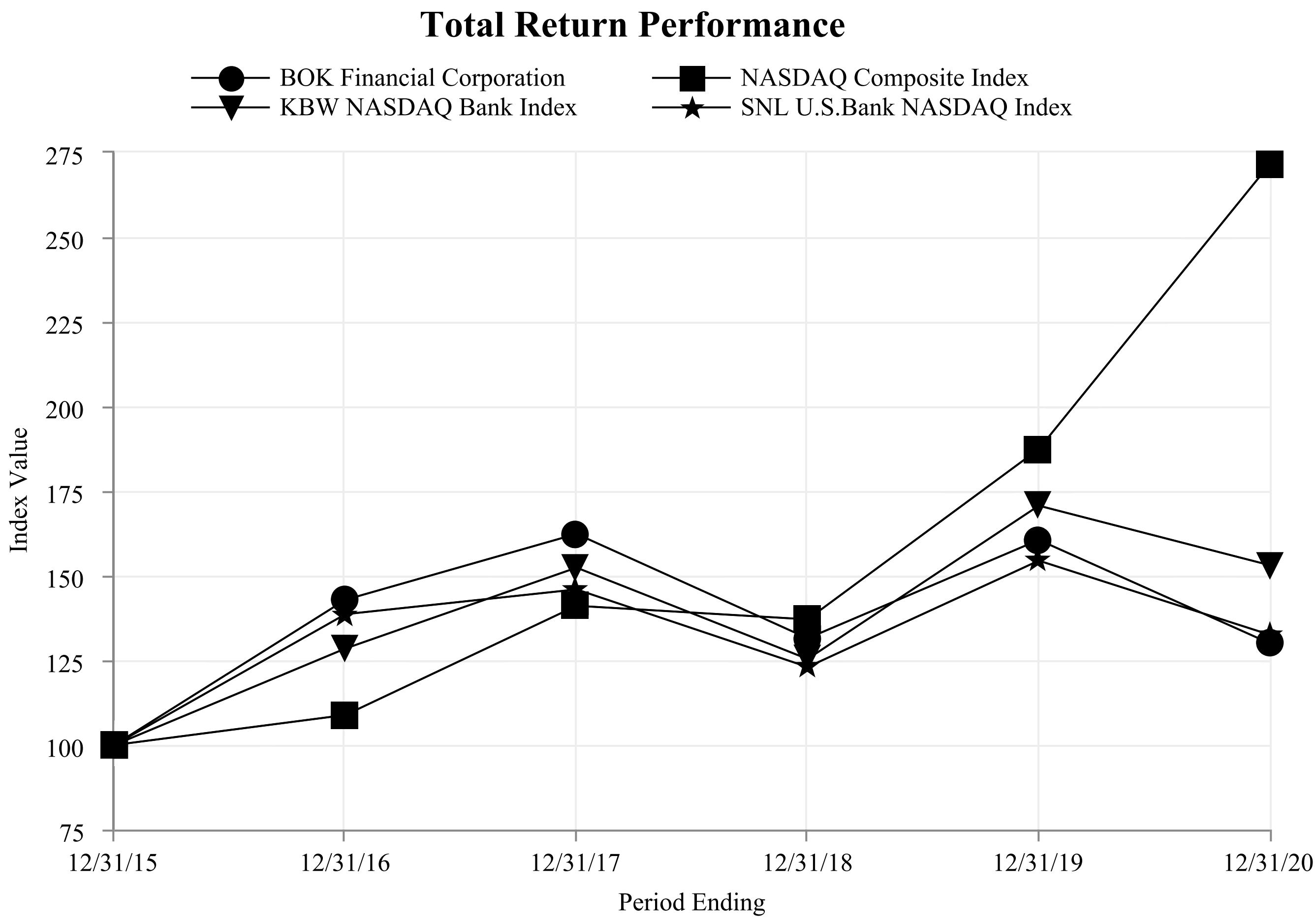
BOK Financial's $0.00006 par value common stock is traded on the NASDAQ Stock Market under the symbol BOKF. As of January 31, 2021, common shareholders of record numbered 724 with 69,577,615 shares outstanding.

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
2020:				
Low	**$ 35.27**	**$ 40.50**	**$ 48.94**	**$ 51.17**
High	**86.82**	**67.46**	**61.55**	**72.61**
Cash dividends declared	**0.51**	**0.51**	**0.51**	**0.52**
2019:				
Low	$ 73.43	$ 73.81	$ 73.45	$ 72.23
High	92.31	87.68	83.41	88.01
Cash dividends declared	0.50	0.50	0.50	0.51

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, 2015 and ending December 31, 2020.*



	Period Ending December 31,					
Index	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
BOK Financial Corporation	100.00	142.91	162.37	131.52	160.59	130.03
NASDAQ Composite	100.00	108.87	141.13	137.12	187.44	271.64
SNL U.S. Bank NASDAQ	100.00	138.65	145.97	123.04	154.47	132.56
KBW NASDAQ Bank Index	100.00	128.51	152.40	125.41	170.71	153.11

* Graph assumes value of an investment in the Company's Common Stock for each index was $100 on December 31, 2015. 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, 2020.

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, 2020 to October 31, 2020	160,000	$ 58.27	160,000	3,531,287
November 1, 2020 to November 30, 2020	465,000	$ 65.24	465,000	3,066,287
December 1, 2020 to December 31, 2020	40,100	$ 69.59	40,100	3,026,187
Total	665,100		665,100	

1 On April 30, 2019, 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, 2020, the Company had repurchased 1,973,813 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,				
	2020	**2019**	**2018**	**2017**	**2016**
Selected Financial Data					
For the year:					
Interest revenue	**$ 1,269,000**	$ 1,531,958	$ 1,228,426	$ 972,751	$ 829,117
Interest expense	**160,556**	419,079	243,559	131,050	81,889
Net interest revenue	**1,108,444**	1,112,879	984,867	841,701	747,228
Provision for credit losses	**222,592**	44,000	8,000	(7,000)	65,000
Fees and commissions revenue[1]	**810,320**	702,201	643,176	642,169	647,986
Net income attributable to BOK Financial Corporation shareholders	**435,030**	500,758	445,646	334,644	232,668
Period-end:					
Loans	**23,007,520**	21,750,987	21,656,730	17,153,424	16,989,660
Assets	**46,671,088**	42,172,021	38,020,504	32,272,160	32,772,281
Deposits	**36,143,880**	27,621,168	25,263,763	22,061,305	22,748,095
Shareholders' equity	**5,266,266**	4,855,795	4,432,109	3,495,367	3,274,854
Nonperforming assets[2]	**476,994**	293,762	267,162	290,305	356,641
Profitability Statistics					
Earnings per share (based on average equivalent shares):					
Basic	**$ 6.19**	$ 7.03	$ 6.63	$ 5.11	$ 3.53
Diluted	**6.19**	7.03	6.63	5.11	3.53
Percentages (based on daily averages):					
Return on average assets	**0.89 %**	1.19 %	1.28 %	1.02 %	0.72 %
Return on average shareholders' equity	**8.55 %**	10.73 %	11.98 %	9.82 %	7.02 %
Average total equity to average assets	**10.46 %**	11.11 %	10.70 %	10.43 %	10.38 %
Common Stock Performance					
Per Share:					
Book value per common share	**$ 75.62**	$ 68.80	$ 61.45	$ 53.45	$ 50.12
Market price: December 31 close	**68.48**	87.40	73.33	92.32	83.04
Market range – High close bid price	**86.82**	92.31	105.24	93.50	84.13
Market range – Low close bid price	**35.27**	72.23	70.61	74.34	44.72
Cash dividends declared	**2.05**	2.01	1.90	1.77	1.73
Dividend payout ratio	**33.04 %**	28.56 %	28.55 %	34.45 %	48.81 %

Table 1 – Consolidated Selected Financial Data

(Dollars in thousands, except per share data)

	December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Selected Financial Data					
Selected Balance Sheet Statistics					
Period-end:					
Common equity Tier 1 ratio	**11.95 %**	11.39 %	10.92 %	12.05 %	11.21 %
Tier 1 capital ratio	**11.95 %**	11.39 %	10.92 %	12.05 %	11.21 %
Total capital ratio	**13.82 %**	12.94 %	12.50 %	13.54 %	12.81 %
Leverage ratio	**8.28 %**	8.40 %	8.96 %	9.31 %	8.72 %
Allowance for loan losses to nonaccruing loans[3]	**171.24 %**	120.54 %	132.89 %	129.09 %	112.33 %
Allowance for loan losses to loans	**1.69 %**	0.97 %	0.96 %	1.34 %	1.45 %
Allowance for loan losses to loans, excluding PPP loans[5]	**1.82 %**	0.97 %	0.96 %	1.34 %	1.45 %
Combined allowances for credit losses to loans [4]	**1.85 %**	0.98 %	0.97 %	1.37 %	1.52 %
Combined allowances for credit losses to loans, excluding PPP loans [4,5]	**2.00 %**	0.98 %	0.97 %	1.37%	1.52%
Miscellaneous (at December 31)					
Number of employees (full-time equivalent)	**4,915**	5,107	5,313	4,930	4,884
Number of TransFund locations	**2,599**	2,463	2,426	2,223	2,021
Fiduciary assets	**$60,495,213**	$ 52,352,135	$ 44,841,339	$ 48,761,477	$ 42,378,053
Mortgage loans serviced for others	**16,228,449**	20,727,106	21,658,335	22,046,632	21,997,568

1 Non-GAAP measure to net interchange charges for 2016-2017 between transaction card revenue and data processing and communications expense as a result of the revenue recognition standard implemented January 1, 2018. This measure has no effect on net income or earnings per share.

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

3 Excludes residential mortgage loans guaranteed by agencies of the U.S. government.

4 Includes allowance for loan losses and accrual for off-balance sheet credit risk.

5 Metric meaningful due to the U.S. government agency guarantee and short-term nature of the PPP loans.

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.

After completing its 11th consecutive year of expansion in 2019, the U.S. economy experienced extreme volatility throughout 2020. The worldwide spread of COVID-19 affected every part of the economic environment. Economic conditions in the U.S. declined drastically in March and April of 2020 following the initial U.S. COVID-19 outbreak. Congress quickly passed the CARES Act economic relief package, which alleviated some of the downturn. With the government stimulus package and some time to settle into the current new normal, the economy rebounded significantly in the second half of the year.

The Federal Reserve lowered the federal funds rate to near zero by April, 2020 and has initiated additional programs to infuse liquidity and stimulate economic activity. The Federal Reserve is expected to keep the federal funds rate at or near zero until the labor market has fully recovered and inflation has stabilized at 2%. See "Summary of Credit Loss Experience" section of Management's Discussion and Analysis for additional discussion around our economic forecast.

Performance Summary

Net income for the year ended December 31, 2020 totaled $435.0 million or $6.19 per diluted share compared with net income of $500.8 million or $7.03 per diluted share for the year ended December 31, 2019. A pre-tax provision for expected credit losses of $222.6 million was included in 2020 while a pre-tax provision for incurred losses of $44.0 million was included in 2019. The Company adopted the current expected credit loss ("CECL") model on January 1, 2020.

Pre-provision net revenue, a non-GAAP measure, was $786.4 million for 2020 compared to $674.9 million in the prior year. This is a measure of revenue less expenses, and is calculated before provision for credit losses and income tax expense. Pre-provision net revenue is a financial measure frequently used by investors and analysts that enables them to assess a company's ability to generate earnings to cover credit losses through a credit cycle. It also provides an additional basis for comparing the results of operations between periods by isolating the impact of the provision for credit losses, which can vary significantly between periods.

We incurred $17.2 million of integration costs in 2019 related to the acquisition of CoBiz Financial, Inc. ("CoBiz") on October 1, 2018, which resulted in an $0.18 per share reduction in 2019. The fluctuation discussion in the highlights below excludes this impact.

Highlights of 2020 included:

- Net interest revenue totaled $1.1 billion for 2020, consistent with the prior year. Net interest margin was 2.83% for 2020 compared to 3.11% for 2019. The Federal Reserve reduced the federal funds rate to near zero early in the year putting pressure on the margin in 2020. Average earning assets were $40.7 billion for 2020, up $4.3 billion over 2019. The increase was largely due to increased trading securities, loans primarily related to the Small Business Administration's Paycheck Protection Program ("PPP"), and the expansion of the available for sale securities portfolio as we repositioned the balance sheet for a lower rate environment.

- Fees and commissions revenue was $810.3 million for 2020, up $108.1 million compared to 2019. Mortgage banking revenue increased $74.8 million and brokerage and trading revenue increased $62.0 million. Lower mortgage interest rates increased both mortgage loan production and related trading activities. These increases were partially offset by a decrease in deposit service charges of $15.7 million and fiduciary and asset management revenue of $9.6 million.

- Other operating expense totaled $1.2 billion, a $50.8 million increase compared to 2019. Personnel expense increased $30.8 million, primarily due to higher incentive compensation expense due to expanded trading activities. This was partially offset by lower employee benefits costs. Increased data processing and communications expense, occupancy and equipment expense, mortgage banking costs and charitable contributions were partially offset by lower business promotions expense.

- The net economic benefit of the changes in the fair value of mortgage servicing rights and related economic hedges was $24.9 million during 2020 compared to an economic cost of $17.9 million during 2019.

- The allowance for loan losses totaled $389 million or 1.69% of outstanding loans at December 31, 2020. The combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was $426 million or 1.85% of outstanding loans at December 31, 2020. Excluding PPP loans, which are fully guaranteed by a U.S. government agency, the allowance for loan losses was 1.82% of outstanding loans and the combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was 2.00%. The allowance for loan losses was $211 million or 0.97% of outstanding loans and the combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was $212 million or 0.98% of outstanding loans at December 31, 2019.

- Period-end outstanding loan balances were $23.0 billion at December 31, 2020, a $1.3 billion increase over the prior year, primarily due to the inflow of PPP loans. Average loans were $23.4 billion, a $1.3 billion increase compared to 2019.

- Period-end deposits totaled $36.1 billion at December 31, 2020, an $8.5 billion increase compared to December 31, 2019. Interest-bearing transaction deposits increased $5.8 billion, while demand deposit balances increased $2.8 billion. Average deposits increased $7.1 billion to $32.8 billion. Deposit growth was largely due to customers retaining higher balances in the current economic environment combined with increases due to various COVID-19 related government program stimulus payments.

- Common equity Tier 1 capital ratio was 11.95% at December 31, 2020. In addition, the Tier 1 capital ratio was 11.95%, total capital ratio was 13.82% and leverage ratio was 8.28% at December 31, 2020. At December 31, 2019, the Tier 1 capital ratio was 11.39%, the total capital ratio was 12.94% and the leverage ratio was 8.40%.

- The Company repurchased 1,107,100 shares at an average price of $68.49 per share during 2020 and 1,572,322 shares at an average price of $82.35 during 2019.

- The Company paid cash dividends of $2.05 per common share during 2020 and $2.01 per common share in 2019.

Net income for the fourth quarter of 2020 totaled $154.2 million or $2.21 per diluted share, compared to $110.4 million or $1.56 per diluted share for the fourth quarter of 2019.

Highlights of the fourth quarter of 2020 included:

- Net interest revenue totaled $297.2 million for the fourth quarter of 2020, an increase of $27.0 million compared to the fourth quarter of 2019, largely due to a $5.2 billion increase in average trading securities. We saw a shift from trading revenue to interest income on trading securities in the fourth quarter of 2020. Net interest margin was 2.72% for the fourth quarter of 2020 and 2.88% for the fourth quarter of 2019. The increase in the trading securities portfolio combined with the repricing of our available for sale securities portfolio decreased the net interest margin.

- Fees and commissions revenue totaled $181.1 million, up $1.6 million over the fourth quarter of 2019. Increased mortgage banking revenue stemming from the low interest rate environment was largely offset by decreased brokerage and trading revenue, fiduciary and asset management revenue, and deposit service charges.

- Operating expenses in the fourth quarter totaled $300.7 million, an $11.9 million increase compared to the prior year. Personnel expense increased $7.8 million primarily due to higher incentive compensation expense, partially offset by regular compensation expense. Non-personnel expenses increased $4.1 million, largely due to increased data processing and communications expense and higher charitable contributions, partially offset by lower business promotion expense.

- Based on an evaluation of economic forecasts and loan portfolio characteristics, the Company recorded a $6.5 million negative provision for expected credit losses in the fourth quarter of 2020 and a $19.0 million provision for incurred credit losses in the fourth quarter of 2019.

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 from Loan Commitments

The allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments represent the portion of amortized cost basis of loans and related unfunded commitments we do not expect to collect over the asset’s contractual life, considering past events, current conditions, as well as reasonable and supportable forecasts of future economic conditions. Appropriateness of the allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments is determined by a senior management Allowance Committee which requires judgment about effects of uncertain matters, resulting in a subjective calculation which is inherently imprecise. Because of the subjective forward-looking nature of the calculation, changes in these measures may not directly correlate with actual economic events. In future periods, management judgment may consider new or changed information which may cause significant changes in these allowances in those future periods.

As of January 1, 2020 BOK Financial’s accounting policies have changed significantly with the adoption of Financial Accounting Standards Board ("FASB") Accounting Standards Update No. 2016-13 *Financial Instruments - Credit Losses (Topic 326): Assets Measured at Amortized Cost* ("ASU 2016-13" or "CECL"). Prior years are not restated. Prior to January 1, 2020, general allowances and nonspecific allowances were based on incurred credit losses. See Note 4 to the Consolidated Financial Statements for the description of the expected credit losses calculation of the allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments.

For the majority of risk-graded loans, the accruing loan’s expected credit loss estimate is sensitive to management judgment, particularly probability of default and loss given default assumptions, changes in specific macroeconomic factor forecasts and the probability weight assigned to each economic scenario.

Probability of default and loss given default measurements are based on historical data that may not be a good predictor of future performance or actual losses. Probability of default is based on risk grades, a subjective measurement of the risk of a loan. This subjective assessment of risk may not reflect actual risk of loss.

Other subjective measures include the forecast for each relevant economic loss driver and the probability weighting of economic scenarios, both of which are overseen by a senior management Economic Forecast Committee which includes members independent of the allowance process. The Allowance Committee may increase or decrease the allowance based on factors that include, for example, new lines of business, market conditions that have not been previously encountered, observed changes in credit risk that are not yet reflected in macroeconomic factors, or economic conditions that impact loss given default assumptions.

Although the resulting expected credit loss estimate represents management’s best estimates at the time, actual credit losses will differ from management’s estimate. Portfolio composition will change over time, actual economic conditions will differ from probability-weighted assumptions, borrower-specific circumstances will change, as well as other factors. Differences between actual losses and management's estimates may materially affect the Company's results of operations.

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 measurements 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 $29 million. We expect a $15 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.

Goodwill Impairment

Goodwill for each reporting unit is evaluated for impairment annually as of October 1st or more frequently if conditions indicate that impairment may have occurred. The evaluation of possible goodwill impairment involves significant judgment based upon short-term and long-term projections of future performance.

During the evaluation for impairment, management qualitatively assesses whether it is more likely than not that the fair value of the reporting units is 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. Specifically, the analysis may include:

- General economic conditions including overall economic activity, consumer spending and mobility, unemployment rates, consumer confidence, and duration and severity of any current market moving instability.
- Global health concerns including ongoing pandemics or potential for widespread health issues, the future course of a pandemic and the potential for medical advances.
- Regional economic conditions including demand for oil and price stability of oil, other overarching conditions that may be affecting any of the Company's primary states such as weather or other catastrophes, pandemics and health related lockdowns, or other state mandates.
- Industry conditions including federal funds rate movement by the Federal Reserve, the interest rate environment and the resulting effect on net interest revenue and operating revenue, and regulatory mandates that hinder or provide relief to the financial services industry.
- Company specific conditions including current and forecasted income, changes in stock price, the Company's stock price compared to peers and other indexes, book value per share compared to fair value per share, goodwill compared to total shareholders' equity, current capital and liquidity position, demand for products and services, health of the loan portfolio and other credit related factors, and current credit ratings with the ratings agencies, and regulatory ratings.
- Reporting unit performance and forecasts including any event that may significantly impact a reporting unit.

If management concludes based on the qualitative assessment that goodwill may be impaired, a quantitative 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.

Both the qualitative assessment and quantitative analysis require significant management judgment, including estimates of changes in future economic conditions and their underlying causes and duration, the reasonableness and effectiveness of management's responses to those changes, changes in governmental fiscal and monetary policies, and fair value measurements based largely on significant unobservable inputs. The results of these judgments may have a significant impact on the Company's reported results of operations.

See Note 6, "Goodwill and Intangible Assets" for breakout of goodwill by reporting unit.

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 $1.1 billion for 2020, consistent with the prior year. This includes $26.0 million of net purchase discount accretion for 2020 and $37.8 million for 2019. Approximately $48 million of purchase accounting discount remains to be accreted. Net interest revenue decreased $108.7 million due to changes in interest rates and increased $102.8 million from growth in earning assets. 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 2.83% for 2020 and 3.11% for 2019. The tax-equivalent yield on earning assets was 3.24% for 2020 compared to 4.27% in 2019. In response to the anticipated impact to the economy from the COVID-19 pandemic, the Federal Reserve reduced the federal funds rate to near zero in March, 2020. The resulting impact on market interest rates has compressed the net interest margin. The company has been proactive in reducing deposit costs and implementing LIBOR floors in loan agreements; however, funds received from available for sale securities have been reinvested at lower rates. Loan yields decreased 129 basis points to 3.84%. The available for sale securities portfolio yield decreased 37 basis points to 2.21%. The yield on trading securities fell 80 basis points to 2.75%. The yield on interest-bearing cash and cash equivalents decreased 183 basis points to 0.45%.

Funding costs decreased 108 basis points compared to 2019. The cost of interest-bearing deposits decreased 69 basis points. The cost of other short-term borrowings decreased 161 basis points. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 12 basis points for 2020, down from 45 basis points for 2019.

Average earning assets for 2020 increased $4.3 billion or 12% over 2019, largely due to the expansion of the available for sale securities portfolio, loans originated as part of the Small Business Administration's Paycheck Protection Program ("PPP"), and an increase in our trading of U.S. government issued mortgage-backed securities. The average balance of available for sale securities, which consists largely of residential and commercial mortgage-backed securities guaranteed by U.S. government agencies, increased $2.3 billion. We purchase securities to supplement earnings and to manage interest rate risk. We increased the size of our bond portfolio during the latter half of 2019 and first quarter 2020 in order to reduce our exposure to falling short-term interest rates. Average loans, net of allowance for loan losses, increased $1.1 billion, primarily related to $1.4 billion in average PPP loans. Trading securities balances increased $1.3 billion.

Total average deposits grew by $7.1 billion over the prior year. This increase is largely due to the combination of focused deposit gathering initiatives, stimulus-related deposits, and customers retaining elevated balances in the current economic environment. Average interest-bearing transaction account balances increased $5.6 billion. Average demand deposit balances increased $1.4 billion. Average short-term borrowings decreased $1.7 billion.

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 70% 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 2020 *Net Interest Revenue*

Tax-equivalent net interest revenue totaled $299.6 million for the fourth quarter of 2020, an increase of $26.7 million compared to the fourth quarter of 2019. Net interest revenue increased $44.5 million, primarily due to the increase in trading securities, available for sale securities and loan balances. This was partially offset by a decrease of $17.8 million primarily due to lower market interest rates in 2020.

Net interest margin was 2.72% for the fourth quarter of 2020 compared to 2.88% for the fourth quarter of 2019. The tax-equivalent yield on earning assets was 2.92% for the fourth quarter of 2020, a decrease of 101 basis points compared to the fourth quarter of 2019, primarily due to the impact on interest rates related to the federal funds rate cuts in 2020. Loan yields decreased 107 basis points to 3.68%. Yield on available for sale securities decreased 54 basis points to 1.98%. Yield on trading securities decreased 117 basis points to 2.02%.

Funding costs decreased 112 basis points compared to the fourth quarter of 2019. The cost of other short-term borrowings decreased 145 basis points. The cost of interest-bearing deposits decreased 90 basis points. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 8 basis points in the fourth quarter of 2020, down from 35 basis points in the fourth quarter of 2019.

Average earning assets for the fourth quarter of 2020 increased $6.3 billion over the fourth quarter of 2019. Trading securities balances increased $5.2 billion as we increased our trading of U.S. government issued mortgage-backed securities. Available for sale securities increased $1.6 billion as the balance sheet was repositioned for the current rate environment. Average loans, net of allowance for loan losses, increased $1.0 billion, largely due to the loans related to the PPP. Fair value option securities held as an economic hedge of our mortgage servicing rights decreased $1.4 billion.

Average deposits increased $8.4 billion over the fourth quarter of 2019, largely due to the combination of government stimulus payments and customers choosing to retain elevated balances in the current environment. Average interest-bearing transaction accounts increased $6.0 billion and average demand deposit balances increased $2.5 billion. Average short-term borrowings decreased $3.0 billion.

2019 *Net Interest Revenue*

Tax-equivalent net interest revenue for 2019 was $1.1 billion, up from $993.8 million for 2018. The acquisition of CoBiz in the fourth quarter of 2018 added $158.5 million to net interest revenue in 2019 and $43.1 million to net interest revenue in 2018. This includes $37.8 million of net purchase discount accretion for 2019 and $6.4 million for 2018. Net interest revenue decreased $13.7 million due to rates and increased $144.4 million from growth in earning assets.

Net interest margin was 3.11% for 2019 compared to 3.20% for 2018. The tax-equivalent yield on average earning assets increased 29 basis points over 2018. Short-term rate increases during the first half of 2019 resulting from four 25 basis point increases in the federal funds rate by the Federal Reserve during 2018 were partially offset by three 25 basis point decreases in the federal funds rate in the second half of 2019. Loan yields increased 33 basis points. The available for sale securities portfolio yield increased 23 basis points.The yield on interest-bearing cash and cash equivalents increased 48 basis points. The yield on trading securities fell 29 basis points. The cost of interest-bearing liabilities increased 42 basis points. The cost of interest-bearing deposits increased 39 basis points and the cost of other short-term borrowings increased 35 basis points. The benefit to net interest margin from earning assets funded by non-interest bearing liabilities was 45 basis points for 2019, compared to 41 basis points for 2018.

Average earning assets increased $5.4 billion or 18% over 2018, largely due to acquired loans from the CoBiz acquisition combined with the expansion of the available for sale securities portfolio. Average loans, net of allowance for loan losses, increased $3.4 billion. The average balance of available for sale securities increased $1.8 billion. Total average deposits grew by $2.8 billion over 2018, largely related to acquired deposits. Average interest-bearing transaction deposits increased $2.5 billion. Average short-term borrowings increased $2.9 billion, primarily from increased borrowings from federal funds purchased and the Federal Home Loan Banks.

Table 2 – Volume/Rate Analysis
(In thousands)

	Year Ended December 31, 2020 / 2019			Year Ended December 31, 2019 / 2018		
		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	**$ (9,384)**	**$ 1,332**	**$ (10,716)**	$ (10,119)	$ (14,371)	$ 4,252
Trading securities	**5,982**	**22,824**	**(16,842)**	4,012	8,666	(4,654)
Investment securities	**(1,657)**	**(2,270)**	**613**	(1,431)	(2,597)	1,166
Available for sale securities	**7,303**	**47,992**	**(40,689)**	56,629	35,720	20,909
Fair value option securities	**(14,461)**	**(9,178)**	**(5,283)**	17,731	19,592	(1,861)
Restricted equity securities	**(15,897)**	**(10,782)**	**(5,115)**	5,305	5,696	(391)
Residential mortgage loans held for sale	**(708)**	**822**	**(1,530)**	(1,018)	(535)	(483)
Loans	**(235,592)**	**58,016**	**(293,608)**	235,141	168,241	66,900
Total tax-equivalent interest revenue	**(264,414)**	**108,756**	**(373,170)**	306,250	220,412	85,838
Interest expense:						
Transaction deposits	**(72,430)**	**38,117**	**(110,547)**	66,995	20,057	46,938
Savings deposits	**(292)**	**88**	**(380)**	238	66	172
Time deposits	**(12,820)**	**176**	**(12,996)**	12,788	1,302	11,486
Funds purchased and repurchase agreements	**(37,398)**	**9,191**	**(46,589)**	43,796	28,392	15,404
Other borrowings	**(134,414)**	**(41,577)**	**(92,837)**	46,417	20,787	25,630
Subordinated debentures	**(1,169)**	**(8)**	**(1,161)**	5,286	5,398	(112)
Total interest expense	**(258,523)**	**5,987**	**(264,510)**	175,520	76,002	99,518
Tax-equivalent net interest revenue	**(5,891)**	**102,769**	**(108,660)**	130,730	144,410	(13,680)
Change in tax-equivalent adjustment	**(1,456)**			2,718		
Net interest revenue	**$ (4,435)**			$ 128,012		

[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, 2020 / 2019		
		Change Due To[1]	
	Change	Volume	Yield / Rate
Tax-equivalent interest revenue:			
Interest-bearing cash and cash equivalents	$ (2,177)	$ 151	$ (2,328)
Trading securities	22,833	35,696	(12,863)
Investment securities	(429)	(522)	93
Available for sale securities	(8,807)	7,122	(15,929)
Fair value option securities	(8,817)	(8,146)	(671)
Restricted equity securities	(4,165)	(2,888)	(1,277)
Residential mortgage loans held for sale	(248)	180	(428)
Loans	(49,339)	12,466	(61,805)
Total tax-equivalent interest revenue	(51,149)	44,059	(95,208)
Interest expense:			
Transaction deposits	(29,850)	8,531	(38,381)
Savings deposits	(67)	34	(101)
Time deposits	(6,670)	(1,141)	(5,529)
Funds purchased and repurchase agreements	(14,686)	(4,571)	(10,115)
Other borrowings	(26,168)	(3,261)	(22,907)
Subordinated debentures	(377)	(4)	(373)
Total interest expense	(77,818)	(412)	(77,406)
Tax-equivalent net interest revenue	26,669	44,471	(17,802)
Change in tax-equivalent adjustment	(312)		
Net interest revenue	$ 26,981		

[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 $843.9 million for 2020, an increase of $149.6 million or 22% over 2019 driven by growth in mortgage banking revenue and brokerage and trading revenue.

Table 3 – Other Operating Revenue
(In thousands)

	Year Ended December 31,				
	2020	2019	2018	2017	2016
Brokerage and trading revenue	**$ 221,833**	$ 159,826	$ 108,323	$ 131,601	$ 138,377
Transaction card revenue[1]	**90,182**	87,216	84,025	81,143	78,347
Fiduciary and asset management revenue	**167,445**	177,025	184,703	162,889	135,387
Deposit service charges and fees	**96,805**	112,485	112,153	112,079	111,589
Mortgage banking revenue	**182,360**	107,541	97,787	104,719	133,914
Other revenue	**51,695**	58,108	56,185	49,738	50,372
Total fees and commissions revenue	**810,320**	702,201	643,176	642,169	647,986
Other gains (losses), net	**7,675**	9,351	(2,265)	11,434	4,687
Gain (loss) on derivatives, net	**42,320**	14,951	(422)	779	(15,685)
Gain (loss) on fair value option securities, net	**53,248**	15,787	(25,572)	(2,733)	(10,555)
Change in fair value of mortgage servicing rights	**(79,524)**	(53,517)	4,668	172	(2,193)
Gain (loss) on available for sale securities, net	**9,910**	5,597	(2,801)	4,428	11,675
Total other operating revenue	**$ 843,949**	$ 694,370	$ 616,784	$ 656,249	$ 635,915
Non-GAAP Reconciliation:[1]					
Transaction card revenue on income statement	**90,182**	87,216	84,025	119,988	116,452
Netting adjustment	**—**	—	—	(38,845)	(38,105)
Transaction card revenue after netting adjustment	**90,182**	87,216	84,025	81,143	78,347

[1] Non-GAAP measure to net interchange charges for 2016-2017 between transaction card revenue and data processing and communications expense as a result of the revenue recognition standard implemented January 1, 2018. 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 42% of total revenue for 2020, 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 and related trading. 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, including the impact of the COVID-19 pandemic, 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, increased $62.0 million or 39% over the prior year.

Trading revenue includes net realized and unrealized gains and losses primarily related to sales of residential mortgage-backed securities guaranteed by U.S. government agencies and related derivative instruments that enable our mortgage-banking customers to manage their production risk. Trading revenue also includes net realized and unrealized gains and losses on municipal securities, asset-backed securities and other financial instruments that we sell to institutional customers, along with changes in the fair value of financial instruments we hold as economic hedges against market risk of our trading securities. Trading revenue was $144.3 million for 2020, an increase of $55.7 million over 2019. Industry-wide mortgage loan production increased in 2020 driven by lower interest rates as the Federal Reserve stepped in to provide market stability. We increased our bond trading pipeline to provide greater liquidity to the housing market during a time of record loan production volumes.

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 $22.7 million for 2020, an increase of $3.8 million or 20% compared to 2019. Customer hedging revenue on energy derivatives is up $12.2 million as energy customers have increased hedging activity in the volatile commodity price environment. This is offset by a $9.6 million decrease on to-be-announced derivatives reflecting a shift in the mix of our to-be-announced residential mortgage-backed securities contracts from our customer hedging program to our trading program.

Revenue earned from retail brokerage transactions totaled $15.7 million for 2020, relatively consistent with 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.

Insurance brokerage fees were $12.7 million for 2020, a decrease of $1.2 million compared to the prior year.

Investment banking, which includes fees earned upon completion of underwriting, financial advisory services and loan syndication fees, totaled $26.4 million for 2020, an increase of $4.1 million or 18% compared to 2019, 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 $90.2 million for 2020, a $3.0 million or 3% increase over 2019. Revenues from the processing of transactions on behalf of the members of our TransFund electronic funds transfer ("EFT") network totaled $78.4 million, up $1.0 million or 1% over 2019. The number of TransFund ATM locations totaled 2,599 at December 31, 2020 compared to 2,463 at December 31, 2019. Merchant services fees paid by customers for account management and electronic processing of card transactions totaled $9.2 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 90% 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 decreased $9.6 million or 5% compared to 2019. The low rate environment has put pressure on our mutual fund revenue streams, partially offset by increased trust and managed account fees from higher client asset balances.We also had approximately $5.6 million in fee waivers during 2020 as a result of the significant decline in interest rates. We have voluntarily waived certain administration fees on the Cavanal Hill money market funds in order to maintain positive yields on these funds in the current low short-term interest rate environment.

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,					
	2020			2019		
	Balance	Revenue[1]	Margin[2]	Balance	Revenue[1]	Margin[2]
Managed fiduciary assets:						
Personal	**$ 11,172,457**	**$ 95,753**	**0.86 %**	$ 10,441,048	$ 97,527	0.93 %
Institutional	**15,364,387**	**29,443**	**0.19 %**	13,512,904	25,603	0.19 %
Total managed fiduciary assets	**26,536,844**	**125,196**	**0.47 %**	23,953,952	123,130	0.51 %
Non-managed assets:						
Fiduciary	**33,958,369**	**40,603**	**0.12 %**	28,398,183	52,480	0.18 %
Non-fiduciary	**13,590,435**	**1,646**	**0.01 %**	14,250,586	1,415	0.01 %
Safekeeping and brokerage assets under administration	**17,506,599**	**—**	**— %**	16,138,240	—	— %
Total non-managed assets	**65,055,403**	**42,249**	**0.06 %**	58,787,009	53,895	0.09 %
Total assets under management or administration	**$ 91,592,247**	**$ 167,445**	**0.18 %**	$ 82,740,961	$ 177,025	0.21 %

1 Fiduciary and asset management revenue includes asset-based and other fees associated with the assets.
2 Revenue divided by period-end balance.

A summary of changes in assets under management or administration for the year ended December 31, 2020 and 2019 follows:

Table 5 -- Changes in Assets Under Management or Administration

	Year Ended December 31,	
	2020	2019
Beginning balance	**$ 82,740,961**	$ 76,279,777
Net inflows (outflows)	**1,859,868**	(257,531)
Net change in fair value	**6,991,418**	6,718,715
Ending balance	**$ 91,592,247**	$ 82,740,961

Mortgage banking revenue totaled $182.4 million for 2020, a $74.8 million or 70% increase compared to 2019. Mortgage production revenue increased $83.1 million. Production volume is up $1.0 billion as average primary interest rates decreased 84 basis points compared to 2019. Gain on sale margin also increased 172 basis points to 3.16%. A rapid decrease in interest rates has led to increased application demand and industry-wide capacity constraints. Mortgage servicing revenue was $56.5 million, an $8.3 million decrease compared to the prior year. The outstanding principal balance of mortgage loans serviced for others totaled $16.2 billion at December 31, 2020, a $4.5 billion decrease compared to December 31, 2019, largely due to our strategic decision to focus on higher-margin products and distribution channels along with a sale of mortgage servicing rights. During the second quarter of 2020, we completed a sale of mortgage servicing rights on $1.6 billion of unpaid principal balance, primarily related to loans guaranteed by the Veteran's Administration. Completion of this sale meaningfully reduced the future expected credit losses in the servicing portfolio.

Table 6 – Mortgage Banking Revenue
(In thousands)

	Year Ended December 31,				
	2020	2019	2018	2017	2016
Mortgage production revenue	**$ 125,848**	$ 42,720	$ 31,690	$ 38,498	$ 69,628
Mortgage loans funded for sale	**$ 3,764,112**	$ 2,973,291	$ 2,587,297	$ 3,286,873	$ 6,117,417
Add: Current year end outstanding commitments	**380,637**	158,460	160,848	222,919	318,359
Less: Prior year end outstanding commitments	**158,460**	160,848	222,919	318,359	601,147
Total mortgage production volume	**3,986,289**	2,970,903	2,525,226	3,191,433	5,834,629
Gain on sale margin	**3.16 %**	1.44 %	1.25 %	1.21 %	1.19 %
Mortgage loan refinances to mortgage loans funded for sale	**58 %**	44 %	28 %	40 %	51 %
Primary mortgage interest rates:					
Average	**3.10 %**	3.94 %	4.54 %	3.99 %	3.65 %
Period end	**2.67 %**	3.74 %	4.55 %	3.99 %	4.32 %
Mortgage servicing revenue	**$ 56,512**	$ 64,821	$ 66,097	$ 66,221	$ 64,286
Average outstanding principal balance of mortgage loans serviced for others	18,422,210	21,257,462	21,891,749	22,055,002	20,837,897
Average mortgage servicing fee rates	**0.31 %**	0.30 %	0.30 %	0.30 %	0.31 %

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 benefit of the changes in fair value of mortgage servicing rights and related economic hedges was $24.9 million in 2020, including a $95.3 million increase in the fair value of securities and derivative contracts held as an economic hedge, offset by a $79.5 million decrease in the fair value of mortgage servicing rights and $9.1 million of related net interest revenue.

The net economic cost of changes in the fair value of mortgage servicing rights and related economic hedges was $17.9 million in 2019. The fair value of mortgage servicing rights decreased $53.5 million. The fair value of securities and interest rate derivative contracts held as an economic hedge increased $30.4 million. Net interest earned on securities held as an economic hedge was $5.2 million.

The significant improvement in results versus 2019 was due to the combination of a more favorable mortgage servicing rights risk profile; increased volume and carry on the hedge portfolio; positive hedge strategy performance; and positive economics on the sale of GNMA servicing rights.

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

	Year Ended December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Gain (loss) on mortgage hedge derivative contracts, net	**$ 42,096**	$ 14,589	$ 551	$ 681	$ (15,696)
Gain (loss) on fair value option securities, net	**53,248**	15,787	(25,572)	(2,733)	(10,555)
Gain (loss) on economic hedge of mortgage servicing rights	**95,344**	30,376	(25,021)	(2,052)	(26,251)
Gain (loss) on change in fair value of mortgage servicing rights	**(79,524)**	(53,517)	4,668	172	(2,193)
Gain (loss) on changes in fair value of mortgage servicing rights, net of economic hedges included in other operating revenue	**15,820**	(23,141)	(20,353)	(1,880)	(28,444)
Net interest revenue on fair value option securities[1]	**9,085**	5,214	4,798	8,435	4,356
Total economic benefit (cost) of changes in the fair value of mortgage servicing rights, net of economic hedges	**$ 24,905**	$ (17,927)	$ (15,555)	$ 6,555	$ (24,088)

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

Fourth Quarter 2020 *Other Operating Revenue*

Other operating revenue was $196.8 million for the fourth quarter of 2020, an $18.2 million or 10% increase over the fourth quarter of 2019.

Mortgage banking revenue was $39.3 million for the fourth quarter of 2020, an increase of $13.9 million. A decrease in mortgage interest rates in 2020 increased mortgage loan production. Mortgage loan production volumes were $819 million for the fourth quarter of 2020, compared to $635 million in the fourth quarter of 2019. The fourth quarter of 2020 included a $6.0 million increase in the fair value of mortgage servicing rights, net of economic hedges, while the fourth quarter of 2019 included a $3.7 million decrease.

Other gains and losses, net, increased $7.0 million largely 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 $39.5 million for the fourth quarter of 2020, a decrease of $4.3 million, largely due to the shift of brokerage and trading fee revenue to net interest revenue partially offset by increased customer hedging fees and investment banking revenue. Fiduciary and asset management revenue decreased $3.2 million while deposit service charges decreased $3.0 million.

2019 *Other Operating Revenue*

Other operating revenue totaled $694.4 million for 2019, an increase of $77.6 million or 13% compared to 2018 driven by growth in brokerage and trading revenue and mortgage banking revenue. 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.

Brokerage and trading revenue for 2019 increased $51.5 million compared to 2018. Lower mortgage interest rates during 2019 increased customer mortgage-backed trading activities. Trading revenue increased $60.5 million in 2019. Customer hedging revenue decreased $19.9 million compared to 2018. This is reflective of a shift in the mix of our to-be-announced residential mortgage-backed securities contracts from our customer hedging program to our trading program. Insurance brokerage fees increased $9.7 million compared to 2018 due to a full of year of operations with the addition of CoBiz in October, 2018.

Transaction card revenue grew by $3.2 million over 2018, primarily due to growth in transaction volumes. Fiduciary and asset management revenue grew $7.7 million over 2018, primarily due to growth in managed fiduciary assets.

Mortgage banking revenue increased by $9.8 million over 2018. Lower mortgage interest rates led to an increase in the supply of mortgage applications.

Other Operating Expense

Other operating expense for 2020 totaled $1.2 billion, a $33.6 million or 3% increase over the prior year. CoBiz added $17.2 million in integration costs during 2019. Excluding those costs, operating expense increased $50.8 million, largely related to incentive compensation. The fluctuation discussion below excludes the impact of closing and integration costs.

Table 8 – Other Operating Expense
(In thousands)

	Year Ended December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Regular compensation	**$ 390,282**	$ 395,902	$ 358,280	$ 333,226	$ 332,740
Incentive compensation:					
Cash-based compensation	**186,059**	144,526	132,593	127,964	128,077
Share-based compensation	**16,037**	15,544	4,229	23,602	10,464
Deferred compensation	**8,401**	8,711	(1,076)	4,091	1,687
Total incentive compensation	**210,497**	168,781	135,746	155,657	140,228
Employee benefits	**87,695**	95,882	89,105	84,525	80,151
Total personnel expense	**688,474**	660,565	583,131	573,408	553,119
Business promotion	**14,511**	35,662	30,523	28,877	26,582
Charitable contributions to BOKF Foundation	**9,000**	3,000	2,846	2,000	2,000
Professional fees and services	**53,437**	54,861	59,099	51,067	56,783
Net occupancy and equipment	**112,722**	110,275	97,981	86,477	80,024
Insurance	**19,990**	20,906	23,318	19,653	32,489
Data processing & communications[1]	**135,497**	124,983	114,796	108,125	93,736
Printing, postage and supplies	**15,061**	16,517	17,169	15,689	15,584
Net losses & operating expenses of repossessed assets	**10,709**	6,707	17,052	9,687	3,359
Amortization of intangible assets	**20,443**	20,618	9,620	6,779	6,862
Mortgage banking costs	**56,711**	50,685	46,298	52,856	61,387
Other expense	**29,382**	27,602	26,333	32,054	47,560
Total other operating expense	**$ 1,165,937**	$ 1,132,381	$ 1,028,166	$ 986,672	$ 979,485
Average number of employees (full-time equivalent)	**5,011**	5,155	4,993	4,900	4,872
Non-GAAP Reconciliation:[1]					
Data processing and communications expense on income statement	**135,497**	124,983	114,796	146,970	131,841
Netting adjustment	—	—	—	(38,845)	(38,105)
Data processing and communications expense after netting adjustment	**135,497**	**124,983**	**114,796**	**108,125**	**93,736**

[1] Non-GAAP measure to net interchange charges for 2016-2017 between transaction card revenue and data processing and communications expense as a result of the revenue recognition standard implemented January 1, 2018. This measure has no effect on net income or earnings per share.

Personnel expense

Personnel expense increased $30.8 million in 2020. Incentive compensation increased $41.8 million or 25% over 2019. 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, grew $41.6 million or 29% over 2019, largely related to the growth in mortgage-backed securities trading activities. This increase was partially offset by lower employee benefits costs of $7.2 million or 8%, largely related to decreased employee healthcare costs.

Non-personnel expense

Non-personnel expense increased $20.0 million or 4% over the prior year.

Data processing and communications expense increased $12.5 million or 10% primarily due to technology project costs. Occupancy and equipment expense increased $6.4 million or 6%, largely due to increased cleaning costs during the pandemic as well as increased depreciation costs. Mortgage banking expense increased $6.0 million or 12%, primarily due to an increase in prepayments and accruals related to default servicing and loss mitigation costs on loans serviced for others. Charitable contributions to the BOKF Foundation increased $6.0 million as we focus on the communities we serve and the extreme needs created by the pandemic. Professional fees increased $5.0 million or 10%. Net losses and operating expenses of repossessed assets increased $4.0 million or 60% over the prior year mainly due to write-downs on a set of oil and gas properties and a retail commercial real estate property during the year.

Business promotion costs, consisting largely of travel and entertainment and advertising costs, were down $19.5 million or 57%, primarily due to the effects of the current pandemic.

Fourth Quarter 2020 *Operating Expenses*

Other operating expense for the fourth quarter of 2020 totaled $300.7 million, an increase of $11.9 million over the fourth quarter of 2019.

Personnel expense increased $7.8 million over the fourth quarter of 2019 An increase in incentive compensation costs of $12.2 million was partially offset by a decrease of $3.4 million in regular compensation. Cash-based incentive compensation increased $11.4 million due to increased activity, particularly in the mortgage banking and trading areas. Deferred compensation expense increased $3.1 million, which is largely offset by changes in the fair value of assets held in rabbi trusts for the benefit of participants. Share-based compensation expense, which represents expense for equity awards based on the grant date fair value, decreased $2.3 million due to changes in vesting assumptions related to performance-based share awards.

Non-personnel expense increased $4.1 million compared to the fourth quarter of 2019. Data processing and communications costs increased $3.2 million related to technology projects. Charitable contributions to the BOKF Foundation increased $4.0 million. These increases were partially offset by a decrease in business promotion expense of $5.1 million, largely related to lower travel and entertainment costs during the pandemic.

2019 *Operating Expenses*

Other operating expense totaled $1.1 billion for 2019, a $104.2 million or 10% increase over 2018. CoBiz added $17.2 million in closing and integration costs in 2019 and $16.6 million in 2018. The fluctuation discussion below excludes these costs.

Personnel expense increased $80.3 million in 2019. Regular compensation expense increased $36.0 million, largely related to the addition of CoBiz employees. Incentive compensation grew $37.6 million, primarily related to increased sales activities and the addition of CoBiz employees. Cash based incentive compensation grew $16.5 million over 2018. Share-based incentive compensation increased $11.3 million due to an increase in the vesting probability of certain performance-based share awards. Deferred compensation expense increased $9.8 million. This expense is largely offset by changes in the fair value of assets held in rabbi trusts for the benefit of participants, which is included in other gains (losses).

Non-personnel expense increased $23.3 million or 5% over 2018. Intangible asset amortization increased $11.0 million due to the addition of CoBiz. Occupancy and equipment expense increased $8.4 million, primarily related to the addition of CoBiz operations. Data processing and communications expense increased $8.5 million due to technology project costs. Mortgage banking costs increased $4.4 million, largely due to an increase in prepayments.

Net losses and operating expenses of repossessed assets decreased $10.3 million compared to 2018 mainly due to write-downs on a set of oil and gas properties and a healthcare property in 2018. Insurance expense decreased $2.6 million, largely due to the elimination of a large bank deposit insurance surcharge assessed by the FDIC in the fourth quarter of 2018.

Income Taxes

Income tax expense was $128.8 million or 22.8% of net income before taxes for 2020, $130.2 million or 20.6% of net income before taxes for 2019 and $119.1 million or 21.1% of net income before taxes for 2018.

Net deferred tax liabilities totaled $9.5 million at December 31, 2020 compared to net deferred tax liabilities of $26 million at December 31, 2019. 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 2020 and 2019.

Income tax expense was $45.1 million or 22.6% of net income before taxes for the fourth quarter of 2020 compared to $30.3 million or 21.5% of net income before taxes for the fourth quarter of 2019.

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

	2020			
	First	**Second**	**Third**	**Fourth**
Interest revenue	**$ 348,937**	**$ 306,384**	**$ 294,659**	**$ 319,020**
Interest expense	**87,577**	**28,280**	**22,909**	**21,790**
Net interest revenue	**261,360**	**278,104**	**271,750**	**297,230**
Provision for credit losses	**93,771**	**135,321**	**—**	**(6,500)**
Net interest revenue after provision for credit losses	**167,589**	**142,783**	**271,750**	**303,730**
Fees and commissions revenue	**192,724**	**213,680**	**222,865**	**181,051**
Gain on financial instruments and other assets, net	**76,075**	**19,774**	**7,853**	**9,451**
Change in fair value of mortgage servicing rights	**(88,480)**	**(761)**	**3,441**	**6,276**
Other operating revenue	**180,319**	**232,693**	**234,159**	**196,778**
Personnel expense	**156,181**	**176,235**	**179,860**	**176,198**
Other non-personnel expense	**112,443**	**119,152**	**121,405**	**124,463**
Total other operating expense	**268,624**	**295,387**	**301,265**	**300,661**
Net income before taxes	**79,284**	**80,089**	**204,644**	**199,847**
Federal and state income taxes	**17,300**	**15,803**	**50,552**	**45,138**
Net income	**61,984**	**64,286**	**154,092**	**154,709**
Net income (loss) attributable to non-controlling interests	**(95)**	**(407)**	**58**	**485**
Net income attributable to BOK Financial Corporation shareholders	**$ 62,079**	**$ 64,693**	**$ 154,034**	**$ 154,224**
Earnings per share:				
Basic	**$ 0.88**	**$ 0.92**	**$ 2.19**	**$ 2.21**
Diluted	**$ 0.88**	**$ 0.92**	**$ 2.19**	**$ 2.21**
Average shares:				
Basic	**70,123,685**	**69,876,043**	**69,877,866**	**69,489,597**
Diluted	**70,130,166**	**69,877,467**	**69,879,290**	**69,493,050**

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

	2019			
	First	Second	Third	Fourth
Interest revenue	$ 376,074	$ 390,820	$ 395,207	$ 369,857
Interest expense	97,972	105,388	116,111	99,608
Net interest revenue	278,102	285,432	279,096	270,249
Provision for credit losses	8,000	5,000	12,000	19,000
Net interest revenue after provision for credit losses	270,102	280,432	267,096	251,249
Fees and commissions revenue	160,552	176,108	186,119	179,422
Gain (loss) on financial instruments and other assets, net	17,384	25,512	12,924	(10,134)
Change in fair value of mortgage servicing rights	(20,666)	(29,555)	(12,593)	9,297
Other operating revenue	157,270	172,065	186,450	178,585
Personnel expense	169,228	160,342	162,573	168,422
Other non-personnel expense	117,929	116,795	116,719	120,373
Total other operating expense	287,157	277,137	279,292	288,795
Net income before taxes	140,215	175,360	174,254	141,039
Federal and state income taxes	29,950	37,580	32,396	30,257
Net income	$ 110,265	$ 137,780	$ 141,858	$ 110,782
Net income (loss) attributable to non-controlling interests	(347)	217	(373)	430
Net income attributable to BOK Financial Corporation shareholders	$ 110,612	$ 137,563	142,231	110,352
Earnings per share:				
Basic	$ 1.54	$ 1.93	$ 2.00	$ 1.56
Diluted	$ 1.54	$ 1.93	$ 2.00	$ 1.56
Average shares:				
Basic	71,387,070	70,887,063	70,596,307	70,295,899
Diluted	71,404,388	70,902,033	70,609,924	70,309,644

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 business customers served through our consumer branch network and all mortgage loan origination and servicing activities. Wealth Management provides fiduciary services, private bank services, insurance 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 indirect 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 repricing and cash flow characteristics. Market rates are generally based on the applicable LIBOR or interest rate swap rates, adjusted for prepayment risk and liquidity 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 that approximate wholesale market rates for funds with similar repricing and cash flow 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 repricing 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. During 2018, the funds transfer pricing rates for non-maturity deposits became inverted due to the flattening of the yield curve. Short term rates continued to increase while long term rates remained relatively flat. In order to appropriately reflect the organizational value of these deposits to the lines of business, we increased the funding credit to reflect the upward rate moves. Those adjustments are set annually each January. During 2019, short-term rates moved down materially, which was reflected in the funding credit to the business lines beginning in January, 2020.

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 other 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 decreased \$9.8 million or 2% compared to the prior year. Net interest revenue decreased by \$119.0 million compared to the prior year, primarily due to decreases in the short-term interest rate related to a 225 basis point reduction in the federal funds rate by the Federal Reserve since the middle of 2019. Net charge-offs were up \$27.1 million over the prior year. Other operating revenue increased \$130.6 million led by our brokerage and trading and mortgage banking businesses. Other operating expense increased \$57.3 million compared to prior year, largely due to increased incentive compensation related to trading activities. The increase in net loss attributed to Funds Management and other is largely due to the excess provision for expected credit losses over net charge-offs.

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

	Year Ended December 31,		
	2020	2019	2018
Commercial Banking	**$ 306,005**	$ 374,806	$ 333,515
Consumer Banking	**95,360**	56,606	25,399
Wealth Management	**115,628**	95,331	86,027
Subtotal	**516,993**	526,743	444,941
Funds Management and other	**(81,963)**	(25,985)	705
Total	**$ 435,030**	$ 500,758	$ 445,646

Commercial Banking

Commercial Banking contributed $306.0 million to consolidated net income in 2020, a decrease of $68.8 million or 18% compared to prior year.

Table 11 – Commercial Banking
(Dollars in thousands)

	Year Ended December 31,		
	2020	2019	2018
Net interest revenue from external sources	**$ 714,932**	$ 919,148	$ 726,855
Net interest expense from internal sources	**(126,444)**	(242,907)	(159,954)
Total net interest revenue	**588,488**	676,241	566,901
Net loans charged off	**69,475**	39,011	30,358
Net interest revenue after net loans charged off	**519,013**	637,230	536,543
Fees and commissions revenue	**187,119**	168,667	161,949
Other gains, net	**242**	1,745	752
Other operating revenue	**187,361**	170,412	162,701
Personnel expense	**159,165**	163,106	122,863
Non-personnel expense	**99,738**	89,353	79,232
Other operating expense	**258,903**	252,459	202,095
Net direct contribution	**447,471**	555,183	497,149
Gain on financial instruments, net	**193**	106	26
Gain (loss) on repossessed assets, net	**(2,677)**	331	(6,532)
Corporate expense allocations	**24,862**	43,055	36,670
Income before taxes	**420,125**	512,565	453,973
Federal and state income taxes	**114,120**	137,759	120,458
Net income	**$ 306,005**	$ 374,806	$ 333,515
Average assets	**$ 26,994,075**	$ 22,807,589	$ 18,432,035
Average loans	**18,711,372**	18,090,224	15,073,484
Average deposits	**14,319,729**	10,319,677	8,517,137
Average invested capital	**2,220,177**	2,218,013	1,561,623

Net interest revenue decreased $87.8 million or 13% compared to the prior year. Yields on deposits sold to the Funds Management unit decreased as the value of deposits was impacted by falling interest rates. Net loans charged-off increased $30.5 million.

Fees and commissions revenue increased $18.5 million or 11% due to growth in customer energy hedging revenue and an increase in revenues from the processing of transactions on behalf of the members of our TransFund EFT network.

Operating expense increased $6.4 million or 3% over 2019. Non-personnel expense increased $10.4 million or 12%. Increases in data processing and communications expense, occupancy and equipment expense, intangible amortization and deposit insurance costs were partially offset by a decrease in business promotion expense. Personnel expense decreased $3.9 million or 2%. An decrease in incentive compensation costs was partially offset by an increase in regular compensation. Corporate expense allocations decreased $18.2 million or 42% compared to the prior year.

The average outstanding balance of loans attributed to Commercial Banking was up $621 million or 3% over 2019 to $18.7 billion, primarily due to the full year benefit of acquired loans from CoBiz. Prior to April 1, 2019, CoBiz loans were attributed to Funds Management and other. See the Loans section of Management's Discussion and Analysis of Financial condition following for additional discussion of changes in commercial and commercial real estate loans, which are primarily attributed to the Commercial Banking segment.

Average deposits attributed to Commercial Banking were $14.3 billion for 2020, a 39% increase over the prior year. See Management's Discussion and Analysis of Financial Condition and Results of Operations - Liquidity and Capital for further discussion of change.

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. In the first quarter of 2019, the strategic decision was made to exit our online lead buying business, HomeDirect, to focus more on our core competency of developing complete, long-term relationships with our clients through our traditional mortgage origination channel.

Net income attributed to Consumer Banking totaled $95.4 million for 2020, compared to $56.6 million in the prior year. Improved performance by Consumer Banking was largely due to the effect of lower mortgage interest rates, which has increased mortgage banking activity and related revenue.

Table 12 – Consumer Banking
(Dollars in thousands)

	Year Ended December 31,		
	2020	2019	2018
Net interest revenue from external sources	**$ 78,004**	$ 99,679	$ 83,231
Net interest revenue from internal sources	**69,000**	95,775	73,448
Total net interest revenue	**147,004**	195,454	156,679
Net loans charged off	**2,805**	6,271	5,143
Net interest revenue after net loans charged off	**144,199**	189,183	151,536
Fees and commissions revenue	**245,554**	187,996	178,174
Other losses, net	**(1,835)**	(496)	(51)
Other operating revenue	**243,719**	187,500	178,123
Personnel expense	**93,966**	96,518	96,234
Other non-personnel expense	**139,459**	134,398	134,841
Total other operating expense	**233,425**	230,916	231,075
Net direct contribution	**154,493**	145,767	98,584
Gain (loss) on financial instruments, net	**95,344**	30,375	(25,021)
Change in fair value of mortgage servicing rights	**(79,524)**	(53,517)	4,668
Gain on repossessed assets, net	**276**	496	247
Corporate expense allocations	**42,638**	47,169	44,398
Net income before taxes	**127,951**	75,952	34,080
Federal and state income taxes	**32,591**	19,346	8,681
Net income	**$ 95,360**	$ 56,606	$ 25,399
Average assets	**$ 9,842,125**	$ 9,301,341	$ 8,303,263
Average loans	**1,764,682**	1,762,915	1,731,894
Average deposits	**7,599,937**	6,876,676	6,560,145
Average invested capital	**259,333**	294,923	292,791

Net interest revenue from Consumer Banking activities decreased by $48.5 million or 25% compared to 2019, primarily due to a decrease in the yield on deposits sold to our Funds Management unit. Average consumer deposits grew $723 million with demand deposit balances up by $470 million or 22%.

Fees and commissions revenue increased $57.6 million or 31% over the prior year. Lower mortgage interest rates increased mortgage loan origination volumes. Mortgage production volume increased $1.0 billion or 34% and gain on sale margin increased 172 basis points due to industry-wide capacity constraints. Deposit service charges decreased $15.4 million. During these uncertain times, we proactively waived certain fees. In addition, the pandemic has resulted in customers retaining cash and not maintaining the usual level of spending, which has decreased overdraft fees compared to the prior year. Operating expense increased $2.5 million or 1% over 2019. An increase in mortgage banking costs was largely offset by lower business promotion expenses. Corporate expense allocations were $4.5 million or 10% lower than the prior year.

Changes in the fair value of our mortgage servicing rights, net of economic hedges, as more fully presented in Table 7, resulted in a $15.8 million increase to pre-tax net income for 2020 compared to a $23.1 million decrease to pre-tax net income in 2019.

Wealth Management

Wealth Management contributed $115.6 million to consolidated net income in 2020, up $20.3 million or 21% over the prior year. Increased fees and commissions revenue, primarily from U.S. agency residential mortgage-backed securities and related derivatives trading, was partially offset by related incentive compensation costs.

Table 13 – Wealth Management
(Dollars in thousands)

	Year Ended December 31,		
	2020	**2019**	**2018**
Net interest revenue from external sources	**$ 130,818**	$ 61,277	$ 81,528
Net interest revenue from internal sources	**(13,528)**	38,815	31,480
Total net interest revenue	**117,290**	100,092	113,008
Net loans recovered	**(209)**	(308)	(288)
Net interest revenue after net loans recovered	**117,499**	100,400	113,296
Fees and commissions revenue	**399,229**	341,333	296,465
Other gains (losses), net	**(395)**	56	(96)
Other operating revenue	**398,834**	341,389	296,369
Personnel expense	**243,461**	201,368	184,144
Other non-personnel expense	**82,147**	75,899	73,506
Other operating expense	**325,608**	277,267	257,650
Net direct contribution	**190,725**	164,522	152,015
Gain on financial instruments, net	**4**	2	7
Corporate expense allocations	**35,331**	36,239	35,920
Net income before taxes	**155,398**	128,285	116,102
Federal and state income tax	**39,770**	32,954	30,075
Net income	**$ 115,628**	$ 95,331	$ 86,027
Average assets	**$ 15,695,646**	$ 10,204,426	$ 8,447,784
Average loans	**1,758,226**	1,609,464	1,423,126
Average deposits	**8,676,047**	6,447,987	5,617,325
Average invested capital	**300,860**	274,599	251,401

Revenue attributed to the Wealth Management segment totaled $516.1 million for 2020, a $74.6 million or 17% increase over the previous year. Net interest revenue increased $17.2 million and fees and commissions revenue increased $57.9 million.

Demand for mortgage loans and related derivative contracts increased significantly due to a decrease in mortgage interest rates that began in early 2020 and continued throughout the year. We expanded trading activities that provide liquidity to our mortgage banking customers and enable them to manage their market risk. Our expanded trading activities are subject to limits established by the Board of Directors as discussed in the Market Risk section following. Growth in transaction volumes resulted in an $89.7 million increase in combined net interest revenue and trading revenue. Our level of trading volume is largely dependent on industry-wide mortgage loan production.

Growth in total revenue from expanded trading activities was partially offset by decreased net interest revenue generated by deposits sold to our Funds Management unit and loans attributed to the Wealth Management segment, and fiduciary and asset management fees. Both were negatively affected by the current low short-term interest rate environment.

Operating expense increased $48.3 million or 17% over the prior year. Personnel expense increased $42.1 million or 21% primarily related to incentive compensation as a result of higher trading activity. Non-personnel expense increased $6.2 million or 8% over 2019. Corporate expense allocations were relatively consistent compared to the prior year.

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,					
	2020		2019		2018	
	Amortized Cost	Fair Value	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Trading:						
U.S. government securities	**$ 9,183**	**$ 9,183**	$ 44,258	$ 44,264	$ 63,511	$ 63,765
Residential agency mortgage-backed securities	**4,672,772**	**4,669,148**	1,502,358	1,504,651	1,781,618	1,791,584
Municipal securities	**19,130**	**19,172**	26,136	26,196	34,508	34,507
Asset-backed securities	**—**	**—**	14,105	14,084	41,971	42,656
Other debt securities	**10,450**	**10,472**	34,705	34,726	24,346	24,411
Total trading securities	**$ 4,711,535**	**$ 4,707,975**	$ 1,621,562	$ 1,623,921	$ 1,945,954	$ 1,956,923
Investment:						
Municipal securities	**$ 229,245**	**$ 255,270**	$ 274,535	295,032	$ 334,665	$ 346,623
Residential agency mortgage-backed securities	**8,913**	**9,790**	10,676	11,164	12,612	12,770
Other debt securities	**7,373**	**7,371**	8,207	8,206	7,910	7,905
Total investment securities	**$ 245,531**	**$ 272,431**	$ 293,418	$ 314,402	$ 355,187	$ 367,298
Allowance for credit losses[1]	**(688)**	—	—	—	—	—
Investment securities, net of allowance	**$ 244,843**	**$ 272,431**	$ 293,418	$ 314,402	$ 355,187	$ 367,298
Available for sale:						
U.S. Treasury	**$ 500**	**$ 508**	$ 1,598	$ 1,600	$ 496	$ 493
Municipal securities	**165,318**	**167,979**	1,789	1,861	2,782	2,864
Mortgage-backed securities:						
Residential agency	**9,019,013**	**9,340,471**	7,956,297	8,046,096	5,886,323	5,804,708
Residential non-agency	**17,563**	**32,770**	25,968	41,609	40,948	59,736
Commercial agency	**3,406,956**	**3,508,465**	3,145,342	3,178,005	2,986,297	2,953,889
Other debt securities	**500**	**472**	500	472	35,545	35,430
Total available for sale securities	**$ 12,609,850**	**$ 13,050,665**	$ 11,131,494	$ 11,269,643	$ 8,952,391	$ 8,857,120
Fair value option securities:						
U.S. Treasury	**$ —**	**$ —**	$ 9,965	$ 9,917	$ —	$ —
Residential agency mortgage-backed securities	**110,519**	**114,982**	1,074,551	1,088,660	280,469	283,235
Total fair value option securities	**$ 110,519**	**$ 114,982**	$ 1,084,516	$ 1,098,577	$ 280,469	$ 283,235

[1] Effective with the adoption of FASB ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326) on January 1, 2020.

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. For further discussion of growth in trading securities, see "Lines of Business" section of Management's Discussion and Analysis.

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 $12.6 billion at December 31, 2020, an increase of $1.5 billion compared to December 31, 2019. 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, 2020, residential mortgage-backed securities represented 72% 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, 2020 is 2.3 years. Management estimates the combined portfolios' duration extends to 4.0 years assuming an immediate 200 basis point upward shock. The estimated duration contracts to 1.9 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 $8.8 million at December 31, 2020, an $11.4 million decrease compared to December 31, 2019. 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 2020.

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. Fair value option securities totaled $115 million, a decrease of $984 million. See Market Risk section for further details.

Bank-Owned Life Insurance

We have approximately $399 million of bank-owned life insurance at December 31, 2020. This investment is expected to provide a long-term source of earnings to support existing employee benefit programs. Approximately $308 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. As of December 31, 2020, the fair value of investments held in separate accounts was approximately $331 million. As the underlying fair value of the investments held in a separate account at December 31, 2020 exceeded the net book value of the investments, no 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 $91 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 $23.0 billion at December 31, 2020, an increase of $1.3 billion over December 31, 2019, primarily due to PPP loans, partially offset by commercial loan paydowns.

Table 15 – Loans
(In thousands)

	December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Commercial:					
Energy	**$ 3,469,194**	$ 3,973,377	$ 3,590,333	$ 2,930,156	$ 2,497,868
Services	**3,508,583**	3,832,031	4,062,742	2,992,534	3,119,056
Healthcare	**3,305,990**	3,033,916	2,799,277	2,314,753	2,201,916
General business	**2,793,768**	3,192,326	3,183,726	2,496,532	2,571,984
Total commercial	**13,077,535**	14,031,650	13,636,078	10,733,975	10,390,824
Commercial real estate:					
Multifamily	**1,328,045**	1,265,562	1,288,065	980,017	903,272
Office	**1,085,257**	928,379	1,072,920	831,770	798,888
Industrial	**810,510**	856,117	778,106	573,014	871,749
Retail	**796,223**	775,521	919,082	691,532	761,888
Residential construction and land development	**119,394**	150,879	148,584	117,245	135,533
Other commercial real estate	**559,109**	457,325	558,056	286,409	337,716
Total commercial real estate	**4,698,538**	4,433,783	4,764,813	3,479,987	3,809,046
Paycheck protection program	**1,682,310**	—	—	—	—
Loans to individuals:					
Residential mortgage	**1,863,003**	1,886,378	2,039,167	1,776,180	1,750,445
Residential mortgage guaranteed by U.S. government agencies	**408,687**	197,794	190,866	197,506	199,387
Personal	**1,277,447**	1,201,382	1,025,806	965,776	839,958
Total loans to individuals	**3,549,137**	3,285,554	3,255,839	2,939,462	2,789,790
Total	**$ 23,007,520**	**$ 21,750,987**	**$ 21,656,730**	**$ 17,153,424**	**$ 16,989,660**

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 $13.1 billion or 57% of the loan portfolio at December 31, 2020, decreasing $954 million or 7% compared to December 31, 2019. Borrowers continue to reduce leverage during this time of economic uncertainty.

Approximately 78% of loans in this segment are located within our geographic footprint, based on collateral location. Loans for which the collateral location is less relevant, such as unsecured loans and reserve-based energy loans are categorized by the borrower's primary operating location. The largest concentration of loans in this segment outside of our footprint is California, totaling 5% of the segment.

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 used 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 $3.5 billion or 15% of total loans at December 31, 2020. Approximately $2.6 billion or 76% of energy loans were to oil and gas producers, a $497 million decrease compared to December 31, 2019. 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 67% of the committed production loans are secured by properties primarily producing oil and 33% of the committed production loans are secured by properties primarily producing natural gas.

Loans to midstream oil and gas companies totaled $700 million or 20% of energy loans, an increase of $91 million over the prior year. Loans to borrowers that provide services to the energy industry totaled $110 million or 3% of energy loans, a decrease of $68 million during 2020. Loans to other energy borrowers, including those engaged in wholesale or retail energy sales totaled $36 million or 1% of energy loans, a decrease of $31 million compared to the prior year.

Unfunded energy loan commitments were $2.4 billion at December 31, 2020, down $524 million compared to December 31, 2019 as a result of the semi-annual borrowing base redetermination process in the second and fourth quarters of 2020.

The healthcare sector of the loan portfolio totaled $3.3 billion or 14% of total loans. Healthcare loans increased $272 million over December 31, 2019, primarily due to growth in loans to senior housing and care facilities. Healthcare sector loans consist primarily of loans for the development and operation of senior housing and care facilities, including independent living, assisted living and skilled nursing. Generally we loan to borrowers with a portfolio of multiple facilities that serves to help diversify risks specific to a single facility. Healthcare also includes loans to hospitals and other medical service providers impacted by a deferral of elective procedures. The CARES Act includes multiple revenue enhancement measures for both hospitals and skilled nursing facilities as they manage through the risks of the virus.

The services sector of the loan portfolio decreased $323 million to $3.5 billion or 15% of total loans. Service sector loans consist of a large number of loans to a variety of businesses, including Native American tribal and state and local governments, Native American tribal casino operations, educational services, foundations and not-for-profit organizations and specialty trade contractors. Approximately $1.9 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.

General business loans decreased $399 million to $2.8 billion or 12% of total loans. General business loans primarily consist of $1.6 billion of wholesale/retail loans and $701 million of loans from other commercial industries.

Our services and general business loans include areas we consider to be more exposed to the economic slowdown as a result of the social distancing measures in place to combat the COVID-19 pandemic such as entertainment and recreation, retail, hotels, churches, airline travel, and higher education that are dependent on large social gatherings to remain profitable. This represents less than 7 percent of our total portfolio. Some of these borrowers have participated in the PPP, which has provided some measure of relief. We will continue to monitor these areas closely in the coming months.

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, 2020, the outstanding principal balance of these loans totaled $4.1 billion, including $1.8 billion in the energy sector. Approximately 85% of shared national credits are to borrowers with local market relationships. We serve as the agent lender in approximately 21% of our shared national credits, based on dollars committed.

We hold shared national 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 generally within our geographical footprint. 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.

The commercial real estate loan balance as a percentage of our total loan portfolio has ranged from 20% to 22% over the past five years. The outstanding balance of commercial real estate loans increased $265 million over 2019. Continued friction in the permanent financing market continued to constrain paydown activity. Loans secured by office buildings increased $157 million or 17%. Other real estate loans increased $102 million or 22%. Loans secured by multifamily real estate increased $62 million or 5%. These increases were partially offset by a decrease of $46 million or 5% in loans secured by industrial facilities and a decrease of $31 million or 21% in construction and land development loans.

Approximately 67% of loans in this segment are in our geographic footprint based on collateral location. The largest concentration of loans in this segment outside our footprint is Utah, totaling 8% of the segment, followed by California at 7%. All other states represent less than 5% individually.

Loans secured by retail facilities and office buildings may be adversely impacted by measures being taken to hinder the spread of the virus as well as changes in consumer behavior.

Paycheck Protection Program

We are actively participating in programs initiated by the Coronavirus Aid, Relief and Economic Security Act ("CARES Act"), including the Small Business Administration's ("SBA") Paycheck Protection Program ("PPP") that began on April 3, 2020. PPP provided fully forgivable loans when utilized for qualified expenditures, including to help small business maintain payrolls during the COVID-19 pandemic. These loans generally have a contractual term of two years, though most are expected to be forgiven prior to maturity after completion of a compliance period. Loans are guaranteed and amounts forgiven will be reimbursed to the Company by the SBA. The loans carry a rate of 1 percent. Interest plus loan fees, which vary depending on loan size, are accrued over the contractual life of the loan. Any unaccreted origination fees will be recognized when the loan is paid. Unaccreted origination fees totaled $24 million at December 31, 2020.

PPP loan balances decreased $415 million to $1.7 billion or 7% of total loans. The complexity of the forgiveness process and borrowers' reluctance to apply for forgiveness in hopes of further legislative action that would relax the requirements has made the forgiveness process slower than initially anticipated. The recent Economic Aid Act will provide substantial forgiveness process relief, particularly for those clients with existing loans of less than $150 thousand, which represents more the 70% of our total PPP loan volume. The Company expects to participate in the newest round of PPP, with largely the same strategy of focusing on our existing client base in order to timely meet our existing clients' needs.

Loans to Individuals

Loans to individuals include residential mortgage and personal loans. Residential mortgage loans provide funds for our customers to purchase or refinance their primary residence or to borrow against the equity in their home. These loans are secured by a first or second mortgage on the customer's primary residence. These loans are made in accordance with underwriting policies we believe to be conservative and are fully documented. Loans may be individually underwritten or credit scored based on size and other criteria. Credit scoring is assessed based on significant credit characteristics including credit history, residential and employment stability.

In general, we sell the majority of our conforming fixed rate loan originations in the secondary market and retain the majority of our non-conforming and adjustable-rate 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. Home equity loans are primarily first-lien and fully amortizing.

Residential mortgage, which includes home equity loans, and personal loans are made in accordance with underwriting policies we believe to be conservative and are fully documented. Loans may be individually underwritten or credit scored based on size and other criteria. Credit scoring is assessed based on significant credit characteristics including credit history, residential and employment stability.

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.

Approximately 91% of the loans in this segment are secured by collateral located within our geographical footprint. Loans for which the collateral location is less relevant, such as unsecured loans are categorized by the borrower’s primary operating location.

Residential mortgage loans guaranteed by U.S. government agencies have limited credit exposure because of the agency guarantee. This amount includes residential mortgage loans previously sold into GNMA mortgage pools that the Company may repurchase 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 on the Consolidated Balance Sheet. Residential mortgage loans guaranteed by U.S. government agencies increased $211 million compared to December 31, 2019, primarily due to increased delinquencies and CARES Act forbearance. The balances of residential mortgage loans guaranteed by U.S. government agencies are expected to decline during the next few quarters as new forbearance plan requests have remained muted, which will reduce the Company's repurchase activity relative to 2020. Loans that have exited forbearance and have met GNMA requirements will be re-pooled into GNMA mortgage pools.

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 the Company are centrally managed by the Oklahoma market.

Table 20 – Loans Managed by Primary Geographical Market
(In thousands)

	December 31,				
	2020	2019	2018	2017	2016
Texas:					
Commercial	**$ 5,445,132**	$ 6,174,894	$ 5,438,133	$ 4,520,401	$ 4,022,455
Commercial real estate	**1,500,250**	1,259,117	1,341,783	1,261,864	1,415,011
Paycheck protection program	**501,079**	—	—	—	—
Loans to individuals	**854,700**	727,175	661,548	608,759	540,729
Total Texas	**8,301,161**	8,161,186	7,441,464	6,391,024	5,978,195
Oklahoma:					
Commercial	**4,381,569**	3,454,825	3,491,117	3,238,720	3,370,259
Commercial real estate	**628,727**	631,026	700,756	682,037	684,381
Paycheck protection program	**413,108**	—	—	—	—
Loans to individuals	**2,054,205**	1,854,864	1,816,109	1,777,644	1,711,020
Total Oklahoma	**7,477,609**	5,940,715	6,007,982	5,698,401	5,765,660
Colorado:					
Commercial	**1,554,670**	2,169,598	2,275,069	1,130,714	1,018,208
Commercial real estate	**877,610**	927,826	963,575	174,201	265,264
Paycheck protection program	**377,111**	—	—	—	—
Loans to individuals	**263,872**	276,939	324,765	126,465	110,003
Total Colorado	**3,073,263**	3,374,363	3,563,409	1,431,380	1,393,475
Arizona:					
Commercial	**1,014,958**	1,307,073	1,320,139	687,792	686,253
Commercial real estate	**718,548**	728,832	889,903	660,094	747,409
Paycheck protection program	**211,725**	—	—	—	—
Loans to individuals	**177,900**	186,539	166,505	98,911	88,818
Total Arizona	**2,123,131**	2,222,444	2,376,547	1,446,797	1,522,480
Kansas/Missouri:					
Commercial	**400,555**	527,872	659,793	717,408	807,816
Commercial real estate	**366,409**	322,541	343,228	273,116	338,762
Paycheck protection program	**56,011**	—	—	—	—
Loans to individuals	**105,755**	131,069	169,412	201,356	206,140
Total Kansas/Missouri	**928,730**	981,482	1,172,433	1,191,880	1,352,718
New Mexico:					
Commercial	**195,846**	305,320	340,489	343,296	399,256
Commercial real estate	**471,310**	402,148	383,670	341,282	284,603
Paycheck protection program	**109,881**	—	—	—	—
Loans to individuals	**75,665**	90,257	98,008	109,739	119,541
Total New Mexico	**852,702**	797,725	822,167	794,317	803,400
Arkansas:					
Commercial	**84,805**	92,068	111,338	95,644	86,577
Commercial real estate	**135,684**	162,293	141,898	87,393	73,616
Paycheck protection program	**13,395**	—	—	—	—
Loans to individuals	**17,040**	18,711	19,492	16,588	13,539
Total Arkansas	**250,924**	273,072	272,728	199,625	173,732
Total BOK Financial loans	**$ 23,007,520**	$ 21,750,987	$ 21,656,730	$ 17,153,424	$ 16,989,660

Table 21 – Loan Maturity and Interest Rate Sensitivity at December 31, 2020
(In thousands)

		Remaining Maturities of Selected Loans		
	Total	Within 1 Year	1-5 Years	After 5 Years
Loan maturity:				
Commercial	$ 13,077,535	$ 729,049	$ 7,506,549	$ 4,841,937
Commercial real estate	4,698,538	529,473	2,945,467	1,223,598
Paycheck protection program	$ 1,682,310	$ —	$ 1,682,310	$ —
Total	$ 19,458,383	$ 1,258,522	$ 12,134,326	$ 6,065,535
Interest rate sensitivity for selected loans with:				
Predetermined interest rates	$ 5,931,766	$ 59,628	$ 2,634,813	$ 3,237,325
Floating or adjustable interest rates	13,526,617	1,198,894	9,499,513	2,828,210
Total	$ 19,458,383	$ 1,258,522	$ 12,134,326	$ 6,065,535

Off-Balance Sheet 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.

We have off-balance sheet commitments related to certain residential mortgage loans sold into mortgage-backed securities as part of our mortgage banking activities. We retain off-balance sheet credit risk related to losses in excess of amounts guaranteed by the U.S. Department of Veteran's Affairs ("VA"). During the second quarter of 2020, we sold mortgage servicing rights related to residential mortgage loans primarily guaranteed by the VA with an unpaid principal balance of $1.6 billion.

We also have off-balance sheet credit risk related to certain residential mortgage loans primarily originated under community development loan programs that were sold to a U.S. government agency with full recourse prior to 2007. 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. The majority of our conforming fixed rate loan originations are sold in the secondary market and we only retain repurchase obligations under standard underwriting representations and warranties.

The CARES Act provided protections for borrowers with agency-backed residential mortgages that are serviced by the Company. Forbearance must be granted upon receiving a request from a borrower and the borrower's attestation to a financial hardship associated with the COVID-19 emergency. The Bank is required to offer up to a 6 month forbearance, with the possibility of an additional 6 month extension. This program was available to all current and delinquent borrowers, including those in bankruptcy and/or foreclosure. As of December 31, 2020, agency-serviced loans in forbearance included 3,258 borrowers with an unpaid principal balance of $511 million. For certain contracts, we must advance principal and interest payments during the forbearance period. Advances as of December 31, 2020 totaled $5.4 million. Advances are generally reimbursed to us by the appropriate agencies. Loans in forbearance are considered delinquent when payments are not made for purposes of valuing mortgage servicing rights and for purposes of determining GNMA loans that are eligible to be repurchased. As of December 31, 2020, 23% of borrowers in forbearance remained current.

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

	December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Loan commitments	**$ 10,967,546**	$ 11,065,649	$ 11,944,525	$ 9,958,080	$ 9,404,665
Standby letters of credit	**681,467**	645,505	582,196	647,653	585,472
Unpaid principal balance of residential mortgage loans sold with recourse	**73,055**	88,808	98,623	125,127	139,486
Unpaid principal balance of residential mortgage loans transferred into mortgage-backed securities guaranteed by U.S. Dept. of Veteran's Affairs	**1,442,504**	3,375,451	3,585,321	3,337,377	2,822,368

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 counterparties 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, 2020, the net fair values of derivative contracts, before consideration of cash margin, reported as assets under these programs totaled $625 million compared to $302 million at December 31, 2019. Derivative contracts carried as assets include foreign exchange contracts with fair values of $332 million, energy contracts with fair values of $175 million and interest rate swaps primarily sold to loan customers with fair values of $113 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 $600 million.

At December 31, 2020, total derivative assets were reduced by $705 thousand of cash collateral received from counterparties and total derivative liabilities were reduced by $223 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, 2020 follows in Table 23.

Table 23 – Fair Value of Derivative Contracts
(In thousands)

Customers	$ 415,021
Banks and other financial institutions	209,532
Fair value of customer hedge asset derivative contracts, net	$ 624,553

The largest exposure to a single counterparty was to a customer for an energy swap which totaled $28 million at December 31, 2020.

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, a decrease in market prices equal to the equivalent of $35.09 per barrel of oil would decrease the fair value of derivative assets by $85 million, with dealer counterparties comprising the bulk of the assets. An increase in prices equal to the equivalent of $61.71 per barrel of oil would increase the fair value of derivative assets by $506 million. 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, 2020, changes in interest rates would not materially impact regulatory capital or liquidity needed to support this portion of our customer derivative program.

Summary of Credit Loss Experience

Table 24 – Summary of Loan Loss Experience
(In thousands)

	Year Ended December 31,	
	2020	
Allowance for loan losses:		
Beginning balance	$	210,759
CECL transition adjustment[1]		25,809
Beginning balance, adjusted		236,568
Loans charged off		(79,399)
Recoveries of loans previously charged off		9,011
Net loans charged off		(70,388)
Provision for credit losses		222,460
Ending balance	$	388,640
Accrual for off-balance sheet credit risk from unfunded loan commitments:		
Beginning balance		1,585
CECL transition adjustment		23,552
Beginning balance, adjusted		25,137
Provision for credit losses		11,784
Ending balance	$	36,921
Accrual for off-balance sheet credit risk associated with mortgage banking activities:		
Beginning balance	$	4,820
CECL transition adjustment		10,915
Beginning balance, adjusted		15,735
Loans charged off		(165)
Provision for credit losses		(11,288)
Ending balance	$	4,282
Allowance for credit losses related to held-to-maturity (investment) securities:		
Beginning balance	$	—
CECL transition adjustment		1,052
Beginning balance, adjusted		1,052
Provision for credit losses		(364)
Ending balance	$	688
Total provision for credit losses	$	222,592
Net charge-offs (recoveries) to average loans		0.30 %
Net charge-offs (recoveries) to average loans excluding PPP loans[2]		0.32 %
Recoveries to gross charge-offs		11.35 %
Provision for loan losses to average loans		0.95 %
Provision for loan losses to average loans excluding PPP loans[2]		1.01 %
Allowance for loan losses to loans outstanding at period-end		1.69 %
Allowance for loan losses to loans outstanding at period-end excluding PPP loans[2]		1.82 %
Accrual for unfunded loan commitments to loan commitments		0.34 %
Combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments to loans outstanding at period-end		1.85 %
Combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments to loans outstanding at period-end excluding PPP loans[2]		2.00 %

1 Included $1.3 million related to measurement changes to the allowance attributed to outstanding loan balances and $24.5 million related to recognition of expected credit losses on acquired loans.
2 Metric meaningful due to the U.S. government agency guarantee and short-term nature of the PPP loans.

	Year Ended December 31,			
	2019	2018	2017	2016
Allowance for loan losses:				
Beginning balance	$ 207,457	$ 230,682	$ 246,159	$ 225,524
Loans charged off:				
Commercial	(43,185)	(37,880)	(19,810)	(35,828)
Commercial real estate	(1,161)	—	(76)	—
Residential mortgage	(288)	(378)	(649)	(1,312)
Personal	(6,343)	(5,325)	(5,064)	(5,448)
Total	(50,977)	(43,583)	(25,599)	(42,588)
Recoveries of loans previously charged off:				
Commercial	2,021	3,316	4,461	1,727
Commercial real estate	4,986	3,552	1,940	1,283
Residential mortgage	562	1,047	760	1,999
Personal	2,505	2,499	2,451	2,747
Total	10,074	10,414	9,612	7,756
Net loans charged off	(40,903)	(33,169)	(15,987)	(34,832)
Provision for loan losses	44,205	9,944	510	55,467
Ending balance	$ 210,759	$ 207,457	$ 230,682	$ 246,159
Accrual for off-balance sheet credit risk:				
Beginning balance	$ 1,790	$ 3,734	$ 11,244	$ 1,711
Provision for off-balance sheet credit risk	(205)	(1,944)	(7,510)	9,533
Ending balance	$ 1,585	$ 1,790	$ 3,734	$ 11,244
Total combined provision for credit losses	$ 44,000	$ 8,000	$ (7,000)	$ 65,000
Allowance for loan losses to loans outstanding at period end	0.97 %	0.96 %	1.34 %	1.45 %
Net charge-offs (recoveries) to average loans	0.19 %	0.18 %	0.09 %	0.21 %
Total provision for credit losses to average loans	0.20 %	0.04 %	(0.04) %	0.40 %
Recoveries to gross charge-offs	19.76 %	23.89 %	37.55 %	18.21 %
Allowance for loan losses as a multiple of net charge-offs	5.15 x	6.25 x	14.43 x	7.07 x
Accrual for off-balance sheet credit risk to off-balance sheet credit commitments	0.01 %	0.01 %	0.04 %	0.11 %
Combined allowance for credit losses to loans outstanding at period-end	0.98 %	0.97 %	1.37 %	1.52 %

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

The Company adopted FASB Accounting Standard Update No. 2016-13, *Financial Instruments – Credit Losses (Topic 326): Assets Measured at Amortized Cost* ("CECL") on January 1, 2020 through a pre-tax cumulative-effect adjustment to equity of $61.4 million. CECL requires recognition of expected credit losses on assets carried at amortized cost over their expected lives. The previous incurred loss model incorporated only known information as of the balance sheet date. Prior years reported under the incurred loss model have not been restated. CECL uses models to measure the probability of default and loss given default over a 12-month reasonable and supportable forecast period. Models incorporate base case, downside, and upside macroeconomic variables such as real gross domestic product ("GDP") growth, civilian unemployment rate and West Texas Intermediate ("WTI") oil prices on a probability weighted basis. See Note 4 to the Consolidated Financial Statements for additional discussion of methodology of allowance for loan losses.

The provision for expected credit losses was $222.6 million for the year ended December 31, 2020. A $234.2 million provision related to lending activities was partially offset by a decrease in the accrual for expected credit losses from mortgage banking activities and allowance for credit losses from investment securities. During the second quarter of 2020, the Company sold certain mortgage servicing rights related to residential mortgage loans transferred to mortgage-backed securities. These servicing rights expose the Company to credit risk for amounts that exceed the U.S. government agency guarantees.

Changes in our reasonable and supportable forecasts of macroeconomic variables, primarily due to the anticipated impact of the COVID-19 pandemic, resulted in a $99.1 million provision for credit losses from lending activities. Economic conditions were volatile during the year, including changes in unemployment rates, GDP and energy commodity prices, causing the 2020 provision to occur in the first half of the year as our allowance grew for expected losses. While this volatility moderated in the latter half of the year, the embedded impact of these risks continue to remain in our portfolio at December 31, 2020. Changes in the loan portfolio characteristics, including specific impairment and losses, loan balances and risk grading resulted in a $135.1 million increase in the provision for credit losses from lending activities during 2020.

We recorded a $6.5 million negative provision for credit losses in the fourth quarter of 2020. Changes in our reasonable and supportable forecasts of macroeconomic variables, primarily due to an improved economic outlook related to the anticipated impact of the on-going COVID-19 pandemic offset by changes in the probability weighting of the economic scenarios and other assumptions, resulted in a $3.0 million increase in the provision for credit losses from lending activities. Changes in the loan portfolio characteristics, including specific impairment and losses, risk grading and loan balances resulted in an $8.6 million decrease in the provision for credit losses from lending activities.

Our reasonable and supportable forecast of macroeconomic variables is significantly influenced by the COVID-19 pandemic developments and related government stimulus policies, which remain highly uncertain. A summary of macroeconomic variables considered in developing our estimate of expected credit losses at December 31, 2020 follows:

	Base	**Downside**	**Upside**
Scenario probability weighting	60%	30%	10%
COVID-19 trajectory	Trajectory of COVID-19 maintains current level with localized and state-level hotspots resulting in isolated shutdowns; FDA approval of several more vaccines in the first half of 2021, with a large share of U.S. population vaccinated by the end of the third quarter of 2021.	Trajectory of COVID-19 pandemic worsens during winter months; additional waves and hotspots emerge through the first half of 2021. Highly impacted states/regions enact shutdowns to manage hospital capacity, though a nation-wide shutdown is not re-implemented. FDA does not approve additional vaccines until the second half of 2021, resulting in more protracted distribution and delaying widespread vaccination in the U.S. until early 2022.	Trajectory of COVID-19 continues to improve from peak experienced in December of 2020. This leads to isolated shutdowns, even at a more localized level. FDA approval of several more vaccines in the first half of 2021, with a large share of U.S. population vaccinated by the end of the third quarter 2021.
Economic recovery (driven by COVID-19 trajectory)	Regional shutdowns and consumer confidence weigh negatively on economic and employment recoveries in the first quarter of 2021. As vaccine distribution boosts consumer confidence, GDP grows at rates above historical averages and recovers to pre-COVID-19 levels by the third quarter of 2021.	Deteriorated COVID-19 situation, slow vaccine distribution and lack of fiscal stimulus in 2020 cause the economy to fall back into recession. GDP does not recover to pre-COVID-19 levels until early 2023.	Consumer confidence grows as optimism around vaccination helps maintain moderate growth in the first quarter of 2021. GDP subsequently continues to grow at levels above historical averages, recovering to pre-COVID-19 levels by the second quarter of 2021.
Fiscal stimulus (driven by economic recovery)	No additional fiscal stimulus packages are enacted in 2021.	Large-scale fiscal stimulus package of $1.2 trillion enacted in the third quarter of 2021 due to on-going political gridlock and includes expanded unemployment benefits, additional small business support, state fiscal aid and payments to individuals.	No additional fiscal stimulus packages are enacted in 2021.
Macro-economic factors	– GDP is forecasted to grow by 4.1% over the next 12 months. – Civilian unemployment rate of 6.8% in the first quarter of 2021 improves to 6.3% by the fourth quarter of 2021. – WTI oil prices are projected to generally follow the NYMEX forward curve that existed at the end of December 2020, averaging $46.80 per barrel over the next 12 months.	– GDP is forecasted to contract 6.0% in the first quarter of 2021, improving to 3.0% growth in the fourth quarter of 2021. – Civilian unemployment rate of 7.9% the first quarter of 2021 increases in the next two quarters and ends at 8.9% by the fourth quarter of 2021. – WTI oil prices are projected to average $35.74 over the next 12 months.	– GDP is forecasted to grow by 6.0% over the next 12 months. – Civilian unemployment rate of 6.6% in the first quarter of 2021 quickly improves to 5.7% by the fourth quarter of 2021. – WTI oil prices are projected to average $49.89 per barrel over the next 12 months.

Net charge-offs and changes in specific impairments attributed to certain credits required a $75.4 million provision during 2020 while changes in risk grading during the year resulted in a $92.9 million provision. This provision was partially offset by a change in outstanding loan balances used to measure the provision for credit losses related to changes in loan portfolio characteristics. A summary of outstanding loan balances by risk grade is included in Note 4 to the Consolidated Financial Statements. Non-pass grade loans include other loans especially mentioned, defined by regulatory guidelines as loans that are currently performing in compliance with original terms but may have a potential weakness that deserves management's close attention, accruing substandard loans, and nonaccruing loans. Non-pass grade loans totaled $1.0 billion at December 31, 2020, composed primarily of $650 million or 19% of energy loans, $133 million or 4% of commercial services loans, $84 million or 3% of commercial general business loans, $58 million or 1% of commercial real estate loans and $53 million or 2% of commercial healthcare loans. Non-pass grade loans totaled $551 million at December 31, 2019.

Although fiscal stimulus through PPP, SBA support and other CARES Act programs have had a positive impact on credit quality, we received a number of deferral or forbearance requests beginning in the second quarter of 2020. All requests were evaluated on a case-by-case basis and all loans greater than $1 million that requested forbearance were reviewed for proper grading. At the peak, deferral requests totaled $1.6 billion or 8% of total loans. At December 31, 2020, loans in deferral status have dropped to just below 1% of total loans. More than 90% of the loans that were deferred have now moved back to payment status and are making payments pursuant to an updated payment schedule.

The allowance for loan losses totaled $389 million or 1.69% of outstanding loans and 171% of nonaccruing loans at December 31, 2020, excluding residential mortgage loans guaranteed by U.S. government agencies. The combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was $426 million or 1.85% of outstanding loans and 188% of nonaccruing loans at December 31, 2020. Excluding PPP loans, the allowance for loan losses was 1.82% of outstanding loans and the combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was 2.00%.

The allowance for credit losses attributed to energy was 3.61% of outstanding energy loans at December 31, 2020. Our most recent semi-annual borrowing base redetermination was completed during the fourth quarter of 2020 based on forward pricing curves that existed at that time. While forward prices subsequently improved, the pricing environment remains fragile and tied to the continued economic recovery from the impact of the COVID-19 pandemic. We believe the duration of the downturn is a more significant factor affecting performance than the level of prices.

We also conduct quarterly stress tests of our energy borrowers with more than 50% funding on their lines of credit and all non-pass graded loans using a current price deck discounted at 20%. This stress test helps us identify potential issues, although the most recent test corroborated the risk grading of energy borrowers evaluated once hedging was taken into consideration. Of all the energy customers that we stress test, which makes up 96% of production loans outstanding, 96% of our customers have some level of hedging in the 12-month range and many of them carry into the 24-month range.

The company recorded a $44 million provision for credit losses under the previous incurred loss model in 2019. The allowance for loan losses under the incurred loss model was $211 million or 0.97% of outstanding loans and 121% of nonaccruing loans, excluding loans guaranteed by U.S. government agencies at December 31, 2019. The combined allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments was $212 million or 0.98% of outstanding loans and 121% of core nonaccruing loans.

Table 25 – Allowance for Loan Losses Allocation
(Dollars in thousands)

	December 31,									
	2020		2019		2018		2017		2016	
	Allowance	% of Loans[1]	Allowance[2]	% of Loans[1]	Allowance[2]	% of Loans[1]	Allowance[2]	% of Loans[1]	Allowance[2]	% of Loans[1]
Loan category:										
Commercial	**$ 254,934**	**56.84 %**	$ 118,187	64.51 %	$ 102,226	62.97 %	$ 124,269	62.58 %	$ 140,213	61.16 %
Commercial real estate	**86,558**	**20.42 %**	51,805	20.38 %	60,026	22.00 %	56,621	20.29 %	50,749	22.42 %
Paycheck protection program	**—**	**7.31 %**	—	— %	—	— %	—	— %	—	— %
Loans to individuals	**47,148**	**15.43 %**	23,572	15.11 %	27,437	15.03 %	27,575	17.13 %	26,997	16.42 %
Nonspecific allowance	**—**		17,195		17,768		22,217		28,200	
Total	**$ 388,640**	**100.00 %**	$ 210,759	100.00 %	$ 207,457	100.00 %	$ 230,682	100.00 %	$ 246,159	100.00 %

[1] Represents ratio of loan category balance to total loans.
[2] Calculated under previous incurred loss method. The Company adopted FASB Accounting Standard Update No. 2016-13, *Financial Instruments – Credit Losses (Topic 326): Assets Measured at Amortized Cost* ("CECL") on January 1, 2020

Net Loans Charged Off

Net loans charged off totaled $70 million or 0.32% of average loans, excluding PPP loans, in 2020. Net loans charged off were $41 million or 0.19% of average loans in 2019.

In 2020, net charge-offs of commercial loans were $69 million, primarily related to energy borrowers. Net commercial real estate loan charge-offs were $1.0 million and net loan charge-offs of loans to individuals were $620 thousand. Net charge-offs of loans to individuals include deposit account overdraft losses.

Accrual for Off-Balance Sheet Credit Risk Associated with Mortgage Banking Activities

The accrual for off-balance sheet credit risk associated with mortgage banking activities includes consideration of credit risk related to certain residential mortgage loans sold into mortgage-backed securities in excess of amounts guaranteed by the U.S. Department of Veteran's Affairs ("VA") and mortgage loans originated under community development loan programs that were sold to a U.S. government agency with full recourse.

We use publicly available long-term national data to estimate total loss given default for our off-balance sheet credit risk related to losses in excess of amounts guaranteed by the VA. This result is combined with probability of default output from our mortgage servicing rights model to estimate total expected loss. Then, we estimate the VA's guarantee percentage to determine our portion of the credit risk. Qualitative adjustment may be used, if necessary.

Allowance for Credit Losses Related to Held-to-Maturity (Investment) Securities

The expected credit losses principles apply to all financial assets measured at cost, including our held-to-maturity (investment) debt securities portfolio. Our investment portfolio includes municipal and other tax-exempt securities and other debt securities. Expected credit losses for these assets is based on probability of default and loss given default assumptions that align with similarly graded loans. Qualitative adjustment may be used, if necessary.

Nonperforming Assets

As more fully described in Note 4 to the Consolidated Financial Statements, loans are generally classified as nonaccruing when it becomes probable that we will not collect the full contractual principal and interest. Accruing renegotiated loans guaranteed by U.S. government agencies represent residential mortgage loans that have been modified in troubled debt restructurings. Interest continues to accrue based on the modified terms of the loan and loans may be sold once they become eligible according to U.S. government agency guidelines. 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 the date of foreclosure or current fair value, less estimated selling costs. A summary of nonperforming assets follows in Table 26:

Table 26 - Nonperforming Assets
(Dollars in Thousands)

	December 31,				
	2020	2019	2018	2017	2016
Nonaccruing loans:					
Commercial					
Energy	**$ 125,059**	$ 91,722	$ 47,494	$ 92,284	$ 132,499
Healthcare	**3,645**	4,480	16,538	14,765	825
Services	**25,598**	7,483	8,567	2,620	8,173
General business	**12,857**	11,731	27,242	27,634	37,456
Total commercial	**167,159**	115,416	99,841	137,303	178,953
Commercial real estate	**27,246**	27,626	21,621	2,855	5,521
Paycheck protection program	**—**	—	—	—	—
Loans to individuals					
Residential mortgage	**32,228**	31,522	34,423	38,268	34,374
Residential mortgage guaranteed by U.S. government agencies	**7,741**	6,100	7,132	9,179	11,846
Personal	**319**	287	230	269	290
Total loans to individuals	**40,288**	37,909	41,785	47,716	46,510
Total nonaccruing loans	**$ 234,693**	$ 180,951	$ 163,247	$ 187,874	$ 230,984
Accruing renegotiated loans guaranteed by U.S. government agencies	**151,775**	92,452	86,428	73,994	81,370
Real estate and other repossessed assets	**90,526**	20,359	17,487	28,437	44,287
Total nonperforming assets	**$ 476,994**	$ 293,762	$ 267,162	$ 290,305	$ 356,641
Total nonperforming assets excluding those guaranteed by U.S. government agencies	**$ 317,478**	$ 195,210	$ 173,602	$ 207,132	$ 263,425
Allowance for loan losses to nonaccruing loans[1,3]	**171.24 %**	120.54 %	132.89 %	129.09 %	112.33 %
Nonperforming assets to outstanding loans and repossessed assets	**2.07 %**	1.35 %	1.23 %	1.69 %	2.09 %
Nonperforming assets to outstanding loans and repossessed assets excluding residential mortgage and PPP loans guaranteed by U.S. government agencies[2,3]	**1.51 %**	0.90 %	0.81 %	1.22 %	1.56 %
Nonaccruing commercial loans to outstanding commercial loans	**1.28 %**	0.82 %	0.73 %	1.28 %	1.72 %
Nonaccruing commercial real estate loans to outstanding commercial real estate loans	**0.58 %**	0.62 %	0.45 %	0.08 %	0.14 %
Nonaccruing loans to individuals to outstanding loans to individuals[3]	**1.04 %**	1.03 %	1.13 %	1.41 %	1.34 %
Accruing loans 90 days of more past due[3]	**$ 10,369**	$ 7,680	$ 1,338	$ 633	$ 5

[1] Effective January 1, 2020, the Company adopted the required expected credit loss approach for the allowance as required by ASU 2016-13, *Financial Instruments - Credit Losses*. All periods prior to January 1, 2020 reflect the incurred loss approach in effect at that time.
[2] Excludes residential mortgage and PPP loans guaranteed by U.S. government agencies.
[3] Excludes residential mortgages guaranteed by U.S. government agencies.

Excluding assets guaranteed by U.S. government agencies, nonperforming assets increased $122 million over December 31, 2019, primarily due to a $70 million increase in real estate and other repossessed assets, a $33 million increase in nonaccruing energy loans and an $18 million increase in nonaccruing services loans. Newly identified nonaccruing loans totaled $305 million, partially offset by $85 million of foreclosures, $79 million of charge-offs and $74 million in payments. The Company generally retains nonperforming assets to maximize potential recovery, which may cause future nonperforming assets to decrease more slowly.

A rollforward of nonperforming assets for the year ended December 31, 2020 follows in Table 27.

Table 27 – Rollforward of Nonperforming Assets
(In thousands)

	Year Ended December 31, 2020						
	Nonaccruing Loans						
	Commercial	Commercial Real Estate	Loan to Individuals	Total	Renegotiated Loans	Real Estate and Other Repossessed Assets	Total Nonperforming Assets
Balance, December 31, 2019	$ 115,416	$ 27,626	$ 37,909	$ 180,951	$ 92,452	$ 20,359	$ 293,762
Additions	263,981	19,919	20,658	304,558	96,935	—	401,493
Payments	(61,617)	(459)	(11,567)	(73,643)	(2,752)	—	(76,395)
Charge-offs	(73,370)	(1,300)	(4,729)	(79,399)	—	—	(79,399)
Net gains (losses) and write-downs	—	—	—	—	—	(1,628)	(1,628)
Foreclosure of nonaccruing loans	(65,690)	(18,540)	(1,093)	(85,323)	—	85,323	—
Foreclosure of loans guaranteed by U.S. government agencies	—	—	(1,506)	(1,506)	(3,422)	—	(4,928)
Proceeds from sales	—	—	—	—	(30,860)	(13,528)	(44,388)
Net transfers to nonaccruing loans	—	—	1,326	1,326	—	—	1,326
Return to accrual status	(11,561)	—	(710)	(12,271)	(1,916)	—	(14,187)
Other, net	—	—	—	—	1,338	—	1,338
Balance, December 31, 2020	$ 167,159	$ 27,246	$ 40,288	$ 234,693	$ 151,775	$ 90,526	$ 476,994

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 limited. These properties will be conveyed to the agencies and receivables collected once applicable criteria have been met.

Real Estate and Other Repossessed Assets

Real estate and other repossessed assets totaled $91 million at December 31, 2020, composed primarily of $64 million of oil and gas properties, including $41 million of repossessed oil & gas properties included in a consolidated limited liability corporation that is 60% owned by the Company and 40% owned by an unrelated financial institution. The remaining balance of real estate and other repossessed assets included $21 million of developed commercial real estate, $3.4 million of undeveloped land primarily zoned for commercial development and $625 thousand of 1-4 family residential properties. The residential properties and undeveloped land are widely disbursed across our geographical footprint. Real estate and other repossessed assets increased $73 million compared to December 31, 2019.

Liquidity and Capital

Based on the average balances for 2020, approximately 67% of our funding was provided by deposit accounts, 17% from borrowed funds, less than 1% from long-term subordinated debt and 10% 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.

Deposits and borrowed funds are the primary sources of liquidity for the subsidiary bank. 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 29 - Average Deposits by Line of Business
(In thousands)

	Year Ended December 31,	
	2020	**2019**
Commercial Banking	**$ 14,319,729**	$ 10,319,677
Consumer Banking	**7,599,937**	6,876,676
Wealth Management	**8,676,047**	6,447,987
Subtotal	**30,595,713**	23,644,340
Funds Management and other	**2,169,285**	2,006,941
Total	**$ 32,764,998**	$ 25,651,281

Average deposits for 2020 totaled $32.8 billion and represented approximately 67% of total liabilities and capital compared to $25.7 billion and 61% of total liabilities and capital for 2019. Average deposits increased $7.1 billion over the prior year. Inflows resulting from PPP loans and government stimulus payments during the pandemic, along with additional core deposit growth as customers maintain higher balances during the current economic environment, have all contributed to the significant increase in deposits. Interest-bearing transaction deposit account balances increased by $5.6 billion and demand deposits grew by $1.4 billion.

Average deposits attributed to Commercial Banking were $14.3 billion for 2020, a $4.0 billion or 39% increase over 2019. Interest-bearing transaction account balances increased $2.5 billion or 60% and demand deposit balances increased $1.3 billion or 22%. Commercial customers continue 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 decrease as the economic outlook improves and if short-term rates move higher, enhancing their investment alternatives.

Average Consumer Banking deposit balances increased $723 million or 11% over the prior year. Average demand deposit balances grew by $470 million or 22% while average interest-bearing transaction accounts increased $253 million or 5%. Time deposit balances decreased $15 million or 2%.

Average Wealth Management deposit balances grew by $2.2 billion or 35% over the prior year. Interest-bearing transaction balances increased $2.3 billion or 52%. Non-interest-bearing demand deposits decreased $42 million or 4%, and time deposit balances decreased $63 million or 8%.

Table 30 - Maturity of Domestic CDs and Public Funds in Amounts of $100,000 or More
(In thousands)

	December 31,	
	2020	**2019**
Months to maturity:		
3 or less	**$ 653,092**	$ 364,642
Over 3 through 6	**247,546**	275,227
Over 6 through 12	**281,865**	466,751
Over 12	**314,623**	572,539
Total	**$ 1,497,126**	$ 1,679,159

Brokered deposits included in time deposits averaged $131 million for 2020, compared to $247 million for 2019. Brokered deposits included in time deposits totaled $81 million at December 31, 2020 and $237 million at December 31, 2019.

Average interest-bearing transaction accounts for 2020 included $1.9 billion of brokered deposits compared to $1.1 billion for 2019. Brokered deposits included in interest-bearing transaction accounts totaled $2.2 billion at December 31, 2020 and $1.2 billion at December 31, 2019.

The distribution of our period end deposit account balances among principal markets follows in Table 31.

Table 31 - Period End Deposits by Principal Market Area
(In thousands)

	December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Oklahoma:					
Demand	**$ 4,328,619**	$ 3,257,337	$ 3,610,593	$ 3,885,008	$ 3,993,170
Interest-bearing:					
Transaction	**12,603,603**	8,574,912	6,445,831	5,901,293	6,345,536
Savings	**420,996**	306,194	288,210	265,870	241,696
Time	**1,134,453**	1,125,446	1,118,643	1,092,133	1,118,355
Total interest-bearing	**14,159,052**	10,006,552	7,852,684	7,259,296	7,705,587
Total Oklahoma	**18,487,671**	13,263,889	11,463,277	11,144,304	11,698,757
Texas:					
Demand	**3,450,468**	2,757,376	3,289,659	3,239,098	3,137,009
Interest-bearing:					
Transaction	**3,800,482**	2,911,731	2,294,740	2,397,071	2,388,812
Savings	**139,173**	102,456	99,624	93,620	83,101
Time	**383,062**	495,343	423,880	502,879	535,642
Total interest-bearing	**4,322,717**	3,509,530	2,818,244	2,993,570	3,007,555
Total Texas	**7,773,185**	6,266,906	6,107,903	6,232,668	6,144,564
Colorado:					
Demand	**2,168,404**	1,729,674	1,658,473	633,714	576,000
Interest-bearing:					
Transaction	**2,170,485**	1,769,037	1,899,203	657,629	616,679
Savings	**69,384**	53,307	57,289	35,223	32,866
Time	**208,778**	283,517	274,877	224,962	242,782
Total interest-bearing	**2,448,647**	2,105,861	2,231,369	917,814	892,327
Total Colorado	**4,617,051**	3,835,535	3,889,842	1,551,528	1,468,327
New Mexico:					
Demand	**941,074**	623,722	691,692	663,353	627,979
Interest-bearing:					
Transaction	**733,007**	558,493	571,347	552,393	590,571
Savings	**91,646**	63,999	58,194	55,647	49,963
Time	**186,307**	238,140	224,515	216,743	238,408
Total interest-bearing	**1,010,960**	860,632	854,056	824,783	878,942
Total New Mexico	**1,952,034**	1,484,354	1,545,748	1,488,136	1,506,921

	December 31,				
	2020	**2019**	**2018**	**2017**	**2016**
Arizona:					
Demand	**905,201**	681,268	709,176	334,701	366,755
Interest-bearing:					
Transaction	**768,220**	684,929	575,996	274,846	305,099
Savings	**12,174**	10,314	10,545	3,343	2,973
Time	**32,721**	49,676	43,051	20,394	27,765
Total interest-bearing	**813,115**	744,919	629,592	298,583	335,837
Total Arizona	**1,718,316**	1,426,187	1,338,768	633,284	702,592
Kansas/Missouri:					
Demand	**426,738**	384,533	418,199	457,080	508,418
Interest-bearing:					
Transaction	**960,237**	784,574	327,866	382,066	513,176
Savings	**16,286**	12,169	13,721	13,574	12,679
Time	**14,610**	17,877	19,688	27,260	42,152
Total interest-bearing	**991,133**	814,620	361,275	422,900	568,007
Total Kansas/Missouri	**1,417,871**	1,199,153	779,474	879,980	1,076,425
Arkansas:					
Demand	**45,834**	27,381	36,800	30,384	26,389
Interest-bearing:					
Transaction	**122,388**	108,076	91,593	85,095	105,232
Savings	**2,333**	1,837	1,632	1,881	2,192
Time	**7,197**	7,850	8,726	14,045	16,696
Total interest-bearing	**131,918**	117,763	101,951	101,021	124,120
Total Arkansas	**177,752**	145,144	138,751	131,405	150,509
Total BOK Financial deposits	**$ 36,143,880**	$ 27,621,168	$ 25,263,763	$ 22,061,305	$ 22,748,095

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

In addition to deposits, liquidity for the subsidiary bank 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 $200 million at December 31, 2020 and $600 million at December 31, 2019. 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 $3.4 billion during 2020 and $7.1 billion during 2019.

On April 13, 2020, the banking agencies published an interim final rule which permits banking organizations to exclude from regulatory capital requirements PPP covered loans pledged to the Federal Reserve's Paycheck Protection Program Liquidity Facility ("PPLF"). The Company initially funded PPP loans from deposits and Federal Home Loan Bank borrowings, but transitioned to the PPLF in June of 2020 in order to realize this regulatory capital relief.

At December 31, 2020, the estimated unused credit available to BOKF, NA from collateralized sources was approximately $16.5 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. The average balance of this liability increased over the prior year primarily due to GNMA loans serviced by the Company that are participating in the forbearance program included in the CARES Act, which began in the second quarter. As delinquencies increase, the GNMA repurchase liability will also increase.

Parent Company and Other Non-Bank Subsidiaries

The primary sources of liquidity for BOK Financial are cash on hand and dividends from the subsidiary bank. Cash and cash equivalents totaled $184 million at December 31, 2020. Dividends from the subsidiary bank 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, 2020, based on the most restrictive limitations as well as management's internal capital policy, BOKF, NA could declare up to $370 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, 2020 was $5.3 billion, an increase of $410 million over December 31, 2019. Net income less cash dividends paid increased equity $357 million during 2020. Changes in interest rates resulted in accumulated other comprehensive income of $336 million at December 31, 2020, compared to $105 million at December 31, 2019. Capital is managed to maximize long-term value to the shareholders. Factors considered in managing capital include projections of future earnings, 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 April 30, 2019, 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, 2020, a cumulative total of 1,973,813 shares have been repurchased under this authorization. The Company repurchased 1,107,100 shares during 2020 at an average price of $68.49 per share.

BOK Financial and the subsidiary bank 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 follows for BOK Financial on a consolidated basis in Table 32.

Table 32 – Capital Ratios

	Minimum Capital Requirement	Capital Conservation Buffer	Minimum Capital Requirement Including Capital Conservation Buffer	December 31, 2020	December 31, 2019
Risk-based capital:					
Common equity Tier 1	4.50 %	2.50 %	7.00 %	**11.95 %**	11.39 %
Tier 1 capital	6.00 %	2.50 %	8.50 %	**11.95 %**	11.39 %
Total capital	8.00 %	2.50 %	10.50 %	**13.82 %**	12.94 %
Tier 1 Leverage	4.00 %	N/A	4.00 %	**8.28 %**	8.40 %
Average total equity to average assets				**10.46 %**	11.11 %
Tangible common equity ratio				**9.02 %**	8.98 %

In March 2020, in response to the impact on the financial markets by the COVID-19 pandemic, the banking agencies issued an interim final rule permitting banking organizations that implement CECL the option to delay for two years an estimate of the CECL methodology's effect on regulatory capital, followed by a three-year transition period. The estimate includes the implementation date adjustment as of January 1, 2020 plus an estimate of the impact of the change for a two year period following implementation of CECL. We have elected to delay the regulatory capital impact of the transition in accordance with the interim final rule. Deferral of the impact of CECL added 26 basis points to the Company's Common equity Tier 1 capital at December 31, 2020.

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

Table 33 – Non-GAAP Measures
(Dollars in thousands)

	December 31, 2020	December 31, 2019
Tangible common equity ratio:		
Total shareholders' equity	**$ 5,266,266**	$ 4,855,795
Less: Goodwill and intangible assets, net	**1,161,527**	1,173,362
Tangible common equity	**4,104,739**	3,682,433
Total assets	**46,671,088**	42,172,021
Less: Goodwill and intangible assets, net	**1,161,527**	1,173,362
Tangible assets	**$ 45,509,561**	$ 40,998,659
Tangible common equity ratio	9.02 %	8.98 %
Pre-provision net revenue:		
Net income before taxes	**$ 563,864**	$ 630,868
Add: Provision for expected credit losses	**222,592**	44,000
Less: Net income (loss) attributable to non-controlling interests	**41**	(73)
Pre-provision net revenue	$ 786,415	$ 674,941

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 34 following summarizes payments due on contractual obligations with initial terms in excess of one year.

Table 34 – Contractual Obligations as of December 31, 2020
(In thousands)

	Less Than 1 Year	1 to 3 Years	4 to 5 Years	More Than 5 Years	Total
Time deposits	$ 560,187	$ 267,384	$ 101,021	$ 106,509	$ 1,035,101
Other borrowings	4,601	1,652,753	11,434	1,100	1,669,888
Subordinated debentures	13,310	26,620	24,933	535,642	600,505
Lease obligations	26,289	41,366	38,493	115,784	221,932
Derivative contracts	145,978	91,489	22,078	9,143	268,688
Data processing services	13,852	23,409	18,788	5,306	61,355
Total	$ 764,217	$ 2,103,021	$ 216,747	$ 773,484	$ 3,857,469
Loan commitments					$ 10,967,546
Standby letters of credit					681,467
Mortgage loans sold with recourse					73,055
Alternative investment commitments					94,380

Payments on time deposits, other borrowed funds and subordinated debentures include interest which has been calculated from rates at December 31, 2020. 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 $2.1 billion of the loan commitments expire within one year.

The Company has commitments to fund an additional $94 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, the economy generally and the expected or potential impact of the novel coronavirus (COVID-19) pandemic, and the related responses of the government, consumers, and others, on our business, financial condition and results of operations. Words such as “anticipates,” “believes,” “estimates,” “expects,” “forecasts,” “plans,” “projects,” “will,” “intends,” variations of 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 acquisitions and 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 various forward-looking 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 government, consumer or business responses to, and ability to treat or prevent further outbreak of, the COVID-19 pandemic, 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. 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.

Annualized, pro forma, projected and estimated numbers are used for illustrative purpose only, are not forecasts and may not reflect actual results.

Legal Notice

As used in this report, the term “BOK Financial” and such terms as “the Company,” “the Corporation,” “our,” “we” and “us” may 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 decrease in interest rates in the current low-rate environment are not meaningful.

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 35 – Interest Rate Sensitivity
(Dollars in thousands)

	200 bp Increase[1]		100 bp Decrease[2]	
	2020	**2019**	**2020**	**2019**
Anticipated impact over the next twelve months on net interest revenue	**$ 24,489**	$ (16,328)	**N/A**	$ (31,629)
	2.33 %	(1.50)%	**N/A**	(2.91)%

[1] Repricing assumptions for non-maturity deposits were updated in the second quarter of 2020 to better represent observed historical performance.
[2] The results of a decrease in the current low-rate environment in 2020 are not meaningful. The results of a 200 basis point decrease in interest rates in the low-rate environment in 2019 were not meaningful, therefore we reported the effect of a 100 basis point decrease in interest rates.

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 36 - MSR Asset and Hedge Sensitivity Analysis
(In thousands)

	December 31,			
	2020		2019	
	Up 50 bp	**Down 50 bp**	**Up 50 bp**	**Down 50 bp**
MSR Asset	**$ 29,065**	**$ (14,585)**	$ 30,369	$ (41,779)
MSR Hedge	**(19,873)**	**18,354**	(40,727)	33,454
Net Exposure	**9,192**	**3,769**	(10,358)	(8,325)

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 37 - Mortgage Pipeline Sensitivity Analysis
(In thousands)

	Year Ended December 31,			
	2020		2019	
	Up 50 bp	Down 50 bp	Up 50 bp	Down 50 bp
Average[1]	**$ (386)**	**$ (414)**	$ (143)	$ (191)
Low[2]	**582**	**998**	528	293
High[3]	**(799)**	**(1,483)**	(498)	(538)
Period End	**(507)**	**(510)**	(112)	(98)

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 38 –Trading Securities Sensitivity Analysis
(In thousands)

	Year Ended December 31,			
	2020		2019	
	Up 50 bp	Down 50 bp	Up 50 bp	Down 50 bp
Average[1]	**$ (2,473)**	**$ 3,910**	$ (1,803)	$ 2,602
Low[2]	**7,893**	**15,309**	2,049	7,106
High[3]	**(12,490)**	**(4,855)**	(5,345)	(1,376)
Period End	**(4,380)**	**4,241**	(1,702)	2,710

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, 2020.

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, 2020. Their report, which expresses an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2020, is included in this annual report.

Report of Independent Registered Public Accounting Firm

To the Shareholders and the 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, 2020, 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, 2020, based on the COSO criteria.

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, 2020 and 2019, 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, 2020, and the related notes and our report dated February 24, 2021 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

February 24, 2021

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, 2020 and 2019, 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, 2020, 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, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, 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, 2020, 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 February 24, 2021 expressed an unqualified opinion thereon.

Adoption of New Accounting Standard

As discussed in Notes 1 and 4 to the consolidated financial statements, the Company changed its method for accounting for credit losses in 2020. As explained below, auditing the Company's allowance for credit losses, including adoption of the new accounting guidance related to the estimate of allowance for credit losses, was a critical audit matter.

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.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Allowance for credit losses

Description of the Matter

The Company's loan portfolio totaled $23.0 billion as of December 31, 2020, and the associated allowance for credit losses (ACL) was $425.6 million. The provision for credit losses was $234.2 million for the year ended December 31, 2020. As discussed above and in Notes 1 and 4, the Company adopted new accounting guidance related to the estimate of the allowance for credit losses (ACL or allowance), resulting in a pre-tax cumulative-effect decrease to equity of $61.4 million. As discussed in Note 1 and 4 to the consolidated financial statements, management's estimate for the expected credit losses within the loan portfolio represents the portion of amortized cost basis of loans and related unfunded commitments they do not expect to collect over the asset's contractual life, considering past events, current conditions, as well as reasonable and supportable forecasts of future economic conditions. The allowance for credit losses consists of specific allowances attributed to certain individual loans, generally nonaccruing loans, with dissimilar risk characteristics that have not yet been charged down to amounts they expect to recover, general allowances for estimated credit losses on pools of loans that share similar risk characteristics, and qualitative reserves with the estimated impact of factors that are not captured in the modeled results or historical experience.

Auditing management's estimate of the ACL and related provision for credit losses was complex due to the allowance models used, high degree of subjectivity in evaluating management's development of forecasts of future economic conditions ("economic scenarios"), probability weighting of economic scenarios, and qualitative reserves used in the general allowance.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design and tested the operating effectiveness of internal controls over the ACL process, including, among others, controls over the development, operation, and monitoring of economic scenarios, probability weighting of economic scenarios and qualitative reserves used in the allowance results.

We involved EY specialists in testing management's models including evaluating model methodology, model performance and testing key modeling assumptions as well as controls covering the economic scenarios used by the ACL models. Additionally, with the support of EY specialists, we assessed the economic scenarios and related probability weights by evaluating management's methodology and agreeing a sample of key economic variables used to external sources. We also performed various sensitivity analyses and analytical procedures, including comparison of a sample of the key economic variables to alternative external sources and historical statistics.

With respect to general ACL models, with the support of EY specialists, we evaluated model design and re-performed the calculation for a sample of models. We also tested the appropriateness of key inputs and assumptions used in these models by agreeing a sample of inputs to internal sources.

We evaluated the overall ACL amount, including model estimates, qualitative reserves, and whether the recorded ACL appropriately reflects expected credit losses. We performed analytical procedures on the ACL, charge-off and delinquency rates, and coverage ratios of the allowance. Our audit response also included specific substantive tests of management's process to measure qualitative reserves, including those related to the significant judgments made by management. We compared calculations to industry peer data and compared qualitative reserves to prior periods and prior economic cycles. We also evaluated if the qualitative reserves were applied based on a comprehensive framework and that all available information was considered, well-documented, and consistently applied. We searched for and evaluated information that corroborates or contradicts management's economic scenarios and related probability weights as well as identification and measurement of qualitative reserves.

/s/ Ernst & Young LLP

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

Tulsa, Oklahoma

February 24, 2021

Consolidated Statements of Earnings

(In thousands, except share and per share data)

	Year Ended December 31,		
Interest and dividend revenue	**2020**	**2019**	**2018**
Loans	**$ 889,507**	$ 1,123,791	$ 891,587
Residential mortgage loans held for sale	**6,397**	7,105	8,123
Trading securities	**67,689**	61,595	57,531
Investment securities	**11,943**	13,426	14,775
Available for sale securities	**261,196**	254,031	197,317
Fair value option securities	**18,475**	32,936	15,205
Restricted equity securities	**10,963**	26,860	21,555
Interest-bearing cash and cash equivalents	**2,830**	12,214	22,333
Total interest and dividend revenue	**1,269,000**	1,531,958	1,228,426
Interest expense			
Deposits	**89,996**	175,538	95,517
Borrowed funds	**56,616**	228,428	138,215
Subordinated debentures	**13,944**	15,113	9,827
Total interest expense	**160,556**	419,079	243,559
Net interest and dividend revenue	**1,108,444**	1,112,879	984,867
Provision for credit losses	**222,592**	44,000	8,000
Net interest and dividend revenue after provision for credit losses	**885,852**	1,068,879	976,867
Other operating revenue			
Brokerage and trading revenue	**221,833**	159,826	108,323
Transaction card revenue	**90,182**	87,216	84,025
Fiduciary and asset management revenue	**167,445**	177,025	184,703
Deposit service charges and fees	**96,805**	112,485	112,153
Mortgage banking revenue	**182,360**	107,541	97,787
Other revenue	**51,695**	58,108	56,185
Total fees and commissions	**810,320**	702,201	643,176
Other gains (losses), net	**7,675**	9,351	(2,265)
Gain (loss) on derivatives, net	**42,320**	14,951	(422)
Gain (loss) on fair value option securities, net	**53,248**	15,787	(25,572)
Change in fair value of mortgage servicing rights	**(79,524)**	(53,517)	4,668
Gain (loss) on available for sale securities, net	**9,910**	5,597	(2,801)
Total other operating revenue	**843,949**	694,370	616,784
Other operating expense			
Personnel	**688,474**	660,565	583,131
Business promotion	**14,511**	35,662	30,523
Charitable contributions to BOKF Foundation	**9,000**	3,000	2,846
Professional fees and services	**53,437**	54,861	59,099
Net occupancy and equipment	**112,722**	110,275	97,981
Insurance	**19,990**	20,906	23,318
Data processing and communications	**135,497**	124,983	114,796
Printing, postage and supplies	**15,061**	16,517	17,169
Net losses and operating expenses of repossessed assets	**10,709**	6,707	17,052
Amortization of intangible assets	**20,443**	20,618	9,620
Mortgage banking costs	**56,711**	50,685	46,298
Other expense	**29,382**	27,602	26,333
Total other operating expense	**1,165,937**	1,132,381	1,028,166
Net income before taxes	**563,864**	630,868	565,485
Federal and state income taxes	**128,793**	130,183	119,061
Net income	**435,071**	500,685	446,424
Net income (loss) attributable to non-controlling interests	**41**	(73)	778
Net income attributable to BOK Financial Corporation shareholders	**$ 435,030**	$ 500,758	$ 445,646
Earnings per share:			
Basic	**$ 6.19**	$ 7.03	$ 6.63
Diluted	**$ 6.19**	$ 7.03	$ 6.63
Average shares used in computation:			
Basic	**69,840,977**	70,787,700	66,628,640
Diluted	**69,844,172**	70,802,612	66,662,273
Dividends declared per share	**$ 2.05**	$ 2.01	$ 1.90

See accompanying notes to Consolidated Financial Statements.

Consolidated Statements of Comprehensive Income

(In thousands)

	Year Ended December 31, 2020		
	2020	**2019**	**2018**
Net income	**$ 435,071**	$ 500,685	$ 446,424
Other comprehensive income (loss) before income taxes:			
Net change in unrealized gain (loss)	**313,796**	241,047	(48,010)
Reclassification adjustments included in earnings:			
Loss (gain) on available for sale securities, net	**(9,910)**	(5,597)	2,801
Other comprehensive gain (loss), before income taxes	**303,886**	235,450	(45,209)
Federal and state income taxes	**72,941**	57,942	(11,507)
Other comprehensive gain (loss), net of income taxes	**230,945**	177,508	(33,702)
Comprehensive income	**666,016**	678,193	412,722
Comprehensive income (loss) attributable to non-controlling interests	**41**	(73)	778
Comprehensive income attributable to BOK Financial Corp. shareholders	**$ 665,975**	$ 678,266	$ 411,944

See accompanying notes to Consolidated Financial Statements.

Consolidated Balance Sheets

(In thousands, except share data)

	December 31,	
	2020	**2019**
Assets		
Cash and due from banks	**$ 798,757**	$ 735,836
Interest-bearing cash and cash equivalents	**381,816**	522,985
Trading securities	**4,707,975**	1,623,921
Investment securities, net of allowance (fair value**: 2020 – $272,431;** 2019 – $314,402)	**244,843**	293,418
Available for sale securities	**13,050,665**	11,269,643
Fair value option securities	**114,982**	1,098,577
Restricted equity securities	**171,391**	460,552
Residential mortgage loans held for sale	**252,316**	182,271
Loans	**23,007,520**	21,750,987
Allowance for loan losses	**(388,640)**	(210,759)
Loans, net of allowance	**22,618,880**	21,540,228
Premises and equipment, net	**551,308**	535,519
Receivables	**245,880**	231,811
Goodwill	**1,048,091**	1,048,091
Intangible assets, net	**113,436**	125,271
Mortgage servicing rights	**101,172**	201,886
Real estate and other repossessed assets, net of allowance (**2020 – $15,060**; 2019 – $11,013)	**90,526**	20,359
Derivative contracts, net	**810,688**	323,375
Cash surrender value of bank-owned life insurance	**398,758**	389,879
Receivable on unsettled securities sales	**62,386**	1,020,404
Other assets	**907,218**	547,995
Total assets	**$ 46,671,088**	$ 42,172,021
Liabilities and Equity		
Liabilities:		
Noninterest-bearing demand deposits	**$ 12,266,338**	$ 9,461,291
Interest-bearing deposits:		
Transaction	**21,158,422**	15,391,752
Savings	**751,992**	550,276
Time	**1,967,128**	2,217,849
Total deposits	**36,143,880**	27,621,168
Funds purchased and repurchase agreements	**1,662,386**	3,818,350
Other borrowings	**1,882,970**	4,527,055
Subordinated debentures	**276,005**	275,923
Accrued interest, taxes and expense	**323,667**	259,701
Derivative contracts, net	**405,779**	251,128
Due on unsettled securities purchases	**257,627**	182,547
Other liabilities	**427,213**	372,230
Total liabilities	**41,379,527**	37,308,102
Shareholders' equity:		
Common stock ($0.00006 par value; 2,500,000,000 shares authorized; shares issued and outstanding: **2020 – 75,995,205;** 2019 – 75,758,597)	**5**	5
Capital surplus	**1,368,062**	1,350,995
Retained earnings	**3,973,675**	3,729,778
Treasury stock (shares at cost: **2020 – 6,357,605**; 2019 – 5,178,999)	**(411,344)**	(329,906)
Accumulated other comprehensive income (loss)	**335,868**	104,923
Total shareholders’ equity	**5,266,266**	4,855,795
Non-controlling interests	**25,295**	8,124
Total equity	**5,291,561**	4,863,919
Total liabilities and equity	**$ 46,671,088**	$ 42,172,021

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, 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)
Capital calls and distributions, net	—	—	—	—	—	—	—	—	(12,809)	(12,809)
Issuance of shares for CoBiz acquisition	400	1	291,125	—	(6,811)	410,185	—	701,311	—	701,311
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
Transition adjustment - Leasing Standard	—	—	—	2,862	—	—	—	2,862	—	2,862
Balance, January 1, 2019, Adjusted	75,711	5	1,334,030	3,372,516	3,589	(198,995)	(72,585)	4,434,971	10,936	4,445,907
Net income (loss)	—	—	—	500,758	—	—	—	500,758	(73)	500,685
Other comprehensive income	—	—	—	—	—	—	177,508	177,508	—	177,508
Repurchase of common stock	—	—	—	—	1,572	(129,483)	—	(129,483)	—	(129,483)
Share-based compensation plans:										
Stock options exercised	27	—	1,421	—	—	—	—	1,421	—	1,421
Non-vested shares awarded, net	21	—	—	—	—	—	—	—	—	—
Vesting of non-vested shares	—	—	—	—	18	(1,428)	—	(1,428)	—	(1,428)
Share-based compensation	—	—	15,544	—	—	—	—	15,544	—	15,544
Cash dividends on common stock	—	—	—	(143,496)	—	—	—	(143,496)	—	(143,496)
Capital calls and distributions, net	—	—	—	—	—	—	—	—	(2,739)	(2,739)
Balance, December 31, 2019	75,759	$ 5	$ 1,350,995	$ 3,729,778	5,179	$(329,906)	$ 104,923	$ 4,855,795	$ 8,124	$4,863,919

(In thousands)

	Common Stock				Treasury Stock					
	Shares	Amount	Capital Surplus	Retained Earnings	Shares	Amount	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity	Non-Controlling Interests	Total Equity
Balance, December 31, 2019	**75,759**	**$ 5**	**$ 1,350,995**	**$ 3,729,778**	**5,179**	**$(329,906)**	**$ 104,923**	**$ 4,855,795**	**$ 8,124**	**$4,863,919**
Transition adjustment - CECL	—	—	—	**(46,696)**	—	—	—	**(46,696)**	—	**(46,696)**
Balance, January 1, 2020, Adjusted	**75,759**	**5**	**1,350,995**	**3,683,082**	**5,179**	**(329,906)**	**104,923**	**4,809,099**	**8,124**	**4,817,223**
Net income	—	—	—	**435,030**	—	—	—	**435,030**	**41**	**435,071**
Other comprehensive income	—	—	—	—	—	—	**230,945**	**230,945**	—	**230,945**
Repurchase of common stock	—	—	—	—	**1,107**	**(75,830)**	—	**(75,830)**	—	**(75,830)**
Share-based compensation plans:										
Stock options exercised	**12**	—	**675**	—	—	—	—	**675**	—	**675**
Non-vested shares awarded, net	**224**	—	—	—	—	—	—	—	—	—
Vesting of non-vested shares	—	—	—	—	**72**	**(5,608)**	—	**(5,608)**	—	**(5,608)**
Share-based compensation	—	—	**16,392**	—	—	—	—	**16,392**	—	**16,392**
Cash dividends on common stock	—	—	—	**(144,437)**	—	—	—	**(144,437)**	—	**(144,437)**
Capital calls and distributions, net	—	—	—	—	—	—	—	—	**17,130**	**17,130**
Balance, December 31, 2020	**75,995**	**$ 5**	**$ 1,368,062**	**$ 3,973,675**	**6,358**	**$(411,344)**	**$ 335,868**	**$ 5,266,266**	**$ 25,295**	**$5,291,561**

See accompanying notes to Consolidated Financial Statements.

Consolidated Statements of Cash Flows

(In thousands)

	Year Ended		
	2020	2019	2018
Cash Flows From Operating Activities:			
Net income	$ **435,071**	$ 500,685	$ 446,424
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Provision for credit losses	**222,592**	44,000	8,000
Change in fair value of mortgage servicing rights due to market changes	**79,524**	53,517	(4,668)
Change in fair value of mortgage servicing rights due to principal payments	**41,598**	38,979	33,528
Net unrealized losses (gains) from derivative contracts	**(59,253)**	(25,936)	4,686
Share-based compensation	**16,392**	15,544	4,229
Depreciation and amortization	**99,013**	95,416	60,843
Net amortization of discounts and premiums	**5,357**	(16,984)	30,945
Net losses (gains) on financial instruments and other losses (gains), net	**(15,949)**	(583)	9,585
Net gain on mortgage loans held for sale	**(114,545)**	(40,402)	(35,705)
Mortgage loans originated for sale	**(3,764,112)**	(3,025,930)	(2,587,297)
Proceeds from sale of mortgage loans held for sale	**3,817,475**	3,035,600	2,691,144
Capitalized mortgage servicing rights	**(31,209)**	(35,128)	(35,247)
Change in trading and fair value option securities	**(2,103,931)**	(483,007)	(1,023,097)
Change in receivables	**945,087**	(740,868)	(38,346)
Change in other assets	**1,739**	18,955	27,507
Change in other liabilities	**8,895**	92,463	(144,537)
Net cash provided by (used in) operating activities	**(416,256)**	(473,679)	(552,006)
Cash Flows From Investing Activities:			
Proceeds from maturities or redemptions of investment securities	**46,992**	60,128	124,864
Proceeds from maturities or redemptions of available for sale securities	**2,695,067**	1,841,069	1,122,680
Purchases of investment securities	**—**	—	(4,468)
Purchases of available for sale securities	**(4,575,324)**	(5,245,256)	(1,955,172)
Proceeds from sales of available for sale securities	**384,507**	1,211,718	745,643
Change in amount receivable on unsettled available for sale securities transactions	**(6,357)**	25,410	38,347
Loans originated, net of principal collected	**(1,103,752)**	(44,414)	(1,553,033)
Net payments on derivative asset contracts	**(121,130)**	33,566	(114,417)
Acquisitions, net of cash acquired	**—**	—	(175,755)
Net change in restricted equity securities	**289,161**	116,105	18,997
Proceeds from disposition of assets	**73,135**	62,576	289,765
Purchases of assets	**(141,134)**	(384,639)	(345,082)
Net cash provided by (used in) investing activities	**(2,458,835)**	(2,323,737)	(1,807,631)
Cash Flows From Financing Activities:			
Net change in demand deposits, transaction deposits and savings accounts	**8,773,433**	2,252,936	(13,870)
Net change in time deposits	**(250,721)**	104,288	(73,089)
Net change in other borrowed funds	**(5,091,026)**	1,110,970	1,295,484
Change in amount due on unsettled security purchases	**63,521**	(41,651)	(41,319)
Issuance of common and treasury stock, net	**(4,933)**	(7)	(88)
Net change in derivative margin accounts	**(600,218)**	(207,122)	85,466
Net payments or proceeds on derivative liability contracts	**127,054**	(33,622)	114,076
Repurchase of common stock	**(75,830)**	(129,483)	(53,465)
Dividends paid	**(144,437)**	(143,496)	(127,188)
Net cash provided by (used in) financing activities	**2,796,843**	2,912,813	1,186,007
Net increase (decrease) in cash and cash equivalents	**(78,248)**	115,397	(1,173,630)
Cash and cash equivalents at beginning of period	**1,258,821**	1,143,424	2,317,054
Cash and cash equivalents at end of period	$ **1,180,573**	$ 1,258,821	$ 1,143,424
Supplemental Cash Flow Information:			
Cash paid for interest	$ **160,288**	$ 417,070	$ 243,121
Cash paid for taxes	$ **136,181**	$ 87,361	$ 92,291
Net loans and bank premises transferred to repossessed real estate and other assets	$ **85,323**	$ 10,665	$ 9,880
Increase in U.S. government guaranteed loans eligible for repurchase	$ **290,977**	$ 91,634	$ 100,238
Increase in receivables from conveyance of GNMA OREO	$ **11,322**	$ 28,669	$ 38,216
Right-of-use assets obtained in exchange for operating lease liabilities	$ **16,177**	$ 62,755	$ —

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, BOK Financial Securities, Inc., BOK Financial Private Wealth, Inc., BOK Financial Insurance, 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 BOK Financial in the metropolitan areas of Phoenix, Arizona; Northwest Arkansas; Denver, Colorado; Kansas City, Missouri/Kansas; and as Bank of Albuquerque in Albuquerque, New Mexico. BOKF, NA also operates the TransFund electronic funds network, Cavanal Hill Investment Management, and BOK Financial Asset Management, Inc.

Use of Estimates

Preparation of BOK Financial's Consolidated Financial Statements requires management to make estimates of future economic activities, including loan collectability, loss contingencies, 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.

On a quarterly basis, the Company performs separate evaluations of debt investment and available for sale securities for the presence of impairment. We assess whether impairment is present on an individual security basis when the fair value of a debt security is less than the amortized cost.

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 and whether there is any impairment attributable to credit-related factors. If an impairment exists, the amount attributed to credit-related factors is measured and an allowance for credit loss is recognized. Declines in fair value that are not recorded in the allowance are recorded in other comprehensive income, net of taxes.

BOK Financial may elect to carry certain securities that are not held for trading purposes 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 other financial 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.

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. 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.

BOK Financial may offer derivative instruments such as to-be-announced U.S. agency residential mortgage-backed securities to mortgage banking customers to enable them to manage their market risk or to mitigate the Company's market risk of holding trading securities. Changes in the fair value of derivative instruments for trading purposes or used to mitigate the market risk of holding trading securities are included in Other Operating Revenue - Brokerage and trading revenue.

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. 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.

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, forward sales contracts, and residential mortgage loans held for sale are carried at fair value. Changes in the fair value are reported in Other Operating Revenue - Mortgage banking revenue.

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 mortgage 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"). 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. Payment deferrals of up to six months are generally considered to be short-term modifications. Generally, principal and accrued but unpaid interest is not voluntarily forgiven.

Performing loans may be renewed under the then 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. A portion of 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.

Allowances for Credit Losses and Accrual for Off-balance Sheet Credit Risk from Unfunded Loans Commitments

BOK Financial’s accounting policies have changed significantly with the adoption of CECL as of January 1, 2020. Prior periods are not restated. Prior to January 1, 2020, general allowances and nonspecific allowances were based on incurred credit losses in accordance with accounting policies disclosed in Note 1 of the Consolidated Financial Statements included in the 2019 Form 10-K.

The allowance for loan losses and accrual for off-balance sheet credit risk from unfunded loan commitments represent the portion of the amortized cost basis of loans that we do not expect to collect over the asset’s contractual life, considering past events, current conditions, and reasonable and supportable forecasts of future economic conditions. The appropriateness of the allowance for credit losses, including industry and product adjustments, is assessed quarterly by a senior management Allowance Committee. This review is based on an on-going evaluation of the estimated expected credit losses in the portfolio and on unused commitments to provide financing. A 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 certain individual loans, generally nonaccruing loans, with dissimilar risk characteristics that have not yet been charged down to amounts we expect to recover and general allowances for estimated credit losses on pools of loans that share similar risk characteristics.

When full collection of principal or interest is uncertain, the loan’s risk characteristics have changed, and we exclude the loan from the general allowance pool, typically designating it as nonaccruing. For these loans, a specific allowance reflects the expected credit loss.

We measure specific allowances for loans excluded from the general allowance pool by an evaluation of estimated future cash flows discounted at the loans initial effective interest rate or the fair value of collateral for certain collateral dependent loans. For a non-collateral dependent loan, the specific allowance is the amount by which the loan’s amortized cost basis exceeds its net realizable value. We measure the specific allowance for collateral dependent loans as the amount by which the loan’s amortized cost basis exceeds its fair value. When repayment is expected to be provided substantially through the sale of collateral, we deduct estimated selling costs from the collateral’s fair value. Generally, third party appraisals that conform to Uniform Standards of Professional Appraisal Practice serve as the basis for the fair value of real property held as collateral. These appraised values are on an “as-is” basis and generally are not adjusted by the Company. We obtain updated appraisals at least annually or more frequently if market conditions indicate collateral values may have declined. For energy loans, our internal staff of engineers generally determines collateral value of mineral rights based on projected cash flows from proven oil and gas reserves under existing economic and operating conditions. For real property held as collateral for other loans, third party appraisals that conform to Uniform Standards of Professional Appraisal Practice generally serve as the basis for the fair value. These appraised values are on an “as-is” basis and generally are not adjusted by the Company. We obtain updated appraisals at least annually or more frequently if market conditions indicate collateral values may have declined. Our special assets staff generally determines the value of other collateral based on projected liquidation cash flows under current market conditions. We evaluate collateral values and available cash resources quarterly. Historical statistics may be used to estimate specific allowances in limited situations, such as when a collateral dependent loan is removed from the general allowance pool near the end of a reporting period until an appraisal of collateral value is received or a full assessment of future cash flows is completed.

General allowances estimate expected credit losses on pools of loans sharing similar risk characteristics that are expected to occur over the loan's estimated remaining life. The loan's estimated remaining life represents the contractual term adjusted for amortization, estimates of prepayments, and borrower-owned extension options. Approximately 90 percent of the committed dollars in the loan portfolio is risk graded loans with general allowance model inputs that include probability of default, loss given default, and exposure at default. Probability of default is based on the migration of loans from performing to nonperforming using historical life of loan analysis periods. Loss given default is based on the aggregate losses incurred, net of estimated recoveries. Exposure at default represents an estimate of the outstanding amount of credit exposure at the time a default may occur.

Charge-off migration is used to calculate the general allowance for the majority of non-risk graded loans to individuals. The expected credit loss on less than 10 percent of the committed dollars in the portfolio is calculated using charge-off migration.

The expected credit loss on approximately 1 percent of the committed dollars in the portfolio is calculated using a non-modeled approach. Specifically, the calculation applies a long-term net charge-off rate to the loan balances, adjusted for the weighted average remaining maturity of each portfolio.

In estimating the expected credit losses for general allowances on performing risk-graded loans, each portfolio class is assigned relevant economic loss drivers which best explain variations in portfolio net loss rates. The probability of default estimates for each portfolio class are adjusted for current and forecasted economic conditions. The result is applied to the exposure at default and loss given default to calculate the lifetime expected credit loss estimate. Selection of relevant economic loss drivers is re-evaluated periodically and involves statistical analysis as well as management judgment. The unemployment rate factors significantly in the allowance for loan losses calculation, affecting commercial and loans to individuals segments. Other primary factors impacting the commercial portfolio include BBB corporate spreads, real gross domestic product growth rate, and energy commodity prices. The primary commercial real estate variables are vacancy rate and BBB corporate spreads. In addition to the unemployment rate, the forecast for loans to individuals is tied to home price index. The forecasts may include regional economic factors when localized conditions diverge from national conditions.

An Economic Forecast Committee, consisting of senior management with members largely independent of the allowance process develops a twelve-month forward-looking forecast for the relevant economic loss drivers. Management develops these forecasts based on external data as well as a view of future economic conditions, which may include adjustments for regional conditions. The forecast includes three economic scenarios and probability weights for each scenario. The base forecast represents management's view of the most likely outcome, while the downside forecast reflects reasonably possible worsening economic conditions, and the upside forecast projects reasonably possible improving conditions.

At the end of the one-year reasonable and supportable forecast period, we transition from shorter-term expected losses to long-term loss averages for the loan's estimated remaining life. The difference between short-term loss forecasts and long-term loss averages is run-off over the reversion horizon, up to three years, depending on the forecasted economic scenarios.

General allowances also consider the estimated impact of factors that are not captured in the modeled results or historical experience. These factors may increase or decrease modeled results by amounts determined by the Allowance Committee. Factors not captured in modeled results or historical experience may include for example, new lines of business, market conditions that have not been previously encountered, observed changes in credit risk that are not yet reflected in macro-economic factors, or economic conditions that impact loss given default assumptions.

The accrual for off-balance sheet credit risk is maintained at a level that is appropriate to cover estimated losses associated with credit instruments that are not currently recognized as assets such as loan commitments, standby letters of credit or guarantees that are not unconditionally cancellable by the bank. This accrual 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, with the added consideration of commitment usage over the remaining life for those loans that the bank can not unconditionally cancel.

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 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 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. These are not credit obligations. 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 flows 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.

Premises and equipment includes rights to use leased facilities and equipment. Right of use assets are initially measured by the present value of future rent payments over lease terms, adjusted for rent concessions. Rent payments exclude both payments made for non-lease components such as services and variable lease payments other than payments dependent on an index at lease commencement. Lease term includes options reasonably certain to be exercised. The right of use assets and lease liabilities are amortized to achieve straight-line expense over the lease term. Upon lease modification, the right of use asset and liability are reassessed and remeasured. Right of use assets are evaluated for impairment when facts and circumstances change that indicate an impairment may be necessary. Leases less than twelve months are excluded from capitalization.

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 an 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 non-vested common shares and stock options as compensation to certain officers. The 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. 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.

Compensation cost is initially based on the grant date fair value of the award and 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. Share-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.

Restricted stock units ("RSUs") may also be awarded for certain executives who have elected to defer income recognition upon vesting of their awards. RSUs are subject to the same vesting criteria as non-vested shares. The value of the awards will vary in amounts equal to changes in the fair value of an equal number of BOK Financial common shares.

Tax effects of share-based payments are recognized through tax expense. Dividends on non-vested shares are charged to retained earnings. Dividend equivalents on RSUs are charged to expense.

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, investment banking and insurance brokerage. 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. Insurance brokerage revenues represent fees and commissions earned on placement of insurance products with carriers for property and casualty and health coverage.

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 BOKF, NA. Electronic funds transfer fees are recognized as electronic transactions are 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. 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. The Company adopted the new standard January 1, 2019 through a cumulative effect adjustment to retained earnings. The implementation of ASU 2016-02 increased the reported right-of-use asset and lease liability by $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 to provide more timely recording of credit losses on loans and other financial assets measured at amortized cost. The Company adopted the new standard January 1, 2020, through a cumulative effect adjustment to retained earnings. Prior periods were not restated.

Under ASU 2016-13, acquired loans must be reserved in a manner consistent with originated loans while the incurred loss model excluded purchased loans because the loans had been marked to fair value at acquisition. Under ASU 2016-13, the fair value discount will remain in place and be accreted into interest income over the life of any acquired loans in the portfolio.

Another transition adjustment component is related to expected credit losses for residential mortgage loans sold that exceed amounts guaranteed by the U.S. Department of Veterans Affairs as we retain the credit risk for any amounts exceeding the guarantee as well as for recourse loans.

Prior to ASU 2016-13, held-to-maturity non-agency securities carried no reserve for credit losses.

Note 4 disaggregates the transition adjustment for loans and unfunded loan commitments among portfolio segments as well as on-and off-balance sheet reserves.

FASB Accounting Standards Update No. 2019-04, *Codification Improvements to Topic 326, Financial Instruments-Credit Losses, Topic 815, Derivatives and Hedging, and Topic 825, Financial Instruments* ("ASU 2019-04")

On April 25, 2019, the FASB issued ASU 2019-04 which clarifies certain aspects of the accounting for credit losses, hedging activities, and financial instruments addressed by ASUs 2016-13, 2017-12, and 2016-01, respectively. Significant amendments made to the provisions of ASU 2016-13 by ASU 2019-04 include providing certain alternatives for the measurement of the allowance for credit losses on accrued interest receivable and clarifying steps entities should take when recording the transfer of loans or debt securities between measurement classification or categories. ASU 2019-04 further clarifies the expectation that entities include recoveries of financial assets in the calculation of the current expected credit losses allowance for both pools of financial assets and individual financial assets. Significant amendments made to the provisions of ASU 2017-12 by ASU 2019-04 include clarification on partial-term fair value hedges of interest rate risk, amortization of fair value hedge basis adjustments and disclosure of fair value hedge basis adjustments. Significant amendments made to provisions of ASU 2016-01 include clarification of the measurement alternative practice for equity securities and remeasurement of equity securities at historical exchange rates. ASU 2019-04 includes other amendments which clarify various provisions within the codification. The Company adopted ASU 2019-04 in the first quarter of 2020. Adoption of ASU 2019-04 did not have a material impact on the Company's financial statements.

FASB Accounting Standards Update No. 2019-05, *Financial Instruments-Credit Losses (Topic 326): Targeted Transition Relief* ("ASU 2019-05")

On May 15, 2019, the FASB issued ASU 2019-05 which provides transition relief for entities adopting the Board's credit losses standard, ASU 2016-13. ASU 2019-05 amends ASU 2016-13 to allow companies to irrevocably elect, upon adoption of ASU 2016-13, the fair value option for financial instruments that meet specific requirements and is effective for the Company for annual reporting periods beginning after December 15, 2019. The Company did not elect the fair value option for additional financial instruments.

FASB Accounting Standards Update No. 2019-11, *Codification Improvements to Topic 326: Financial Instruments-Credit Losses* ("ASU 2019-11")

On November 27, 2019, the FASB issued ASU 2019-11 which revises certain aspects of new guidance on credit losses. Topics addressed include purchased credit-deteriorated assets, transition relief for troubled debt restructurings, disclosure relief for accrued interest receivable, and financial assets secured by collateral maintenance provisions. ASU 2019-11 is effective for the Company for annual reporting periods beginning after December 15, 2019. The Company adopted ASU 2019-11 in the first quarter of 2020. Adoption of ASU 2019-11 did not have a material impact on the Company's financial statements.

FASB Accounting Standards Update No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* ("ASU 2019-12")

On December 18, 2019, the FASB issued ASU 2019-12 which simplifies the accounting for income taxes by eliminating certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. The ASU also simplifies aspects of accounting for franchise taxes and enacted changes in tax laws or rates and clarifies accounting for transactions that result in a step-up in the tax basis of goodwill. ASU 2019-12 is effective for the Company for annual reporting periods beginning after December 15, 2020, and interim periods within; however, early adoption is permitted. The Company adopted ASU 2019-12 in the first quarter of 2020. Adoption of ASU 2019-12 did not have a material impact on the Company's financial statements.

FASB Accounting Standards Update No. 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting* ("ASU 2020-04")

On March 12, 2020, the FASB issued ASU 2020-04 which provides optional expedients and exceptions for applying U.S. GAAP to contract modifications and hedging relationships that reference LIBOR or another reference rate expected to be discontinued, subject to meeting certain criteria. Under the new guidance, an entity can elect by accounting topic or industry subtopic to account for the modification of a contract affected by reference rate reform as a continuation of the existing contract, if certain conditions are met. In addition, the new guidance allows an entity to elect on a hedge-by-hedge basis to continue to apply hedge accounting for hedging relationships in which the critical terms change due to reference rate reform, if certain conditions are met. A one-time election to sell and/or transfer held-to-maturity debt securities that reference a rate affected by reference rate reform is also allowed. ASU 2020-04 became effective for all entities as of March 12, 2020 and will apply to all LIBOR reference rate modifications through December 31, 2022. Management is currently evaluating the impact of ASU 2020-04 on the Company's financial statements.

FASB Accounting Standards Update No. 2021-01, *Reference Rate Reform (Topic 848): Scope* ("ASU 2021-01")

On January 7, 2021, the FASB issued ASU 2021-01 which clarifies that certain optional expedients and exceptions in Topic 848 for contract modifications and hedge accounting apply to derivatives that are affected by the discounting transition. The amendments in this update are elective and apply to all entities that have derivative instruments that use an interest rate for margining, discounting, or contract price alignment that is modified as a result of reference rate reform. The amendments also optionally apply to all entities that designate receive-variable rate, pay-variable-rate cross-currency interest rate swaps as hedging instruments in net investment hedges that are modified as a result of reference rate reform. ASU 2021-01 is effective immediately for all entities and amendments may be applied on a full retrospective basis as of any date from the beginning of an interim period that includes or is subsequent to March 12, 2020. Management is currently evaluating the impact of ASU 2021-01 on the Company's financial statements.

(2) Securities

Trading Securities

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

	December 31, 2020		December 31, 2019	
	Fair Value	Net Unrealized Gain (Loss)	Fair Value	Net Unrealized Gain (Loss)
U.S. government securities	**$ 9,183**	**$ —**	$ 44,264	$ 6
Residential agency mortgage-backed securities	**4,669,148**	**(3,624)**	1,504,651	2,293
Municipal securities	**19,172**	**42**	26,196	60
Asset-backed securities	**—**	**—**	14,084	(21)
Other debt securities	**10,472**	**22**	34,726	21
Total trading securities	**$ 4,707,975**	**$ (3,560)**	$ 1,623,921	$ 2,359

Investment Securities

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

	December 31, 2020			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
Municipal securities	**$ 229,245**	**$ 255,270**	**$ 26,169**	**$ (144)**
Residential agency mortgage-backed securities	**8,913**	**9,790**	**877**	**—**
Other debt securities	**7,373**	**7,371**	**—**	**(2)**
Total investment securities	**$ 245,531**	**$ 272,431**	**$ 27,046**	**$ (146)**
Allowance for credit losses[1]	**(688)**			
Investment securities, net of allowance	**$ 244,843**	**$ 272,431**	**$ 27,046**	**$ (146)**

[1] Effective with the adoption of FASB ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326) on January 1, 2020.

	December 31, 2019			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
Municipal securities	$ 274,535	$ 295,032	$ 20,797	$ (300)
Residential agency mortgage-backed securities	10,676	11,164	488	—
Other debt securities	8,207	8,206	—	(1)
Total investment securities	$ 293,418	$ 314,402	$ 21,285	$ (301)

The amortized cost and fair values of investment securities at December 31, 2020, 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[1]
Fixed maturity debt securities:						
Amortized cost	$ 31,029	$ 76,646	$ 119,966	$ 8,977	$ 236,618	4.90
Fair value	31,459	83,944	138,101	9,137	262,641	
Residential mortgage-backed securities:						
Amortized cost					$ 8,913	[2]
Fair value					9,790	
Total investment securities:						
Amortized cost					$ 245,531	
Fair value					272,431	

[1] Expected maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without penalty.
[2] The average expected lives of residential mortgage-backed securities were 4.0 years based upon current prepayment assumptions.

Temporarily Impaired Investment Securities
(in thousands):

	December 31, 2020						
	Number of Securities	Less Than 12 Months		12 Months or Longer		Total	
		Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Investment:							
Municipal securities	**6**	**$ 2,451**	**$ 40**	**$ 2,043**	**$ 104**	**$ 4,494**	**$ 144**
Other debt securities	**2**	**$ 250**	**$ 1**	**$ 25**	**$ 1**	**$ 275**	**$ 2**
Total investment securities	**8**	**$ 2,701**	**$ 41**	**$ 2,068**	**$ 105**	**$ 4,769**	**$ 146**

	December 31, 2019						
	Number of Securities	Less Than 12 Months		12 Months or Longer		Total	
		Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Investment:							
Municipal securities	15	$ 1,001	$ 1	$ 9,747	$ 299	$ 10,748	$ 300
Other debt securities	2	275	1	—	—	275	1
Total investment securities	17	$ 1,276	$ 2	$ 9,747	$ 299	$ 11,023	$ 301

Available for Sale Securities

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

	December 31, 2020			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
U.S. Treasury	**$ 500**	**$ 508**	**$ 8**	**$ —**
Municipal securities	**165,318**	**167,979**	**2,666**	**(5)**
Mortgage-backed securities:				
Residential agency	**9,019,013**	**9,340,471**	**328,183**	**(6,725)**
Residential non-agency	**17,563**	**32,770**	**15,207**	**—**
Commercial agency	**3,406,956**	**3,508,465**	**103,590**	**(2,081)**
Other debt securities	**500**	**472**	**—**	**(28)**
Total available for sale securities	**$ 12,609,850**	**$ 13,050,665**	**$ 449,654**	**$ (8,839)**

	December 31, 2019			
	Amortized	Fair	Gross Unrealized	
	Cost	Value	Gain	Loss
U.S. Treasury	$ 1,598	$ 1,600	$ 2	$ —
Municipal securities	1,789	1,861	72	—
Mortgage-backed securities:				
Residential agency	7,956,297	8,046,096	104,912	(15,113)
Residential non-agency	25,968	41,609	15,641	—
Commercial agency	3,145,342	3,178,005	37,808	(5,145)
Other debt securities	500	472	—	(28)
Total available for sale securities	$ 11,131,494	$ 11,269,643	$ 158,435	$ (20,286)

The amortized cost and fair values of available for sale securities at December 31, 2020, 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[1]
Fixed maturity debt securities:						
Amortized cost	$ 78,673	$ 1,413,405	$ 1,472,918	$ 608,278	$ 3,573,274	7.79
Fair value	78,918	1,469,630	1,498,376	630,500	3,677,424	
Residential mortgage-backed securities:						
Amortized cost					$ 9,036,576	[2]
Fair value					9,373,241	
Total available-for-sale securities:						
Amortized cost					$ 12,609,850	
Fair value					13,050,665	

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

[2] The average expected lives of residential mortgage-backed securities were 3.0 years based upon current prepayment assumptions.

Sales of available for sale securities resulted in gains and losses as follows (in thousands):

	Year Ended December 31,		
	2020	**2019**	**2018**
Proceeds	**$ 384,507**	$ 1,211,718	$ 745,643
Gross realized gains	**9,976**	14,996	7,117
Gross realized losses	**(66)**	(9,399)	(9,918)
Related federal and state income tax expense (benefit)	**2,524**	1,425	(713)

The fair value of debt securities pledged as collateral for repurchase agreements, public trust funds on deposit and for other purposes, as required by law was $11.6 billion at December 31, 2020 and $10.1 billion at December 31, 2019.

The secured parties do not have the right to sell or re-pledge these securities.

Temporarily Impaired Available for Sale Securities
(In thousands)

	December 31, 2020						
	Number of Securities	Less Than 12 Months		12 Months or Longer		Total	
		Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available for sale:							
Municipal securities	**1**	**6,166**	**5**	**—**	**—**	**6,166**	**5**
Mortgage-backed securities:							
Residential agency	**38**	**$ 786,890**	**$ 6,605**	**$ 160,747**	**$ 120**	**$ 947,637**	**$ 6,725**
Commercial agency	**37**	**350,506**	**1,587**	**277,627**	**494**	**628,133**	**2,081**
Other debt securities	**1**	**—**	**—**	**472**	**28**	**472**	**28**
Total available for sale securities	**77**	**$ 1,143,562**	**$ 8,197**	**$ 438,846**	**$ 642**	**$ 1,582,408**	**$ 8,839**

	December 31, 2019						
	Number of Securities	Less Than 12 Months		12 Months or Longer		Total	
		Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available for sale:							
Municipal securities	—	—	—	—	—	—	—
Mortgage-backed securities:							
Residential agency	133	$ 1,352,597	$ 6,690	$ 686,002	$ 8,423	$ 2,038,599	$ 15,113
Commercial agency	69	830,047	4,238	210,877	907	1,040,924	5,145
Other debt securities	1	—	—	472	28	472	28
Total available for sale securities	203	$ 2,182,644	$ 10,928	$ 897,351	$ 9,358	$ 3,079,995	$ 20,286

No credit impairment of available for sale securities was recognized in 2020. Unrealized losses related to changes in interest rates subsequent to purchase and are not attributable to credit. Based on evaluations of impaired securities as of December 31, 2020, the Company does not intend to sell any impaired available for sale securities before fair value recovers to the current amortized cost and it is more-likely-than-not that the Company will not be required to sell impaired securities before fair value recovers, which may be maturity.

Fair Value Option Securities

Fair value option securities represent securities which the Company has elected to carry at fair value and are separately identified on the Consolidated Balance Sheets with changes in the fair value recognized in earnings as they occur. Certain residential mortgage-backed securities issued by U.S. government agencies and derivative contracts are held as an economic hedge of the mortgage servicing rights.

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

	December 31, 2020		December 31, 2019	
	Fair Value	Net Unrealized Gain (Loss)	Fair Value	Net Unrealized Gain (Loss)
U.S. Treasury	**$ —**	**$ —**	$ 9,917	$ (48)
Residential agency mortgage-backed securities	**114,982**	**4,463**	1,088,660	14,109
Total	**$ 114,982**	**$ 4,463**	$ 1,098,577	$ 14,061

(3) Derivatives

The following table summarizes the fair values of derivative contracts recorded as "derivative contracts" assets and liabilities in the balance sheet at December 31, 2020 (in thousands):

	Assets					
	Notional[1]	Gross Fair Value	Netting Adjustments	Net Fair Value Before Cash Collateral	Cash Collateral	Fair Value Net of Cash Collateral
Customer risk management programs:						
Interest rate contracts	$ 3,212,469	$ 113,524	$ (144)	$ 113,380	$ —	$ 113,380
Energy contracts	3,791,565	386,008	(211,468)	174,540	—	174,540
Agricultural contracts	14,765	3,859	—	3,859	—	3,859
Foreign exchange contracts	337,001	332,257	—	332,257	(420)	331,837
Equity option contracts	70,199	1,222	—	1,222	(285)	937
Total customer risk management programs	7,425,999	836,870	(211,612)	625,258	(705)	624,553
Trading	84,997,593	440,627	(240,655)	199,972	(26,958)	173,014
Interest rate risk management programs	995,123	17,352	(4,231)	13,121	—	13,121
Total derivative contracts	$ 93,418,715	$1,294,849	$ (456,498)	$ 838,351	$ (27,663)	$ 810,688

	Liabilities					
	Notional[1]	Gross Fair Value	Netting Adjustments	Net Fair Value Before Cash Collateral	Cash Collateral	Fair Value Net of Cash Collateral
Customer risk management programs:						
Interest rate contracts	$ 3,212,469	$ 113,900	$ (144)	$ 113,756	$ (104,202)	$ 9,554
Energy contracts	3,617,678	361,334	(211,468)	149,866	(114,070)	35,796
Agricultural contracts	14,781	3,844	—	3,844	(3,844)	—
Foreign exchange contracts	336,223	331,035	—	331,035	(1,165)	329,870
Equity option contracts	70,199	1,222	—	1,222	—	1,222
Total customer risk management programs	7,251,350	811,335	(211,612)	599,723	(223,281)	376,442
Trading	88,929,916	414,801	(240,655)	174,146	(145,692)	28,454
Interest rate risk management programs	145,256	5,529	(4,231)	1,298	(415)	883
Total derivative contracts	$ 96,326,522	$1,231,665	$ (456,498)	$ 775,167	$ (369,388)	$ 405,779

[1] Notional amounts for commodity contracts are converted into dollar-equivalent amounts based on dollar prices at the inception of the contract.

The following table summarizes the fair values of derivative contracts recorded as "derivative contracts" assets and liabilities in the balance sheet at December 31, 2019 (in thousands):

	Assets					
	Notional[1]	Gross Fair Value	Netting Adjustments	Net Fair Value Before Cash Collateral	Cash Collateral	Fair Value Net of Cash Collateral
Customer risk management programs:						
Interest rate contracts	$ 2,464,478	$ 49,100	$ (1,839)	$ 47,261	$ —	$ 47,261
Energy contracts	2,151,096	144,906	(107,591)	37,315	(38)	37,277
Agricultural contracts	16,118	1,522	(22)	1,500	—	1,500
Foreign exchange contracts	214,119	213,007	—	213,007	—	213,007
Equity option contracts	81,455	3,233	—	3,233	(660)	2,573
Total customer risk management programs	4,927,266	411,768	(109,452)	302,316	(698)	301,618
Trading	69,721,932	131,561	(115,949)	15,612	—	15,612
Internal risk management programs	1,268,180	6,226	(81)	6,145	—	6,145
Total derivative contracts	$ 75,917,378	$ 549,555	$ (225,482)	$ 324,073	$ (698)	$ 323,375

	Liabilities					
	Notional[1]	Gross Fair Value	Netting Adjustments	Net Fair Value Before Cash Collateral	Cash Collateral	Fair Value Net of Cash Collateral
Customer risk management programs:						
Interest rate contracts	$ 2,464,478	$ 49,194	$ (1,839)	$ 47,355	$ (43,932)	$ 3,423
Energy contracts	2,105,391	139,311	(107,591)	31,720	(6,031)	25,689
Agricultural contracts	16,139	1,507	(22)	1,485	(1,485)	—
Foreign exchange contracts	207,919	207,020	—	207,020	—	207,020
Equity option contracts	81,455	3,233	—	3,233	—	3,233
Total customer risk management programs	4,875,382	400,265	(109,452)	290,813	(51,448)	239,365
Trading	65,144,388	125,535	(115,949)	9,586	—	9,586
Internal risk management programs	380,401	3,121	(81)	3,040	(863)	2,177
Total derivative contracts	$ 70,400,171	$ 528,921	$ (225,482)	$ 303,439	$ (52,311)	$ 251,128

1 Notional amounts for commodity contracts are converted into dollar-equivalent amounts based on dollar prices at the inception of the contract.

The following summarizes the pre-tax net gains (losses) on derivative instruments and where they are recorded in the Consolidated Statements of Earnings (in thousands):

	Year Ended December 31,					
	2020		2019		2018	
	Brokerage and Trading Revenue	Gain (Loss) on Derivatives, Net	Brokerage and Trading Revenue	Gain (Loss) on Derivatives, Net	Brokerage and Trading Revenue	Gain (Loss) on Derivatives, Net
Customer risk management programs:						
Interest rate contracts						
To-be-announced U.S. agency residential mortgage-backed securities[1]	$ —	$ —	$ 9,579	$ —	$ 27,190	$ —
Interest rate swaps	**4,507**	—	3,647	—	2,614	—
Energy contracts	**17,287**	—	5,064	—	8,443	—
Agricultural contracts	**34**	—	28	—	53	—
Foreign exchange contracts	**921**	—	623	—	535	—
Equity option contracts	—	—	—	—	—	—
Total customer risk management programs	**22,749**	—	18,941	—	38,835	—
Trading[2]	**8,255**	—	13,999	—	(13,643)	—
Internal risk management programs	—	**42,320**	—	14,951	—	(442)
Total derivative contracts	**$ 31,004**	**$ 42,320**	$ 32,940	$ 14,951	$ 25,192	$ (442)

[1] To-be-announced U.S. agency residential mortgage-backed securities customer hedging program transitioned to trading program during 2019.

[2] Includes changes in fair value of to-be-announced U.S. agency residential mortgage-backed securities and other derivative instruments offered to mortgage banking customers to manage their market risk or held to mitigate market risk of trading securities portfolio, which is offset by changes in fair value of trading securities also included in Brokerage and trading revenue in the Consolidated Statement of Earnings.

As discussed in Note 7, certain derivative contracts not designated as hedging instruments related to mortgage loan commitments and forward sales contracts are included in Residential mortgage loans held for sale on the Consolidated Balance Sheets. See Note 7 for additional discussion of notional, fair value and impact on earnings of these contracts.

No derivative contracts have been designated as hedging instruments for financial reporting purposes.

(4) Loans and Allowances for Credit Losses

The portfolio segments of the loan portfolio are as follows (in thousands):

	December 31, 2020			
	Fixed Rate	Variable Rate	Non-accrual	Total
Commercial	**$ 1,805,286**	**$ 11,105,090**	**$ 167,159**	**$ 13,077,535**
Commercial real estate	**1,021,443**	**3,649,849**	**27,246**	**4,698,538**
Paycheck protection program	**1,682,310**	—	—	**1,682,310**
Loans to individuals	**2,173,437**	**1,335,412**	**40,288**	**3,549,137**
Total	**$ 6,682,476**	**$ 16,090,351**	**$ 234,693**	**$ 23,007,520**
Foregone interest on nonaccrual loans				**$ 22,870**

At December 31, 2020, loans to businesses and individuals with collateral primarily located in Texas totaled $7.2 billion or 31% of the total loan portfolio. Loans to businesses and individuals with collateral primarily located in Oklahoma totaled $3.8 billion or 17% of our total loan portfolio. Loans to businesses and individuals with collateral primarily located in Colorado totaled $2.8 billion or 12% of our total loan portfolio. Loans for which the collateral location is not relevant, such as unsecured loans and reserve-based energy loans, are distributed by the borrower's primary operating location. These geographic concentrations subject the loan portfolio to the general economic conditions within these areas.

At December 31, 2019, loans to businesses and individuals with collateral primarily located in Texas totaled $6.8 billion or 31% of the loan portfolio, loans to businesses and individuals with collateral primarily located in Oklahoma totaled $3.5 billion or 16% of the loan portfolio and loans to businesses and individuals with collateral primarily located in Colorado totaled $2.8 billion or 13% of the loan portfolio.

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 on-going 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, interest 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 risk is centrally monitored on a continuous basis from underwriting throughout the life of the loan for compliance with commercial lending policies.

At December 31, 2020, commercial loans with collateral primarily located in Texas totaled $4.3 billion or 33% of the commercial loan portfolio segment. Commercial loans with collateral primarily located in Oklahoma totaled $1.8 billion or 14% of the commercial loan portfolio segment. Commercial loans with collateral primarily located in Colorado totaled $1.7 billion or 13% of the commercial loan portfolio segment. The commercial loan portfolio segment is further divided into loan classes. The services loan class totaled $3.5 billion or 15% of total loans. Approximately $1.8 billion of loans in the services class consisted of loans with individual balances of less than $10 million. Businesses included in the services class include Native American tribal and state and local municipal government entities, Native American tribal casino operations, educational services, foundations and not-for-profit organizations and specialty trade contractors. The energy loan class totaled $3.5 billion or 15% of total loans, including $2.6 billion of outstanding loans to energy producers. Approximately 67% of the committed production loans are secured by properties primarily producing oil and 33% of the committed production loans are secured by properties primarily producing natural gas. The healthcare loan class totaled $3.3 billion or 14% of total loans. The healthcare loan class 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.

At December 31, 2019, commercial loans with collateral primarily located in Texas totaled $4.7 billion or 33% of the commercial loan portfolio segment, commercial loans with collateral primarily located in Oklahoma totaled $2.0 billion or 14% of the commercial loan portfolio segment and commercial loans with collateral primarily located in Colorado totaled $2.0 billion or 14% of the commercial loan portfolio segment. The energy loan class totaled $4.0 billion or 18% of total loans, including $3.1 billion of outstanding loans to energy producers. At December 31, 2019, approximately 58% of committed production loans were secured by properties primarily producing oil and 42% were secured by properties producing natural gas. The services loan class totaled $3.8 billion or 18% of total loans. Approximately $1.5 billion of loans in the services category consisted of loans with individual balances of less than $10 million. The healthcare loan class totaled $3.0 billion or 14% of total loans.

Commercial Real Estate

Commercial real estate loans are for the construction of buildings or other improvements to real estate and property held by borrowers for investment purposes primarily within our geographical footprint. 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.

At December 31, 2020, 27% of commercial real estate loans were secured by properties primarily located in the Dallas and Houston metropolitan areas of Texas and 10% of commercial real estate loans were secured by properties located primarily in the Tulsa and Oklahoma City metropolitan areas of Oklahoma. At December 31, 2019, 24% of commercial real estate loans are secured by properties primarily located in the Dallas and Houston metropolitan areas of Texas, 12% of commercial real estate loans were secured by properties located primarily in the Tulsa and Oklahoma City metropolitan areas of Oklahoma and 11% of commercial real estate loans are secured by properties located primarily in the Denver, Colorado metropolitan area.

Paycheck Protection Program

BOK Financial is actively participating in programs initiated by the Coronavirus Aid, Relief and Economic Security Act ("CARES Act"), including the Small Business Administration's ("SBA") Paycheck Protection Program ("PPP") that began on April 3, 2020. PPP provided fully forgivable loans when utilized for qualified expenditures, including to help small business maintain payrolls during the COVID-19 pandemic. These loans generally have a contractual term of two years, though most are expected to be forgiven prior to maturity after completion of a compliance period. Loans are guaranteed and amounts forgiven will be reimbursed to the Company by the SBA. The loans carry a rate of 1 percent. Interest plus loan fees, which vary depending on loan size, are accrued over the contractual life of the loan. Any unaccreted origination fees will be recognized when the loan is paid.

Loans to Individuals

Loans to individuals include residential mortgage and personal loans. Residential mortgage loans provide funds for our customers to purchase or refinance their primary residence or to borrow against the equity in their home. These loans are secured by a first or second mortgage on the customer's primary residence. These loans are made in accordance with underwriting policies we believe to be conservative and are fully documented. Loans may be individually underwritten or credit scored based on size and other criteria. Credit scoring is assessed based on significant credit characteristics including credit history, residential and employment stability.

In general, we sell the majority of our conforming fixed rate loan originations in the secondary market and retain the majority of our non-conforming and adjustable-rate 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. Home equity loans are primarily first-lien and fully amortizing.

Residential mortgage, which includes home equity loans, and personal loans are made in accordance with underwriting policies we believe to be conservative and are fully documented. Loans may be individually underwritten or credit scored based on size and other criteria. Credit scoring is assessed based on significant credit characteristics including credit history, residential and employment stability.

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.

Approximately 91% of the loans in this segment are secured by collateral located within our geographical footprint. Loans for which the collateral location is less relevant, such as unsecured loans are categorized by the borrower's primary operating location.

Residential mortgage loans guaranteed by U.S. government agencies have limited credit exposure because of the agency guarantee. This amount includes residential mortgage loans previously sold into GNMA mortgage pools that the Company may repurchase 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 on the Consolidated Balance Sheet.

Credit Commitments

Commitments to extend credit are agreements to lend to a customer as long as there is no violation of conditions established in the contract. Commitments generally have fixed expiration dates or other termination clauses and may require payment of a fee. At December 31, 2020, outstanding commitments totaled $11.0 billion. Because some commitments are expected to expire before being drawn upon, the total commitment amounts do not necessarily represent future cash requirements. BOK Financial uses the same credit policies in making commitments as it does loans.

The amount of collateral obtained, if deemed necessary, is based upon management's credit evaluation of the borrower.

Standby letters of credit are conditional commitments issued to guarantee the performance of a customer to a third party. Because the credit risk involved in issuing standby letters of credit is essentially the same as that involved in extending loan commitments, BOK Financial uses the same credit policies in evaluating the creditworthiness of the customer. Additionally, BOK Financial uses the same evaluation process in obtaining collateral on standby letters of credit as it does for loan commitments. The term of these standby letters of credit is defined in each commitment and typically corresponds with the underlying loan commitment. At December 31, 2020, outstanding standby letters of credit totaled $681 million.

Allowances for Credit Losses and Accrual for Off-balance Sheet Credit Risk from Unfunded Loans Commitments

BOK Financial maintains an allowance for loan losses and accrual for off-balance sheet credit risk from unfunded commitments. The allowance consists of specific allowances attributed to certain individual loans, generally nonaccruing loans, with dissimilar risk characteristics that have not yet been charged down to amounts we expect to recover and general allowances for estimated credit losses on pools of loans that share similar risk characteristics based on probability of default, loss given default and exposure at default for each loan class developed based on current and forecasted relevant economic loss drivers.

The accrual for off-balance sheet credit risk is maintained at a level that is appropriate to cover estimated losses associated with credit instruments that are not currently recognized as assets such as loan commitments, standby letters of credit or guarantees that are not unconditionally cancellable by the bank.

The activity in the allowance for loan losses and the allowance for off-balance sheet credit losses related to loan commitments and standby letters of credit is for the year ended December 31, 2020 summarized as follows (in thousands):

	Commercial	Commercial Real Estate	Paycheck Protection Program	Loans to Individuals	Nonspecific Allowance	Total
Allowance for loan losses:						
Beginning balance	$ 118,187	$ 51,805	$ —	$ 23,572	$ 17,195	$ 210,759
Transition adjustment	33,681	(4,620)	—	13,943	(17,195)	25,809
Beginning balance, adjusted	151,868	47,185	—	37,515	—	236,568
Provision for loan losses	171,800	40,407	—	10,253	—	222,460
Loans charged off	(73,370)	(1,300)	—	(4,729)	—	(79,399)
Recoveries of loans previously charged off	4,636	266	—	4,109	—	9,011
Ending balance	$ 254,934	$ 86,558	$ —	$ 47,148	$ —	$ 388,640
Allowance for off-balance sheet credit risk from unfunded loan commitments:						
Beginning balance	$ 1,434	$ 107	$ —	$ 44	$ —	$ 1,585
Transition adjustment	10,144	11,660	—	1,748	—	23,552
Beginning balance, adjusted	11,578	11,767	—	1,792	—	25,137
Provision for off-balance sheet credit risk	2,844	8,804	—	136	—	11,784
Ending balance	$ 14,422	$ 20,571	$ —	$ 1,928	$ —	$ 36,921

Changes in our reasonable and supportable forecasts of macroeconomic variables, primarily due to the anticipated impact of the on-going COVID-19 pandemic, and other assumptions, resulted in a $99.1 million increase in the allowance for lending activities during the year ended December 31, 2020. Changes in the loan portfolio characteristics, including specific impairment and losses, loan balances and risk grading resulted in a $135.2 million increase in the allowance for lending activities.

The allowance for loan losses and recorded investment of the related loans by portfolio segment for each impairment measurement method at December 31, 2020 is as follows (in thousands):

	Collectively Measured for General Allowances		Individually Measured for Specific Allowances		Total	
	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance
Commercial	**$ 12,910,376**	**$ 235,882**	**$ 167,159**	**$ 19,052**	**$ 13,077,535**	**$ 254,934**
Commercial real estate	**4,671,292**	**83,169**	**27,246**	**3,389**	**4,698,538**	**86,558**
Paycheck protection program	**1,682,310**	**—**	**—**	**—**	**1,682,310**	**—**
Loans to individuals	**3,508,849**	**47,148**	**40,288**	**—**	**3,549,137**	**47,148**
Total	**$ 22,772,827**	**$ 366,199**	**$ 234,693**	**$ 22,441**	**$ 23,007,520**	**$ 388,640**

Credit Quality Indicators

The Company utilizes risk grading as primary credit quality indicators as it influences the probability of default which is a key attribute in the expected credit losses calculation. Substantially all commercial as well as commercial real estate loans and certain loans to individuals are risk graded based on a quarterly evaluation of the borrowers' ability to repay the loans. Certain commercial loans and most loans to individuals are small, homogeneous pools that are not risk-graded. The credit quality of these loans is based on past due days in accordance with regulatory guidelines.

We have included in the credit quality indicator "pass" loans that are in compliance with the original terms of the agreement and currently exhibit no factors that cause management to have doubts about the borrowers' ability to remain in compliance with the original terms of the agreement, which is consistent with the regulatory guideline of "pass." This also includes past due residential mortgages that are guaranteed by agencies of the U.S. government that continue to accrue interest based on criteria of the guarantors' programs.

Other loans especially mentioned ("Special Mention") are currently performing in compliance with the original terms of the agreement but may have a potential weakness that deserves management's close attention, consistent with regulatory guidelines. Non-graded loans 30 to 59 days past due are categorized as Special Mention.

The risk grading process identified certain loans that have a well-defined weakness (for example, inadequate debt service coverage or liquidity or marginal capitalization; repayment may depend on collateral or other risk mitigation) that may jeopardize liquidation of the debt and represent a greater risk due to deterioration in the financial condition of the borrower. This is consistent with the regulatory guideline for "substandard." Because the borrowers are still performing in accordance with the original terms of the loan agreements, these loans remain on accruing status. Non-graded loans 60 to 89 days past due are categorized as Accruing Substandard.

Nonaccruing loans represent loans for which full collection of principal and interest is uncertain. This includes certain loans considered "substandard" and all loans considered "doubtful" by regulatory guidelines. Non-graded loans 90 or more days past due are categorized as Nonaccrual.

Probability of default is lowest for pass graded loans and increases for each credit quality indicator, Special Mention, and Accruing Substandard.

Vintage represents the year of origination, except for revolving loans which are considered in aggregate. Loans that were once revolving but have converted to term loans without additional underwriting appear in a separate vintage column.

The following table summarizes the Company's loan portfolio at December 31, 2020 by the risk grade categories and vintage (in thousands):

	Origination Year								
	2020	**2019**	**2018**	**2017**	**2016**	**Prior**	**Revolving Loans**	**Revolving Loans Converted to Term Loans**	**Total**
Commercial:									
Energy									
Pass	$ 112,614	$ 51,863	$ 89,346	$ 7,178	$ 1,148	$ 7,956	$ 2,548,663	$ —	$ 2,818,768
Special Mention	—	—	—	—	—	—	202,590	—	202,590
Accruing Substandard	24,000	1,363	1,453	—	12,667	—	283,294	—	322,777
Nonaccrual	21,076	2,607	—	—	—	21,064	80,312	—	125,059
Total energy	157,690	55,833	90,799	7,178	13,815	29,020	3,114,859	—	3,469,194
Healthcare									
Pass	536,745	615,221	638,302	422,834	234,399	658,286	147,132	—	3,252,919
Special Mention	—	27,500	—	—	—	8,282	5	—	35,787
Accruing Substandard	—	—	1,191	929	132	11,387	—	—	13,639
Nonaccrual	—	18	183	—	—	2,935	509	—	3,645
Total healthcare	536,745	642,739	639,676	423,763	234,531	680,890	147,646	—	3,305,990
Services									
Pass	534,853	436,384	372,867	307,374	373,785	683,936	665,491	682	3,375,372
Special Mention	150	9,057	389	291	2,038	2,000	3,063	—	16,988
Accruing Substandard	429	6,380	26,008	6,027	5,030	7,954	38,797	—	90,625
Nonaccrual	4,833	448	—	12,590	1,049	6,138	540	—	25,598
Total services	540,265	452,269	399,264	326,282	381,902	700,028	707,891	682	3,508,583
General business									
Pass	419,756	394,985	310,273	236,222	103,987	186,600	1,055,878	2,316	2,710,017
Special Mention	197	4,519	9,713	7,803	2,511	3,159	2,483	19	30,404
Accruing Substandard	1,432	3,069	6,694	10,935	10,042	3,729	4,449	140	40,490
Nonaccrual	1,675	3,728	4,863	1,436	530	107	477	41	12,857
Total general business	423,060	406,301	331,543	256,396	117,070	193,595	1,063,287	2,516	2,793,768
Total commercial	1,657,760	1,557,142	1,461,282	1,013,619	747,318	1,603,533	5,033,683	3,198	13,077,535
Commercial real estate:									
Pass	725,577	1,211,338	954,226	489,193	314,899	722,475	223,131	38	4,640,877
Special Mention	—	—	259	12,311	2,725	5,831	—	—	21,126
Accruing Substandard	—	—	—	4,410	—	4,852	27	—	9,289
Nonaccrual	—	8,300	—	232	7,468	11,246	—	—	27,246
Total commercial real estate	725,577	1,219,638	954,485	506,146	325,092	744,404	223,158	38	4,698,538

	Origination Year								
	2020	2019	2018	2017	2016	Prior	Revolving Loans	Revolving Loans Converted to Term Loans	Total
Paycheck protection program:									
Pass	**1,682,310**	—	—	—	—	—	—	—	**1,682,310**
Total paycheck protection program	**1,682,310**	—	—	—	—	—	—	—	**1,682,310**
Loans to individuals:									
Residential mortgage									
Pass	**564,325**	**149,832**	**120,875**	**124,930**	**158,801**	**348,292**	**335,259**	**24,553**	**1,826,867**
Special Mention	**33**	**11**	**2,094**	—	**59**	**318**	**950**	**10**	**3,475**
Accruing Substandard	—	—	**51**	—	—	**34**	**272**	**76**	**433**
Nonaccrual	**648**	**104**	**1,658**	**784**	**2,010**	**22,415**	**3,835**	**774**	**32,228**
Total residential mortgage	**565,006**	**149,947**	**124,678**	**125,714**	**160,870**	**371,059**	**340,316**	**25,413**	**1,863,003**
Residential mortgage guaranteed by U.S. government agencies									
Pass	**4,859**	**33,880**	**34,464**	**43,099**	**58,264**	**226,380**	—	—	**400,946**
Special Mention	—	—	—	—	—	—	—	—	—
Accruing Substandard	—	—	—	—	—	—	—	—	—
Nonaccrual	—	—	**545**	—	**309**	**6,887**	—	—	**7,741**
Total residential mortgage guaranteed by U.S. government agencies	**4,859**	**33,880**	**35,009**	**43,099**	**58,573**	**233,267**	—	—	**408,687**
Personal:									
Pass	**219,873**	**200,580**	**76,246**	**100,229**	**64,104**	**102,126**	**510,571**	**1,510**	**1,275,239**
Special Mention	**39**	**55**	**66**	—	**469**	**31**	**965**	—	**1,625**
Accruing Substandard	**11**	**214**	**10**	—	—	—	**29**	—	**264**
Nonaccrual	**28**	**17**	**57**	**73**	**50**	**49**	**45**	—	**319**
Total personal	**219,951**	**200,866**	**76,379**	**100,302**	**64,623**	**102,206**	**511,610**	**1,510**	**1,277,447**
Total loans to individuals	**789,816**	**384,693**	**236,066**	**269,115**	**284,066**	**706,532**	**851,926**	**26,923**	**3,549,137**
Total loans	**$ 4,855,463**	**$ 3,161,473**	**$ 2,651,833**	**$ 1,788,880**	**$ 1,356,476**	**$ 3,054,469**	**$ 6,108,767**	**$ 30,159**	**$ 23,007,520**

Nonaccruing Loans

A summary of nonaccruing loans as of December 31, 2020 follows (in thousands):

	Total	With No Allowance	With Allowance	Related Allowance
Commercial:				
Energy	**$ 125,059**	**$ 76,633**	**$ 48,426**	**$ 16,478**
Healthcare	**3,645**	**3,645**	**—**	**—**
Services	**25,598**	**20,810**	**4,788**	**2,574**
General business	**12,857**	**12,857**	**—**	**—**
Total commercial	**167,159**	**113,945**	**53,214**	**19,052**
Commercial real estate	**27,246**	**13,645**	**13,601**	**3,389**
Loans to individuals:				
Residential mortgage	**32,228**	**32,228**	**—**	**—**
Residential mortgage guaranteed by U.S. government agencies	**7,741**	**7,741**	**—**	**—**
Personal	**319**	**319**	**—**	**—**
Total loans to individuals	**40,288**	**40,288**	**—**	**—**
Total	**$ 234,693**	**$ 167,878**	**$ 66,815**	**$ 22,441**

Troubled Debt Restructurings

At December 31, 2020 the Company has $187 million in troubled debt restructurings (TDRs), of which $152 million are accruing residential mortgage loans guaranteed by U.S. government agencies. Approximately $95 million of TDRs are performing in accordance with the modified terms. The loans designated as TDRs had $20.9 million in charge offs during the year ended December 31, 2020.

At December 31, 2019, TDRs totaled $132 million, of which $92 million were accruing residential mortgage loans guaranteed by U.S. government agencies. Approximately $57 million of TDRs were performing. The loans designated as TDRs had $18.6 million in charge offs during the year ended December 31, 2019.

TDRs generally consist of interest rate concessions, payment stream concessions or a combination of concessions to distressed borrowers. During the year ended December 31, 2020, $83 million of loans were restructured. During the year ended December 31, 2019, $37 million of loans were restructured.

Past Due Loans

Past due status for all loan classes is based on the actual number of days since the last payment was due according to the contractual terms of the loans, as modified for short-term payment deferral forbearance.

A summary of loans currently performing and past due as of December 31, 2020 is as follows (in thousands):

		Past Due				
	Current	**30 to 59 Days**	**60 to 89 Days**	**90 Days or More**	**Total**	**Past Due 90 Days or More and Accruing**
Commercial:						
Energy	**$ 3,410,995**	**$ 12,735**	**4,050**	**$ 41,414**	**$ 3,469,194**	**$ —**
Healthcare	**3,302,345**	**—**	**—**	**3,645**	**3,305,990**	**—**
Services	**3,489,423**	**3,278**	**177**	**15,705**	**3,508,583**	**326**
General business	**2,776,038**	**1,206**	**6,277**	**10,247**	**2,793,768**	**4,495**
Total commercial	**12,978,801**	**17,219**	**10,504**	**71,011**	**13,077,535**	**4,821**
Commercial real estate	**4,672,279**	**276**	**5,310**	**20,673**	**4,698,538**	**5,126**
Paycheck protection program	**1,682,310**	**—**	**—**	**—**	**1,682,310**	**—**
Loans to individuals						
Permanent mortgage	**1,849,304**	**5,812**	**837**	**7,050**	**1,863,003**	**181**
Permanent mortgages guaranteed by U.S. government agencies	**262,102**	**41,389**	**22,041**	**83,155**	**408,687**	**78,349**
Personal	**1,273,702**	**3,317**	**90**	**338**	**1,277,447**	**241**
Total loans to individuals	**3,385,108**	**50,518**	**22,968**	**90,543**	**3,549,137**	**78,771**
Total	**$ 22,718,498**	**$ 68,013**	**$ 38,782**	**$ 182,227**	**$ 23,007,520**	**$ 88,718**

Following is disclosure of loans and the combined allowance for loan losses and accrual for off-balance sheet credit losses under the previous incurred loss model.

Portfolio segments of the loan portfolio are as follows (in thousands):

	December 31, 2019			
	Fixed Rate	Variable Rate	Non-accrual	Total
Commercial	$ 3,231,485	$ 10,684,749	$ 115,416	$ 14,031,650
Commercial real estate	1,056,321	3,349,836	27,626	4,433,783
Residential mortgage	1,652,653	393,897	37,622	2,084,172
Personal	193,903	1,007,192	287	1,201,382
Total	$ 6,134,362	$ 15,435,674	$ 180,951	$ 21,750,987
Accruing loans past due (90 days)[1]				$ 7,680
Foregone interest on nonaccrual loans				$ 17,409

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

The activity in the allowance for loan losses and the allowance for off-balance sheet credit losses related to loan commitments and standby letters of credit is for the year ended December 31, 2019 summarized as follows (in thousands):

	Commercial	Commercial Real Estate	Residential Mortgage	Personal	Nonspecific Allowance	Total
Allowance for loan losses:						
Beginning balance	$ 102,226	$ 60,026	$ 17,964	$ 9,473	$ 17,768	$ 207,457
Provision for loan losses	57,125	(12,046)	(3,838)	3,537	(573)	44,205
Loans charged off	(43,185)	(1,161)	(288)	(6,343)	—	(50,977)
Recoveries	2,021	4,986	562	2,505	—	10,074
Ending balance	$ 118,187	$ 51,805	$ 14,400	$ 9,172	$ 17,195	$ 210,759
Allowance for off-balance sheet credit losses:						
Beginning balance	1,655	52	52	31	—	1,790
Provision for off-balance sheet credit losses	(221)	55	(8)	(31)	—	(205)
Ending balance	$ 1,434	$ 107	$ 44	$ —	$ —	$ 1,585
Total provision for credit losses	$ 56,904	$ (11,991)	$ (3,846)	$ 3,506	$ (573)	$ 44,000

The activity in the allowance for loan losses and the allowance for off-balance sheet credit losses related to loan commitments and standby letters of credit is for the year ended December 31, 2018 summarized as follows (in thousands):

	Commercial	Commercial Real Estate	Residential Mortgage	Personal	Nonspecific Allowance	Total
Allowance for loan losses:						
Beginning balance	$ 124,269	$ 56,621	$ 18,451	$ 9,124	$ 22,217	$ 230,682
Provision for loan losses	12,521	(147)	(1,156)	3,175	(4,449)	9,944
Loans charged off	(37,880)	—	(378)	(5,325)	—	(43,583)
Recoveries	3,316	3,552	1,047	2,499	—	10,414
Ending balance	$ 102,226	$ 60,026	$ 17,964	$ 9,473	$ 17,768	$ 207,457
Allowance for off-balance sheet credit losses:						
Beginning balance	3,644	45	43	2	—	3,734
Provision for off-balance sheet credit losses	(1,989)	7	9	29	—	(1,944)
Ending balance	$ 1,655	$ 52	$ 52	$ 31	$ —	$ 1,790
Total provision for credit losses	$ 10,532	$ (140)	$ (1,147)	$ 3,204	$ (4,449)	$ 8,000

The allowance for loan losses and recorded investment of the related loans by portfolio segment for each impairment measurement method at December 31, 2019 is as follows (in thousands):

	Collectively Measured for Impairment		Individually Measured for Impairment		Total	
	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance
Commercial	$ 13,916,234	$ 100,773	$ 115,416	$ 17,414	$ 14,031,650	$ 118,187
Commercial real estate	4,406,157	51,805	27,626	—	4,433,783	51,805
Residential mortgage	2,046,550	14,400	37,622	—	2,084,172	14,400
Personal	1,201,095	9,172	287	—	1,201,382	9,172
Total	21,570,036	176,150	180,951	17,414	21,750,987	193,564
Nonspecific allowance	—	—	—	—	—	17,195
Total	$ 21,570,036	$ 176,150	$ 180,951	$ 17,414	$ 21,750,987	$ 210,759

The allowance for loan losses and recorded investment of the related loans by portfolio segment for risk graded and non-risk graded loans at December 31, 2019 is as follows (in thousands):

	Internally Risk Graded		Non-Graded		Total	
	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance	Recorded Investment	Related Allowance
Commercial	$ 13,997,538	$ 117,236	$ 34,112	$ 951	$ 14,031,650	$ 118,187
Commercial real estate	4,433,783	51,805	—	—	4,433,783	51,805
Residential mortgage	279,113	3,085	1,805,059	11,315	2,084,172	14,400
Personal	1,116,297	7,003	85,085	2,169	1,201,382	9,172
Total	19,826,731	179,129	1,924,256	14,435	21,750,987	193,564
Nonspecific allowance	—	—	—	—	—	17,195
Total	$ 19,826,731	$ 179,129	$ 1,924,256	$ 14,435	$ 21,750,987	$ 210,759

The following table summarizes the Company's loan portfolio at December 31, 2019 by the risk grade categories (in thousands):

	Internally Risk Graded				Non-Graded		
	Performing						
	Pass	Other Loans Especially Mentioned	Accruing Substandard	Nonaccrual	Performing	Nonaccrual	Total
Commercial:							
Energy	$ 3,700,406	$ 117,298	$ 63,951	$ 91,722	$ —	$ —	$ 3,973,377
Services	3,050,946	29,943	33,791	7,483	—	—	3,122,163
Wholesale/retail	1,749,023	5,281	5,399	1,163	—	—	1,760,866
Manufacturing	623,219	18,214	13,883	10,133	—	—	665,449
Healthcare	2,995,514	13,117	20,805	4,480	—	—	3,033,916
Public finance	709,868	—	—	—	—	—	709,868
Other commercial and industrial	709,729	4,028	17,744	398	34,075	37	766,011
Total commercial	13,538,705	187,881	155,573	115,379	34,075	37	14,031,650
Commercial real estate:							
Residential construction and land development	150,529	—	—	350	—	—	150,879
Retail	743,343	12,067	1,243	18,868	—	—	775,521
Office	923,202	5,177	—	—	—	—	928,379
Multifamily	1,257,005	1,604	95	6,858	—	—	1,265,562
Industrial	852,539	1,658	1,011	909	—	—	856,117
Other commercial real estate	455,045	1,639	—	641	—	—	457,325
Total commercial real estate	4,381,663	22,145	2,349	27,626	—	—	4,433,783
Residential mortgage:							
Permanent mortgage	276,138	78	2,404	493	758,260	19,948	1,057,321
Permanent mortgage guaranteed by U.S. government agencies	—	—	—	—	191,694	6,100	197,794
Home equity	—	—	—	—	817,976	11,081	829,057
Total residential mortgage	276,138	78	2,404	493	1,767,930	37,129	2,084,172
Personal	1,116,196	45	—	56	84,853	232	1,201,382
Total	$19,312,702	$ 210,149	$ 160,326	$ 143,554	$ 1,886,858	$ 37,398	$21,750,987

Impaired Loans

Loans are considered to be impaired when it is probable that the Company will not be able to collect all amounts due according to the contractual terms of the loan agreement. This generally includes all nonaccruing loans, all loans modified in a TDR and all loans repurchased from GNMA pools.

Generally, no interest income is recognized on impaired loans until all principal balances, including amounts charged-off, are recovered.

A summary of impaired loans at December 31, 2019 follows (in thousand):

	As of December 31, 2019					Year Ended December 31, 2019	
		Recorded Investment					
	Unpaid Principal Balance	Total	With No Allowance	With Allowance	Related Allowance	Average Recorded Investment	Interest Income Recognized
Commercial:							
Energy	$ 149,441	$ 91,722	$ 44,244	$ 47,478	$ 16,854	$ 69,119	$ —
Services	10,923	7,483	6,301	1,182	240	5,854	—
Wholesale/retail	1,980	1,163	902	261	101	916	—
Manufacturing	10,848	10,133	9,914	219	219	9,144	—
Healthcare	13,774	4,480	4,480	—	—	7,798	—
Public finance	—	—	—	—	—	—	—
Other commercial and industrial	8,227	435	435	—	—	8,568	—
Total commercial	195,193	115,416	66,276	49,140	17,414	101,399	—
Commercial real estate:							
Residential construction and land development	1,306	350	350	—	—	350	—
Retail	20,265	18,868	18,868	—	—	19,573	—
Office	—	—	—	—	—	—	—
Multifamily	6,858	6,858	6,858	—	—	3,580	—
Industrial	909	909	909	—	—	454	—
Other commercial real estate	801	641	641	—	—	666	—
Total commercial real estate	30,139	27,626	27,626	—	—	24,623	—
Residential mortgage:							
Permanent mortgage	24,868	20,441	20,441	—	—	22,196	1,198
Permanent mortgage guaranteed by U.S. government agencies[1]	204,187	197,794	197,794	—	—	195,009	7,733
Home equity	12,967	11,081	11,081	—	—	10,776	—
Total residential mortgage	242,022	229,316	229,316	—	—	227,981	8,931
Personal	360	287	287	—	—	259	—
Total	$ 467,714	$ 372,645	$ 323,505	$ 49,140	$ 17,414	$ 354,262	$ 8,931

[1] All permanent mortgage loans guaranteed by U.S. government agencies are considered impaired as we do not expect full collection of contractual principal and interest. At December 31, 2019, the majority were accruing based on the guarantee by U.S. government agencies.

A summary of loans currently performing, loans past due and accruing and nonaccrual loans as of December 31, 2019 is as follows (in thousands):

		Past Due				
	Current	30 to 59 Days	60 to 89 Days	90 Days or More	Nonaccrual	Total
Commercial:						
Energy	$ 3,881,244	$ 401	10	$ —	$ 91,722	$ 3,973,377
Services	3,105,621	1,737	523	6,799	7,483	3,122,163
Wholesale/retail	1,758,878	712	113	—	1,163	1,760,866
Manufacturing	654,329	410	190	387	10,133	665,449
Healthcare	3,027,329	2,039	—	68	4,480	3,033,916
Public finance	707,638	2,230	—	—	—	709,868
Other commercial and industrial	764,390	414	772	—	435	766,011
Total commercial	13,899,429	7,943	1,608	7,254	115,416	14,031,650
Commercial real estate:						
Residential construction and land development	147,379	3,093	—	57	350	150,879
Retail	756,653	—	—	—	18,868	775,521
Office	928,379	—	—	—	—	928,379
Multifamily	1,258,704	—	—	—	6,858	1,265,562
Industrial	855,208	—	—	—	909	856,117
Other commercial real estate	454,253	1,827	250	354	641	457,325
Total commercial real estate	4,400,576	4,920	250	411	27,626	4,433,783
Residential mortgage:						
Permanent mortgage	1,034,716	2,011	153	—	20,441	1,057,321
Permanent mortgages guaranteed by U.S. government agencies	46,898	24,203	18,187	102,406	6,100	197,794
Home equity	814,325	3,343	308	—	11,081	829,057
Total residential mortgage	1,895,939	29,557	18,648	102,406	37,622	2,084,172
Personal	1,196,362	4,664	54	15	287	1,201,382
Total	$ 21,392,306	$ 47,084	20,560	$ 110,086	$ 180,951	$ 21,750,987

(5) Premises and Equipment and Leases

Premises and equipment at December 31 are summarized as follows (in thousands):

	December 31,	
	2020	**2019**
Land	**$ 69,776**	$ 69,960
Buildings and improvements	**440,528**	421,952
Software and related integration	**120,444**	98,487
Furniture and equipment	**165,344**	135,153
Construction in progress	**46,949**	53,498
Premises and equipment	**843,041**	779,050
Less accumulated depreciation	**291,733**	243,531
Premises and equipment, net of accumulated depreciation	**$ 551,308**	$ 535,519

Depreciation expense of premises and equipment was $54.3 million, $51.6 million and $51.2 million for the years ended December 31, 2020, 2019 and 2018, respectively.

Effective January 1, 2019, premises and equipment included right-of-use assets for leased office space and facilities. Leases are at market rates at inception and may contain escalations based on consumer price index or similar benchmarks and options to renew at then market rates.

Right-of-use assets of $166 million at December 31, 2020 and $180 million at December 31, 2019 are included in buildings and improvements and related right-of-use liabilities are included in other liabilities. At December 31, 2020, the weighted-average remaining lease term was 11 years and the weighted average discount rate on operating leases was 3.0 percent. Operating lease costs recognized as occupancy and equipment expense were $25.0 million and $24.2 million for the years ended December 31, 2020 and December 31, 2019, respectively. Operating cash flows from operating leases were $25.6 million and $23.3 million for the years ended December 31, 2020 and December 31, 2019, respectively.

Total rent expense for BOK Financial was $42.0 million in 2020, $43.0 million in 2019 and $28.5 million in 2018. At December 31, 2020, un-discounted operating lease liabilities are scheduled to mature as follows: $26.3 million in 2021, $21.2 million in 2022, $20.1 million in 2023, $19.6 million in 2024, $18.9 million in 2025 and $116 million thereafter. Operating expense and short term lease costs total $13.4 million and $12.6 million for the year ended December 31, 2020 and December 31, 2019, respectively. BOKF, NA is obligated under a long-term lease for its bank premises in downtown Tulsa. The original lease dated November 1, 1976 was renegotiated on July 1, 2019. The new lease will terminate on December 31, 2034. The Company has the option to renew for an additional 10 years. Premises leases may include options to renew at then current market rates and may include escalation provisions based upon changes in consumer price index or similar benchmarks.

The Company may lease owned properties or sublease unoccupied leased facilities. Income on these leases is immaterial.

(6) Goodwill and Intangible Assets

The following table presents the original cost and accumulated amortization of intangible assets (in thousands):

	Dec. 31, 2020	Dec. 31, 2019
Core deposit premiums	**$ 103,200**	$ 103,200
Less accumulated amortization	**32,256**	19,364
Net core deposit premiums	**70,944**	83,836
Other identifiable intangible assets	**82,731**	74,372
Less accumulated amortization	**40,239**	32,937
Net other identifiable intangible assets	**42,492**	41,435
Total intangible assets, net	**$ 113,436**	$ 125,271

Expected amortization expense for intangible assets that will continue to be amortized (in thousands):

	Core Deposit Premiums	Other Identifiable Intangible Assets	Total
2021	$ 11,893	$ 6,599	$ 18,492
2022	10,981	5,232	16,213
2023	10,145	4,191	14,336
2024	9,379	3,178	12,557
2025	8,675	2,767	11,442
Thereafter	19,871	20,525	40,396
	$ 70,944	$ 42,492	$ 113,436

The changes in the carrying value of goodwill by operating segment are as follows (in thousands):

	Commercial Banking	Consumer Banking	Wealth Management	Funds Management and Other	Total
Balance, December 31, 2018	$ 313,270	$ 43,458	$ 90,702	$ 601,833	$ 1,049,263
Adjustment[1]	600,661	—	—	(601,833)	(1,172)
Balance, December 31, 2019	913,931	43,458	90,702	—	1,048,091
Balance, December 31, 2020	**$ 913,931**	**$ 43,458**	**$ 90,702**	**$ —**	**$ 1,048,091**

[1] Goodwill related to the CoBiz acquisition was not yet allocated to the operating segments as of December 31, 2018 and was included in Funds Management and Other in 2018 then allocated during 2019.

At October 1, 2020, the Company performed a qualitative impairment assessment of goodwill based on factors including, but not limited to, general economic conditions, financial services industry considerations, regional economic conditions, global health concerns and related medical developments, general BOKF Financial performance and reporting unit performance. During 2020, the U.S. and global economies were negatively impacted by the spread of COVID-19. This resulted in the need for quarterly qualitative impairment analyses and quantitative corroboration of the annual qualitative impairment assessment. No impairment was indicated for any reporting unit.

(7) Mortgage Banking Activities

Residential Mortgage Loan Production

The Company originates, markets and services conventional and government-sponsored residential mortgage loans. Generally, conforming fixed rate residential mortgage loans are held for sale in the secondary market and non-conforming and adjustable-rate residential mortgage loans are held for investment. The volume of mortgage loans originated for sale and secondary market prices are the primary drivers of originating and marketing revenue.

Residential mortgage loan commitments are generally outstanding for 60 to 90 days, which represents the typical period from commitment to originate a residential mortgage loan to when the closed loan is sold to an investor. Residential mortgage loan commitments are subject to both credit and interest rate risk. Credit risk is managed through underwriting policies and procedures, including collateral requirements, which are generally accepted by the secondary loan markets. Exposure to interest rate fluctuations is partially managed through forward sales of residential mortgage-backed securities and forward sales contracts. These latter contracts set the price for loans that will be delivered in the next 60 to 90 days.

The unpaid principal balance of residential mortgage loans held for sale, notional amounts of derivative contracts related to residential mortgage loan commitments and forward contract sales and their related fair values included in Mortgage loans held for sale on the Consolidated Balance Sheets were (in thousands):

	December 31, 2020		December 31, 2019	
	Unpaid Principal Balance/ Notional	**Fair Value**	**Unpaid Principal Balance/ Notional**	**Fair Value**
Residential mortgage loans held for sale	**$ 227,161**	**$ 236,444**	$ 175,117	$ 177,703
Residential mortgage loan commitments	**380,637**	**20,435**	158,460	5,233
Forward sales contracts	**549,414**	**(4,563)**	315,203	(665)
		$ 252,316		$ 182,271

No residential mortgage loans held for sale were 90 days or more past due or considered impaired as of December 31, 2020 or December 31, 2019. No credit losses were recognized on residential mortgage loans held for sale for the years ended December 31, 2020, 2019 and 2018.

Mortgage banking revenue was as follows (in thousands):

	Year Ended		
	2020	**2019**	**2018**
Production revenue:			
Net realized gains on sales of mortgage loans	**$ 107,847**	$ 39,730	$ 36,379
Net change in unrealized gain on mortgage loans held for sale	**6,697**	672	(674)
Net change in the fair value of mortgage loan commitments	**15,202**	(145)	(1,145)
Net change in the fair value of forward sales contracts	**(3,898)**	2,463	(2,870)
Total mortgage production revenue	**125,848**	42,720	31,690
Servicing revenue	**56,512**	64,821	66,097
Total mortgage banking revenue	**$ 182,360**	$ 107,541	$ 97,787

Mortgage production revenue includes gain (loss) on residential mortgage loans held for sale and changes in the fair value of derivative contracts not designated as hedging instruments related to residential mortgage loan commitments and forward sales contracts. Servicing revenue includes servicing fee income and late charges on loans serviced for others.

Residential Mortgage Servicing

The Company generally retains the right to service residential mortgage loans sold and may purchase mortgage servicing rights. The unpaid principal balance of loans serviced for others is the primary driver of servicing revenue.

The following represents a summary of mortgage servicing rights (Dollars in thousands):

	December 31,		
	2020	**2019**	**2018**
Number of residential mortgage loans serviced for others	**106,201**	126,828	132,463
Outstanding principal balance of residential mortgage loans serviced for others	**$ 16,228,449**	$ 20,727,106	$ 21,658,335
Weighted average interest rate	**3.84 %**	3.98 %	3.99 %
Remaining contractual term (in months)	**280**	289	293

Activity in capitalized mortgage servicing rights during the three years ended December 31, 2020 is as follows (in thousands):

Balance, December 31, 2017	$ 252,867
Additions, net	35,247
Change in fair value due to loan runoff	(33,528)
Change in fair value due to market changes	4,668
Balance, December 31, 2018	259,254
Additions, net	35,128
Change in fair value due to loan runoff	(38,979)
Change in fair value due to market changes	(53,517)
Balance, December 31, 2019	201,886
Additions	**31,209**
Disposals	**(10,801)**
Change in fair value due to loan runoff	**(41,598)**
Change in fair value due to market changes	**(79,524)**
Balance, December 31, 2020	**$ 101,172**

Changes in the fair value of mortgage servicing rights due to market changes are included in Other operating revenue in the Consolidated Statements of Earnings. Changes in fair value due to loan runoff are included in Mortgage banking costs.

Mortgage servicing rights are not traded in active markets. Fair value is determined by discounting the projected net cash flows. Significant assumptions used to determine fair value considered to be significant unobservable inputs were as follows:

	December 31,	
	2020	**2019**
Discount rate – risk-free rate plus a market premium	**9.14%**	9.81%
Prepayment rate - based upon loan interest rate, original term and loan type	**9.41% - 21.87%**	8.28% - 16.05%
Loan servicing costs – annually per loan based upon loan type:		
Performing loans	**$69 - $94**	$68 - $94
Delinquent loans	**$150 - $500**	$150 - $500
Loans in foreclosure	**$1,000 - $4,000**	$1,000 - $4,000
Primary/secondary mortgage rate spread	**105 bps**	104 bps
Escrow earnings rate – indexed to rates paid on deposit accounts with comparable average life	**0.43%**	1.73%
Delinquency rate	**3.54%**	2.73%

Changes in primary residential mortgage interest rates directly affect the prepayment speeds used in valuing our mortgage servicing rights. 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 BOK Financial's servicing portfolio.

(8) Deposits

Interest expense on deposits is summarized as follows (in thousands):

	Year Ended December 31,		
	2020	**2019**	**2018**
Transaction deposits	**$ 60,424**	$ 132,854	$ 65,859
Savings	**385**	677	439
Time:			
Certificates of deposits under $100,000	**6,741**	8,299	5,751
Certificates of deposits $100,000 and over	**18,270**	29,288	19,739
Other time deposits	**4,176**	4,420	3,729
Total time	**29,187**	42,007	29,219
Total	**$ 89,996**	$ 175,538	$ 95,517

The aggregate amounts of time deposits in denominations of $250,000 or more at December 31, 2020 and 2019 were $815 million and $845 million, respectively.

Time deposit maturities are as follows: 2021 – $1.5 billion, 2022 – $172 million, 2023 – $90 million, 2024 – $54 million, 2025 – $41 million and $100 million thereafter.

The aggregate amount of overdrawn customer transaction deposits that have been reclassified as loan balances was $3.1 million at December 31, 2020 and $8.7 million at December 31, 2019.

(9) Other Borrowed Funds

Information relating to other borrowings is summarized as follows (dollars in thousands):

	As of December 31, 2020		Year Ended December 31, 2020		
	Balance	Rate	Average Balance	Rate	Maximum Outstanding At Any Month End
Funds purchased	**769,365**	**0.05 %**	**2,045,795**	**0.58 %**	**3,311,938**
Repurchase agreements	**893,021**	**0.09 %**	**1,589,746**	**0.24 %**	**3,230,097**
Other borrowings:					
Federal Home Loan Bank advances	**200,000**	**0.29 %**	**3,393,989**	**1.00 %**	**7,500,000**
GNMA repurchase liability	**19,500**	**4.35 %**	**42,771**	**4.18 %**	**126,569**
Federal Reserve Bank advances	**—**	**— %**	**42,464**	**0.26 %**	**—**
Paycheck protection program liquidity facility	**1,635,963**	**0.35 %**	**1,152,073**	**0.35 %**	**2,013,414**
Other	**27,507**	**5.24 %**	**28,156**	**5.12 %**	**49,376**
Total other borrowings	**1,882,970**		**4,659,453**	**0.88 %**	
Subordinated debentures[1]	**276,005**	**4.72 %**	**275,965**	**5.05 %**	**276,005**
Total other borrowed funds	**$ 3,821,361**		**$ 8,570,959**	**0.82 %**	

	As of December 31, 2019		Year Ended December 31, 2019		
	Balance	Rate	Average Balance	Rate	Maximum Outstanding At Any Month End
Funds purchased	3,390,528	1.53 %	2,438,376	2.08 %	3,390,528
Repurchase agreements	427,822	0.50 %	399,785	0.57 %	427,822
Other borrowings:					
Federal Home Loan Bank advances	4,500,000	1.79 %	7,122,466	2.44 %	8,000,000
GNMA repurchase liability	15,417	4.32 %	13,746	4.47 %	19,581
Other	11,638	5.09 %	11,144	5.30 %	34,676
Total other borrowings	4,527,055		7,147,356	2.45 %	
Subordinated debentures[1]	275,923	5.15 %	276,075	5.47 %	275,923
Total other borrowed funds	$ 8,621,328		$ 10,261,592	2.37 %	

	As of December 31, 2018		Year Ended December 31, 2018		
	Balance	Rate	Average Balance	Rate	Maximum Outstanding At Any Month End
Funds purchased	402,450	2.34 %	419,322	1.89 %	949,531
Repurchase agreements	615,961	0.36 %	464,582	0.28 %	615,961
Other borrowings:					
Federal Home Loan Bank advances	6,100,000	2.65 %	6,207,142	2.06 %	6,500,000
GNMA repurchase liability	15,552	4.43 %	14,783	4.47 %	16,529
Other	8,838	2.90 %	14,516	2.67 %	20,422
Total other borrowings	6,124,390		6,236,441	2.07 %	
Subordinated debentures[1]	275,913	5.34 %	177,884	5.52 %	275,913
Total other borrowed funds	$ 7,418,714		$ 7,298,229	2.03 %	

[1] Parent Company only.

Aggregate annual principal repayments at December 31, 2020 are as follows (in thousands):

2021	$ 1,884,974
2022	1,639,735
2023	9,625
2024	625
2025	10,555
Thereafter	275,847
Total	$ 3,821,361

Funds purchased are unsecured and generally mature within one day to ninety days from the transaction date. Securities repurchase agreements are recorded as secured borrowings that generally mature within ninety days and are secured by certain available for sale securities.

Additional information relating to securities sold under agreements to repurchase and related liabilities at December 31, 2020 and 2019 is as follows (dollars in thousands):

	December 31, 2020			
Security Sold/Maturity	**Amortized Cost**	**Fair Value**	**Repurchase Liability[1]**	**Rate**
U.S. government agency mortgage-backed securities:				
Overnight[1]	**$ 893,069**	**$ 910,885**	**$ 893,021**	**0.09 %**
Long-term	**—**	**—**	**—**	**— %**
Total Agency Securities	**$ 893,069**	**$ 910,885**	**$ 893,021**	**0.09 %**

	December 31, 2019			
Security Sold/Maturity	**Amortized Cost**	**Fair Value**	**Repurchase Liability[1]**	**Rate**
U.S. government agency mortgage-backed securities:				
Overnight[1]	$ 431,939	$ 435,898	$ 427,822	0.50 %
Long-term	—	—	—	— %
Total Agency Securities	$ 431,939	$ 435,898	$ 427,822	0.50 %

1 BOK Financial maintains control over the securities underlying overnight repurchase agreements and generally transfers control over securities underlying longer-term dealer repurchase agreements to the respective counterparty.

Borrowings from the Federal Home Loan Banks are used for funding purposes. In accordance with policies of the Federal Home Loan Banks, BOK Financial has granted a blanket pledge of eligible assets (generally unencumbered U.S. Treasury and residential mortgage-backed securities, 1-4 family loans and multifamily loans) as collateral for these advances. The Federal Home Loan Banks have issued letters of credit totaling $381 million to secure BOK Financial's obligations to depositors of public funds. The unused credit available to BOK Financial at December 31, 2020 pursuant to the Federal Home Loan Bank's collateral policies is $8.6 billion.

In 2016, BOK Financial issued $150 million of subordinated debt that will mature on June 30, 2056. Interest on this debt bears an interest rate of 5.375%, payable quarterly. On June 30, 2021, BOK Financial 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 2025 and thereafter, the notes will bear interest at an annual floating rate equal to three-month LIBOR plus 3.17%. The debt contains a call option that allows for repayment prior to contractual maturity. The call option is available on June 25, 2025 and quarterly thereafter at 100% of the principal amount.

Also through CoBiz Financial, we acquired junior subordinated debentures split across three issuance tranches. Junior subordinated debentures of $21 million will mature September 17, 2033 and bear an interest rate of three-month LIBOR plus 2.95% that resets quarterly. Junior subordinated debentures of $31 million will mature on July 23, 2034 and bear an interest rate of three-month LIBOR plus 2.60% that resets quarterly. Junior subordinated debentures of $20 million will mature on September 30, 2035 and bear an interest rate of three-month LIBOR plus 1.45% that resets quarterly. The junior subordinated debentures are subject to early redemption prior to maturity.

BOK Financial Securities, Inc. may borrow funds from Pershing, LLC ("Pershing"), a clearing broker/dealer and a wholly owned subsidiary of Bank of New York Mellon, for the purposes of financing securities purchases or to facilitate funding of investment banking activities, on terms to be negotiated at the time of the borrowing. BOK Financial Securities, Inc. had no borrowings outstanding at December 31, 2020 and December 31, 2019.

The Company has a liability related to the repurchase of certain delinquent residential mortgage loans previously sold into GNMA mortgage pools. Interest is payable at rates contractually due to investors.

(10) Federal and State Income Taxes

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of deferred tax assets and liabilities are as follows (in thousands):

	December 31,	
	2020	**2019**
Deferred tax assets:		
Credit loss reserves	**$ 101,265**	$ 50,611
Lease liability	**44,794**	46,084
Deferred compensation	**29,504**	25,976
Unearned fees	**14,584**	9,080
Purchased loan discount	**11,537**	18,042
Share-based compensation	**6,525**	7,392
Valuation adjustments	**3,834**	1,545
Other	**29,963**	26,384
Total deferred tax assets	**242,006**	185,114
Deferred tax liabilities:		
Available for sale securities mark to market	**105,769**	33,140
Right-of-use asset	**38,635**	42,180
Mortgage servicing rights	**24,182**	48,435
Acquired identifiable intangible	**18,138**	23,181
Depreciation	**13,754**	18,909
Lease financing	**11,828**	10,720
Other	**39,210**	34,826
Total deferred tax liabilities	**251,516**	211,391
Net deferred tax liabilities	**$ (9,510)**	$ (26,277)

No valuation allowance was necessary on deferred tax assets as of December 31, 2020 and 2019.

The significant components of the provision for income taxes attributable to continuing operations for BOK Financial are shown below (in thousands):

	Year Ended December 31,		
	2020	**2019**	**2018**
Current income tax expense:			
Federal	**$ 173,888**	$ 110,887	$ 103,748
State	**29,889**	15,088	15,253
Total current income tax expense	**203,777**	125,975	119,001
Deferred income tax expense (benefit):			
Federal	**(65,989)**	3,416	(190)
State	**(8,995)**	792	250
Total deferred income tax expense (benefit)	**(74,984)**	4,208	60
Total income tax expense	**$ 128,793**	$ 130,183	$ 119,061

The reconciliations of income attributable to continuing operations at the U.S. federal statutory tax rate to income tax expense are as follows (in thousands):

	Year Ended December 31,		
	2020	**2019**	**2018**
Amount:			
Federal statutory tax	**$ 118,412**	$ 132,482	$ 118,752
Tax exempt revenue	**(7,035)**	(12,227)	(8,311)
Effect of state income taxes, net of federal benefit	**14,251**	12,715	12,430
Utilization of tax credits, net of proportional amortization of low-income housing limited partnership investments	**(6,994)**	(5,127)	(4,559)
Other, net	**10,159**	2,340	749
Total income tax expense	**$ 128,793**	$ 130,183	$ 119,061

	Year Ended December 31,		
	2020	**2019**	**2018**
Percent of pretax income:			
Federal statutory tax	**21.0 %**	21.0 %	21.0 %
Tax exempt revenue	**(1.2)**	(1.9)	(1.5)
Effect of state income taxes, net of federal benefit	**2.5**	2.0	2.2
Utilization of tax credits, net of proportional amortization of low-income housing limited partnership investments	**(1.2)**	(0.8)	(0.8)
Other, net	**1.7**	0.3	0.2
Total	**22.8 %**	20.6 %	21.1 %

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in thousands):

	2020	**2019**	**2018**
Balance as of January 1	**$ 20,465**	$ 18,869	$ 18,110
Additions for tax for current year positions	**6,384**	5,649	2,649
Settlements during the period	**—**	—	—
Lapses of applicable statute of limitations	**(3,947)**	(4,053)	(1,890)
Balance as of December 31	**$ 22,902**	$ 20,465	$ 18,869

Of the above unrecognized tax benefits, $17.2 million, if recognized, would have affected the effective tax rate.

BOK Financial recognizes interest and penalties accrued related to unrecognized tax benefits in income tax expense. The Company recognized $2.4 million for 2020, $2.2 million for 2019 and $1.7 million for 2018 in interest and penalties. The Company had approximately $5.9 million and $5.6 million accrued for the payment of interest and penalties at December 31, 2020 and 2019, respectively. Federal statutes remain open for federal tax returns filed in the previous three reporting periods. Various state income tax statutes remain open for the previous three to six reporting periods.

(11) Employee Benefits

BOK Financial sponsors a defined benefit cash balance Pension Plan for all employees who satisfy certain age and service requirements. Pension Plan benefits were curtailed as of April 1, 2006. No participants may be added to the plan and no additional service benefits will be accrued. Interest continues to accrue on employees' account balances at a variable rate tied to the five-year trailing average of five-year U.S. Treasury securities plus 1.5%. The rate has a floor of 3.0% and a ceiling of 5.0%. The 2020 quarterly variable rates ranged from 3.28% to 3.40%.

The projected benefit obligation and fair value of plan assets, respectively, were $24 million and $38 million at December 31, 2020 and $25 million and $36 million at December 31, 2019. The net periodic benefit credit was $1.3 million for December 31, 2020, $815 thousand for December 31, 2019 and $583 thousand for December 31, 2018. Total expected future benefit payments related to the Pension Plan were $26.6 million at December 31, 2020.

The following table presents the weighted-average assumptions used in the measurement of the Company's net periodic benefit cost as of December 31:

	2020	**2019**
Discount rate	**2.69 %**	4.10 %
Expected return on plan assets	**5.50 %**	5.50 %

Assets of the Pension Plan consist primarily of shares in the Cavanal Hill Active Core Fund. The stated objective of this fund is to provide an attractive total return with a well-balanced mix of equities and bonds. The typical portfolio mix is approximately 60% equities and 40% bonds. The net asset value of shares in the Cavanal Hill Funds is reported daily based on market quotations for the Fund’s securities. Management considers the Fund's recent and long-term performance as indicators when setting the expected return on plan assets. No minimum contribution was required for 2020, 2019 or 2018.

Employee contributions to the Thrift Plan are eligible for Company matching equal to 6% of base compensation, as defined in the plan. The Company-provided matching contribution rates range from 50% for employees with less than 4 years of service to 200% for employees with 15 or more years of service. Additionally, a maximum Company-provided, non-elective annual contribution of up to $750 per participant is provided for employees whose annual base compensation is less than $40,000. Participants may direct investments in their accounts to a variety of options, including a BOK Financial common stock fund and Cavanal Hill funds. Employer contributions, which are invested in accordance with the participant’s investment options, vest over five years. Thrift Plan expenses were $29.9 million for 2020, $27.6 million for 2019 and $25.1 million for 2018.

(12) Share-Based Compensation Plans

The shareholders and Board of Directors of BOK Financial have approved various share-based compensation plans. An independent compensation committee of the Board of Directors determines the number of awards granted to the Chief Executive Officer and other senior executives. Share-based compensation is granted to other officers and employees as determined by the Chief Executive Officer.

The following table presents stock options outstanding under these plans (in thousands, except for per share data):

	Number	Weighted-Average Exercise Price	Aggregate Intrinsic Value
Options outstanding at:			
December 31, 2018	63,058	$ 54.89	$ 1,163
December 31, 2019	36,100	56.75	1,106
December 31, 2020	**17,671**	**57.35**	**197**
Options vested at:			
December 31, 2018	33,573	$ 53.09	$ 679
December 31, 2019	27,193	57.08	824
December 31, 2020	**17,671**	**57.35**	**197**

No options have been awarded since 2013. At December 31, 2020, the weighted average remaining contractual life of options outstanding was 1.03 years and the weighted average remaining contractual life of vested options was 1.03 years. The aggregate intrinsic value of options exercised was $318 thousand for 2020, $761 thousand for 2019 and $2.3 million for 2018.

The Company also awards restricted stock to certain officers and employees and restricted stock units ("RSUs") to certain executives, (collectively "non-vested shares"). Vesting of all non-vested shares is subject to service requirements. Additionally, vesting of certain non-vested shares is subject to performance criteria based on changes in the Company's earnings per share relative to defined peers. The following represents a summary of the non-vested shares for the three years ended December 31, 2020 (in thousands):

	Restricted Stock		Restricted Stock Units	
	Shares	Weighted Average Grant Date Fair Value	Units	Weighted Average Grant Date Fair Value
Non-vested at January 1, 2018	667,103		—	
Granted	150,419	$ 85.58	—	—
Vested	(242,215)	74.85	—	—
Forfeited	(47,700)	75.68	—	—
Non-vested at December 31, 2018	527,607		—	
Granted	145,724	$ 76.74	46,689	$ 87.40
Vested	(114,201)	61.28	—	—
Forfeited	(131,952)	83.69	—	—
Non-vested at December 31, 2019	427,178		46,689	
Granted	**236,750**	**$ 83.49**	**22,980**	**$ 77.36**
Vested	**(225,527)**	**83.50**	**—**	**—**
Forfeited	**(18,167)**	**83.10**	**—**	**—**
Non-vested at December 31, 2020	**420,234**		**69,669**	

Compensation expense recognized on non-vested shares totaled $16.0 million for 2020, $15.1 million for 2019 and $3.6 million for 2018. Unrecognized compensation cost of non-vested shares totaled $16.3 million at December 31, 2020. We expect to recognize compensation expense of $10.8 million in 2021, $5.4 million in 2022, and $134 thousand in 2023.

Compensation cost for restricted stock units is variable based on the current fair value of BOK Financial common shares. Vesting of 244,392 non-vested shares may be increased or decreased based on performance criteria defined in the plan documents.

(13) Related Parties

In compliance with applicable banking regulations, the Company may extend credit to certain executive officers, directors, principal shareholders and their affiliates (collectively referred to as "related parties") in the ordinary course of business. The Company's loans to related parties do not involve more than the normal credit risk.

Activity in loans to related parties is summarized as follows (in thousands):

	Year Ended December 31,	
	2020	**2019**
Beginning balance	**$ 75,189**	$ 75,265
Advances	**498,425**	886,610
Payments	**(484,958)**	(896,643)
Adjustments[1]	**4,284**	9,957
Ending balance	**$ 92,940**	$ 75,189

[1] Adjustments generally consist of changes in status as a related party.

As defined by banking regulations, loan commitments and equity investments from the subsidiary banks to a single affiliate may not exceed 10% of unimpaired capital and surplus while loan commitments and equity investments to all affiliates may not exceed 20% of unimpaired capital and surplus. All loans to affiliates must be fully secured by eligible collateral. At December 31, 2020, loan commitments and equity investments were limited to $416 million to a single affiliate and $832 million to all affiliates. The largest loan commitment and equity investment to a single affiliate was $264 million and the aggregate loan commitments and equity investments to all affiliates were $324 million. The largest outstanding amount to a single affiliate at December 31, 2020 was $4.1 million and the total outstanding amounts to all affiliates were $5.3 million. At December 31, 2019, total loan commitments and equity investments to all affiliates were $392 million and the total outstanding amounts to all affiliates were $5.0 million.

Certain related parties are customers of the Company for services other than loans, including consumer banking, corporate banking, risk management, wealth management, brokerage and trading, or fiduciary/trust services. The Company engages in transactions with related parties in the ordinary course of business in compliance with applicable regulations.

QuikTrip Corporation has entered into a fee sharing agreement with TransFund, BOKF's electronic funds transfer network ("TransFund"), respecting transactions completed at TransFund automated teller machines placed in QuikTrip locations. In 2020, BOKF paid QuikTrip approximately $10.0 million pursuant to this agreement. A BOK Financial director is Chief Executive Officer, Chairman, and a significant shareholder of QuikTrip Corporation.

Cavanal Hill Investment Management, Inc., a wholly-owned subsidiary of BOKF, NA, is the administrator to and investment advisor for the Cavanal Hill Funds (the "Funds"), a diversified, open-ended investment company established as a business trust under the Investment Company Act of 1940 (the "1940 Act"). BOKF, NA is custodian and Cavanal Hill Distributors, Inc. is distributor for the Funds. The Funds' products are offered to customers, employee benefit plans, trusts and the general public in the ordinary course of business. Approximately 80% of the Funds' assets of $3.7 billion are held for the Company's clients. A Company executive officer serves on the Funds' board of trustees and officers of BOKF, NA serve as president and secretary of the Funds. A majority of the members of the Funds' board of trustees are, however, independent of the Company and the Funds are managed by its board of trustees.

(14) Commitments and Contingent Liabilities

Litigation Contingencies

As a member of Visa, BOK Financial is obligated for a proportionate share of certain covered litigation losses incurred by Visa under a retrospective responsibility plan. A contingent liability was recognized for the Company's share of Visa's covered litigation liabilities. Visa funded an escrow account to cover litigation claims, including covered litigation losses under the retrospective responsibility plan, with proceeds from its initial public offering in 2008 and from available cash.

BOK Financial currently owns 252,233 Visa Class B shares which are convertible into 409,324 shares of Visa Class A shares after the final settlement of all covered litigation. Class B shares may be diluted in the future if the escrow fund is not adequate to cover future covered litigation costs. No value has been currently assigned to the Class B shares.

On June 24, 2015, BOKF, NA received a complaint alleging that an employee had colluded with a bond issuer and an individual in misusing revenues pledged to municipal bonds for which BOKF, NA served as trustee under the bond indenture. The Company conducted an investigation and concluded that employees in one of its Corporate Trust offices had, with respect to a single group of affiliated bond issuances, violated Company policies and procedures by waiving financial covenants, granting forbearances and accepting without disclosure to the bondholders, debt service payments from sources other than pledged revenues. The relationship manager was terminated. The Company reported the circumstances to, and cooperated with an investigation by, the Securities and Exchange Commission ("SEC"). On September 7, 2016, BOKF, NA agreed, and the SEC entered, a consent order finding that BOKF, NA had violated Section 17(a) of the Securities Act of 1933 and Section 10(b) of the Securities Exchange Act and requiring BOKF, NA to disgorge $1,067,721 of fees and pay a civil penalty of $600,000. BOKF, NA disgorged the fees and paid the penalty.

On December 28, 2015, in an action brought by the SEC, the United States District Court for the District of New Jersey entered a judgment against the principals involved in issuing the bonds, precluding the principals from denying the alleged violations of the federal securities laws and requiring the principals to pay all outstanding principal, accrued interest, and other amounts required under the bond documents, less the value of the facilities securing repayment of the bonds, subject to oversight by a court appointed monitor ("Payment Plan").

On August 26, 2016, BOKF, NA was sued in the United States District Court for New Jersey by two bondholders in a putative class action on behalf of all holders of the bonds alleging BOKF, NA participated in the fraudulent sale of securities by the principals. The New Jersey Federal District Action remains stayed with no current deadlines pending. On September 14, 2016, BOKF, NA was sued in the District Court of Tulsa County, Oklahoma by 19 bondholders alleging BOKF, NA participated in the fraudulent sale of securities by the principals. The Tulsa County District Court Action is pending on BOKF, NA's motion to dismiss the plaintiff's Third Amended Petition.

On January 8, 2020, the New Jersey District Court entered judgment against the principal individual and his wife for $36,805,051 in principal amount and $10,937,831 in pre-judgment interest. On January 17, 2020, the New Jersey Federal District Court formally terminated the Payment Plan. Management is no longer able to conclude that the individual principal and his wife will be successful in paying the obligations they have to pay the bonds in full but such obligations remain and are not dischargeable in bankruptcy. Beginning September 2020, the SEC filed multiple garnishments on entities either related to or holding assets for the debtor. If the individual principal and his wife do not have the financial ability to pay the bonds in full, a bondholder loss could become probable. Management has been advised by counsel that BOKF, NA has valid defenses to claims of bondholders and that no loss to the company is probable. No provision for losses has been made at this time. BOKF, NA estimates that, upon sale of all remaining collateral securing payment of the bonds, approximately $20 million will remain outstanding. A reasonable estimate cannot be made of the amount of any bondholder loss, though the amount of bondholder loss could be material to the company in the event a loss to the company becomes probable.

On March 5, 2018, BOKF, NA was sued in the Fulton, Georgia County District Court by a Wrongful Death Judgment Creditor of one of the operators of a nursing home financed by one of the bonds which are the subject of the litigation discussed above. The judgment is alleged to total approximately $8 million in principal and interest at this time. Plaintiff alleges that BOKF, as Trustee, colluded with the borrower and others to defraud creditors of the nursing home by misleading the public about the solvency of the nursing home. Plaintiff alleges that this conduct has prevented her from collecting on her judgment. On April 19, 2019, the Court granted BOKF, NA's Motion to Dismiss. On May 3, 2019, the plaintiff filed a Motion for Reconsideration which remains pending. BOKF, NA is advised by counsel that BOKF, NA has valid defenses to the plaintiffs' claims and no loss is probable.

On March 14, 2017, BOKF, NA was sued in the United States District Court for the Northern District of Oklahoma by bondholders in a second putative class action representing a different set of municipal securities. The bondholders in this second action alleged two individuals purchased facilities from the principals who are the subject of the SEC New Jersey proceedings by means of the fraudulent sale of $60 million of municipal securities for which BOKF, NA also served as indenture trustee. On December 18, 2020, the action was dismissed with prejudice in exchange for a nominal payment.

On March 7, 2017, a plaintiff filed a putative class action in the United States District Court for the Northern District of Texas alleging an extended overdraft fee charged by BOKF, NA is interest and exceeds permitted rates. On September 18, 2018, the District Court dismissed the Texas action and the plaintiff appealed the dismissal to the United States Court of Appeals for the Fifth Circuit which heard argument on October 8, 2019. On August 22, 2018, a plaintiff filed a second putative class action in the United States District Court for New Mexico making the same allegations as the Texas action. The District Court dismissed the plaintiff's action. The plaintiff has appealed to the United States Court of Appeals for the Tenth Circuit. Management is advised by counsel that a loss is not probable in either the now dismissed Texas action or the New Mexico action and that the loss, if any, cannot be reasonably estimated.

On March 7, 2020, three former employees sued BOKF, NA, the Plan Committee of the BOKF, NA 401k Plan, and Cavanal Hill Investment Management, Inc., a subsidiary of BOKF, NA, alleging that the Defendants included proprietary investment products as investment options in the BOKF, NA 401k Plan, whose fees were too high and performance too low, for the purpose of earning fees. The action is brought as a putative class action on behalf of all Plan Participants. The action is pending on the defendants' motion to dismiss. Management is advised by counsel that a loss is not probable and that the loss, if any, cannot be reasonably estimated.

On May 12, 2020, an accounting firm filed a putative class action in the District Court of Colorado alleging that BOKF, NA and other national banks failed to pay the agents of borrowers making application through the Bank to the Small Business Administration for Paycheck Protection Program (CARES Act) loans. The action has now been dismissed with prejudice by the plaintiff.

In the ordinary course of business, BOK Financial and its subsidiaries are subject to legal actions and complaints. Management believes, based upon the opinion of counsel, that the actions and liability or loss, if any, resulting from the final outcomes of the proceedings, will not have a material effect on the Company’s financial condition, results of operations or cash flows.

Alternative Investment Commitments

The Company sponsors a private equity fund and invests in several tax credit entities and other funds as permitted by banking regulations. Consolidation of these investments is based on the variable interest model.

At December 31, 2020, the Company has $290 million in interests in various alternative investments generally consisting of unconsolidated limited partnership interests in entities for which investment return is in the form of low income housing tax credits or other investments in merchant banking activities. The investment balance also includes $94 million in unfunded commitments included in Other liabilities on the Consolidated Balance Sheets. At December 31, 2019, the Company had $259 million in interests in various alternative investments and included $82 million in unfunded commitments in Other liabilities.

Other Commitments and Contingencies

Cavanal Hill Funds’ assets include U.S. Treasury and government securities money market funds. Assets of these funds consist of highly-rated, short-term obligations of the U.S. Treasury and Agencies. The net asset value of units in these funds was $1.00 at December 31, 2020. An investment in these funds is not insured by the Federal Deposit Insurance Corporation or guaranteed by BOK Financial or any of its subsidiaries. BOK Financial may, but is not obligated to purchase assets from these funds to maintain the net asset value at $1.00. No assets were purchased from the funds in 2020 or 2019.

The Federal Reserve Bank requires member banks to maintain certain minimum average cash balances. Member banks may satisfy reserve balance requirements through holdings of vault cash and balances maintained directly with a Federal Reserve Bank. The combined average balance of vault cash and balances held at the Federal Reserve Bank was $727 million for the year ended December 31, 2020 and $618 million for the year ended December 31, 2019.

(15) Shareholders Equity

Preferred Stock

One billion shares of preferred stock with a par value of $0.00005 per share are authorized. The Series A Preferred Stock has no voting rights except as otherwise provided by Oklahoma corporate law and may be converted into one share of Common Stock for each 36 shares of Series A Preferred Stock at the option of the holder. Dividends are cumulative at an annual rate of ten percent of the $0.06 per share liquidation preference value when declared and are payable in cash. Aggregate liquidation preference is $15 million. No Series A Preferred Stock was outstanding in 2020, 2019 or 2018.

Common Stock

Common stock consists of 2.5 billion authorized shares with a $0.00006 par value. Holders of common shares are entitled to one vote per share at the election of the Board of Directors and on any question arising at any shareholders' meeting and to receive dividends when and as declared. Additionally, regulations restrict the ability of national banks and bank holding companies to pay dividends.

Subsidiary Bank

The amounts of dividends that BOK Financial's subsidiary bank can declare and the amounts of loans the subsidiary bank can extend to affiliates are limited by various federal banking regulations and state corporate law. Generally, dividends declared during a calendar year are limited to net profits, as defined, for the year plus retained profits for the preceding two years. Dividends are further restricted by minimum capital requirements.

Regulatory Capital

BOK Financial and the subsidiary bank is subject to various capital requirements administered by the federal banking agencies. Failure to meet minimum capital requirements can initiate certain mandatory and additional discretionary actions by regulators that could have a material effect on BOK Financial's operations. These capital requirements include quantitative measures of assets, liabilities and certain off-balance sheet items. The capital standards are also subject to qualitative judgments by the regulators.

A bank falling below the minimum capital requirements, 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. For a banking institution to qualify as well capitalized, Common Equity Tier 1, Tier I, Total and Leverage capital ratios must be at least 6.5%, 8%, 10% and 5%, respectively. Tier I capital consists primarily of common stockholders' equity, excluding unrealized gains or losses on available for sale securities, less goodwill, core deposit premiums and certain other intangible assets. Total capital consists primarily of Tier I capital plus preferred stock, subordinated debt and allowances for credit losses, subject to certain limitations. The subsidiary bank exceeded the regulatory definition of well capitalized as of December 31, 2020 and December 31, 2019.

A summary of regulatory capital minimum requirements and levels follows (dollars in thousands):

	Minimum Capital Requirement	Capital Conservation Buffer	Minimum Capital Requirement Including Capital Conservation Buffer	Well Capitalized Bank Requirement	December 31, 2020		December 31, 2019	
Common Equity Tier 1 Capital (to Risk Weighted Assets):								
Consolidated	**4.50%**	**2.50%**	**7.00%**	**N/A**	**$3,881,912**	**11.95 %**	$ 3,608,821	11.39 %
BOKF, NA	**4.50%**	**N/A**	**4.50%**	**6.50%**	**3,756,950**	**11.66 %**	3,414,446	10.90 %
Tier I Capital (to Risk Weighted Assets):								
Consolidated	**6.00%**	**2.50%**	**8.50%**	**N/A**	**$3,881,912**	**11.95 %**	$ 3,608,821	11.39 %
BOKF, NA	**6.00%**	**N/A**	**6.00%**	**8.00%**	**3,756,950**	**11.66 %**	3,414,446	10.90 %
Total Capital (to Risk Weighted Assets):								
Consolidated	**8.00%**	**2.50%**	**10.50%**	**N/A**	**$4,489,110**	**13.82 %**	$ 4,097,087	12.94 %
BOKF, NA	**8.00%**	**N/A**	**8.00%**	**10.00%**	**4,153,347**	**12.89 %**	3,692,010	11.79 %
Leverage (Tier I Capital to Average Assets):								
Consolidated	**4.00%**	**N/A**	**4.00%**	**N/A**	**$3,881,912**	**8.28 %**	$ 3,608,820	8.40 %
BOKF, NA	**4.00%**	**N/A**	**4.00%**	**5.00%**	**3,756,950**	**8.04 %**	3,414,446	7.98 %

Accumulated Other Comprehensive Income (Loss)

AOCI includes unrealized gains and losses on available for sale ("AFS") securities and non-credit related unrealized losses on AFS securities for which an other-than-temporary impairment has been recorded in earnings. Unrealized losses on employee benefit plans will be reclassified into income as pension plan costs are recognized over the remaining service period of plan participants. Gains and losses in AOCI are net of deferred income taxes.

A rollforward of the components of accumulated other comprehensive income (loss) is included as follows (in thousands):

	Unrealized Gain (Loss) on		
	Available for Sale Securities	**Employee Benefit Plans**	**Total**
Balance, December 31, 2017	$ (35,385)	$ (789)	$ (36,174)
Transition adjustment for net unrealized gains on equity securities	(2,709)	—	(2,709)
Net change in unrealized gain (loss)	(46,941)	(1,069)	(48,010)
Reclassification adjustments included in earnings:			
Loss on available for sale securities, net	2,801	—	2,801
Other comprehensive income (loss), before income taxes	(44,140)	(1,069)	(45,209)
Federal and state income tax	(11,235)	(272)	(11,507)
Other comprehensive income (loss), net of income taxes	(32,905)	(797)	(33,702)
Balance, December 31, 2018	(70,999)	(1,586)	(72,585)
Net change in unrealized gain (loss)	239,017	2,030	241,047
Reclassification adjustments included in earnings:			
Gain on available for sale securities, net	(5,597)	—	(5,597)
Other comprehensive income (loss), before income taxes	233,420	2,030	235,450
Federal and state income tax	57,425	517	57,942
Other comprehensive income (loss), net of income taxes	175,995	1,513	177,508
Balance, December 31, 2019	104,996	(73)	104,923
Net change in unrealized gain (loss)	**312,576**	**1,220**	**313,796**
Reclassification adjustments included in earnings:			
Gain on available for sale securities, net	**(9,910)**	**—**	**(9,910)**
Other comprehensive income (loss), before income taxes	**302,666**	**1,220**	**303,886**
Federal and state income tax	**72,630**	**311**	**72,941**
Other comprehensive income (loss), net of income taxes	**230,036**	**909**	**230,945**
Balance, December 31, 2020	**$ 335,032**	**$ 836**	**$ 335,868**

(16) Earnings Per Share

The following table presents the computation of basic and diluted earnings per share (dollars in thousands, except per share data):

	Year Ended		
	2020	**2019**	**2018**
Numerator:			
Net income attributable to BOK Financial Corp. shareholders	**$ 435,030**	$ 500,758	$ 445,646
Less: Earnings allocated to participating securities	**2,612**	3,227	3,737
Numerator for basic earnings per share – income available to common shareholders	**432,418**	497,531	441,909
Effect of reallocating undistributed earnings of participating securities	**—**	—	1
Numerator for diluted earnings per share – income available to common shareholders	**$ 432,418**	$ 497,531	$ 441,910
Denominator:			
Weighted average shares outstanding	**70,259,553**	71,250,081	67,190,257
Less: Participating securities included in weighted average shares outstanding	**418,576**	462,381	561,617
Denominator for basic earnings per common share	**69,840,977**	70,787,700	66,628,640
Dilutive effect of employee stock compensation plans	**3,195**	14,912	33,633
Denominator for diluted earnings per common share	**69,844,172**	70,802,612	66,662,273
Basic earnings per share	**$ 6.19**	$ 7.03	$ 6.63
Diluted earnings per share	**$ 6.19**	$ 7.03	$ 6.63

(17) Reportable 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 to 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 business customers served through the consumer branch network and all mortgage banking activities. Wealth Management provides fiduciary services, private bank services, insurance 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 its lines of business, BOK Financial has a Funds Management unit. The primary purpose of this unit is to manage 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.

BOK Financial allocates resources and evaluates performance of its lines of business after allocation of funds, actual net credit losses and capital costs. In addition, we measure the performance of our business lines after allocation of certain indirect expenses and taxes on statutory rates. The allocation for the prior comparable periods have been revised on a comparable basis.

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 duration. 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 based on rates which approximate the 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 rates 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 intermediate swap rates. The expected duration ranges from 30 days for certain rate-sensitive deposits to five years.

Substantially all revenue is from domestic customers. No single external customer accounts for more than 10% of total revenue.

Net loans charged off and provision for credit losses represents net loans charged off as attributed to the lines of business and the provision for credit losses in excess of net charge-offs attributed to Funds Management and Other.

The operations of CoBiz, acquired on October 1, 2018 were allocated to the operating segments in the second quarter of 2019. Prior to April 1, 2019, CoBiz operations were included in Funds Management and other.

Reportable segments reconciliation to the Consolidated Financial Statements for the year ended December 31, 2020 is as follows (in thousands):

	Commercial	Consumer	Wealth Management	Funds Management and Other	BOK Financial Consolidated
Net interest and dividend revenue from external sources	$ 714,932	$ 78,004	$ 130,818	$ 184,690	$ 1,108,444
Net interest revenue (expense) from internal sources	(126,444)	69,000	(13,528)	70,972	—
Net interest and dividend revenue	588,488	147,004	117,290	255,662	1,108,444
Provision for credit losses	69,475	2,805	(209)	150,521	222,592
Net interest and dividend revenue after provision for credit losses	519,013	144,199	117,499	105,141	885,852
Other operating revenue	187,361	243,719	398,834	14,035	843,949
Other operating expense	258,903	233,425	325,608	348,001	1,165,937
Net direct contribution	447,471	154,493	190,725	(228,825)	563,864
Gain (loss) on financial instruments, net	193	95,344	4	(95,541)	—
Change in fair value of mortgage servicing rights	—	(79,524)	—	79,524	—
Gain (loss) on repossessed assets, net	(2,677)	276	—	2,401	—
Corporate expense allocations	24,862	42,638	35,331	(102,831)	—
Net income before taxes	420,125	127,951	155,398	(139,610)	563,864
Federal and state income taxes	114,120	32,591	39,770	(57,688)	128,793
Net income	306,005	95,360	115,628	(81,922)	435,071
Net income attributable to non-controlling interests	—	—	—	41	41
Net income attributable to BOK Financial Corp. shareholders	$ 306,005	$ 95,360	$ 115,628	$ (81,963)	$ 435,030
Average assets	$ 26,994,075	$ 9,842,125	$ 15,695,646	$ (3,827,456)	$ 48,704,390

Reportable segments reconciliation to the Consolidated Financial Statements for the year ended December 31, 2019 is as follows (in thousands):

	Commercial	Consumer	Wealth Management	Funds Management and Other	BOK Financial Consolidated
Net interest and dividend revenue from external sources	$ 919,148	$ 99,679	$ 61,277	$ 32,775	$ 1,112,879
Net interest revenue (expense) from internal sources	(242,907)	95,775	38,815	108,317	—
Net interest and dividend revenue	676,241	195,454	100,092	141,092	1,112,879
Provision for credit losses	39,011	6,271	(308)	(974)	44,000
Net interest and dividend revenue after provision for credit losses	637,230	189,183	100,400	142,066	1,068,879
Other operating revenue	170,412	187,500	341,389	(4,931)	694,370
Other operating expense	252,459	230,916	277,267	371,739	1,132,381
Net direct contribution	555,183	145,767	164,522	(234,604)	630,868
Gain (loss) on financial instruments, net	106	30,375	2	(30,483)	—
Change in fair value of mortgage servicing rights	—	(53,517)	—	53,517	—
Gain (loss) on repossessed assets, net	331	496	—	(827)	—
Corporate expense allocations	43,055	47,169	36,239	(126,463)	—
Net income before taxes	512,565	75,952	128,285	(85,934)	630,868
Federal and state income taxes	137,759	19,346	32,954	(59,876)	130,183
Net income	374,806	56,606	95,331	(26,058)	500,685
Net loss attributable to non-controlling interests	—	—	—	(73)	(73)
Net income attributable to BOK Financial Corp. shareholders	$ 374,806	$ 56,606	$ 95,331	$ (25,985)	$ 500,758
Average assets	$ 22,807,589	$ 9,301,341	$ 10,204,426	$ (219,009)	$ 42,094,347

Reportable segments reconciliation to the Consolidated Financial Statements for the year ended December 31, 2018 is as follows (in thousands):

	Commercial	Consumer	Wealth Management	Funds Management and Other	BOK Financial Consolidated
Net interest and dividend revenue from external sources	$ 726,855	$ 83,231	$ 81,528	$ 93,253	$ 984,867
Net interest revenue (expense) from internal sources	(159,954)	73,448	31,480	55,026	—
Net interest and dividend revenue	566,901	156,679	113,008	148,279	984,867
Provision for credit losses	30,358	5,143	(288)	(27,213)	8,000
Net interest and dividend revenue after provision for credit losses	536,543	151,536	113,296	175,492	976,867
Other operating revenue	162,701	178,123	296,369	(20,409)	616,784
Other operating expense	202,095	231,075	257,650	337,346	1,028,166
Net direct contribution	497,149	98,584	152,015	(182,263)	565,485
Gain (loss) on financial instruments, net	26	(25,021)	7	24,988	—
Change in fair value of mortgage servicing rights	—	4,668	—	(4,668)	—
Gain (loss) on repossessed assets, net	(6,532)	247	—	6,285	—
Corporate expense allocations	36,670	44,398	35,920	(116,988)	—
Net income before taxes	453,973	34,080	116,102	(38,670)	565,485
Federal and state income taxes	120,458	8,681	30,075	(40,153)	119,061
Net income	333,515	25,399	86,027	1,483	446,424
Net income attributable to non-controlling interests	—	—	—	778	778
Net income attributable to BOK Financial Corp. shareholders	$ 333,515	$ 25,399	$ 86,027	$ 705	$ 445,646
Average assets	$ 18,432,035	$ 8,303,263	$ 8,447,784	$ (245,552)	$ 34,937,530

(18) Fees and Commissions Revenue

Fees and commissions revenue by reportable segment and primary service line is as follows for the year ended December 31, 2020.

	Commercial	Consumer	Wealth Management	Funds Management and Other	Consolidated	Out of Scope[1]	In Scope[2]
Trading revenue	$ —	$ —	$ 144,299	$ —	$ 144,299	$ 144,299	$ —
Customer hedging revenue	22,767	—	395	(413)	22,749	22,749	—
Retail brokerage revenue	—	—	15,690	—	15,690	—	15,690
Insurance brokerage revenue	—	—	12,702	—	12,702	—	12,702
Investment banking revenue	9,183	—	17,391	(181)	26,393	8,530	17,863
Brokerage and trading revenue	31,950	—	190,477	(594)	221,833	175,578	46,255
TransFund EFT network revenue	75,363	3,058	(56)	5	78,370	—	78,370
Merchant services revenue	9,172	60	—	—	9,232	—	9,232
Corporate card revenue	2,362	—	75	143	2,580	—	2,580
Transaction card revenue	86,897	3,118	19	148	90,182	—	90,182
Personal trust revenue	—	—	84,759	—	84,759	—	84,759
Corporate trust revenue	—	—	19,308	—	19,308	—	19,308
Institutional trust & retirement plan services revenue	—	—	46,253	—	46,253	—	46,253
Investment management services and other	—	—	17,290	(165)	17,125	—	17,125
Fiduciary and asset management revenue	—	—	167,610	(165)	167,445	—	167,445
Commercial account service charge revenue	44,489	1,654	2,282	(4)	48,421	—	48,421
Overdraft fee revenue	132	21,679	74	7	21,892	—	21,892
Check card revenue	—	21,355	—	—	21,355	—	21,355
Automated service charge and other deposit fee revenue	311	4,749	74	3	5,137	—	5,137
Deposit service charges and fees	44,932	49,437	2,430	6	96,805	—	96,805
Mortgage production revenue	—	125,848	—	—	125,848	125,848	—
Mortgage servicing revenue	—	58,249	—	(1,737)	56,512	56,512	—
Mortgage banking revenue	—	184,097	—	(1,737)	182,360	182,360	—
Other revenue	23,340	8,902	38,693	(19,240)	51,695	39,092	12,603
Total fees and commissions revenue	$ 187,119	$ 245,554	$ 399,229	$ (21,582)	$ 810,320	$ 397,030	$ 413,290

[1] Out of scope revenue generally relates to financial instruments or contractual rights and obligations within the scope of other applicable accounting guidance.

[2] In scope revenue represents revenue subject to FASB ASC Topic 606, *Revenue from Contracts with Customers.*

Fees and commissions revenue by reportable segment and primary service line is as follows for the year ended December 31, 2019.

	Commercial	Consumer	Wealth Management	Funds Management and Other	Consolidated	Out of Scope[1]	In Scope[2]
Trading revenue	$ —	$ —	$ 88,558	$ —	$ 88,558	$ 88,558	$ —
Customer hedging revenue	8,422	—	9,667	852	18,941	18,941	—
Retail brokerage revenue	—	—	16,251	(115)	16,136	—	16,136
Insurance brokerage revenue	—	—	10,131	3,730	13,861	—	13,861
Investment banking revenue	10,136	—	12,194	—	22,330	8,678	13,652
Brokerage and trading revenue	18,558	—	136,801	4,467	159,826	116,177	43,649
TransFund EFT network revenue	73,479	3,924	(82)	3	77,324	—	77,324
Merchant services revenue	8,607	56	—	123	8,786	—	8,786
Corporate card revenue	1,072	—	32	2	1,106	—	1,106
Transaction card revenue	83,158	3,980	(50)	128	87,216	—	87,216
Personal trust revenue	—	—	81,763	—	81,763	—	81,763
Corporate trust revenue	—	—	24,635	—	24,635	—	24,635
Institutional trust & retirement plan services revenue	—	—	45,084	—	45,084	—	45,084
Investment management services and other	—	—	23,993	1,550	25,543	—	25,543
Fiduciary and asset management revenue	—	—	175,475	1,550	177,025	—	177,025
Commercial account service charge revenue	42,251	1,713	2,137	1,804	47,905	—	47,905
Overdraft fee revenue	313	35,134	138	(229)	35,356	—	35,356
Check card revenue	—	21,865	—	165	22,030	—	22,030
Automated service charge and other deposit fee revenue	823	6,155	168	48	7,194	—	7,194
Deposit service charges and fees	43,387	64,867	2,443	1,788	112,485	—	112,485
Mortgage production revenue	—	42,724	—	(4)	42,720	42,720	—
Mortgage servicing revenue	—	66,692	—	(1,871)	64,821	64,821	—
Mortgage banking revenue	—	109,416	—	(1,875)	107,541	107,541	—
Other revenue	23,564	9,733	26,664	(1,853)	58,108	39,428	18,680
Total fees and commissions revenue	$ 168,667	$ 187,996	$ 341,333	$ 4,205	$ 702,201	$ 263,146	$ 439,055

1 Out of scope revenue generally relates to financial instruments or contractual rights and obligations within the scope of other applicable accounting guidance.

2 In scope revenue represents revenue subject to FASB ASC Topic 606, *Revenue from Contracts with Customers.*

Fees and commissions revenue by reportable segment and primary service line is as follows for the year ended December 31, 2018.

	Commercial	Consumer	Wealth Management	Funds Management and Other	Consolidated	Out of Scope[1]	In Scope[2]
Trading revenue	$ —	$ —	$ 28,077	$ —	$ 28,077	$ 28,077	$ —
Customer hedging revenue	7,748	—	27,512	3,574	38,834	38,834	—
Retail brokerage revenue	—	—	19,030	(1,078)	17,952	—	17,952
Insurance brokerage revenue	—	—	—	4,198	4,198	—	4,198
Investment banking revenue	7,628	—	11,634	—	19,262	6,380	12,882
Brokerage and trading revenue	15,376	—	86,253	6,694	108,323	73,291	35,032
TransFund EFT network revenue	72,280	4,017	(82)	6	76,221	—	76,221
Merchant services revenue	7,666	59	—	79	7,804	—	7,804
Corporate card revenue	—	—	—	—	—	—	—
Transaction card revenue	79,946	4,076	(82)	85	84,025	—	84,025
Personal trust revenue	—	—	96,839	—	96,839	—	96,839
Corporate trust revenue	—	—	22,292	—	22,292	—	22,292
Institutional trust & retirement plan services revenue	—	—	44,400	76	44,476	—	44,476
Investment management services and other	—	—	19,729	1,367	21,096	—	21,096
Fiduciary and asset management revenue	—	—	183,260	1,443	184,703	—	184,703
Commercial account service charge revenue	41,931	1,445	2,331	1,565	47,272	—	47,272
Overdraft fee revenue	370	36,177	134	(145)	36,536	—	36,536
Check card revenue	—	20,967	—	339	21,306	—	21,306
Automated service charge and other deposit fee revenue	282	6,621	62	74	7,039	—	7,039
Deposit service charges and fees	42,583	65,210	2,527	1,833	112,153	—	112,153
Mortgage production revenue	—	31,690	—	—	31,690	31,690	—
Mortgage servicing revenue	—	67,980	—	(1,883)	66,097	66,097	—
Mortgage banking revenue	—	99,670	—	(1,883)	97,787	97,787	—
Other revenue	24,044	9,218	24,507	(1,584)	56,185	38,306	17,879
Total fees and commissions revenue	$ 161,949	$ 178,174	$ 296,465	$ 6,588	$ 643,176	$ 209,384	$ 433,792

1 Out of scope revenue generally relates to financial instruments or contractual rights and obligations within the scope of other applicable accounting guidance.

2 In scope revenue represents revenue subject to FASB ASC Topic 606, *Revenue from Contracts with Customers.*

(19) Fair Value Measurements

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 market 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. Certain assets and liabilities are recorded in the Company's financial statements at fair value. Some are recorded on a recurring basis and some on a non-recurring basis.

For some assets and liabilities, observable market transactions and market information might be available. For other assets and liabilities, observable market transactions and market information might not be available. A hierarchy for fair value has been established which categorizes into three levels the inputs to valuation techniques used to measure fair value. The three levels are as follows:

Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1) - fair value is based on unadjusted quoted prices in active markets for identical assets or liabilities.

Significant Other Observable Inputs (Level 2) - fair value is based on significant other observable inputs which are generally determined based on a single price for each financial instrument provided to us by an applicable third-party pricing service and is based on 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;
- Other inputs derived from or corroborated by observable market inputs.

Significant Unobservable Inputs (Level 3) - fair value is based upon model-based valuation techniques for which at least one significant assumption is not observable in the market.

Transfers between levels are recognized as of the end of the reporting period. There were no transfers in or out of quoted prices in active markets for identical instruments to significant other observable inputs or significant unobservable inputs during the year ended December 31, 2020 and 2019, respectively. Transfers between significant other observable inputs and significant unobservable inputs during the year ended December 31, 2020 and 2019 are included in the summary of changes in recurring fair values measured using unobservable inputs.

The underlying methods used by the third-party pricing services are considered in determining the primary inputs used to determine fair values. Management has evaluated 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. No significant adjustments were made to prices provided by third-party pricing services at December 31, 2020 and 2019.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The fair value of financial assets and liabilities that are measured on a recurring basis is as follows as of December 31, 2020 (in thousands):

	Total	Quoted Prices in Active Markets for Identical Instruments	Significant Other Observable Inputs	Significant Unobservable Inputs
Assets:				
Trading securities:				
U.S. government securities	$ 9,183	$ 4,999	$ 4,184	$ —
Residential agency mortgage-backed securities	4,669,148	—	4,669,148	—
Municipal securities	19,172	—	19,172	—
Other trading securities	10,472	—	10,472	—
Total trading securities	4,707,975	4,999	4,702,976	—
Available for sale securities:				
U.S. Treasury	508	508	—	—
Municipal securities	167,979	—	167,979	—
Residential agency mortgage-backed securities	9,340,471	—	9,340,471	—
Residential non-agency mortgage-backed securities	32,770	—	32,770	—
Commercial agency mortgage-backed securities	3,508,465	—	3,508,465	—
Other debt securities	472	—	—	472
Total available for sale securities	13,050,665	508	13,049,685	472
Fair value option securities — Residential agency mortgage-backed securities	114,982	—	114,982	—
Residential mortgage loans held for sale[1]	252,316	—	245,299	7,017
Mortgage servicing rights, net[2]	101,172	—	—	101,172
Derivative contracts, net of cash margin[3]	810,688	10,780	799,908	—
Liabilities:				
Derivative contracts, net of cash margin[3]	405,779	—	405,779	—

1 Residential mortgage loans held for sale measured at fair value on a recurring basis using significant unobservable inputs (Level 3) consist of residential mortgage loans intended for sale to U.S. government agencies that fail to meet conforming standards and are valued at 94.57% of the unpaid principal balance.

2 A reconciliation of the beginning and ending fair value of mortgage servicing rights and disclosures of significant assumptions used to determine fair value are presented in Note 7, Mortgage Banking Activities.

3 See Note 3 for detail of fair value of derivative contracts by contract type. Derivative contracts in asset positions that were valued based on quoted prices in active markets for identical instruments (Level 1) are primarily exchange-traded interest rate derivative contracts. Derivative contracts in liability positions that were valued using quoted prices in active markets for identical instruments are exchange-traded interest rate, energy and agricultural derivative contracts, fully offset by cash margin.

The fair value of financial assets and liabilities that are measured on a recurring basis is as follows as of December 31, 2019 (in thousands):

	Total	Quoted Prices in Active Markets for Identical Instruments	Significant Other Observable Inputs	Significant Unobservable Inputs
Assets:				
Trading securities:				
U.S. government securities	$ 44,264	$ —	$ 44,264	$ —
Residential agency mortgage-backed securities	1,504,651	—	1,504,651	—
Municipal securities	26,196	—	26,196	—
Asset-backed securities	14,084	—	14,084	—
Other trading securities	34,726	—	34,726	—
Total trading securities	1,623,921	—	1,623,921	—
Available for sale securities:				
U.S. Treasury	1,600	1,600	—	—
Municipal securities	1,861	—	1,861	—
Residential agency mortgage-backed securities	8,046,096	—	8,046,096	—
Residential non-agency mortgage-backed securities	41,609	—	41,609	—
Commercial agency mortgage-backed securities	3,178,005	—	3,178,005	—
Other debt securities	472	—	—	472
Total available for sale securities	11,269,643	1,600	11,267,571	472
Fair value option securities:				
U.S. Treasury	9,917	9,917	—	—
Residential agency mortgage-backed securities	1,088,660	—	1,088,660	—
Total fair value option securities	1,098,577	9,917	1,088,660	—
Residential mortgage loans held for sale[1]	182,271	—	173,958	8,313
Mortgage servicing rights, net[2]	201,886	—	—	201,886
Derivative contracts, net of cash margin[3]	323,375	8,944	314,431	—
Liabilities:				
Derivative contracts, net of cash margin[3]	251,128	—	251,128	—

1 Residential mortgage loans held for sale measured at fair value on a recurring basis using significant unobservable inputs (Level 3) consist of residential mortgage loans intended for sale to U.S. government agencies that fail to meet conforming standards and are valued at 95.23% of the unpaid principal balance.

2 A reconciliation of the beginning and ending fair value of mortgage servicing rights and disclosures of significant assumptions used to determine fair value are presented in Note 7, Mortgage Banking Activities.

3 See Note 3 for detail of fair value of derivative contracts by contract type. Derivative contracts based on quoted prices in active markets for identical instruments (Level 1) are exchange-traded interest rate and energy derivative contracts, net of cash margin. Derivative contracts in liability positions that were valued using quoted prices in active markets for identical instruments (Level 1) are exchange-traded interest rate and agricultural contracts, fully offset by cash margin.

Following is a description of the Company's valuation methodologies used for assets and liabilities measured on a recurring basis:

Securities

The fair values of trading, available for sale and fair value option securities are based on quoted prices for identical instruments in active markets, when available. If quoted prices for identical instruments are not available, fair values are based on significant other observable inputs such as quoted prices of comparable instruments or interest rates and credit spreads, yield curves, volatilities, prepayment speeds and loss severities.

The fair value of certain available for sale and held-to-maturity municipal and other debt securities may be based on significant unobservable inputs. These significant unobservable inputs include limited observed trades, projected cash flows, current credit rating of the issuers and, when applicable, the insurers of the debt and observed trades of similar debt. Discount rates are primarily based on reference to interest rate spreads on comparable securities of similar duration and credit rating as determined by the nationally-recognized rating agencies adjusted for a lack of trading volume. Significant unobservable inputs are developed by investment securities professionals involved in the active trading of similar securities. A summary of significant inputs used to value these securities follows. A management committee composed of senior members from the Company's Capital Markets, Risk Management and Finance departments assess the appropriateness of these inputs quarterly.

Derivatives

All derivative instruments are carried on the balance sheet at fair value. Fair values for exchange-traded contracts are based on quoted prices. Fair values for over-the-counter interest rate, commodity and foreign exchange contracts are based on valuations provided either by third-party dealers in the contracts, quotes provided by independent pricing services, or a third-party provided pricing model that uses significant other observable market inputs.

Credit risk is considered in determining the fair value of derivative instruments. Management determines fair value adjustments based on various risk factors including but not limited to counterparty credit rating or equivalent loan grading, derivative contract notional size, price volatility of the underlying commodity, duration of the derivative contracts and expected loss severity. Expected loss severity is based on historical losses for similarly risk graded commercial loan customers. Decreases in counterparty credit rating or grading and increases in price volatility and expected loss severity all tend to increase the credit quality adjustment which reduces the fair value of asset contracts.

We also consider our own credit risk in determining the fair value of derivative contracts. Changes in our credit rating would affect the fair value of our derivative liabilities. In the event of a credit downgrade, the fair value of our derivative liabilities would increase.

Residential Mortgage Loans Held for Sale

Residential mortgage loans held for sale are carried on the balance sheet at fair value. The fair values of conforming residential mortgage loans held for sale are based upon quoted market prices of such loans sold in securitization transactions, including related unfunded loan commitments. The fair value of mortgage loans that are unable to be sold to U.S. government agencies is determined using quoted prices of loans that are sold in securitization transactions with a liquidity discount applied.

Fair Value of Assets and Liabilities Measured on a Non-Recurring Basis

Assets measured at fair value on a non-recurring basis include pension plan assets, which are based on quoted prices in active markets for identical instruments, collateral for certain impaired loans and real property and other assets acquired to satisfy loans, which are based primarily on comparisons to completed sales of similar assets.

The following represents the carrying value of assets measured at fair value on a non-recurring basis and related losses recorded during the year. The carrying value represents only those assets with the balance sheet date for which the fair value was adjusted during the year:

	Carrying Value at December 31, 2020			Fair Value Adjustments for the Year Ended December 31, 2020 Recognized In:	
	Quoted Prices in Active Markets for Identical Instruments	Significant Other Observable Inputs	Significant Unobservable Inputs	Gross charge-offs against allowance for loan losses	Net losses (gains) and expenses of repossessed assets, net
Nonaccrual loans	**$ —**	**$ 801**	**$ 20,423**	**$ 39,299**	**$ —**
Real estate and other repossessed assets	**—**	**18,188**	**2,842**	**—**	**(4,602)**

	Carrying Value at December 31, 2019			Fair Value Adjustments for the Year Ended December 31, 2019 Recognized In:	
	Quoted Prices in Active Markets for Identical Instruments	Significant Other Observable Inputs	Significant Unobservable Inputs	Gross charge-offs against allowance for loan losses	Net losses (gains) and expenses of repossessed assets, net
Nonaccrual loans	$ —	$ 41	$ 55,665	$ 31,305	$ —
Real estate and other repossessed assets	—	5,986	1,551	—	(461)

The fair value of collateral-dependent nonaccruing loans and real estate and other repossessed assets and the related fair value adjustments are generally based on unadjusted third-party appraisals. Our appraisal review policies require appraised values to be supported by observed inputs derived principally from or corroborated by observable market data. Appraisals that are not based on observable inputs or that require significant adjustments or fair value measurements that are not based on third-party appraisals are considered to be based on significant unobservable inputs. Non-recurring fair value measurements of collateral-dependent nonaccruing loans and real estate and other repossessed assets based on significant unobservable inputs are generally due to estimates of current fair values between appraisal dates. Significant unobservable inputs include listing prices for comparable assets, uncorroborated expert opinions or management's knowledge of the collateral or industry. Non-recurring fair value measurements of collateral dependent loans secured by mineral rights are generally determined by our internal staff of engineers on projected cash flows under current market conditions and are based on significant unobservable inputs. Projected cash flows are discounted according to risk characteristics of the underlying oil and gas properties. Assets 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 prices with existing conventional equipment, operating methods and costs. Significant unobservable inputs are developed by asset management and workout professionals and approved by senior Credit Administration executives.

A summary of quantitative information about Non-recurring Fair Value Measurements based on Significant Unobservable Inputs (Level 3) as of December 31, 2020 follows (in thousands):

Quantitative Information about Level 3 Non-recurring Fair Value Measurements

	Fair Value	Valuation Technique(s)	Significant Unobservable Input	Range (Weighted Average)
Nonaccrual loans	$ 20,423	Discounted cash flows	Management knowledge of industry and non-real estate collateral including but not limited to recoverable oil & gas reserves, forward looking commodity prices, and estimated operating costs	1% - 91% (23%)[1]
Real estate and other repossessed assets	2,842	Discounted cash flows	Management knowledge of industry and non-real estate collateral including but not limited to recoverable oil & gas reserves, forward looking commodity prices, and estimated operating costs	N/A

1 Represents fair value as a percentage of the unpaid principal balance.

A summary of quantitative information about Non-recurring Fair Value Measurements based on Significant Unobservable Inputs (Level 3) as of December 31, 2019 follows (in thousands):

Quantitative Information about Level 3 Non-recurring Fair Value Measurements

	Fair Value	Valuation Technique(s)	Significant Unobservable Input	Range (Weighted Average)
Nonaccrual loans	$ 55,665	Discounted cash flows	Management knowledge of industry and non-real estate collateral including but not limited to recoverable oil & gas reserves, forward looking commodity prices, and estimated operating costs	4% - 94% (55%)[1]
Real estate and other repossessed assets	1,551	Discounted cash flows	Marketability adjustments off appraised value[2]	74% - 86% (84%)

1 Represents fair value as a percentage of the unpaid principal balance.
2 Marketability adjustments include consideration of estimated costs to sell which is approximately 10% of the fair value.

The fair value of pension plan assets was approximately $38 million at December 31, 2020 and $36 million at December 31, 2019, determined by significant other observable inputs. Fair value adjustments of pension plan assets along with changes in the projected benefit obligation are recognized in other comprehensive income.

Fair Value of Financial Instruments

The following table presents the carrying values and estimated fair values of all financial instruments, including those financial assets and liabilities that are not measured and reported at fair value on a recurring basis or non-recurring (dollars in thousands):

	December 31, 2020				
	Carrying Value	Estimated Fair Value	Quoted Prices in Active Markets for Identical Instruments (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash and due from banks	$ 798,757	$ 798,757	$ 798,757	$ —	$ —
Interest-bearing cash and cash equivalents	381,816	381,816	381,816	—	—
Trading securities:					
U.S. government securities	9,183	9,183	4,999	4,184	—
Residential agency mortgage-backed securities	4,669,148	4,669,148	—	4,669,148	—
Municipal securities	19,172	19,172	—	19,172	—
Other trading securities	10,472	10,472	—	10,472	—
Total trading securities	4,707,975	4,707,975	4,999	4,702,976	—
Investment securities:					
Municipal securities	229,245	255,270	—	69,404	185,866
Residential agency mortgage-backed securities	8,913	9,790	—	9,790	—
Other debt securities	7,373	7,371	—	7,371	—
Total investment securities	245,531	272,431	—	86,565	185,866
Allowance for credit losses	(688)	—	—	—	—
Investment securities, net of allowance	244,843	272,431	—	86,565	185,866
Available for sale securities:					
U.S. Treasury	508	508	508	—	—
Municipal securities	167,979	167,979	—	167,979	—
Residential agency mortgage-backed securities	9,340,471	9,340,471	—	9,340,471	—
Residential non-agency mortgage-backed securities	32,770	32,770	—	32,770	—
Commercial agency mortgage-backed securities	3,508,465	3,508,465	—	3,508,465	—
Other debt securities	472	472	—	—	472
Total available for sale securities	13,050,665	13,050,665	508	13,049,685	472
Fair value option securities — Residential agency mortgage-backed securities	114,982	114,982	—	114,982	—
Residential mortgage loans held for sale	252,316	252,316	—	245,299	7,017
Loans:					
Commercial	13,077,535	13,003,383	—	—	13,003,383
Commercial real estate	4,698,538	4,649,763	—	—	4,649,763
Paycheck protection program	1,682,310	1,669,461	—	—	1,669,461
Loans to individuals	3,549,137	3,563,199	—	—	3,563,199
Total loans	23,007,520	22,885,806	—	—	22,885,806
Allowance for loan losses	(388,640)	—	—	—	—
Loans, net of allowance	22,618,880	22,885,806	—	—	22,885,806
Mortgage servicing rights	101,172	101,172	—	—	101,172
Derivative instruments with positive fair value, net of cash margin	810,688	810,688	10,780	799,908	—
Deposits with no stated maturity	34,176,752	34,176,752	—	—	34,176,752
Time deposits	1,967,128	1,976,936	—	—	1,976,936
Other borrowed funds	3,545,356	3,542,489	—	—	3,542,489
Subordinated debentures	276,005	269,544	—	269,544	—
Derivative instruments with negative fair value, net of cash margin	405,779	405,779	—	405,779	—

	December 31, 2019				
	Carrying Value	Estimated Fair Value	Quoted Prices in Active Markets for Identical Instruments (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash and due from banks	$ 735,836	$ 735,836	$ 735,836	$ —	$ —
Interest-bearing cash and cash equivalents	522,985	522,985	522,985	—	—
Trading securities:					
U.S. government securities	44,264	44,264	—	44,264	—
Residential agency mortgage-backed securities	1,504,651	1,504,651	—	1,504,651	—
Municipal securities	26,196	26,196	—	26,196	—
Asset-backed securities	14,084	14,084	—	14,084	—
Other trading securities	34,726	34,726	—	34,726	—
Total trading securities	1,623,921	1,623,921	—	1,623,921	—
Investment securities:					
Municipal securities	274,535	295,032	—	96,897	198,135
Residential agency mortgage-backed securities	10,676	11,164	—	11,164	—
Other debt securities	8,207	8,206	—	8,206	—
Total investment securities	293,418	314,402	—	116,267	198,135
Available for sale securities:					
U.S. Treasury securities	1,600	1,600	1,600	—	—
Municipal securities	1,861	1,861	—	1,861	—
Residential agency mortgage-backed securities	8,046,096	8,046,096	—	8,046,096	—
Residential non-agency mortgage-backed securities	41,609	41,609	—	41,609	—
Commercial agency mortgage-backed securities	3,178,005	3,178,005	—	3,178,005	—
Other debt securities	472	472	—	—	472
Total available for sale securities	11,269,643	11,269,643	1,600	11,267,571	472
Fair value option securities:					
U.S. Treasury	9,917	9,917	9,917	—	—
Residential agency mortgage-backed securities	1,088,660	1,088,660	—	1,088,660	—
Total fair value option securities	1,098,577	1,098,577	9,917	1,088,660	—
Residential mortgage loans held for sale	182,271	182,271	—	173,958	8,313
Loans:					
Commercial	14,031,650	13,966,221	—	—	13,966,221
Commercial real estate	4,433,783	4,422,717	—	—	4,422,717
Residential mortgage	2,084,172	2,098,093	—	—	2,098,093
Personal	1,201,382	1,202,298	—	—	1,202,298
Total loans	21,750,987	21,689,329	—	—	21,689,329
Allowance for loan losses	(210,759)	—	—	—	—
Loans, net of allowance	21,540,228	21,689,329	—	—	21,689,329
Mortgage servicing rights	201,886	201,886	—	—	201,886
Derivative instruments with positive fair value, net of cash margin	323,375	323,375	8,944	314,431	—
Deposits with no stated maturity	25,403,319	25,403,319	—	—	25,403,319
Time deposits	2,217,849	2,212,467	—	—	2,212,467
Other borrowed funds	8,345,405	8,315,860	—	—	8,315,860
Subordinated debentures	275,923	284,627	—	284,627	—
Derivative instruments with negative fair value, net of cash margin	251,128	251,128	—	251,128	—

Because no market exists for certain of these financial instruments and management does not intend to sell these financial instruments, the fair values shown in the tables above may not represent values at which the respective financial instruments could be sold individually or in the aggregate at the given reporting date.

Fair Value Election

As more fully disclosed in Note 2 and Note 7 to the Consolidated Financial Statements, the Company has elected to carry all securities held as economic hedges against changes in the fair value of mortgage servicing rights and all residential mortgage loans originated for sale at fair value. Changes in the fair value of these financial instruments are recognized in earnings.

(20) Parent Company Only Financial Statements

Summarized financial information for BOK Financial – Parent Company Only follows:

Balance Sheets
(In thousands)

	December 31,	
	2020	**2019**
Assets		
Cash and cash equivalents	**$ 183,805**	$ 214,779
Loan to bank subsidiary	**65,204**	65,220
Investment in bank subsidiaries	**5,079,336**	4,602,977
Investment in non-bank subsidiaries	**195,768**	216,542
Other assets	**24,338**	38,082
Total assets	**$ 5,548,451**	$ 5,137,600
Liabilities and Shareholders' Equity		
Liabilities:		
Other liabilities	**$ 6,180**	$ 5,882
Subordinated debentures	**276,005**	275,923
Total liabilities	**282,185**	281,805
Shareholders' equity:		
Common stock	**5**	5
Capital surplus	**1,368,062**	1,350,995
Retained earnings	**3,973,675**	3,729,778
Treasury stock	**(411,344)**	(329,906)
Accumulated other comprehensive income	**335,868**	104,923
Total shareholders' equity	**5,266,266**	**4,855,795**
Total liabilities and shareholders' equity	**$ 5,548,451**	$ 5,137,600

Statements of Earnings
(In thousands)

	Year Ended December 31,		
	2020	2019	2018
Dividends, interest and fees received from bank subsidiaries	**$ 179,140**	$ 344,007	$ 426,071
Dividends, interest and fees received from non-bank subsidiaries	**25,050**	9,325	12,800
Other revenue	**907**	1,036	954
Total revenue	**205,097**	354,368	439,825
Interest expense	**13,944**	15,113	9,827
Other operating expense	**2,697**	2,352	12,110
Total expense	**16,641**	17,465	21,937
Net income before taxes, other losses, net, and equity in undistributed income of subsidiaries	**188,456**	336,903	417,888
Other gains (losses), net	**1,465**	3,310	(3,921)
Net income before taxes and equity in undistributed income of subsidiaries	**189,921**	340,213	413,967
Federal and state income taxes	**(4,502)**	(4,516)	(7,078)
Net income before equity in undistributed income of subsidiaries	**194,423**	344,729	421,045
Equity in undistributed income of bank subsidiaries	**276,217**	166,797	37,515
Equity in undistributed income of non-bank subsidiaries	**(35,610)**	(10,768)	(12,914)
Net income attributable to BOK Financial Corp. shareholders	**$ 435,030**	$ 500,758	$ 445,646

Statements of Cash Flows
(In thousands)

	Year Ended December 31,		
	2020	**2019**	**2018**
Cash Flows From Operating Activities:			
Net income	**$ 435,030**	$ 500,758	$ 445,646
Adjustments to reconcile net income to net cash provided by operating activities:			
Equity in undistributed income of bank subsidiaries	**(276,217)**	(166,797)	(37,515)
Equity in undistributed income of non-bank subsidiaries	**35,610**	10,768	12,914
Change in other assets	**13,760**	(5,075)	(1,072)
Change in other liabilities	**850**	855	(13,434)
Net cash provided by operating activities	**209,033**	340,509	406,539
Cash Flows From Investing Activities:			
Investment in subsidiaries	**(14,807)**	(19,837)	(31,901)
Acquisitions, net of cash acquired	**—**	—	(232,680)
Net cash used in investing activities	**(14,807)**	(19,837)	(264,581)
Cash Flows From Financing Activities:			
Issuance of common and treasury stock, net	**(4,933)**	(7)	(88)
Dividends paid	**(144,437)**	(143,496)	(127,188)
Repurchase of common stock	**(75,830)**	(129,483)	(53,465)
Net cash used in financing activities	**(225,200)**	(272,986)	(180,741)
Net increase (decrease) in cash and cash equivalents	**(30,974)**	47,686	(38,783)
Cash and cash equivalents at beginning of period	**214,779**	167,093	205,876
Cash and cash equivalents at end of period	**$ 183,805**	$ 214,779	$ 167,093
Cash paid for interest	**$ 14,064**	$ 15,099	$ 11,457

(21) Subsequent Events

The Company evaluated events from the date of the Consolidated Financial Statements on December 31, 2020 through the issuance of those consolidated financial statements included in this Annual Report on Form 10-K. No events were identified requiring recognition in and/or disclosure in the Consolidated Financial Statements.

Annual Financial Summary – Unaudited
Consolidated Daily Average Balances, Average Yields and Rates

(Dollars in Thousands, Except Per Share Data)	Year Ended December 31, 2020		
	Average Balance	Revenue/ Expense	Yield/ Rate
Assets			
Interest-bearing cash and cash equivalents	$ 634,401	$ 2,830	0.45 %
Trading securities	3,078,075	67,942	2.75 %
Investment securities	265,455	12,760	4.81 %
Available for sale securities	12,420,678	261,404	2.21 %
Fair value option securities	769,760	18,475	2.39 %
Restricted equity securities	281,594	10,963	3.89 %
Residential mortgage loans held for sale	215,296	6,397	3.05 %
Loans	23,402,195	898,445	3.84 %
Allowance for loan losses	(368,820)		
Loans, net of allowance	23,033,375	898,445	3.90 %
Total earning assets	40,698,634	1,279,216	3.24 %
Receivable on unsettled securities sales	3,329,727		
Cash and other assets	4,676,029		
Total assets	$ 48,704,390		
Liabilities and equity			
Interest-bearing deposits:			
Transaction	$ 18,676,146	$ 60,424	0.32 %
Savings	666,549	385	0.06 %
Time	2,220,749	29,187	1.31 %
Total interest-bearing deposits	21,563,444	89,996	0.42 %
Funds purchased and repurchase agreements	3,635,541	15,605	0.43 %
Other borrowings	4,659,453	41,011	0.88 %
Subordinated debentures	275,965	13,944	5.05 %
Total interest-bearing liabilities	30,134,403	160,556	0.53 %
Non-interest bearing demand deposits	11,201,554		
Due on unsettled securities purchases	1,081,674		
Other liabilities	1,193,445		
Total equity	5,093,314		
Total liabilities and equity	$ 48,704,390		
Tax-equivalent Net Interest Revenue		$ 1,118,660	2.71 %
Tax-equivalent Net Interest Revenue to Earning Assets			2.83 %
Less tax-equivalent adjustment		10,216	
Net Interest Revenue		1,108,444	
Provision for credit losses		222,592	
Other operating revenue		843,949	
Other operating expense		1,165,937	
Net income before taxes		563,864	
Federal and state income taxes		128,793	
Net income		435,071	
Net income attributable to non-controlling interests		41	
Net income attributable to BOK Financial Corporation shareholders		$ 435,030	
Earnings Per Average Common Share Equivalent:			
Net income:			
Basic		$ 6.19	
Diluted		$ 6.19	

Yield calculations are shown on a tax equivalent at the statutory federal and state rates for the periods presented.The yield calculations exclude security trades that have been recorded on trade date with no corresponding interest income and the unrealized gains and losses. The yield calculation also include average loan balances for which the accrual of interest has been discontinued and are net of unearned income. Yield/rate calculations are generally based on the conventions that determine how interest income and expense is accrued.

Annual Financial Summary – Unaudited (continued)
Consolidated Daily Average Balances, Average Yields and Rates

(Dollars in Thousands, Except Per Share Data)	Year Ended					
	December 31, 2019			December 31, 2018		
	Average Balance	Revenue/ Expense	Yield/ Rate	Average Balance	Revenue/ Expense	Yield/ Rate
Assets						
Interest-bearing cash and cash equivalents	$ 536,853	$ 12,214	2.28 %	$ 1,240,600	$ 22,333	1.80 %
Trading securities	1,772,660	61,960	3.55 %	1,530,400	57,948	3.84 %
Investment securities	319,451	14,417	4.51 %	395,895	15,848	4.00 %
Available for sale securities	10,108,409	254,101	2.58 %	8,309,355	197,472	2.35 %
Fair value option securities	1,145,800	32,936	2.95 %	464,160	15,205	3.18 %
Restricted equity securities	441,756	26,860	6.08 %	347,447	21,555	6.20 %
Residential mortgage loans held for sale	186,207	7,105	3.82 %	201,218	8,123	4.07 %
Loans	22,106,979	1,134,037	5.13 %	18,709,433	898,896	4.80 %
Allowance for loan losses	(204,679)			(218,840)		
Loans, net of allowance	21,902,300	1,134,037	5.18 %	18,490,593	898,896	4.86 %
Total earning assets	36,413,436	1,543,630	4.27 %	30,979,668	1,237,380	3.98 %
Receivable on unsettled securities sales	1,597,098			795,723		
Cash and other assets	4,083,813			3,162,139		
Total assets	$ 42,094,347			$ 34,937,530		
Liabilities and equity						
Interest-bearing deposits:						
Transaction	$ 13,072,914	$ 132,854	1.02 %	$ 10,581,732	$ 65,859	0.62 %
Savings	553,057	677	0.12 %	503,597	439	0.09 %
Time	2,215,405	42,007	1.90 %	2,133,427	29,219	1.37 %
Total interest-bearing deposits	15,841,376	175,538	1.11 %	13,218,756	95,517	0.72 %
Funds purchased and repurchase agreements	2,838,161	53,003	1.87 %	883,904	9,207	1.04 %
Other borrowings	7,147,356	175,425	2.45 %	6,236,441	129,008	2.07 %
Subordinated debentures	276,075	15,113	5.47 %	177,884	9,827	5.52 %
Total interest-bearing liabilities	26,102,968	419,079	1.61 %	20,516,985	243,559	1.19 %
Non-interest bearing demand deposits	9,809,905			9,590,455		
Due on unsettled securities purchases	702,450			531,071		
Other liabilities	801,474			559,802		
Total equity	4,677,550			3,739,217		
Total liabilities and equity	$ 42,094,347			$ 34,937,530		
Tax-equivalent Net Interest Revenue		$ 1,124,551	2.66 %		$ 993,821	2.79 %
Tax-equivalent Net Interest Revenue to Earning Assets			3.11 %			3.20 %
Less tax-equivalent adjustment		11,672			8,954	
Net Interest Revenue		1,112,879			984,867	
Provision for credit losses		44,000			8,000	
Other operating revenue		694,370			616,784	
Other operating expense		1,132,381			1,028,166	
Net income before taxes		630,868			565,485	
Federal and state income taxes		130,183			119,061	
Net income		500,685			446,424	
Net income attributable to non-controlling interests		(73)			778	
Net income attributable to BOK Financial Corporation shareholders		$ 500,758			$ 445,646	
Earnings Per Average Common Share Equivalent:						
Net income:						
Basic		$ 7.03			$ 6.63	
Diluted		$ 7.03			$ 6.63	

Quarterly Financial Summary – Unaudited

Consolidated Daily Average Balances, Average Yields and Rates

(In Thousands, Except Per Share Data)	Three Months Ended					
	December 31, 2020			September 30, 2020		
	Average Balance	Revenue/ Expense	Yield/ Rate	Average Balance	Revenue/ Expense	Yield/ Rate
Assets						
Interest-bearing cash and cash equivalents	**$ 643,926**	**$ 158**	**0.10 %**	$ 553,070	$ 167	0.12 %
Trading securities	**6,888,189**	**35,848**	**2.02 %**	1,834,160	8,766	1.92 %
Investment securities	**251,863**	**3,071**	**4.88 %**	258,965	3,141	4.85 %
Available for sale securities	**12,949,702**	**60,885**	**1.98 %**	12,580,850	62,433	2.11 %
Fair value option securities	**122,329**	**671**	**2.27 %**	387,784	1,986	1.92 %
Restricted equity securities	**280,428**	**2,276**	**3.25 %**	144,415	913	2.53 %
Residential mortgage loans held for sale	**229,631**	**1,549**	**2.75 %**	213,125	1,585	3.01 %
Loans	**23,447,518**	**216,976**	**3.68 %**	24,110,463	218,125	3.60 %
Allowance for loan losses	**(414,225)**			(441,831)		
Loans, net of allowance	**23,033,293**	**216,976**	**3.75 %**	23,668,632	218,125	3.67 %
Total earning assets	**44,399,361**	**321,434**	**2.92 %**	39,641,001	297,116	3.04 %
Receivable on unsettled securities sales	**1,094,198**			4,563,301		
Cash and other assets	**4,893,605**			4,727,453		
Total assets	**$ 50,387,164**			$ 48,931,755		
Liabilities and equity						
Interest-bearing deposits:						
Transaction	**$ 20,718,390**	**$ 7,047**	**0.14 %**	$ 19,752,106	$ 8,199	0.17 %
Savings	**737,360**	**87**	**0.05 %**	707,121	88	0.05 %
Time	**1,930,808**	**4,300**	**0.89 %**	2,251,012	6,371	1.13 %
Total interest-bearing deposits	**23,386,558**	**11,434**	**0.19 %**	22,710,239	14,658	0.26 %
Funds purchased and repurchase agreements	**2,153,254**	**1,526**	**0.28 %**	2,782,150	1,199	0.17 %
Other borrowings	**5,193,656**	**5,453**	**0.42 %**	3,382,688	3,657	0.43 %
Subordinated debentures	**275,998**	**3,377**	**4.87 %**	275,980	3,395	4.89 %
Total interest-bearing liabilities	**31,009,466**	**21,790**	**0.28 %**	29,151,057	22,909	0.31 %
Non-interest bearing demand deposits	**12,136,071**			11,929,694		
Due on unsettled securities purchases	**957,642**			1,516,880		
Other liabilities	**1,055,623**			1,171,064		
Total equity	**5,228,362**			5,163,060		
Total liabilities and equity	**$ 50,387,164**			$ 48,931,755		
Tax-equivalent Net Interest Revenue		**$ 299,644**	**2.64 %**		$ 274,207	2.73 %
Tax-equivalent Net Interest Revenue to Earning Assets			**2.72 %**			2.81 %
Less tax-equivalent adjustment		**2,414**			2,457	
Net Interest Revenue		**297,230**			271,750	
Provision for credit losses		**(6,500)**			—	
Other operating revenue		**196,778**			234,159	
Other operating expense		**300,661**			301,265	
Net income before taxes		**199,847**			204,644	
Federal and state income taxes		**45,138**			50,552	
Net income		**154,709**			154,092	
Net income attributable to non-controlling interests		**485**			58	
Net income attributable to BOK Financial Corp. shareholders		**$ 154,224**			$ 154,034	
Earnings Per Average Common Share Equivalent:						
Basic		**$ 2.21**			$ 2.19	
Diluted		**$ 2.21**			$ 2.19	

Yield calculations are shown on a tax equivalent at the statutory federal and state rates for the periods presented.The yield calculations exclude security trades that have been recorded on trade date with no corresponding interest income and the unrealized gains and losses. The yield calculation also include average loan balances for which the accrual of interest has been discontinued and are net of unearned income. Yield/rate calculations are generally based on the conventions that determine how interest income and expense is accrued

Quarterly Financial Summary – Unaudited (continued)
Consolidated Daily Average Balances, Average Yields and Rates

Three Months Ended								
June 30, 2020			**March 31, 2020**			**December 31, 2019**		
Average Balance	**Revenue / Expense**	**Yield / Rate**	**Average Balance**	**Revenue / Expense**	**Yield / Rate**	**Average Balance**	**Revenue / Expense**	**Yield / Rate**
$ 619,737	$ 112	0.07 %	$ 721,659	$ 2,393	1.33 %	$ 573,203	$ 2,335	1.62 %
1,871,647	11,473	2.46 %	1,690,104	11,855	2.89 %	1,672,426	13,015	3.19 %
268,947	3,210	4.77 %	282,265	3,338	4.73 %	298,567	3,500	4.69 %
12,480,065	68,358	2.29 %	11,664,521	69,728	2.48 %	11,333,524	69,692	2.52 %
786,757	4,110	2.00 %	1,793,480	11,708	2.67 %	1,521,528	9,488	2.62 %
273,922	1,880	2.75 %	429,133	5,894	5.49 %	479,687	6,441	5.37 %
288,588	2,140	3.10 %	129,708	1,123	3.50 %	203,535	1,797	3.55 %
24,099,492	217,731	3.63 %	21,943,023	245,613	4.50 %	22,236,000	266,315	4.75 %
(367,583)			(250,338)			(205,417)		
23,731,909	217,731	3.69 %	21,692,685	245,613	4.55 %	22,030,583	266,315	4.80 %
40,321,572	309,014	3.12 %	38,403,555	351,652	3.73 %	38,113,053	372,583	3.93 %
4,626,307			3,046,111			1,973,604		
4,809,152			4,270,952			4,126,697		
$ 49,757,031			$ 45,720,618			$ 44,213,354		
$ 18,040,170	$ 9,321	0.21 %	$ 16,159,654	$ 35,857	0.89 %	$ 14,685,385	$ 36,897	1.00 %
656,669	84	0.05 %	563,821	126	0.09 %	554,605	154	0.11 %
2,464,793	8,340	1.36 %	2,239,234	10,176	1.83 %	2,247,717	10,970	1.94 %
21,161,632	17,745	0.34 %	18,962,709	46,159	0.98 %	17,487,707	48,021	1.09 %
5,816,484	2,042	0.14 %	3,815,941	10,838	1.14 %	4,120,610	16,212	1.56 %
3,527,303	4,954	0.56 %	6,542,325	26,947	1.66 %	6,247,194	31,621	2.01 %
275,949	3,539	5.16 %	275,932	3,633	5.30 %	275,916	3,754	5.40 %
30,781,368	28,280	0.37 %	29,596,907	87,577	1.19 %	28,131,427	99,608	1.40 %
11,489,322			9,232,859			9,612,533		
887,973			960,780			784,174		
1,526,754			1,022,106			837,732		
5,071,614			4,907,966			4,847,488		
$ 49,757,031			$ 45,720,618			$ 44,213,354		
	$ 280,734	2.75 %		$ 264,075	2.54 %		$ 272,975	2.53 %
		2.83 %			2.80 %			2.88 %
	2,630			2,715			2,726	
	278,104			261,360			270,249	
	135,321			93,771			19,000	
	232,693			180,319			178,585	
	295,387			268,624			288,795	
	80,089			79,284			141,039	
	15,803			17,300			30,257	
	64,286			61,984			110,782	
	(407)			(95)			430	
	$ 64,693			$ 62,079			$ 110,352	
	$ 0.92			$ 0.88			$ 1.56	
	$ 0.92			$ 0.88			$ 1.56	

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

As of the end of the period covered by this report and pursuant to Rule 13a-15 of the Securities Exchange Act of 1934 (the “Exchange Act”), the Company's management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness and design of the Company's disclosure controls and procedures (as that term is defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act). Based upon that evaluation, the Company's Chief Executive Officer and Chief Financial Officer concluded, as of the end of the period covered by this report, that the Company's disclosure controls and procedures were effective in recording, processing, summarizing and reporting information required to be disclosed by the Company, within the time periods specified in the Securities and Exchange Commission's rules and forms.

In addition and as of the end of the period covered by this report, there have been no changes in internal control over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f), as amended, of the Exchange Act) during the Company's fourth fiscal quarter that have materially affected, or are reasonably likely to materially affect, the internal control over financial reporting.

Management's Report on Internal Control over Financial Reporting appears within Item 8, “Financial Statements and Supplementary Data.” The independent registered public accounting firm, Ernst & Young LLP, has audited the financial statements included in Item 8 and has issued an audit report on the Company's internal control over financial reporting, which appears therein.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information set forth under the headings “Election of Directors,” “Executive Officers, “Insider Reporting,” “Director Nominations,” and “Report of the Audit Committee” in BOK Financial's 2021 Annual Proxy Statement is incorporated herein by reference.

The Company has a Code of Ethics which is applicable to all Directors, officers and employees of the Company, including the Chief Executive Officer and the Chief Financial Officer, the principal executive officer and principal financial and accounting officer, respectively. A copy of the Code of Ethics will be provided without charge to any person who requests it by writing to the Company's headquarters at Bank of Oklahoma Tower, P.O. Box 2300, Tulsa, Oklahoma 74192 or telephoning the Chief Risk Officer at (918) 588-6000. The Company will also make available amendments to or waivers from its Code of Ethics applicable to Directors or executive officers, including the Chief Executive Officer and the Chief Financial Officer, in accordance with all applicable laws and regulations.

There are no material changes to the procedures by which security holders may recommend nominees to the Company's board of directors since the Company's 2020 Annual Proxy Statement to Shareholders.

ITEM 11. EXECUTIVE COMPENSATION

The information set forth under the heading “Compensation Discussion and Analysis,” “Compensation Committee Interlocks and Insider Participation", “Compensation Committee Report,” “Executive Compensation Tables,” and “Director Compensation” in BOK Financial's 2021 Annual Proxy Statement is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information set forth under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Election of Directors" in BOK Financial's 2021 Annual Proxy Statement is incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Information regarding related parties is set forth in Note 13 of the Company's Notes to Consolidated Financial Statements, which appears elsewhere herein. Additionally, the information set forth under the headings "Certain Transactions," "Director Independence" and "Related Party Transaction Review and Approval Process" in BOK Financial's 2021 Annual Proxy Statement is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information set forth under the heading "Principal Accountant Fees and Services" in BOK Financial's 2021 Annual Proxy Statement is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) (1) Financial Statements

The following financial statements of BOK Financial Corporation are filed as part of this Form 10-K in Item 8:

Consolidated Statements of Earnings for the years ended December 31, 2020, 2019 and 2018
Consolidated Statements of Comprehensive Income for the years ended December 31, 2020, 2019 and 2018
Consolidated Balance Sheets as of December 31, 2020 and 2019
Consolidated Statements of Changes in Equity for the years ended December 31, 2020, 2019 and 2018
Consolidated Statements of Cash Flows for the years ended December 31, 2020, 2019 and 2018
Notes to Consolidated Financial Statements
Annual Financial Summary - Unaudited
Quarterly Financial Summary - Unaudited
Reports of Independent Registered Public Accounting Firm

(a) (2) Financial Statement Schedules

The schedules to the Consolidated Financial Statements required by Regulation S-X are not required under the related instructions or are inapplicable and are therefore omitted.

(a) (3) Exhibits

Exhibit Number	Description of Exhibit
2.0	Agreement and Plan of Merger by and among BOK Financial Corporation, CoBiz Financial Inc., and BOKF Merger Corporation Number Sixteen dated June 17, 2018, incorporated by reference to EX 99.1 of Form 8-K filed on June 18, 2018.
3.0	The Articles of Incorporation of BOK Financial, incorporated by reference to (i) Amended and Restated Certificate of Incorporation of BOK Financial filed with the Oklahoma Secretary of State on May 28, 1991, filed as Exhibit 3.0 to S-1 Registration Statement No. 33-90450, and (ii) Amendment attached as Exhibit A to Information Statement and Prospectus Supplement filed November 20, 1991.
3.1	Bylaws of BOK Financial, as amended and restated as of October 30, 2007, incorporated by reference to Exhibit 3.1 of Form 8-K filed on November 5, 2007.
4.0	The rights of the holders of the Common Stock of BOK Financial are set forth in its Certificate of Incorporation.
4.1	Subordinated Notes Indenture, dated as of June 27, 2016, between the Company and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the Company's filing on Form 8-K filed June 27, 2016).
4.2	Form of 5.375% Subordinated Notes due 2056 Global Security (incorporated by reference to Exhibit 4.2 to the Company's Registration Statement on Form 8-A filed on June 24, 2016).
	Pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K, BOK Financial is not filing certain documents. BOK Financial agrees to furnish a copy of each such documents to the Commission upon the request of the Commission.
4.3	Form of Subordinated Notes Indenture, to be dated as of June 25, 2015 between CoBiz Financial Inc. and U.S. Bank National Association, as trustee, incorporated by reference to Exhibit 4.1 to CoBiz Financial Inc. Form 8-K filed June 25, 2015.
4.5	Form of 5.625% Subordinated Notes due June 25, 2030, incorporated by reference to Exhibit 4.2 to CoBiz Financial Inc. Form 8-K filed June 25, 2015.
10.4	Employment and Compensation Agreements.
10.4.2	Amended and Restated Deferred Compensation Agreement (Amended as of December 1, 2003) between Steven G. Bradshaw and BOK Financial Corporation, incorporated by reference to Exhibit 10.4.2 of Form 10-K for the fiscal year ended December 31, 2003.
10.4.2 (a)	409A Deferred Compensation Agreement between Steven G. Bradshaw and BOK Financial Corporation dated December 31, 2004, incorporated by reference to Exhibit 10.4.2 (a) of Form 8-K filed on January 5, 2005.
10.4.2 (b)	Amended and Restated Employment Agreement (amended as of June 30, 2013) between BOK Financial and Steven G. Bradshaw, incorporated by reference to Exhibit 99.A of Form 8-K filed August 20, 2013.
10.4.7	Amended and Restated Employment Agreement (amended June 15, 2013) between BOK Financial and Steven Nell incorporated by reference to Exhibit 99.B of Form 8-K filed September 4, 2013.
10.4.9	Amended and Restated Employment Agreement (amended as of June 15, 2013) between BOK Financial and Norman Bagwell, incorporated by reference to Exhibit 99.A of Form 8-K filed September 4, 2013.
10.4.10	Amended and Restated Employment Agreement (amended as of June 15, 2013) between BOK Financial and Stacy C. Kymes incorporated by reference to Exhibit 10.4.10 of Form 10-K for the fiscal year ended December 31, 2015.
10.4.11	Employment Agreement between BOK Financial and Scott B. Grauer dated December 18, 2013.
10.7.7	BOK Financial Corporation 2001 Stock Option Plan, incorporated by reference to Exhibit 4.0 of S-8 Registration Statement No. 333-62578.

Exhibit Number	Description of Exhibit
10.7.8	BOK Financial Corporation Directors' Stock Compensation Plan, incorporated by reference to Exhibit 4.0 of S-8 Registration Statement No. 33-79836.
10.7.9	Bank of Oklahoma Thrift Plan (Amended and Restated Effective as of January 1, 1995), incorporated by reference to Exhibit 10.7.6 of Form 10-K for the year ended December 31, 1994.
10.7.10	Trust Agreement for the Bank of Oklahoma Thrift Plan (December 30, 1994), incorporated by reference to Exhibit 10.7.7 of Form 10-K for the year ended December 31, 1994.
10.7.11	BOK Financial Corporation 2003 Stock Option Plan, incorporated by reference to Exhibit 4.0 of S-8 Registration Statement No. 333-106531.
10.7.12	BOK Financial Corporation 2003 Executive Incentive Plan, incorporated by reference to Exhibit 4.0 of S-8 Registration Statement No. 333-106530.
10.7.13	10b5-1 Repurchase Plan between BOK Financial Corporation and BOSC, Inc. dated May 27, 2008, incorporated by reference to Exhibit 10.1 of Form 8-K filed May 30, 2008.
10.7.14	BOK Financial Corporation 2003 Executive Incentive Plan, as amended and restated, for the Chief Executive Officer and for Direct Reports to the Chief Executive Officer, incorporated by reference to the Schedule 14 A Definitive Proxy Statement filed on March 15, 2011.
10.7.16	BOK Financial Corporation 2009 Omnibus Incentive Plan, Amended and Restated effective April 30, 2013, incorporated by reference to the Schedule 14A Definitive Proxy Statement filed on March 20, 2013.
10.8	Lease Agreement between Williams Headquarters Building LLC and BOKF, NA dated July 1, 2019.
10.8.1	First Amendment to Lease Agreement between Williams Headquarters Building LLC and BOKF, NA dated November 8th, 2019.
21	Subsidiaries of BOK Financial, filed herewith.
23	Consent of independent registered public accounting firm - Ernst & Young LLP, filed herewith.
31.1	Certification of Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, filed herewith.
31.2	Certification of Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, filed herewith.
32	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, filed herewith.
99	Additional Exhibits.
101	Interactive data files pursuant to Rule 405 of Regulation S-T: (i) the Consolidated Balance Sheets, (ii) the Consolidated Statements of Earnings, (iii) the Consolidated Statements of Changes in Equity, (iv) the Consolidated Statement of Cash Flows and (v) the Notes to the Consolidated Financial Statements, filed herewith. The XBRL instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.

(b) Exhibits

See Item 15 (a) (3) above.

(c) Financial Statement Schedules

See Item 15 (a) (2) above.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BOK FINANCIAL CORPORATION

DATE: February 24, 2021

BY: /s/ George B. Kaiser
George B. Kaiser
Chairman of the Board of Directors

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below on February 24, 2021, by the following persons on behalf of the registrant and in the capacities indicated.

OFFICERS

/s/ George B. Kaiser
George B. Kaiser
Chairman of the Board of Directors

/s/ Steven G. Bradshaw
Steven G. Bradshaw
Director, President and Chief Executive Officer

/s/ Steven E. Nell
Steven E. Nell
Director, Executive Vice President and
Chief Financial Officer

/s/ John C. Morrow
John C. Morrow
Senior Vice President and
Chief Accounting Officer

DIRECTORS

/s/ Alan S. Armstrong	/s/ Douglas D. Hawthorne
Alan S. Armstrong	Douglas D. Hawthorne
/s/ C. Frederick Ball, Jr.	/s/ Kimberley D. Henry
C. Frederick Ball, Jr.	Kimberley D. Henry
/s/ Steve Bangert	/s/ E. Carey Joullian, IV
Steve Bangert	E. Carey Joullian, IV
/s/ Peter C. Boylan III	
Peter C. Boylan III	Stanley A. Lybarger
/s/ Chester E. Cadieux, III	/s/ Steven J. Malcolm
Chester E. Cadieux, III	Steven J. Malcolm
/s/ John W. Coffey	/s/ Emmet C. Richards
John W. Coffey	Emmet C. Richards
/s/ Joseph W. Craft, III	/s/ Claudia San Pedro
Joseph W. Craft, III	Claudia San Pedro
/s/ Jack E. Finley	/s/ Michael C. Turpen
Jack E. Finley	Michael C. Turpen
	/s/ Rose M. Washington
David F. Griffin	Rose M. Washington
/s/ V. Burns Hargis	
V. Burns Hargis	

Exhibit 21

BOK FINANCIAL CORPORATION

SUBSIDIARIES OF THE REGISTRANT

Banking Subsidiaries

BOKF, National Association (1)

Other subsidiaries of BOK Financial Corporation

BOK Capital Services Corporation

BOKF Capital Corporation

BOKF-CC (Collision Works), LLC

BOKFCC (FIXED INCOME I), LLC

BOKF-CC (FSE), LLC

BOKF-CC (IPS), LLC

BOKF-CC (O2 Concepts), LLC

BOKF-CC (QRC), LLC

BOKF-CC (SSP), LLC

BOKF-CC (Switchgrass), LLC

BOKFCC Merchant Banking Fund I, LLC

BOKFCC MB II, LLC

BOKF Energy Fund Investment I, LLC

BOKF Equity, LLC

BOKF Private Equity Limited Partnership II

BOK Financial Insurance, Inc. (7)

BOK Financial Private Wealth, Inc. (5)

BOK Financial Securities, Inc.

Cavanal Hill Distributors, Inc.

BOKF Risk Management, Inc. (8)

Industrial Pipe & Supply , LLC

RMA Holdings, Inc. (7)

Switchgrass I, LLC

Switchgrass II, LLC

Switchgrass III, LLC

Switchgrass IV, LLC

Switchgrass V, LLC

Switchgrass VI, LLC

Switchgrass Holdings, LLC

Switchgrass Management, LLC

Switchgrass Properties, LLC

Switchgrass Properties II, LLC

Subsidiaries of BOKF, National Association (1)

Affiliated BancServices, Inc.

Affiliated Financial Holding Co.

Affiliated Financial Insurance Agency, Inc.

AWREI, Inc. (7)

BancOklahoma Agri-Service Corporation

BOK Delaware, Inc. (3)

BOK Financial Asset Management, Inc. (2)

BOK Financial Equipment Finance, Inc.

BOK Financial Public Finance, Inc. (7)

BOK Funding Trust (3)

BOKFCDF Fund I, LLC

BOKF Community Development Fund, LLC

BOKF Community Development Fund II

BOKF Community Development Corporation

BOKF Petro Holding, LLC

BOKF Petro Holdings II, LLC

BOKF Petro Holdings III, LLC

BOKF Petro Holdings IV, LLC

BOKF Real Estate Holdings, LLC

BOKF Special Assets I, LLC

BOSC Agency, Inc. (Oklahoma)

BOSC Agency, Inc. (New Mexico) (4)

BOSC Agency, Inc. (Texas) (2)

Cavanal Hill Investment Management, Inc.

Cottonwood Valley Ventures, Inc.

CVV Management, Inc.

CVV Partnership, an Oklahoma General Partnership

Oklahoma New Markets Fund I, LLC

Remora Holdings, LLC

Remora Operating, LLC

Western Real Estate Investors, Inc. (7)

All Subsidiaries listed above were incorporated in Oklahoma, except as noted.

(1) Chartered by the United States Government
(2) Incorporated in Texas
(3) Incorporated in Delaware
(4) Incorporated in New Mexico
(5) Incorporated in Colorado
(6) Incorporated in Kansas
(7) Incorporated in Colorado
(8) Incorporated in Nevada

Exhibit 23

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

- Registration Statement (Form S-8, No. 33-44121) pertaining to the Reoffer Prospectus of the Bank of Oklahoma Master Thrift Plan and Trust Agreement as amended October 6, 2008.
- Registration Statement (Form S-8, No. 333-40280) pertaining to the Reoffer Prospectus of the BOK Financial Corporation Master Thrift Plan for Hourly Employees as amended October 6, 2008.
- Registration Statement (Form S-8, No. 33-79836) pertaining to the Reoffer Prospectus of the BOK Financial Corporation Directors' Stock Compensation Plan.
- Registration Statement (Form S-8, No. 333-32649) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 1997 Stock Option Plan.
- Registration Statement (Form S-8, No. 333-93957) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2000 Stock Option Plan.
- Registration Statement (Form S-8, No. 333-62578) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2001 Stock Option Plan.
- Registration Statement (Form S-8, No. 333-106530) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2003 Executive Incentive Plan.
- Registration Statement (Form S-8, No. 333-106531) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2003 Stock Option Plan.
- Registration Statement (Form S-8, No. 333-135224) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2003 Stock Option Plan.
- Registration Statement (Form S-8, No. 333-158846) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2009 Omnibus Incentive Plan.
- Registration Statement (Form S-3, No. 333-212120) pertaining to the Reoffer Prospectus of the BOK Financial Corporation 2016 Subordinated Note Issuance.
- Registration Statement (Form S-4, No. 333-226211) pertaining to the Registration Statement for the registration of BOK Financial Corporation's common stock.

of our reports dated February 24, 2021, with respect to the consolidated financial statements of BOK Financial Corporation and the effectiveness of internal control over financial reporting of BOK Financial Corporation included in this Annual Report (Form 10-K) of BOK Financial Corporation for the year ended December 31, 2020.

/s/ Ernst & Young LLP

Tulsa, Oklahoma

February 24, 2021

Exhibit 31.1

CERTIFICATION PURSUANT TO
SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002
FOR THE CHIEF EXECUTIVE OFFICER

I, Steven G. Bradshaw, President and Chief Executive Officer of BOK Financial Corporation ("BOK Financial"), certify that:

1. I have reviewed this Annual Report on Form 10-K of BOK Financial;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 2021

/s/ Steven G. Bradshaw

Steven G. Bradshaw
President
Chief Executive Officer
BOK Financial Corporation

Exhibit 31.2

CERTIFICATION PURSUANT TO
SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002
FOR THE CHIEF FINANCIAL OFFICER

I, Steven E. Nell, Chief Financial Officer of BOK Financial Corporation ("BOK Financial"), certify that:

1. I have reviewed this Annual Report on Form 10-K of BOK Financial;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 2021

/s/ Steven E. Nell

Steven E. Nell
Executive Vice President
Chief Financial Officer
BOK Financial Corporation

Exhibit 32

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of BOK Financial Corporation ("BOK Financial") on Form 10-K for the fiscal period ending December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we, Steven G. Bradshaw and Steven E. Nell, Chief Executive Officer and Chief Financial Officer, respectively, of BOK Financial, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to our knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of BOK Financial as of, and for, the periods presented.

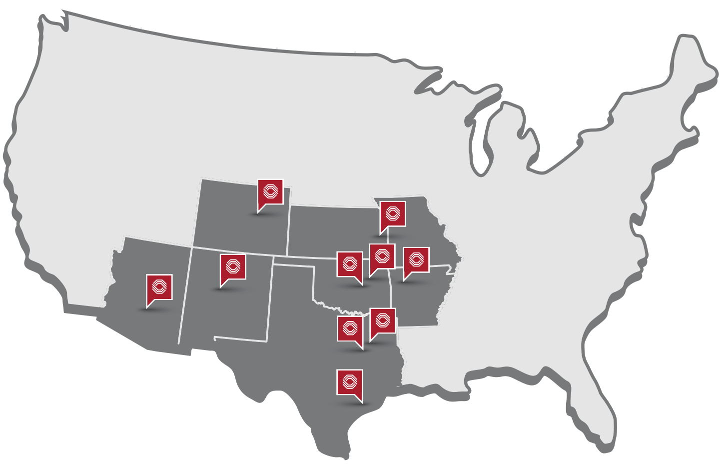
February 24, 2021

/s/ Steven G. Bradshaw
Steven G. Bradshaw
President
Chief Executive Officer
BOK Financial Corporation

/s/ Steven E. Nell
Steven E. Nell
Executive Vice President
Chief Financial Officer
BOK Financial Corporation

A Family Of Brands

BOK Financial Corporation has a long-time commitment to serving customers and communities throughout the United States. It provides a wide array of banking, fiduciary and investment services through regional bank operations, a broker dealer, four registered investment advisor firms and an electronic funds network.



Full Service Banking Markets

Arizona
Arkansas
Colorado
Kansas
Missouri
New Mexico
Oklahoma
Texas

Consumer and Commercial Banking:

BOK FINANCIAL
BANK OF ALBUQUERQUE
BANK OF OKLAHOMA
BANK OF TEXAS

Wealth Management:

BOK FINANCIAL PRIVATE WEALTH
BOK FINANCIAL ADVISORS
BOK FINANCIAL SECURITIES
BOK FINANCIAL INSURANCE
BOK FINANCIAL ASSET MANAGEMENT
CAVANAL HILL®

Transaction and Payment Processing:

TransFund℠
making money move

Mortgage Banking:

BOK FINANCIAL MORTGAGE

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