2022
ANNUAL REPORT

INTEGRITY, CARING, EXCELLENCE

OUR CORE VALUES

Everything we do is in service of making our customers' lives better through our core values of **integrity, caring** and **excellence.** We're deeply involved in the communities where we live and work. We do the right thing, even when no one is looking. We consistently surpass what's expected from not only a bank, but from each other as neighbors, colleagues and financial professionals.

THE ANNUAL MEETING OF SHAREHOLDERS
APRIL 26, 2023

FROST TOWER | 111 West Houston Street / San Antonio, TX | 10:30 a.m. in the Frost Conference Center

FINANCIAL HIGHLIGHTS

2022

DOLLARS IN THOUSANDS, EXCEPT PER-SHARE AMOUNTS

	2022	2021
NET INCOME AVAILABLE TO COMMON SHAREHOLDERS	$ 572,475	$ 435,922
PER COMMON SHARE DATA		
Earnings per Common Share – Basic	$ 8.84	$ 6.79
Earnings per Common Share – Diluted	8.81	6.76
Cash Dividends	3.24	2.94
Book Value	46.49	67.11
PERFORMANCE RATIOS		
Return on Average Assets	1.11 %	0.95 %
Return on Average Common Equity	16.86	10.35
Net Interest Margin	2.82	2.53
Dividend Payout Ratio on Common Shares	36.64	43.31
YEAR-END BALANCE SHEET DATA		
Loans	$ 17,154,969	$ 16,336,397
Securities	20,910,733	15,698,969
Earning Assets	49,402,439	48,062,746
Total Assets	52,892,376	50,878,490
Non-interest-bearing Demand Deposits	17,598,234	18,423,018
Interest-bearing Demand Deposits	26,355,962	24,272,678
Total Deposits	43,954,196	42,695,696
Long-term Debt and Other Borrowings	222,404	222,189
Shareholders' Equity	3,137,228	4,439,555

TO OUR SHAREHOLDERS:

Earnings for 2022 were up 31%, our second consecutive year of earnings growth in excess of 30%. As good as those earnings are, I believe there are a host of investments, activities, and accomplishments that occurred during the year, which I believe you'll also be pleased to hear about.

In 2022 we not only experienced tremendous growth in net income, we also saw our operating margin – which is just the percentage of each dollar of revenue which ends up as pre-tax profit – increase to 39.4%, up sharply from 35.7% in 2021. These higher levels of earnings and profitability were driven primarily by increased net interest income resulting from rising interest rates, as well as growth in our volumes of business.

Of these two, higher interest rates accounted for about half of the impact. As we've often said, our company tends to be solidly "asset sensitive," a banking term meaning we tend to make more money when interest rates increase and less money when rates decline. This results mainly from the makeup of our balance sheet (lots of floating rate loans and checking deposits). During 2022, the Federal Reserve raised interest rates dramatically as the federal funds rate went from 0.25% to 4.50%, to our benefit.

We amplified this impact by deciding in August 2020 to limit what we might otherwise have purchased in long-term fixed rate investments in favor of maintaining high levels of funds in short-term liquid deposits at the Fed in order to take direct advantage of Fed rate hikes as they addressed developing inflation.

At the same time, our decision early on to share this increasing profitability with our depositors in the form of higher deposit rates helped us grow our deposit base and avoid some of the outflows that many in our industry experienced. This strengthened our competitive position and gave us more funds to invest while also building trust with our customers. All this is consistent with our culture, which calls for providing a "square deal" to those banking at Frost. It's also just common sense for any business to treat their customers with respect and fairness.

I was pleased with the performance of our various businesses in 2022 and our progress in growing those businesses organically. Let's look at some examples.

Our commercial business saw loan growth of 10.9%, exceeding our long-term target of high single digits. This was despite a drop of 5.5% in the energy component of that portfolio, as well as a softening later in the year in the flow of commercial real estate activity as borrowers began reacting to the Fed's higher rates. As we've discussed in the past, the drop in energy loans reflected our effort to reduce outstanding energy loans as a percent of total loans to a mid-single digit level. We achieved that level in 2022.

Commercial deposits also saw good growth, increasing 18.1% for the year. But as important as anything was our overall growth in customer deposit relationships, which were up by 6.3% overall. This is important because we aren't in the market chasing transactions, we're building long-term relationships which is consistent with our mission statement: We will grow and prosper building

I BELIEVE PHILOSOPHICALLY IF BUSINESSES AREN'T GROWING, THEY'RE DYING. WE INTEND TO CONTINUE GROWING.

long-term relationships based on top quality service, high ethical standards and safe sound assets.

Our consumer business continued to exhibit strong growth in both loans, deposits, and customer acquisition:

Our consumer deposits grew 15.1% for the year, while our overall consumer customers increased 6.6%.

For the year we brought on almost 26,000 new relationships, and to give you an idea of how this has become a developing competency of ours, this was three times our level in 2018.

This level of new relationships was slightly under our all-time record in 2021 of 27,000 new relationships; however, I believe that results mainly from the timing of new branch openings in our expansion efforts. In 2021, we opened a net of two locations compared to 14 in 2022. I'm hopeful that the traction we get from those 14 locations plus the planned addition of 21 new locations in 2023 bode well for a new customer acquisition high in 2023.

Also, during 2022, our consumer loan growth was 280% of our previous best year, with balances increasing 24%. This was the result of our consumer real estate portfolio driven mainly by home improvement and home equity loans, which turned out to be the right product at the right time to meet our customers' needs.

The sharp rise in mortgage rates in 2022 made it uneconomic for consumers to obtain cash for home improvements by refinancing historically low-rate mortgages. Our products, which allowed their low-rate mortgages to stay in place, saw a great increase in demand and allowed us to grow our portfolio while maintaining strong credit disciplines.

An important element of our organic growth strategy continues to be our physical expansion of locations in high growth markets in Texas. For example, in 2022 our expansion locations added 1% to company deposit growth and 2% to our overall loan growth.

Our Houston expansion locations reached an important milestone at year end by passing the $1 billion mark for deposits. Along with that we stood at $723 million in loans. That represents almost 20,000 new relationships since 2019. We finished our initial 25 location deployment in 2021, so most of our locations in that market are still in a development stage. As of year end, here's how they stood versus our original proformas:

Deposits	$1 bil	104% of goal
Loans	$729 mil	170% of goal
Households	19,929	114% of goal

The mix of business from the expansion locations in Houston continues to be consistent with our company as a whole and leans toward a more commercial orientation with 60% of deposits and 80% of loans representing commercial business. In addition, our follow-on expansion locations in this market, which we refer to as "Houston 2.0," began in 2022 with two locations and will add an additional seven as a part of that effort. Early results for these additional locations are consistent with our previous expansion efforts.

Our physical expansion efforts in Dallas essentially began in 2022 with the opening of 10 locations, including one in Frisco on the last day of the year. The results from these new locations admittedly are early, but they have performed at least as well to this point as our initial Houston rollout with:

Deposits	$81 mil	372% of goal
Loans	$65 mil	275% of goal
Households	3,020	229% of goal

An interesting development in Dallas has been our success in the consumer segment of the market, which represents 58% of our loans and 44% of our deposits. I'll admit our level of success in the consumer segment has surprised us, and it has the potential to open new opportunities for our company as we expand organically. As we've pointed out, the primary market focus of our expansion effort has been in middle market commercial and small business, so the trade areas we've focused on normally contain a high concentration of businesses. However, our fastest growing new financial centers have recently proven to be in more consumer-centric markets. If this trend proves durable, it can open new trade areas in major Texas markets to expand profitably.

We are becoming increasingly more confident of our ability to execute our expansion strategy. I have become convinced that it is both a durable and scalable strategy and will generate meaningful shareholder value over the long-term. I am asked regularly if we intend to execute this strategy outside Texas. My response is both philosophical and practical.

First, I believe philosophically if businesses aren't growing, they're dying. We intend to continue growing. I also believe there's nothing in our value proposition of great service

and technology that wouldn't resonate with consumers and businesses in great markets outside the state of Texas. I like to say if there's a problem with that, then we have another problem because consumers and businesses from those markets seem to be moving into Texas in droves and we need to be able to bank them.

However, as a practical matter, moving outside of Texas is not a priority today because of the tremendous opportunity we have to develop what I and many others believe are some of the most dynamic markets in the nation right here in Texas.

Wealth Advisors utilizes relatively little capital to generate these earnings, makes it an enviable business, and we are actively working to enhance its growth along with our insurance brokerage subsidiary FIA.

We were pleased to once again begin making residential mortgage loans in late 2022 after putting in place leading edge technology to provide efficient processes and great customer experiences. We began in late 2022 with an employee pilot program in order to assure our experiences were great and all our systems were working effectively and integrated properly. Once the pilot is completed, we will begin rolling this product out region by region in 2023.

BY NOW, I HOPE THOSE OF YOU WHO HAVE KNOWN US FOR SOME TIME HAVE BEEN CONVINCED OF OUR TENDENCY TO FOCUS ON THE LONG-TERM HEALTH OF OUR BUSINESS EVEN WHEN THAT SOMETIMES IS AT ODDS WITH OUR SHORT-TERM RESULTS.

It helps to keep in mind that Texas has three of the nation's 10 most populous cities, and five of the top 13. And in terms of deposits, Houston and Dallas are each at least 50% larger than Colorado or Arizona. And in terms of sheer size, the Texas economy ranks somewhere between that of Canada and Italy.

Our investment management, brokerage and private trust operations are collectively known as Frost Wealth Advisors and together accounted for $21.4 billion of assets under management at year end. That doesn't include the $22.2 billion on assets we hold in custody. It is well known that 2022 was a historically bad market for both equities and fixed income securities. It is, therefore, understandable that the revenues we recognize on these assets, which are largely based on their market values, would have been under some pressure. The total for all these assets increased only $300 million, or 0.7%, in 2022, but we were able to recognize a 4% increase in earnings because of our diversified revenue streams which showed growth in fees such as oil and gas management, real estate management and estates.

Overall, this business represents a little over 7% of our company's earnings and sports a pre-tax profit margin of almost 27%. This, combined with the fact that Frost

We believe this will be an important and profitable asset class for us as we offer this product through our expanded physical distribution system.

By now, I hope those of you who have known us for some time have been convinced of our tendency to focus on the long-term health of our business even when that sometimes is at odds with our short-term results. One of those long-term decisions we recently announced was the decision to make a "generational investment" in our information technology. We estimate the impact of that investment will increase the growth in our IT spending by about 24% in 2023 versus the 11% we typically have seen in the last few years.

There are many elements of that investment, but I think they are best summarized into three broad components.

EXPANDED DIGITAL CAPACITY

This mostly represents expanding the number of agile digital teams to meet increased customer demand for functionality. We will almost double these teams from six today up to 11. This will include our first two teams dedicated to our commercial business. This accounts for roughly half of the investment.

MODERNIZING LARGE OPERATIONAL SYSTEMS

This includes three main areas – commercial loan servicing, check processing and payments. This accounts for roughly one third of the investment.

SECURITY

The remaining 15% of the investment is focused on continually improving our security and fraud operations.

A large part of our success has come from our ability to compete with some of the largest financial institutions in the country with a value proposition that combines our empathetic customer service experience with great technology. We like to say doing this well allows us to "punch above our weight class." Just as we protect the empathetic customer service experience through a constant focus on our culture, the quality of our technology requires disciplined execution and a commitment to long term investing.

Our emphasis on building long-term relationships with our customers resulted in several recognitions in 2022 such as:

- Received the highest ranking in customer satisfaction in J.D. Power's Texas Retail Banking Satisfaction Study for 13 years in a row.
- Earned the highest number of Greenwich Awards in the nation for service to small- and medium-sized companies for seven years in a row.
- In 2022 Frost has ranked as one of GOBankingRates' Best Banks & Credit Unions.
- Texas Lawyer magazine named Frost the best private bank in Austin, among the best private banks in Dallas, and the best private bank and trust services in Houston.
- Forbes magazine recognized Frost as one of Texas' best banks and Texas' best employers.

And while it's not a third-party award, we were happy to be able to increase our common stock dividend for the 29th consecutive year.

In 2022, we commissioned an extensive nationwide banking satisfaction study, and we announced the results early in 2023. Our research showed that people are looking for something more from their banking relationship – they're looking for financial belonging. Respondents in the Frost survey defined financial belonging in terms of personal relationships, such as feeling welcome and part of a community, as well as being treated with care and respect no matter how much money is in their bank account. Although nearly three-quarters of Americans say a sense of financial belonging with their bank is important to them, only 11% reported that they felt like they belong. The reason this is so important is that consumers who feel a sense of belonging are 160% more likely to have better financial health.

The research found four key indicators of financial belonging that banks can provide, and consumers should seek: trust, which banks show by waiving overdraft fees and providing early access to direct deposits; knowledge, the lack of which can get in the way of customers feeling like they belong; access to funds and bank personnel; and a hybrid experience of both technology options and brick-and-mortar locations where customers can get advice.

Frost is committed to exploring financial belonging and breaking down the barriers that stand in people's way to better relationships with their financial institutions, and in turn, better financial health. Our financial belonging research is part of Frost's commitment to helping people improve their financial well-being. Whether it's through a human-first approach to financial services or expanding products and services to meet customers' needs, Frost is working to create financial belonging and wants to share that feeling with others.

Finally, I want to thank our truly outstanding group of employees who are 100% responsible for the success of Frost. I believe they are the best in our industry. I also want to thank our board members for their guidance and support as we build this great company. In that regard, I want to recognize our recent new board members – Linda Rutherford, Joe Pierce and Jack Willome. We are blessed to have these accomplished individuals come along side us in our work.

Thanks also to you, our shareholders, for your consistent support of our great company.

SINCERELY,

PHILLIP D. GREEN

Chairman and Chief Executive Officer

THE BOARD OF DIRECTORS

OF CULLEN/FROST BANKERS, INC. AND FROST BANK

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Ellison Industries

EXECUTIVE OFFICERS

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Annette Alonzo
Group Executive Vice President
Chief Human Resources Officer
Cullen/Frost Bankers, Inc. and Frost Bank

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Group Executive Vice President
Research and Strategy
Cullen/Frost Bankers, Inc. and Frost Bank

Paul H. Bracher
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Cullen/Frost Bankers, Inc.
Group Executive Vice President
Chief Banking Officer, Frost Bank

Patrick B. Frost
Group Executive Vice President
Cullen/Frost Bankers, Inc. and Frost Wealth Advisors
President
Frost Bank and Frost Insurance

Howard L. Kasanoff
Group Executive Vice President
Chief Credit Officer
Cullen/Frost Bankers, Inc. and Frost Bank

Jerry Salinas
Group Executive Vice President
Chief Financial Officer
Cullen/Frost Bankers, Inc. and Frost Bank

Carol J. Severyn
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Chief Risk Officer
Cullen/Frost Bankers, Inc. and Frost Bank

Jimmy Stead
Group Executive Vice President
Chief Consumer Banking and Technology Officer
Cullen/Frost Bankers, Inc. and Frost Bank

Coolidge E. Rhodes, Jr.
Group Executive Vice President
General Counsel and Corporate Secretary
Cullen/Frost Bankers, Inc. and Frost Bank

Candace Wolfshohl
Group Executive Vice President
Culture and People Development
Cullen/Frost Bankers, Inc. and Frost Bank

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

FORM 10-K

☒ **Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the fiscal year ended: **December 31, 2022**

Or

☐ **Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the transition period from to

Commission file number: **001-13221**

CULLEN/FROST BANKERS, INC.

(Exact name of registrant as specified in its charter)

Texas	**74-1751768**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
111 W. Houston Street, San Antonio, Texas	**78205**
(Address of principal executive offices)	(Zip code)

(210) 220-4011

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $.01 Par Value	**CFR**	**New York Stock Exchange**
Depositary Shares, each representing a 1/40th interest in a share of 4.450% Non-Cumulative Perpetual Preferred Stock, Series B	**CFR.PrB**	**New York Stock Exchange**

Securities registered pursuant to Section 12(g) of the Act: None

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

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

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

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

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

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

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

As of June 30, 2022, the last business day of the registrant’s most recently completed second fiscal quarter, the aggregate market value of the shares of common stock held by non-affiliates, based upon the closing price per share of the registrant’s common stock as reported on The New York Stock Exchange, Inc., was approximately $7.2 billion.

As of January 25, 2023, there were 64,360,313 shares of the registrant’s common stock, $.01 par value, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the 2023 Annual Meeting of Shareholders of Cullen/Frost Bankers, Inc. to be held on April 26, 2023 are incorporated by reference in this Form 10-K in response to Part III, Items 10, 11, 12, 13 and 14.

CULLEN/FROST BANKERS, INC.
ANNUAL REPORT ON FORM 10-K

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PART I

ITEM 1. BUSINESS

The disclosures set forth in this item are qualified by Item 1A. Risk Factors and the section captioned "Forward-Looking Statements and Factors that Could Affect Future Results" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations of this report and other cautionary statements set forth elsewhere in this report.

The Corporation

Cullen/Frost Bankers, Inc., a Texas business corporation incorporated in 1977, is a financial holding company and a bank holding company headquartered in San Antonio, Texas that provides, through its subsidiaries, a broad array of products and services throughout numerous Texas markets. The terms "Cullen/Frost," "the Corporation," "we," "us" and "our" mean Cullen/Frost Bankers, Inc. and its subsidiaries, when appropriate. We offer commercial and consumer banking services, as well as trust and investment management, insurance, brokerage, mutual funds, leasing, treasury management, capital markets advisory and item processing services. At December 31, 2022, Cullen/Frost had consolidated total assets of $52.9 billion and was one of the largest independent bank holding companies headquartered in the State of Texas.

Our philosophy is to grow and prosper, building long-term relationships based on top quality service, high ethical standards, and safe, sound assets. We operate as a locally-oriented, community-based financial services organization, augmented by experienced, centralized support in select critical areas. Our local market orientation is reflected in our regional management and regional advisory boards, which are comprised of local business persons, professionals and other community representatives that assist our regional management in responding to local banking needs. Despite this local market, community-based focus, we offer many of the products available at much larger money-center financial institutions.

We serve a wide variety of industries including, among others, energy, manufacturing, services, construction, retail, telecommunications, healthcare, military and transportation. Our customer base is similarly diverse. While our loan portfolio has a concentration of energy-related loans totaling approximately 5.4% of total loans at December 31, 2022, we are not dependent upon any single industry or customer.

Our operating objectives include expansion, diversification within our markets, growth of our fee-based income, and growth internally and through acquisitions of financial institutions, branches and financial services businesses. While we are currently focused on organic growth, we may seek merger or acquisition partners that are culturally similar and have experienced management and possess either significant market presence or have potential for improved profitability through financial management, economies of scale and expanded services. From time to time, we evaluate merger and acquisition opportunities and conduct due diligence activities related to possible transactions with other financial institutions and financial services companies. As a result, merger or acquisition discussions and, in some cases, negotiations may take place and future mergers or acquisitions involving cash, debt or equity securities may occur. Acquisitions typically involve the payment of a premium over book and market values, and, therefore, some dilution of our tangible book value and net income per common share may occur in connection with any future transaction. Our ability to engage in certain merger or acquisition transactions, whether or not any regulatory approval is required, will be dependent upon our bank regulators' views at the time as to the capital levels, quality of management and our overall condition and their assessment of a variety of other factors. Certain merger or acquisition transactions, including those involving the acquisition of a depository institution or the assumption of the deposits of any depository institution, require formal approval from various bank regulatory authorities, which will be subject to a variety of factors and considerations.

Although Cullen/Frost is a corporate entity, legally separate and distinct from its affiliates, bank holding companies such as Cullen/Frost are required to act as a source of financial strength for their subsidiary banks. The principal source of Cullen/Frost's income is dividends from its subsidiaries. There are certain regulatory restrictions on the extent to which these subsidiaries can pay dividends or otherwise supply funds to Cullen/Frost. See the section captioned "Supervision and Regulation" elsewhere in this item for further discussion of these matters.

Cullen/Frost's executive offices are located at 111 W. Houston Street, San Antonio, Texas 78205, and its telephone number is (210) 220-4011.

Subsidiaries of Cullen/Frost

Frost Bank

Frost Bank, the principal operating subsidiary and sole banking subsidiary of Cullen/Frost, is a Texas-chartered bank primarily engaged in the business of commercial and consumer banking through approximately 170 financial centers across Texas in the Austin, Corpus Christi, Dallas, Fort Worth, Houston, Permian Basin, Rio Grande Valley and San Antonio regions. Frost Bank also operates approximately 1,729 automated-teller machines ("ATMs") throughout the State of Texas, the majority of which are operated in connection with branding and licensing agreements with various retailers throughout the State of Texas. Frost Bank was originally chartered as a national banking association in 1899, but its origin can be traced to a mercantile partnership organized in 1868. At December 31, 2022, Frost Bank had consolidated total assets of $53.0 billion and total deposits of $44.4 billion and was one of the largest commercial banks headquartered in the State of Texas.

Significant services offered by Frost Bank include:

- *Commercial Banking.* Frost Bank provides commercial banking services to corporations and other business clients. Loans are made for a wide variety of general corporate purposes, including financing for industrial and commercial properties and to a lesser extent, financing for interim construction related to industrial and commercial properties, financing for equipment, inventories and accounts receivable, and acquisition financing. We also originate commercial leases and offer treasury management services.
- *Consumer Services.* Frost Bank provides a full range of consumer banking services, including checking accounts, savings programs, ATMs, overdraft facilities, installment loans, first mortgage loans, home equity loans and lines of credit, drive-in and night deposit services, safe deposit facilities and brokerage services.
- *International Banking.* Frost Bank provides international banking services to customers residing in or dealing with businesses located in Mexico. These services consist of accepting deposits (generally only in U.S. dollars), making loans (generally only in U.S. dollars), issuing letters of credit, handling foreign collections, transmitting funds, and to a limited extent, dealing in foreign exchange.
- *Correspondent Banking.* Frost Bank acts as correspondent for approximately 168 financial institutions, which are primarily banks in Texas. These banks maintain deposits with Frost Bank, which offers them a full range of services including check clearing, transfer of funds, fixed income security services, and securities custody and clearance services.
- *Trust Services.* Frost Bank provides a wide range of trust, investment, agency and custodial services for individual and corporate clients. These services include the administration of estates and personal trusts, as well as the management of investment accounts for individuals, employee benefit plans and charitable foundations. At December 31, 2022, the estimated fair value of trust assets was $43.6 billion, including managed assets of $21.4 billion and custody assets of $22.2 billion.
- *Capital Markets - Fixed-Income Services*. Frost Bank's Capital Markets Division supports the transaction needs of fixed-income institutional investors. Services include sales and trading, new issue underwriting, money market trading, advisory services and securities safekeeping and clearance.
- *Global Trade Services.* Frost Bank's Global Trade Services Division supports international business activities including foreign exchange, international letters of credit and export-import financing, among other things.

Frost Insurance Agency, Inc.

Frost Insurance Agency, Inc. is a wholly-owned subsidiary of Frost Bank that provides insurance brokerage services to individuals and businesses covering corporate and personal property and casualty insurance products, as well as group health and life insurance products.

Frost Brokerage Services, Inc.

Frost Brokerage Services, Inc. ("FBS") is a wholly-owned subsidiary of Frost Bank that provides brokerage services and performs other transactions or operations related to the sale and purchase of securities of all types. FBS is registered as a fully disclosed introducing broker-dealer under the Securities Exchange Act of 1934 and, as such, does not hold any customer accounts.

Frost Investment Advisors, LLC

Frost Investment Advisors, LLC is a registered investment advisor and a wholly-owned subsidiary of Frost Bank that provides investment management services to Frost-managed mutual funds, institutions and individuals.

Frost Investment Services, LLC

Frost Investment Services, LLC is a registered investment advisor and a wholly-owned subsidiary of Frost Bank that provides investment management services to individuals.

Tri–Frost Corporation

Tri-Frost Corporation is a wholly-owned subsidiary of Frost Bank that primarily holds securities for investment purposes and the receipt of cash flows related to principal and interest on the securities until such time that the securities mature.

Cullen/Frost Capital Trust II

Cullen/Frost Capital Trust II ("Trust II") is a Delaware statutory business trust formed in 2004 for the purpose of issuing $120.0 million in trust preferred securities and lending the proceeds to Cullen/Frost. Cullen/Frost guarantees, on a limited basis, payments of distributions on the trust preferred securities and payments on redemption of the trust preferred securities. Trust II is a variable interest entity for which we are not the primary beneficiary. As such, the accounts of Trust II are not included in our consolidated financial statements. See our accounting policy related to consolidation in Note 1 - Summary of Significant Accounting Policies in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report.

Although the accounts of Trust II are not included in our consolidated financial statements, the $120.0 million in trust preferred securities issued by Trust II are included in the regulatory capital of Cullen/Frost during the reported periods. See the section captioned "Supervision and Regulation - Capital Requirements" for a discussion of the regulatory capital treatment of our trust preferred securities.

Other Subsidiaries

Cullen/Frost has various other subsidiaries that are not significant to the consolidated entity.

Operating Segments

Our operations are managed along two reportable operating segments consisting of Banking and Frost Wealth Advisors. See the sections captioned "Results of Segment Operations" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 18 - Operating Segments in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report.

Competition

There is significant competition among commercial banks in our market areas. In addition, we also compete with other providers of financial services, such as savings and loan associations, credit unions, consumer finance companies, securities firms, insurance companies, insurance agencies, commercial finance and leasing companies, full service brokerage firms, discount brokerage firms, and financial/wealth technology ("fintech/wealthtech") firms. Some of our competitors have greater resources and, as such, may have higher lending limits and may offer other services that are not provided by us. We generally compete on the basis of customer service and responsiveness to customer needs, available loan and deposit products, the rates of interest charged on loans, the rates of interest paid for funds, and the availability and pricing of trust, brokerage and insurance services. For further discussion, see the section captioned "We Operate In A Highly Competitive Industry and Market Area" in Item 1A. Risk Factors.

Supervision and Regulation

Cullen/Frost, Frost Bank and most of its non-banking subsidiaries are subject to extensive regulation under federal and state laws. The regulatory framework is intended primarily for the protection of depositors, federal deposit insurance funds and the banking system as a whole and not for the protection of shareholders and creditors.

Significant elements of the laws and regulations applicable to Cullen/Frost and its subsidiaries are described below. The description is qualified in its entirety by reference to the full text of the statutes, regulations and policies that are described. Also, such statutes, regulations and policies are continually under review by Congress and state legislatures and federal and state regulatory agencies. A change in statutes, regulations or regulatory policies applicable to Cullen/Frost and its subsidiaries could have a material effect on our business, financial condition or our results of operations.

Regulatory Agencies

Cullen/Frost is a legal entity separate and distinct from Frost Bank and its other subsidiaries. As a financial holding company and a bank holding company, Cullen/Frost is regulated under the Bank Holding Company Act of 1956, as amended ("BHC Act"), and it and its subsidiaries are subject to inspection, examination and supervision by the Federal Reserve Board. The BHC Act provides generally for "umbrella" regulation of financial holding companies such as Cullen/Frost by the Federal Reserve Board, and for functional regulation of banking activities by bank regulators, securities activities by securities regulators, and insurance activities by insurance regulators. Cullen/Frost is also under the jurisdiction of the Securities and Exchange Commission ("SEC") and is subject to the disclosure and regulatory requirements of the Securities Act of 1933, as amended, and the Securities Exchange Act of 1934, as amended, as administered by the SEC. Cullen/Frost's common stock is listed on the New York Stock Exchange ("NYSE") under the trading symbol "CFR" and our Depositary Shares, each representing a 1/40th interest in a share of our 4.450% Non-Cumulative Perpetual Preferred Stock, Series B, is listed on the NYSE under the trading symbol "CFR PrB." Accordingly, Cullen/Frost is also subject to the rules of the NYSE for listed companies.

Frost Bank is a Texas state chartered bank and a member of the Federal Reserve System. Accordingly, the Texas Department of Banking and the Federal Reserve Board are the primary regulators of Frost Bank. Deposits at Frost Bank are insured by the Federal Deposit Insurance Corporation ("FDIC") up to applicable limits.

All member banks of the Federal Reserve System, including Frost Bank, are required to hold stock in the Federal Reserve System's Reserve Banks in an amount equal to six percent of their capital stock and surplus (half paid to acquire the stock with the remainder held as a cash reserve). Member banks do not have any control over the Federal Reserve System as a result of owning the stock and the stock cannot be sold or traded. The annual dividend rate for larger member banks, including Frost Bank, is tied to 10-year U.S. Treasuries with the maximum dividend rate capped at six percent. The total amount of stock dividends that Frost Bank received from the Federal Reserve totaled $1.2 million in 2022, $532 thousand in 2021 and $313 thousand in 2020.

Most of our non-bank subsidiaries also are subject to regulation by the Federal Reserve Board and other federal and state agencies. Frost Brokerage Services, Inc. is regulated by the SEC, the Financial Industry Regulatory Authority ("FINRA") and state securities regulators. Frost Investment Advisors, LLC and Frost Investment Services, LLC are subject to the disclosure and regulatory requirements of the Investment Advisors Act of 1940, as administered by the SEC. Our insurance subsidiary is subject to regulation by applicable state insurance regulatory agencies. Other non-bank subsidiaries are subject to both federal and state laws and regulations. Frost Bank and its affiliates are also subject to supervision, regulation, examination and enforcement by the Consumer Financial Protection Bureau ("CFPB") with respect to consumer protection laws and regulations.

Bank Holding Company Activities

In general, the BHC Act limits the business of bank holding companies to banking, managing or controlling banks and other activities that the Federal Reserve Board has determined to be so closely related to banking as to be a proper incident thereto. In addition, bank holding companies that qualify and elect to be financial holding companies may engage in any activity, or acquire and retain the shares of a company engaged in any activity, that is either (i) financial in nature or incidental to such financial activity (as determined by the Federal Reserve Board in consultation with the Secretary of the Treasury) or (ii) complementary to a financial activity and does not pose a substantial risk to the safety and soundness of depository institutions or the financial system generally (as solely determined by the Federal Reserve Board), without prior approval of the Federal Reserve Board. Activities that are

financial in nature include securities underwriting and dealing, insurance underwriting and making merchant banking investments.

To maintain financial holding company status, a financial holding company and all of its depository institution subsidiaries must be "well capitalized" and "well managed." A depository institution subsidiary is considered to be "well capitalized" if it satisfies the requirements for this status discussed in the section captioned "Prompt Corrective Action," elsewhere in this item. A depository institution subsidiary is considered "well managed" if it received a composite rating and management rating of at least "satisfactory" in its most recent examination. A financial holding company's status will also depend upon it maintaining its status as "well capitalized" and "well managed" under applicable Federal Reserve Board regulations. If a financial holding company ceases to meet these capital and management requirements, the Federal Reserve Board's regulations provide that the financial holding company must enter into an agreement with the Federal Reserve Board to comply with all applicable capital and management requirements. Until the financial holding company returns to compliance, the Federal Reserve Board may impose limitations or conditions on the conduct of its activities, and the company may not commence any of the broader financial activities permissible for financial holding companies or acquire a company engaged in such financial activities without prior approval of the Federal Reserve Board. If the company does not return to compliance within 180 days, the Federal Reserve Board may require divestiture of the holding company's depository institutions. Bank holding companies and banks must also be both well capitalized and well managed in order to acquire banks located outside their home state.

In order for a financial holding company to commence any new activity permitted by the BHC Act or to acquire a company engaged in any new activity permitted by the BHC Act, 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 Community Reinvestment Act. See the section captioned "Community Reinvestment Act" elsewhere in this item.

The Federal Reserve Board has the power to order any bank holding company or its subsidiaries to terminate any activity or to terminate its ownership or control of any subsidiary when the Federal Reserve Board has reasonable grounds to believe that continuation of such activity or such ownership or control constitutes a serious risk to the financial soundness, safety or stability of any bank subsidiary of the bank holding company.

The BHC Act, the Bank Merger Act, the Texas Banking Code and other federal and state statutes regulate acquisitions of commercial banks and their parent holding companies. The BHC Act requires the prior approval of the Federal Reserve Board for the direct or indirect acquisition by a bank holding company of more than 5.0% of the voting shares of a commercial bank or its parent holding company. Under the Bank Merger Act, the prior approval of the Federal Reserve Board or other appropriate bank regulatory authority is required for a member bank to merge with another bank or purchase substantially all of the assets or assume any deposits of another bank. In reviewing applications seeking approval of merger and acquisition transactions, the bank regulatory authorities will consider, among other things, the competitive effect and public benefits of the transactions, the applicant's managerial and financial resources, the capital position of the combined organization, the risks to the stability of the U.S. banking or financial system (e.g., systemic risk), the applicant's performance record under the Community Reinvestment Act (see the section captioned "Community Reinvestment Act" elsewhere in this item) and its compliance with law, including fair lending, fair housing and other consumer protection laws, and the effectiveness of the subject organizations in combating money laundering activities.

Dividends and Stock Repurchases

The principal source of Cullen/Frost's liquidity is dividends from Frost Bank. The prior approval of the Federal Reserve Board is required if the total of all dividends declared by a state-chartered member bank in any calendar year would exceed the sum of the bank's net profits for that year and its retained net profits for the preceding two calendar years, less any required transfers to surplus or to fund the retirement of preferred stock. Federal law also prohibits a state-chartered, member bank from paying dividends that would be greater than the bank's undivided profits. Frost Bank is also subject to limitations under Texas state law regarding the level of dividends that may be paid. Under the foregoing dividend restrictions, and while maintaining its "well capitalized" status, Frost Bank could pay aggregate dividends of approximately $813.6 million to Cullen/Frost, without obtaining affirmative governmental approvals, at December 31, 2022. This amount is not necessarily indicative of amounts that may be paid or available to be paid in future periods.

In addition, Cullen/Frost and Frost Bank are subject to other regulatory policies and requirements relating to the payment of dividends, including requirements to maintain adequate capital above regulatory minimums. The appropriate federal regulatory authority is authorized to determine under certain circumstances relating to the financial condition of a bank holding company or a bank that the payment of dividends would be an unsafe or unsound practice and to prohibit payment thereof. Additionally, it is Federal Reserve policy that bank holding companies generally should pay dividends on common stock only out of net income available to common shareholders over the past year and only if the prospective rate of earnings retention appears consistent with the organization's current and expected future capital needs, asset quality and overall financial condition. Federal Reserve policy also provides that a bank holding company should inform the Federal Reserve reasonably in advance of declaring or paying a dividend that exceeds earnings for the period for which the dividend is being paid or that could result in a material adverse change to the bank holding company's capital structure.

In July 2019, the federal bank regulators adopted final rules (the "Capital Simplifications Rules") that, among other things, eliminated the standalone prior approval requirement in the Basel III Capital Rules for any repurchase of common stock. In certain circumstances, Cullen/Frost's repurchases of its common stock may be subject to a prior approval or notice requirement under other regulations, policies or supervisory expectations of the Federal Reserve Board. Any redemption or repurchase of preferred stock or subordinated debt remains subject to the prior approval of the Federal Reserve Board.

In August 2022, the Inflation Reduction Act of 2022 (the "IRA") was enacted. Among other things, the IRA imposes a new 1% excise tax on the fair market value of stock repurchased after December 31, 2022 by publicly traded U.S. corporations. With certain exceptions, the value of stock repurchased is determined net of stock issued in the year, including shares issued pursuant to compensatory arrangements.

Transactions with Affiliates

Transactions between Frost Bank and its subsidiaries, on the one hand, and Cullen/Frost or any other subsidiary, on the other hand, are regulated under federal banking law. The Federal Reserve Act imposes quantitative and qualitative requirements and collateral requirements on covered transactions by Frost Bank with, or for the benefit of, its affiliates, and generally requires those transactions to be on terms at least as favorable to Frost Bank as if the transaction were conducted with an unaffiliated third party. Covered transactions are defined by statute to include a loan or extension of credit, as well as a purchase of securities issued by an affiliate, a purchase of assets (unless otherwise exempted by the Federal Reserve Board) from the affiliate, certain derivative transactions that create a credit exposure to an affiliate, the acceptance of securities issued by the affiliate as collateral for a loan, and the issuance of a guarantee, acceptance or letter of credit on behalf of an affiliate. In general, any such transaction by Frost Bank or its subsidiaries must be limited to certain thresholds on an individual and aggregate basis and, for credit transactions with any affiliate, must be secured by designated amounts of specified collateral.

Federal law also limits a bank's authority to extend credit to its directors, executive officers and 10% stockholders, as well as to entities controlled by such persons. Among other things, extensions of credit to insiders are required to be made on terms that are substantially the same as, and follow credit underwriting procedures that are not less stringent than, those prevailing for comparable transactions with unaffiliated persons. Also, the terms of such extensions of credit may not involve more than the normal risk of non-repayment or present other unfavorable features and may not exceed certain limitations on the amount of credit extended to such persons individually and in the aggregate.

Source of Strength Doctrine

Federal Reserve Board policy and federal law require bank holding companies to act as a source of financial and managerial strength to their subsidiary banks. Under this requirement, Cullen/Frost is expected to commit resources to support Frost Bank, including at times when Cullen/Frost may not be in a financial position to provide such resources. Any capital loans by a bank holding company to any of its subsidiary banks are subordinate in right of payment to depositors and to certain other indebtedness of such subsidiary banks. In the event of a bank holding company's bankruptcy, any commitment by the bank holding company to a federal bank regulatory agency to maintain the capital of a subsidiary bank will be assumed by the bankruptcy trustee and entitled to priority of payment.

Capital Requirements

Cullen/Frost and Frost Bank are each required to comply with applicable capital adequacy standards adopted by the Federal Reserve Board (the "Basel III Capital Rules"). The Basel III Capital Rules require Cullen/Frost and Frost Bank to maintain the following:

- A minimum ratio of Common Equity Tier 1 ("CET1") to risk-weighted assets of at least 4.5%, plus a 2.5% "capital conservation buffer" that is composed entirely of CET1 capital (resulting in a minimum ratio of CET1 to risk-weighted assets of 7.0%);
- A minimum ratio of Tier 1 capital to risk-weighted assets of at least 6.0%, plus the capital conservation buffer (resulting in a minimum Tier 1 capital ratio of 8.5%);
- A minimum ratio of total capital (Tier 1 capital plus Tier 2 capital) to risk-weighted assets of at least 8.0%, plus the capital conservation buffer (resulting in a minimum total capital ratio of 10.5%); and
- A minimum leverage ratio of 4.0%, calculated as the ratio of Tier 1 capital to average consolidated assets as reported on consolidated financial statements (known as the "leverage ratio").

Banking institutions that fail to meet the effective minimum ratios once the capital conservation buffer is taken into account, as detailed above, will be subject to constraints on capital distributions, including dividends and share repurchases, and certain discretionary executive compensation. The severity of the constraints depends on the amount of the shortfall and the institution's "eligible retained income" (that is, the greater of (i) net income for the preceding four quarters, net of distributions and associated tax effects not reflected in net income and (ii) average net income over the preceding four quarters).

The Basel III Capital Rules and the Capital Simplification Rules also provide for a number of deductions from and adjustments to CET1. These include, for example, the requirement that certain deferred tax assets and significant investments in non-consolidated financial entities be deducted from CET1 to the extent that any one such category exceeds 25% of CET1. Prior to the adoption of the Capital Simplification Rules in July 2019, amounts were deducted from CET1 to the extent that any one such category exceeded 10% of CET1 or all such items, in the aggregate, exceeded 15% of CET1. The Capital Simplification Rules took effect for Cullen/Frost and Frost Bank as of January 1, 2020. These limitations did not impact our regulatory capital during any of the reported periods.

In addition, under the general risk-based capital rules, the effects of accumulated other comprehensive income items included in capital were excluded for the purposes of determining regulatory capital ratios. Under the Basel III Capital Rules, the effects of certain accumulated other comprehensive income items are not excluded; however, non-advanced approaches banking organizations, including Cullen/Frost and Frost Bank, were able to make a one-time permanent election to continue to exclude these items. Both Cullen/Frost and Frost Bank made this election in order to avoid significant variations in the level of capital depending upon the impact of interest rate fluctuations on the fair value of their available-for-sale securities portfolio. Under the Basel III Capital Rules, trust preferred securities no longer included in our Tier 1 capital may nonetheless be included as a component of Tier 2 capital on a permanent basis without phase-out.

In February 2019, the federal bank regulatory agencies issued a final rule (the "2019 CECL Rule") that revised certain capital regulations to account for changes to credit loss accounting under U.S. GAAP. The 2019 CECL Rule included a transition option that allows banking organizations to phase in, over a three-year period, the day-one adverse effects of adopting a new accounting standard related to the measurement of current expected credit losses ("CECL") on their regulatory capital ratios (three-year transition option). In March 2020, the federal bank regulatory agencies issued an interim final rule that maintains the three-year transition option of the 2019 CECL Rule and also provides banking organizations that were required under U.S. GAAP (as of January 2020) to implement CECL before the end of 2020 the option to delay for two years an estimate of the effect of CECL on regulatory capital, relative to the incurred loss methodology's effect on regulatory capital, followed by a three-year transition period (five-year transition option). We elected to adopt the five-year transition option. Accordingly, CECL transitional amounts have been added back to CET1 totaling $46.2 million and $61.6 million at December 31, 2022 and 2021, respectively.

The Basel III Capital Rules prescribe a standardized approach for risk weightings that expanded the risk-weighting categories from the general risk-based capital rules to a much larger and more risk-sensitive number of categories, depending on the nature of the assets, generally ranging from 0% for U.S. government and agency

securities, to 600% for certain equity exposures (and higher percentages for certain other types of interests), and resulting in higher risk weights for a variety of asset categories.

In December 2017, the Basel Committee published standards that it described as the finalization of the Basel III post-crisis regulatory reforms (the standards are commonly referred to as “Basel IV”). Among other things, these standards revise the Basel Committee's standardized approach for credit risk (including by recalibrating risk weights and introducing new capital requirements for certain “unconditionally cancellable commitments,” such as unused credit card lines of credit) and provides a new standardized approach for operational risk capital. Under the Basel framework, these standards will generally be effective on January 1, 2023, with an aggregate output floor phasing in through January 1, 2028. Under the current U.S. capital rules, operational risk capital requirements and a capital floor apply only to advanced approaches institutions, and not to Cullen/Frost or Frost Bank. The impact of Basel IV on us will depend on the manner in which it is implemented by the federal bank regulators.

Liquidity Requirements

The Basel III liquidity framework and regulations of the Federal Reserve require that certain banks and bank holding companies measure their liquidity against specific liquidity tests. One test, referred to as the liquidity coverage ratio (“LCR”), is designed to ensure that the banking entity maintains an adequate level of unencumbered high-quality liquid assets equal to the entity’s expected net cash outflow for a 30-day time horizon (or, if greater, 25% of its expected total cash outflow) under an acute liquidity stress scenario. The other test, referred to as the net stable funding ratio (“NSFR”), is designed to promote more medium- and long-term funding of the assets and activities of banking entities over a one-year time horizon. Rules applicable to certain large banking organizations have been implemented for LCR and for NSFR; however, based on our asset size, these rules do not currently apply to Cullen/Frost and Frost Bank.

Prompt Corrective Action

The Federal Deposit Insurance Act, as amended (“FDIA”), requires among other things, the federal banking agencies to take “prompt corrective action” in respect of depository institutions that do not meet minimum capital requirements. The FDIA includes the following five capital tiers: “well capitalized,” “adequately capitalized,” “undercapitalized,” “significantly undercapitalized” and “critically undercapitalized.”

A bank will be (i) “well capitalized” if the institution has a total risk-based capital ratio of 10.0% or greater, a CET1 capital ratio of 6.5% or greater, a Tier 1 risk-based capital ratio of 8.0% or greater, and a leverage ratio of 5.0% or greater, and is not subject to any order or written directive by any such regulatory authority to meet and maintain a specific capital level for any capital measure; (ii) “adequately capitalized” if the institution has a total risk-based capital ratio of 8.0% or greater, a CET1 capital ratio of 4.5% or greater, a Tier 1 risk-based capital ratio of 6.0% or greater, and a leverage ratio of 4.0% or greater and is not “well capitalized”; (iii) “undercapitalized” if the institution has a total risk-based capital ratio that is less than 8.0%, a CET1 capital ratio less than 4.5%, a Tier 1 risk-based capital ratio of less than 6.0% or a leverage ratio of less than 4.0%; (iv) “significantly undercapitalized” if the institution has a total risk-based capital ratio of less than 6.0%, a CET1 capital ratio less than 3.0%, a Tier 1 risk-based capital ratio of less than 4.0% or a leverage ratio of less than 3.0%; and (v) “critically undercapitalized” if the institution’s tangible equity is equal to or less than 2.0% of average quarterly tangible assets. An institution may be downgraded to, or deemed to be in, a capital category that is lower than indicated by its capital ratios if it is determined to be in an unsafe or unsound condition or if it receives an unsatisfactory examination rating with respect to certain matters. A bank’s capital category is determined solely for the purpose of applying prompt corrective action regulations, and the capital category may not constitute an accurate representation of the bank’s overall financial condition or prospects for other purposes.

The FDIA prohibits an insured depository institution from accepting brokered deposits or offering interest rates on any deposits significantly higher than the prevailing rate in the bank’s normal market area or nationally (depending upon where the deposits are solicited), unless it is well capitalized or is adequately capitalized and receives a waiver from the FDIC.

Additionally, the FDIA generally prohibits a depository institution from making any capital distributions (including payment of a dividend) or paying any management fee to its parent holding company if the depository institution would thereafter be “undercapitalized.” “Undercapitalized” institutions are subject to growth limitations and are required to submit a capital restoration plan. The agencies may not accept such a plan without determining, among other things, that the plan is based on realistic assumptions and is likely to succeed in restoring the depository

institution's capital. In addition, for a capital restoration plan to be acceptable, the depository institution's parent holding company must guarantee that the institution will comply with such capital restoration plan. The bank holding company must also provide appropriate assurances of performance. The aggregate liability of the parent holding company is limited to the lesser of (i) an amount equal to 5.0% of the depository institution's total assets at the time it became undercapitalized and (ii) the amount which is necessary (or would have been necessary) to bring the institution into compliance with all capital standards applicable with respect to such institution as of the time it fails to comply with the plan. If a depository institution fails to submit an acceptable plan, it is treated as if it is "significantly undercapitalized."

"Significantly undercapitalized" depository institutions may be subject to a number of requirements and restrictions, including orders to sell sufficient voting stock to become "adequately capitalized," requirements to reduce total assets, and cessation of receipt of deposits from correspondent banks. "Critically undercapitalized" institutions are subject to the appointment of a receiver or conservator.

The appropriate federal banking agency may, under certain circumstances, reclassify a well capitalized insured depository institution as adequately capitalized. The FDIA provides that an institution may be reclassified if the appropriate federal banking agency determines (after notice and opportunity for hearing) that the institution is in an unsafe or unsound condition or deems the institution to be engaging in an unsafe or unsound practice. The appropriate agency is also permitted to require an adequately capitalized or undercapitalized institution to comply with the supervisory provisions as if the institution were in the next lower category (but not treat a significantly undercapitalized institution as critically undercapitalized) based on supervisory information other than the capital levels of the institution.

Cullen/Frost believes that, as of December 31, 2022, its bank subsidiary, Frost Bank, was "well capitalized" based on the aforementioned ratios. For further information regarding the capital ratios and leverage ratio of Cullen/Frost and Frost Bank see the discussion under the section captioned "Capital and Liquidity" included in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 9 - Capital and Regulatory Matters in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data, elsewhere in this report.

The prompt corrective action regulations do not apply to bank holding companies. However, the Federal Reserve Board is authorized to take appropriate action at the bank holding company level, based upon the undercapitalized status of the bank holding company's depository institution subsidiaries.

Safety and Soundness Standards

The FDIA requires the federal bank regulatory agencies to prescribe standards, by regulations or guidelines, relating to internal controls, information systems and internal audit systems, loan documentation, credit underwriting, interest rate risk exposure, asset growth, asset quality, earnings, stock valuation and compensation, fees and benefits, and such other operational and managerial standards as the agencies deem appropriate. Guidelines adopted by the federal bank regulatory agencies establish general standards relating to internal controls and information systems, internal audit systems, loan documentation, credit underwriting, interest rate exposure, asset growth and compensation, fees and benefits. In general, the guidelines require, among other things, appropriate systems and practices to identify and manage the risk and exposures specified in the guidelines. The guidelines 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 stockholder. In addition, the agencies adopted regulations that authorize, but do not require, an agency to order an institution that has been given notice by an agency that it is not satisfying any of such safety and soundness standards to submit a compliance plan. If, after being so notified, an institution fails to submit an acceptable compliance plan or fails in any material respect to implement an acceptable compliance plan, the agency must issue an order directing action to correct the deficiency and may issue an order directing other actions of the types to which an undercapitalized institution is subject under the "prompt corrective action" provisions of the FDIA. See "Prompt Corrective Action" above. If an institution fails to comply with such an order, the agency may seek to enforce such order in judicial proceedings and to impose civil money penalties.

Deposit Insurance

Deposits at Frost Bank are insured up to applicable limits by the Deposit Insurance Fund ("DIF") of the FDIC and Frost Bank is subject to deposit insurance assessments to maintain the DIF. Deposit insurance assessments are based on average total assets minus average tangible equity. For larger institutions, such as Frost Bank, the FDIC uses a performance score and a loss-severity score that are used to calculate an initial assessment rate. In calculating these scores, the FDIC uses a bank's capital level and supervisory ratings and certain financial measures to assess an institution's ability to withstand asset-related stress and funding-related stress. The FDIC has the ability to make discretionary adjustments to the total score based upon significant risk factors that are not adequately captured in the calculations.

Under the FDIA, the FDIC may terminate deposit insurance upon a finding that the institution has engaged in unsafe and unsound practices, is in an unsafe or unsound condition to continue operations, or has violated any applicable law, regulation, rule, order or condition imposed by the FDIC. In addition, the FDIC is authorized to conduct examinations of and require reporting by FDIC-insured institutions.

In October 2022, the FDIC adopted a final rule to increase the initial base deposit insurance assessment rate schedules uniformly by 2 basis points beginning with the first quarterly assessment period of 2023. The increased assessment is expected to improve the likelihood that the DIF reserve ratio would reach the statutory minimum of 1.35% by the statutory deadline prescribed under the FDIC's amended restoration plan.

Enhanced Prudential Standards

The Federal Reserve Board is required to monitor emerging risks to financial stability and enact enhanced supervision and prudential standards applicable to large bank holding companies and certain non-bank covered companies designated as systemically important by the Financial Stability Oversight Council. The Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act") mandates that certain regulatory requirements applicable to these systemically important financial institutions be more stringent than those applicable to other financial institutions. In 2019, the Federal Reserve Board adopted new rules impacting certain capital and liquidity requirements and other enhanced prudential standards. The final rules assign all domestic bank holding companies with $100 billion or more in total consolidated assets to one of four categories of tailored regulatory requirements. Cullen/Frost and Frost Bank are generally not impacted by these rules. The enhanced prudential standards rules, as amended in 2019, require publicly traded bank holding companies with $50 billion or more in total consolidated assets to establish risk committees. Prior to the amendment, the requirement to establish a risk committee was applicable to publicly traded bank holding companies with $10 billion or more in consolidated assets. Cullen/Frost has established and currently maintains a risk committee.

The Volcker Rule

The so-called Volcker Rule under the Dodd-Frank Act restricts banks and their affiliates from engaging in proprietary trading and investing in and sponsoring hedge funds and private equity funds. The Volcker Rule does not significantly impact the operations of Cullen/Frost and its subsidiaries as we do not have any engagement in the businesses prohibited by the Volcker Rule.

Depositor Preference

The FDIA provides that, in the event of the "liquidation or other resolution" of an insured depository institution, the claims of depositors of the institution, including the claims of the FDIC as subrogee of insured depositors, and certain claims for administrative expenses of the FDIC as a receiver, will have priority over other general unsecured claims against the institution. If an insured depository institution fails, insured and uninsured depositors, along with the FDIC, will have priority in payment ahead of unsecured, non-deposit creditors, including depositors whose deposits are payable only outside of the United States and the parent bank holding company, with respect to any extensions of credit they have made to such insured depository institution.

Interchange Fees

Under the Durbin Amendment to the Dodd-Frank Act, the Federal Reserve adopted rules establishing standards for assessing whether the interchange fees that may be charged with respect to certain electronic debit transactions are "reasonable and proportional" to the costs incurred by issuers for processing such transactions.

Interchange fees, or "swipe" fees, are charges that merchants pay to us and other card-issuing banks for processing electronic payment transactions. Federal Reserve Board rules applicable to financial institutions that have assets of $10 billion or more provide that the maximum permissible interchange fee for an electronic debit transaction is the sum of 21 cents per transaction and 5 basis points multiplied by the value of the transaction. An upward adjustment of no more than 1 cent to an issuer's debit card interchange fee is allowed if the card issuer develops and implements policies and procedures reasonably designed to achieve certain fraud-prevention standards. The Federal Reserve Board also has rules governing routing and exclusivity that require issuers to offer two unaffiliated networks for routing transactions on each debit or prepaid product.

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 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 Consumer Financial Protection Bureau ("CFPB") is a federal agency responsible for implementing, examining and enforcing compliance with federal consumer protection laws. The CFPB has broad rulemaking authority for a wide range of consumer financial laws that apply to all banks, including, among other things, laws relating to fair lending and 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. The CFPB has examination and enforcement authority over all banks with more than $10 billion in assets, as well as their affiliates. Banking regulators take into account compliance with consumer protection laws when considering approval of a proposed transaction.

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 BHC Act, or to acquire any company engaged in any new activity permitted by the BHC Act, 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. Frost Bank received a rating of "satisfactory" in its most recent CRA examination.

In May 2022, the Federal Reserve Board, the FDIC and the Office of the Comptroller of the Currency ("OCC") issued a joint proposal that would, among other things (i) expand access to credit, investment and basic banking services in low- and moderate-income communities, (ii) adapt to changes in the banking industry, including internet

and mobile banking, (iii) provide greater clarity, consistency and transparency in the application of the regulations and (iv) tailor performance standards to account for differences in bank size, business model, and local conditions. We will continue to evaluate the impact of any changes to the regulations implementing the CRA and their impact to our financial condition, results of operations, and/or liquidity, which cannot be predicted at this time.

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 nonaffiliated 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 nonaffiliated third party. These regulations affect how consumer information is transmitted through diversified financial companies and conveyed to outside vendors.

Anti-Money Laundering and the USA Patriot Act

A major focus of governmental policy on financial institutions in recent years has been aimed at combating money laundering and terrorist financing. The USA PATRIOT Act of 2001, or the USA Patriot Act, substantially broadened the scope of United States anti-money laundering laws and regulations by imposing significant new compliance and due diligence obligations, creating new crimes and penalties and expanding the extra-territorial jurisdiction of the United States. Financial institutions are also prohibited from entering into specified financial transactions and account relationships and must use enhanced due diligence procedures in their dealings with certain types of high-risk customers and implement a written customer identification program. Financial institutions must take certain steps to assist government agencies in detecting and preventing money laundering and report certain types of suspicious transactions. Regulatory authorities routinely examine financial institutions for compliance with these obligations, and failure of a financial institution to maintain and implement adequate programs to combat money laundering and terrorist financing, or to comply with all of the relevant laws or regulations, could have serious financial, legal and reputational consequences for the institution, including causing applicable bank regulatory authorities not to approve merger or acquisition transactions when regulatory approval is required or to prohibit such transactions even if approval is not required. Regulatory authorities have imposed cease and desist orders and civil money penalties against institutions found to be violating these obligations.

The Anti-Money Laundering Act of 2020 (“AMLA”), which amends the Bank Secrecy Act of 1970 (“BSA”), was enacted in January 2021. The AMLA is intended to be a comprehensive reform and modernization to U.S. bank secrecy and anti-money laundering laws. Among other things, it codifies a risk-based approach to anti-money laundering compliance for financial institutions; requires the U.S. Department of the Treasury to promulgate priorities for anti-money laundering and countering the financing of terrorism policy; requires the development of standards for testing technology and internal processes for BSA compliance; expands enforcement- and investigation-related authority, including increasing available sanctions for certain BSA violations; and expands BSA whistleblower incentives and protections. Many of the statutory provisions in the AMLA will require additional rulemakings, reports and other measures, and the impact of the AMLA will depend on, among other things, rulemaking and implementation guidance. In June 2021, the Financial Crimes Enforcement Network, a bureau of the U.S. Department of the Treasury, issued the priorities for anti-money laundering and countering the financing of terrorism policy required under the AMLA. The priorities include: corruption, cybercrime, terrorist financing, fraud, transnational crime, drug trafficking, human trafficking and proliferation financing.

Office of Foreign Assets Control Regulation

The U.S. Treasury Department’s Office of Foreign Assets Control, or OFAC, administers and enforces economic and trade sanctions against targeted foreign countries and regimes, under authority of various laws, including designated foreign countries, nationals and others. OFAC publishes lists of specially designated targets and countries. We are responsible for, among other things, blocking accounts of, and transactions with, such targets and countries, prohibiting unlicensed trade and financial transactions with them and reporting blocked transactions after their occurrence. Failure to comply with these sanctions could have serious financial, legal and reputational consequences, including causing applicable bank regulatory authorities not to approve merger or acquisition transactions when regulatory approval is required or to prohibit such transactions even if approval is not required. Regulatory authorities have imposed cease and desist orders and civil money penalties against institutions found to be violating these obligations.

Incentive Compensation

The Federal Reserve Board reviews, as part of its regular, risk-focused examination process, the incentive compensation arrangements of banking organizations, such as Cullen/Frost, that are not "large, complex banking organizations." These reviews are tailored to each organization based on the scope and complexity of the organization's activities and the prevalence of incentive compensation arrangements. Deficiencies will be incorporated into the organization's supervisory ratings, which can affect the organization's ability to make acquisitions and take other actions. Enforcement actions may be taken against a banking organization if its incentive compensation arrangements, or related risk-management control or governance processes, pose a risk to the organization's safety and soundness and the organization is not taking prompt and effective measures to correct the deficiencies.

In June 2010, the Federal Reserve Board, OCC and FDIC issued comprehensive final guidance on incentive compensation policies intended to ensure that the incentive compensation policies of banking organizations do not undermine the safety and soundness of such organizations by encouraging excessive risk-taking. The guidance, which covers all employees that have the ability to materially affect the risk profile of an organization, either individually or as part of a group, is based upon the key principles that a banking organization's incentive compensation arrangements should (i) provide incentives that do not encourage risk-taking beyond the organization's ability to effectively identify and manage risks, (ii) be compatible with effective internal controls and risk management, and (iii) be supported by strong corporate governance, including active and effective oversight by the organization's board of directors.

In 2016, the U.S. financial regulators, including the Federal Reserve Board and the SEC, proposed revised rules on incentive-based payment arrangements at specified regulated entities having at least $1 billion in total assets (including Cullen/Frost and Frost Bank), but these proposed rules have not been finalized.

In October 2022, the SEC adopted a final rule directing national securities exchanges and associations, including the NYSE, to implement listing standards that require listed companies to adopt policies mandating the recovery or "clawback" of excess incentive-based compensation earned by a current or former executive officer during the three fiscal years preceding the date the listed company is required to prepare an accounting restatement, including to correct an error that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period. The final rule requires us to adopt a clawback policy within 60 days after such listing standard becomes effective.

Cybersecurity

In February 2018, the SEC published interpretive guidance to assist public companies in preparing disclosures about cybersecurity risks and incidents. These SEC guidelines, and any other regulatory guidance, are in addition to notification and disclosure requirements under state and federal banking law and regulations. In addition, in March 2022, the SEC proposed rules that would require disclosure of material cybersecurity incidents, as well as cybersecurity risk management, strategy and governance.

The federal banking regulators regularly issue new guidance and standards, and update existing guidance and standards, regarding cybersecurity intended to enhance cyber risk management among financial institutions. Financial institutions are expected to comply with such guidance and standards and to accordingly develop appropriate security controls and risk management processes. If we fail to observe such regulatory guidance or standards, we could be subject to various regulatory sanctions, including financial penalties.

Under a final rule adopted by federal banking agencies in November 2021, banking organizations are required to notify their primary banking regulator within 36 hours of determining that a "computer-security incident" has materially disrupted or degraded, or is reasonably likely to materially disrupt or degrade, the banking organization's ability to carry out banking operations or deliver banking products and services to a material portion of its customer base, its businesses and operations that would result in material loss, or its operations that would impact the stability of the United States.

State regulators have also been increasingly active in implementing privacy and cybersecurity standards and regulations. Recently, several states have adopted regulations requiring certain financial institutions to implement cybersecurity programs and many states, including Texas, have also recently implemented or modified their data breach notification, information security and data privacy requirements. We expect this trend of state-level activity

in those areas to continue, and are continually monitoring developments in the states in which our customers are located.

Risks and exposures related to cybersecurity attacks, including litigation and enforcement risks, are expected to be elevated for the foreseeable future due to the rapidly evolving nature and sophistication of these threats, as well as due to the expanding use of Internet banking, mobile banking and other technology-based products and services by us and our customers.

See Item 1A. Risk Factors for a further discussion of risks related to cybersecurity.

Future Legislation and Regulation

Congress may enact legislation from time to time that affects the regulation of the financial services industry, and state legislatures may enact legislation from time to time affecting the regulation of financial institutions chartered by or operating in those states. Federal and state regulatory agencies also periodically propose and adopt changes to their regulations or change the manner in which existing regulations are applied. The substance or impact of pending or future legislation or regulation, or the application thereof, cannot be predicted, although any change could impact the regulatory structure under which we or our competitors operate and may significantly increase costs, impede the efficiency of internal business processes, require an increase in regulatory capital, require modifications to our business strategy, and limit our ability to pursue business opportunities in an efficient manner. It could also affect our competitors differently than us, including in a manner that would make them more competitive. A change in statutes, regulations or regulatory policies applicable to Cullen/Frost or any of its subsidiaries could have a material, adverse effect on our business, financial condition and results of operations.

Human Capital Resources

At December 31, 2022, we employed 4,985 full-time equivalent employees. At that date, the average tenure of all of our full-time employees was approximately 9.9 years while the average tenure of our executive officers was approximately 31.3 years. None of our employees are represented by collective bargaining agreements. We believe our employee relations to be good.

Oversight of our corporate culture is an important element of our board of director's oversight of risk because our people are critical to the success of our corporate strategy. Our board sets the "tone at the top," and holds senior management accountable for embodying, maintaining, and communicating our culture to employees. In that regard, our culture is designed to promote our commitment to making people's lives better and to uphold that principle in everything we do. That commitment has been a central pillar in our approach to our employees, our planet and the communities we have proudly served for over 150 years. Our culture is designed to adhere to the timeless values of integrity, caring and excellence. In keeping with that culture, we expect our people to treat each other and our customers with the highest level of honesty and respect and go out of their way to do the right thing, and we strive to be a force for good in everyday life. We dedicate resources to promote a safe and inclusive workplace; attract, develop and retain talented, diverse employees; promote a culture of integrity, caring and excellence; and reward and recognize employees for both the results they deliver and, importantly, how they deliver them. We also seek to design careers that are fulfilling ones, with competitive compensation and benefits alongside a positive work-life balance. We also dedicate resources to fostering professional and personal growth with continuing education, on-the-job training and development programs. This devotion to our people has earned us a spot on Forbes magazine's Best Employers list in 2022.

Our employees are key to our success as an organization. We are committed to attracting, retaining and promoting top quality talent regardless of sex, sexual orientation, gender identity, race, color, national origin, age, religion and physical ability. We strive to identify and select the best candidates for all open positions based on qualifying factors for each job. We are dedicated to providing a workplace for our employees that is inclusive, supportive, and free of any form of discrimination or harassment; rewarding and recognizing our employees based on their individual results and performance as well as that of their department and the company overall; and recognizing and respecting all of the characteristics and differences that make each of our employees unique.

We believe employing a diverse workforce enhances our ability to serve our customers and our communities. By promoting and fostering a workforce that we believe is reflective of our customers and communities, we seek to better understand the financial needs of our prospects and customers and provide them with relevant financial service products. Understanding and supporting our community has always been a priority to us. We have

established a voluntary, employee-led and staffed team that is committed to touching and improving the lives of people that live and work in our community. Additionally, we provide employees the opportunity to use paid time off to perform community service activities in their choice of ways. In 2022, this amounted to approximately 14 thousand hours of community service performed by our employees. Our efforts are designed to enrich the lives of not only those that are in need but also the lives of our employees who participate in these meaningful and rewarding opportunities.

We believe embracing and understanding diversity has and will continue to make us a stronger company. We also believe that our diverse workforce is representative of our customers in the community and enables us to better serve our customers, enhancing our success as an organization. As we move forward, we will continue to embrace diversity and approach it in a manner consistent with our philosophy, by focusing on our employees, our customers, and our community.

Information About Our Executive Officers

The names, ages as of December 31, 2022, recent business experience and positions or offices held by each of the executive officers of Cullen/Frost are as follows:

Name and Position Held	Age	Recent Business Experience
Phillip D. Green Chairman of the Board, Chief Executive Officer and Director	68	Officer of Frost Bank since 1980. Chairman of the Board and Chief Executive Officer since April 2016.
Patrick B. Frost Director of Cullen/Frost; Group Executive Vice President, Frost Wealth Advisors; President of Frost Bank and President of Frost Insurance	62	Officer of Frost Bank since 1985. Director of Cullen/Frost since May 1997. Group Executive Vice President, Frost Wealth Advisors since April 2016. President of Frost Bank since August 1993. President of Frost Insurance since October 2014.
Jerry Salinas Group Executive Vice President, Chief Financial Officer	64	Officer of Frost Bank since 1986. Group Executive Vice President, Chief Financial Officer since January 2015.
Annette Alonzo Group Executive Vice President, Chief Human Resources Officer	54	Officer of Frost Bank since 1993. Group Executive Vice President, Chief Human Resources Officer since April 2016.
Robert A. Berman Group Executive Vice President, Research and Strategy	60	Officer of Frost Bank since 1989. Group Executive Vice President, Research and Strategy of Frost Bank since May 2001.
Paul H. Bracher President of Cullen/Frost and Group Executive Vice President, Chief Banking Officer of Frost Bank	66	Officer of Frost Bank since 1982. Group Executive Vice President, Chief Banking Officer since January 2015. President of Cullen/Frost since April 2016.
Howard L. Kasanoff Group Executive Vice President, Chief Credit Officer	53	Officer of Frost Bank since June 1994. Group Executive Vice President, Chief Credit Officer since January 2023. Senior Executive Vice President, Director of Complex Risk from October 2017 to December 2022.
Coolidge E. Rhodes, Jr. Group Executive Vice President, General Counsel and Secretary	47	Officer of Frost Bank since September 2021. Group Executive Vice President, General Counsel since September 2021 and Secretary since October 2021. Prior to joining Frost, Mr. Rhodes was most recently managing director and chief compliance officer at New Fortress Energy Inc. Mr. Rhodes also previously worked as a lawyer in private practice and as associate general counsel for a publicly traded oilfield services company.
Carol Severyn Group Executive Vice President, Chief Risk Officer	58	Officer of Frost Bank since 1993. Executive Vice President and Auditor from January 2004 to January 2019. Group Executive Vice President, Chief Risk Officer since January 2019.
Jimmy Stead Group Executive Vice President, Chief Consumer Banking Officer	47	Officer of Frost Bank since 2001. Group Executive Vice President, Chief Consumer Banking Officer since January 2017.
Candace Wolfshohl Group Executive Vice President, Culture and People Development	62	Officer of Frost Bank since 1989. Group Executive Vice President, Culture and People Development since July 2015.

There are no arrangements or understandings between any executive officer of Cullen/Frost and any other person pursuant to which such executive officer was or is to be selected as an officer.

Available Information

Under the Securities Exchange Act of 1934, we are required to file annual, quarterly and current reports, proxy statements and other information with the Securities and Exchange Commission ("SEC"). The SEC maintains a website at http://www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. We file electronically with the SEC.

We make available, free of charge through our website, our reports on Forms 10-K, 10-Q and 8-K, and amendments to those reports, as soon as reasonably practicable after such reports are filed with or furnished to the SEC. Additionally, we have adopted and posted on our website a code of ethics that applies to our principal executive officer, principal financial officer and principal accounting officer. Our website also includes our corporate governance guidelines and the charters for our audit committee, our compensation and benefits committee, our risk committee, our corporate governance and nominating committee and our technology committee. The address for our website is http://www.frostbank.com. We will provide a printed copy of any of the aforementioned documents to any requesting shareholder.

ITEM 1A. RISK FACTORS

An investment in our common stock is subject to risks inherent to our business. The material risks and uncertainties that management believes affect us are described below. Before making an investment decision, you should carefully consider the risks and uncertainties described below together with all of the other information included or incorporated by reference in this report. The risks and uncertainties described below are not the only ones facing us. Additional risks and uncertainties that management is not aware of or focused on or that management currently deems immaterial may also impair our business operations. This report is qualified in its entirety by these risk factors. If any of the following risks actually occur, our business, financial condition and results of operations could be materially and adversely affected. If this were to happen, the market price of our common stock and preferred stock could decline significantly, and you could lose all or part of your investment.

Risks Related To Our Business

Interest Rate Risks

We Are Subject To Interest Rate Risk

Our earnings and cash flows are largely dependent upon our net interest income. Net interest income is the difference between interest income earned on interest-earning assets such as loans and securities and interest expense paid on interest-bearing liabilities such as deposits and borrowed funds. Interest rates are highly sensitive to many factors that are beyond our control, including general economic conditions, inflationary trends, changes in government spending and debt issuances and policies of various governmental and regulatory agencies and, in particular, the Federal Open Market Committee. Changes in monetary policy, including changes in interest rates, could influence not only the interest we receive on loans and securities and the amount of interest we pay on deposits and borrowings, but such changes could also affect (i) our ability to originate loans and obtain deposits, (ii) the fair value of our financial assets and liabilities, and (iii) the average duration of our mortgage-backed securities portfolio. If the interest rates paid on deposits and other borrowings increase at a faster rate than the interest rates received on loans and other investments, our net interest income, and therefore earnings, could be adversely affected. Earnings could also be adversely affected if the interest rates received on loans and other investments fall more quickly than the interest rates paid on deposits and other borrowings. Any substantial, unexpected, or prolonged change in market interest rates could have a material adverse effect on our business, financial condition and results of operations. See Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations under the section captioned "Net Interest Income" and Item 7A. Quantitative and Qualitative Disclosures About Market Risk elsewhere in this report for further discussion related to interest rate sensitivity and our management of interest rate risk.

We May Be Adversely Impacted By The Transition From LIBOR As A Reference Rate

The United Kingdom's Financial Conduct Authority and the administrator of LIBOR have announced that the publication of the most commonly used U.S. dollar London Interbank Offered Rate ("LIBOR") settings will cease to be published or cease to be representative after June 30, 2023. The publication of all other LIBOR settings ceased to be published as of December 31, 2021. Given consumer protection, litigation, and reputation risks, the bank

regulatory agencies indicated that entering into new contracts that use LIBOR as a reference rate after December 31, 2021, would create safety and soundness risks and that they would examine bank practices accordingly. The Adjustable Interest Rate (LIBOR) Act, enacted in March 2022, provides a statutory framework to replace U.S. dollar LIBOR with a benchmark rate based on the Secured Overnight Financing Rate ("SOFR") for contracts governed by U.S. law that have no or ineffective fallbacks, and in December 2022, the Federal Reserve Board adopted related implementing rules. Although governmental authorities have endeavored to facilitate an orderly discontinuation of LIBOR, no assurance can be provided that this aim will be achieved or that the use, level, and volatility of LIBOR or other interest rates or the value of LIBOR-based securities will not be adversely affected. As a result, and despite the enactment of the LIBOR Act, for the most commonly used LIBOR settings, the use or selection of a successor rate could expose us to risks associated with disputes and litigation with our customers and counterparties and other market participants in connection with implementing LIBOR fallback provisions.

We discontinued originating LIBOR-based loans effective December 31, 2021 and are now negotiating loans using our preferred replacement index, AMERIBOR, a benchmark developed by the American Financial Exchange, as well as SOFR and BSBY, a benchmark developed by Bloomberg Index Services.

As of December 31, 2022, approximately $1.4 billion of our outstanding loans, and, in addition, certain derivative contracts, borrowings and other financial instruments have attributes that are either directly or indirectly dependent on LIBOR. The transition from LIBOR has resulted in and could continue to result in added costs and employee efforts and could present additional risk. We are subject to litigation and reputational risks if we are unable to renegotiate and amend existing contracts with counterparties that are dependent on LIBOR, including contracts that do not have fallback language. The timing and manner in which each customer's contract transitions to AMERIBOR, SOFR or BSBY will vary on a case-by-case basis. There continues to be substantial uncertainty as to the ultimate effects of the LIBOR transition. Since AMERIBOR, SOFR and BSBY rates are calculated differently, payments under contracts referencing new rates will differ from those referencing LIBOR, which may lead to increased volatility as compared to LIBOR. The transition has impacted our market risk profiles and required changes to our risk and pricing models, valuation tools, product design and hedging strategies. Furthermore, failure to adequately manage this transition process with our customers could adversely impact our reputation. Although we are currently unable to assess what the ultimate impact of the transition from LIBOR will be, failure to adequately manage the transition could have a material adverse effect on our business, financial condition and results of operations.

Credit and Lending Risks

We Are Subject To Lending Risk and Lending Concentration Risk

There are inherent risks associated with our lending activities. These risks include, among other things, the impact of changes in interest rates and changes in the economic conditions in the markets where we operate as well as those across the State of Texas and the United States. Increases in interest rates and/or weakening economic conditions could adversely impact the ability of borrowers to repay outstanding loans or the value of the collateral securing these loans.

As of December 31, 2022, approximately 86.2% of our loan portfolio consisted of commercial and industrial, energy, construction and commercial real estate mortgage loans. These types of loans are generally viewed as having more risk of default and are typically larger than residential real estate loans or consumer loans. Because our loan portfolio contains a significant number of commercial and industrial, energy, construction and commercial real estate loans with relatively large balances, the deterioration of one or a few of these loans could cause a significant increase in non-performing loans. Increases in non-performing loans have resulted in a net loss of earnings from particular loans, an increase in credit loss expense and an increase in loan charge-offs, and these and future instances could have a material adverse effect on our business, financial condition and results of operations. Certain of our credit exposures are concentrated in industries that may be more susceptible to the long-term risks of climate change, natural disasters or global pandemics. To the extent that these risks may have a negative impact on the financial condition of borrowers, it could also have a material adverse effect on our business, financial condition and results of operations. See the section captioned "Loans" in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations elsewhere in this report for further discussion related to commercial and industrial, energy, construction and commercial real estate loans.

Our Allowance For Credit Losses May Be Insufficient

We maintain allowances for credit losses on loans, securities and off-balance sheet credit exposures. In the case of loans and securities, allowances for credit losses are contra-asset valuation accounts that are deducted from the amortized cost basis of these assets to present the net amount expected to be collected. In the case of off-balance-sheet credit exposures, the allowance for credit losses is a liability account reported as a component of accrued interest payable and other liabilities in our consolidated balance sheets. The amount of each allowance account represents management's best estimate of current expected credit losses on these financial instruments considering available information, from internal and external sources, relevant to assessing exposure to credit loss over the contractual term of the instrument. Relevant available information includes historical credit loss experience, current conditions and reasonable and supportable forecasts. As a result, the determination of the appropriate level of allowance for credit losses inherently involves a high degree of subjectivity and requires us to make significant estimates related to current and expected future credit risks and trends, all of which may undergo material changes. Continuing deterioration in economic conditions, including the possibility of a recession, affecting borrowers and securities issuers; inflation; rising interest rates; new information regarding existing loans, credit commitments and securities holdings; the lingering effects of the COVID-19 pandemic or other global pandemics; natural disasters and risks related to climate change; and identification of additional problem loans, ratings down-grades and other factors, both within and outside of our control, may require an increase in the allowances for credit losses on loans, securities and off-balance sheet credit exposures. In addition, bank regulatory agencies periodically review our allowance for credit losses and may require an increase in credit loss expense or the recognition of further loan charge-offs, based on judgments different than those of management. Furthermore, if any charge-offs related to loans, securities or off-balance sheet credit exposures in future periods exceed our allowances for credit losses on loans, securities or off-balance sheet credit exposures, we will need to recognize additional credit loss expense to increase the applicable allowance. Any increase in the allowance for credit losses on loans, securities and/or off-balance sheet credit exposures will result in a decrease in net income and, possibly, capital, and may have a material adverse effect on our business, financial condition and results of operations. See the section captioned “Allowance for Credit Losses” in Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations elsewhere in this report for further discussion related to our process for determining the appropriate level of the allowance for credit losses.

We Are Subject to Risk Arising From Conditions In The Commercial Real Estate Market

As of December 31, 2022, commercial real estate mortgage loans comprised approximately 36.0% of our loan portfolio. Commercial real estate mortgage loans generally involve a greater degree of credit risk than residential real estate mortgage loans because they typically have larger balances and are more affected by adverse conditions in the economy. Because payments on loans secured by commercial real estate often depend upon the successful operation and management of the properties and the businesses which operate from within them, repayment of such loans may be affected by factors outside the borrower’s control, such as adverse conditions in the real estate market or the economy or changes in government regulations. In recent years, commercial real estate markets have been particularly impacted by the economic disruption resulting from the COVID-19 pandemic. The COVID-19 pandemic has also been a catalyst for the evolution of various remote work options which could impact the long-term performance of some types of office properties within our commercial real estate portfolio. Accordingly, the federal banking regulatory agencies have expressed concerns about weaknesses in the current commercial real estate market. Failures in our risk management policies, procedures and controls could adversely affect our ability to manage this portfolio going forward and could result in an increased rate of delinquencies in, and increased losses from, this portfolio, which, accordingly, could have a material adverse effect on our business, financial condition and results of operations.

We Are Subject To Volatility Risk In Crude Oil Prices

As of December 31, 2022, we had $925.7 million of energy loans which comprised approximately 5.4% of our loan portfolio at that date. Furthermore, energy production and related industries represent a large part of the economies in some of our primary markets. Actions by members of the Organization of Petroleum Exporting Countries (“OPEC”) can impact global crude oil production levels and lead to significant volatility in global oil supplies and market oil prices. In recent years, decreased market oil prices compressed margins for many U.S. and Texas-based oil producers, particularly those that utilize higher-cost production technologies such as hydraulic fracking and horizontal drilling, as well as oilfield service providers, energy equipment manufacturers and transportation suppliers, among others. In March of 2020, disagreements between members of OPEC signaled that

production levels would rise and, when coupled with the uncertainties of the COVID-19 pandemic, led to a significant decline in market oil prices. As the global economy emerged from pandemic lockdowns in 2021, the demand for oil naturally increased and supply could not keep up with the sudden surge in demand. Consequently, oil prices began to rise. The current Russian invasion of Ukraine has also impacted global oil supplies and caused further increases in oil prices. The price per barrel of crude oil was approximately $80 at December 31, 2022 up from $75 at December 31, 2021. We have experienced increased losses within our energy portfolio in recent years which were impacted by oil price volatility, relative to our historical experience. Continued oil price volatility could have further negative impacts on the U.S. economy, in particular, the economies of energy-dominant states such as Texas, and our borrowers and customers.

We Are Subject To Environmental Liability Risk Associated With Lending Activities

A significant portion of our loan portfolio is secured by real property. During the ordinary course of business, we foreclose on and take title to properties securing certain loans. In doing so, there is a risk that hazardous or toxic substances could be found on these properties. If hazardous or toxic substances are found, we may be liable for remediation costs, as well as for personal injury and property damage. Environmental laws may require us to incur substantial expenses and may materially reduce the affected property's value or limit our ability to use or ability to sell the affected property. Environmental reviews of real property before initiating foreclosure actions may not be sufficient to detect all potential environmental hazards. The remediation costs and any other financial liabilities associated with an environmental hazard could have a material adverse effect on our business, financial condition and results of operations.

Liquidity Risk

We Are Subject To Liquidity Risk

We require liquidity to meet our deposit and debt obligations as they come due. Our access to funding sources in amounts adequate to finance our activities or on terms that are acceptable to us could be impaired by factors that affect us specifically or the financial services industry or economy generally. Factors that could reduce our access to liquidity sources include a downturn in the Texas economy, difficult credit markets or adverse regulatory actions against us. Our access to deposits may also be affected by the liquidity needs of our depositors. In particular, a substantial majority of our liabilities are demand, savings, interest checking and money market deposits, which are payable on demand or upon several days' notice, while by comparison, a substantial portion of our assets are loans, which cannot be called or sold in the same time frame. We may not be able to replace maturing deposits and advances as necessary in the future, especially if a large number of our depositors sought to withdraw their accounts, regardless of the reason. Our access to deposits may be negatively impacted by, among other factors, periods of low interest rates or higher interest rates which could promote increased competition for deposits, including from new financial technology competitors, or provide customers with alternative investment options. A failure to maintain adequate liquidity could have a material adverse effect on our business, financial condition and results of operations.

Operational Risks

Our Accounting Estimates and Risk Management Processes Rely On Analytical and Forecasting Models

The processes we use to estimate our expected credit losses and to measure the fair value of financial instruments, as well as the processes used to estimate the effects of changing interest rates and other market measures on our financial condition and results of operations, depends upon the use of analytical and forecasting models. These models reflect assumptions that may not be accurate, particularly in times of market stress or other unforeseen circumstances. Even if these assumptions are adequate, the models may prove to be inadequate or inaccurate because of other flaws in their design or their implementation, including flaws caused by failures in controls, data management, human error or from the reliance on technology. If the models we use for interest rate risk and asset-liability management are inadequate, we may incur increased or unexpected losses upon changes in market interest rates or other market measures. If the models we use for estimating our expected credit losses are inadequate, the allowance for credit losses may not be sufficient to support future charge-offs. If the models we use to measure the fair value of financial instruments are inadequate, the fair value of such financial instruments may fluctuate unexpectedly or may not accurately reflect what we could realize upon sale or settlement of such financial instruments. Any such failure in our analytical or forecasting models could have a material adverse effect on our business, financial condition and results of operations.

The Value Of Our Goodwill and Other Intangible Assets May Decline In The Future

As of December 31, 2022, we had $655.3 million of goodwill and other intangible assets. A significant decline in our expected future cash flows, a significant adverse change in the business climate, slower growth rates or a significant and sustained decline in the price of Cullen/Frost's common stock may necessitate taking charges in the future related to the impairment of our goodwill and other intangible assets which could have a material adverse effect on our business, financial condition and results of operations.

We Are Subject To Risk Arising From Failure Or Circumvention Of Our Controls and Procedures

Our internal controls, including fraud detection and controls, disclosure controls and procedures, and corporate governance procedures are based in part on certain assumptions and can provide only reasonable, not absolute, assurances that the objectives of the controls and procedures are met. Any failure or circumvention of our controls and procedures; failure to comply with regulations related to controls and procedures; or failure to comply with our corporate governance procedures could have a material adverse effect on our reputation, business, financial condition and results of operations, including subjecting us to litigation, regulatory fines, penalties or other sanctions. Furthermore, notwithstanding the proliferation of technology and technology-based risk and control systems, our businesses ultimately rely on people as our greatest resource, and we are subject to the risk that they make mistakes or engage in violations of applicable policies, laws, rules or procedures that in the past have not, and in the future may not always be prevented by our technological processes or by our controls and other procedures intended to prevent and detect such errors or violations. Human errors, malfeasance and other misconduct, even if promptly discovered and remediated, can result in reputational damage or legal risk and have a material adverse effect on our business, financial condition and results of operations.

New Lines Of Business, Products Or Services and Technological Advancements May Subject Us To Additional Risks

From time to time, we implement new lines of business or offer new products and services within existing lines of business. For instance, we are currently implementing a new residential mortgage product offering. There are substantial risks and uncertainties associated with these efforts, particularly in instances where the markets are not fully developed. In developing and marketing new lines of business and/or new products and services we invest significant time and resources. Initial timetables for the introduction and development of new lines of business and/or new products or services may not be achieved and price and profitability targets may not prove feasible. External factors, such as compliance with regulations, competitive alternatives, and shifting market preferences, may also impact the successful implementation of a new line of business or a new product or service.

The financial services industry is continually undergoing rapid technological change with frequent introductions of new technology-driven products and services. Our future success depends, in part, upon our ability to address the needs of our customers by using technology to provide products and services that will satisfy customer demands, as well as to create additional efficiencies in our operations. Many of our competitors have substantially greater resources to invest in technological improvements. We may not be able to effectively implement new technology driven products and services or be successful in marketing these products and services to our customers. In addition, our implementation of certain new technologies, such as those related to artificial intelligence, automation and algorithms, in our business processes may have unintended consequences due to their limitations or our failure to use them effectively. In addition, cloud technologies are also critical to the operation of our systems, and our reliance on cloud technologies is growing. Failure to successfully keep pace with technological change affecting the financial services industry could have a material adverse effect on our business, financial condition and results of operations.

Furthermore, any new line of business, new product or service and/or new technology could have a significant impact on the effectiveness of our system of internal controls. Failure to successfully manage these risks in the development and implementation of new lines of business, new products or services and/or new technologies could have a material adverse effect on our business, financial condition and results of operations.

Our Reputation and Our Business Are Subject to Negative Publicity Risk

Reputation risk, or the risk to our earnings and capital from negative public opinion, is inherent in our business. Negative public opinion could adversely affect our ability to keep and attract customers and expose us to adverse legal and regulatory consequences. Negative public opinion could result from our actual or alleged conduct in any number of activities, including (i) lending practices, (ii) branching strategy, (iii) product and service offerings,

(iv) corporate governance, (v) regulatory compliance, (vi) mergers and acquisitions, (vii) disclosure, (viii) sharing or inadequate protection of customer information, (ix) successful or attempted cyber attacks against us, our customers or our third-party partners or vendors and (x) failure to discharge any publicly announced commitments to employees or environmental, social and governance initiatives or to respond adequately to social and sustainability concerns from the viewpoint of our stakeholders from actions taken by government regulators and community organizations in response to our conduct. Negative public opinion could also result from adverse news or publicity that impairs the reputation of the financial services industry generally or from the actions of our employees, customers, affiliates or third parties with whom we do business. In addition, our reputation or prospects may be significantly damaged by adverse publicity or negative information regarding us, whether or not true, that may be posted on social media, non-mainstream news services or other parts of the internet, and this risk is magnified by the speed and pervasiveness with which information is disseminated through those channels. Because we conduct most of our business under the "Frost" brand, negative public opinion about one business could affect our other businesses.

Our Business, Financial Condition and Results Of Operations Are Subject To Risk From Changes in Customer Behavior

Individual, economic, political, industry-specific conditions and other factors outside of our control, such as fuel prices, energy costs, real estate values, inflation, taxes or other factors that affect customer income levels, could alter anticipated customer behavior, including borrowing, repayment, investment and deposit practices. Such a change in these practices could materially adversely affect our ability to anticipate business needs and meet regulatory requirements. Further, difficult economic conditions may negatively affect consumer confidence levels. A decrease in consumer confidence levels would likely aggravate the adverse effects of these difficult market conditions on us, our customers and others in the financial institutions industry.

Cullen/Frost Relies On Dividends From Its Subsidiaries For Most Of Its Revenue

Cullen/Frost is a separate and distinct legal entity from its subsidiaries. It receives substantially all of its revenue from dividends from its subsidiaries. These dividends are the principal source of funds to pay dividends on Cullen/Frost's common stock and preferred stock and interest and principal on Cullen/Frost's debt. Various federal and state laws and regulations limit the amount of dividends that Frost Bank and certain non-bank subsidiaries may pay to Cullen/Frost. Also, Cullen/Frost's right to participate in a distribution of assets upon a subsidiary's liquidation or reorganization is subject to the prior claims of the subsidiary's creditors and depositors. In the event Frost Bank is unable to pay dividends to Cullen/Frost, Cullen/Frost may not be able to service debt, pay obligations or pay dividends on our common stock or our preferred stock. The inability to receive dividends from Frost Bank could have a material adverse effect on our business, financial condition and results of operations. See the section captioned "Supervision and Regulation" in Item 1. Business and Note 9 - Capital and Regulatory Matters in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report.

Our Information Systems May Experience Failure, Interruption Or Breach In Security

In the ordinary course of business, we rely on electronic communications and information systems to conduct our operations and to store sensitive data. Any failure, interruption or breach in security of these systems could result in significant disruption to our operations. Information security breaches and cybersecurity-related incidents include, but are not limited to, attempts to access information, including customer and company information, malicious code, computer viruses and denial of service attacks that could result in unauthorized access, theft, misuse, loss, release or destruction of data (including confidential customer information), account takeovers, unavailability of service or other events. These types of threats may derive from human error, fraud or malice on the part of external or internal parties, or may result from accidental technological failure. Our technologies, systems, networks and software have been and continue to be subject to cybersecurity threats and attacks, which range from uncoordinated individual attempts to sophisticated and targeted measures directed at us. Any failures related to upgrades and maintenance of our technology and information systems could further increase our information and system security risk. Our increased use of cloud and other technologies, such as remote work technologies, also increases our risk of being subject to a cyber attack. The risk of a security breach or disruption, particularly through cyber attack or cyber intrusion, has increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased.

Our customers, employees and third parties that we do business with have been, and will continue to be, targeted by parties using fraudulent e-mails and other communications in attempts to misappropriate passwords, bank account information or other personal information or to introduce viruses or other malware programs to our information systems, the information systems of our merchants or third-party service providers and/or our customers' personal devices, which are beyond our security control systems. Though we endeavor to mitigate these threats through product improvements, use of encryption and authentication technology and customer and employee education, such cyber attacks against us, our merchants, our third-party service providers and our customers remain a serious issue and have been successful in the past.

Although we make significant efforts to maintain the security and integrity of our information systems and have implemented various measures to manage the risks of a security breach or disruption, there can be no assurance that our security efforts and measures will be effective or that attempted security breaches or disruptions would not be successful or damaging. Even well protected information, networks, systems and facilities remain potentially vulnerable to attempted security breaches or disruptions because the techniques used in such attempts are constantly evolving and generally are not recognized until launched against a target, and in some cases are designed not to be detected and, in fact, may not be detected. Accordingly, we may be unable to anticipate these techniques or to implement adequate security barriers or other preventative measures, and thus it is virtually impossible for us to entirely mitigate this risk. Furthermore, in the event of a cyber attack, we may be delayed in identifying or responding to the attack, which could increase the negative impact of the cyber attack on our business, financial condition and results of operations. While we maintain specific “cyber” insurance coverage, which would apply in the event of various breach scenarios, the amount of coverage may not be adequate in any particular case. Furthermore, because cyber threat scenarios are inherently difficult to predict and can take many forms, some breaches may not be covered under our cyber insurance coverage. A security breach or other significant disruption of our information systems or those related to our customers, merchants or our third-party vendors, including as a result of cyber attacks, could (i) disrupt the proper functioning of our networks and systems and therefore our operations and/or those of our customers; (ii) result in the unauthorized access to, and destruction, loss, theft, misappropriation or release of confidential, sensitive or otherwise valuable information of ours or our customers; (iii) result in a violation of applicable privacy, data breach and other laws, subjecting us to additional regulatory scrutiny and exposing us to civil litigation, enforcement actions, governmental fines and possible financial liability; (iv) require significant management attention and resources to remedy the damages that result; or (v) harm our reputation or cause a decrease in the number of customers that choose to do business with us. The occurrence of any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Our Operations Rely On Certain External Vendors

We rely on certain external vendors to provide products and services necessary to maintain our day-to-day operations. These third-party vendors are sources of operational and informational security risk to us, including risks associated with operational errors, information system failures, interruptions or breaches and unauthorized disclosures of sensitive or confidential client or customer information. If these vendors encounter any of these issues, or if we have difficulty communicating with them, we could be exposed to disruption of operations, loss of service or connectivity to customers, reputational damage, and litigation risk that could have a material adverse effect on our business and, in turn, our financial condition and results of operations.

In addition, our operations are exposed to risk that these vendors will not perform in accordance with the contracted arrangements under service level agreements. Although we have selected these external vendors carefully, we do not control their actions. The failure of an external vendor to perform in accordance with the contracted arrangements under service level agreements, because of changes in the vendor’s organizational structure, financial condition, support for existing products and services or strategic focus or for any other reason, could be disruptive to our operations, which could have a material adverse effect on our business and, in turn, our financial condition and results of operations. Replacing these external vendors could also entail significant delay and expense.

We Are Subject To Litigation Risk Pertaining To Fiduciary Responsibility

From time to time, customers make claims and take legal action pertaining to our performance of our fiduciary responsibilities. Whether customer claims and legal action related to our performance of our fiduciary responsibilities are founded or unfounded, if such claims and legal actions are not resolved in a manner favorable to us they may result in significant financial liability and/or adversely affect the market perception of us and our products and services as well as impact customer demand for those products and services. Any financial liability or

reputational damage could have a material adverse effect on our business, financial condition and results of operations.

We Are Subject To Litigation Risk Pertaining To Intellectual Property

Banking and other financial services companies, including us, rely on technology companies to provide information technology products and services necessary to support day-to-day operations. Technology companies frequently enter into litigation based on allegations of patent infringement or other violations of intellectual property rights. In addition, patent holding companies seek to monetize patents they have purchased or otherwise obtained. Competitors of our vendors, or other individuals or companies, have from time to time claimed to hold intellectual property sold to us by our vendors or in use by us and we are, and may in the future be, named as defendants in various related legal claims. Such claims may increase in the future as the financial services sector becomes more reliant on information technology vendors. The plaintiffs in these actions frequently seek injunctions and substantial damages and may also seek to enter into licensing agreements with us to obtain ongoing fees.

Regardless of the scope or validity of such patents or other intellectual property rights, or the merits of any claims by potential or actual litigants, we may have to engage in protracted litigation. Such litigation is often expensive, time-consuming, disruptive to our operations and distracting to management. If we are found to infringe upon one or more patents or other intellectual property rights, we may be required to pay substantial damages or royalties to a third-party. In certain cases, we have and in the future may consider entering into licensing agreements for disputed intellectual property, although no assurance can be given that such licenses can be obtained on acceptable terms or that litigation will not occur. These licenses may also significantly increase our operating expenses. If legal matters related to intellectual property claims were resolved against us or settled, we could be required to make payments in amounts that could have a material adverse effect on our business, financial condition and results of operations.

Financial Services Companies Depend On The Accuracy and Completeness Of Information About Customers and Counterparties

In deciding whether to extend credit or enter into other transactions, we rely on information furnished by or on behalf of customers and counterparties, including financial statements, credit reports and other financial information. We also rely on representations of those customers, counterparties or other third parties, such as independent auditors, as to the accuracy and completeness of that information. Reliance on inaccurate or misleading financial statements, credit reports or other financial information could have a material adverse impact on our business, financial condition and results of operations.

External and Market-Related Risks

Our Profitability Depends Significantly On Economic Conditions In The State Of Texas

Our success depends substantially on the general economic conditions of the State of Texas and the specific local markets in which we operate. Unlike larger national or other regional banks that are more geographically diversified, we provide banking and financial services primarily to customers across Texas through financial centers in the Austin, Corpus Christi, Dallas, Fort Worth, Houston, Permian Basin, Rio Grande Valley and San Antonio regions. The local economic conditions in these areas have a significant impact on the demand for our products and services as well as the ability of our customers to repay loans, the value of the collateral securing loans and the stability of our deposit funding sources. Moreover, all of the securities in our municipal bond portfolio were issued by political subdivisions or agencies within the State of Texas. A significant decline in general economic conditions in Texas, whether caused by recession, inflation, unemployment, changes or prolonged stagnation in oil prices, changes in securities markets, acts of terrorism, pandemics, natural disasters, climate change, outbreak of hostilities or other international or domestic occurrences or other factors could impact these local economic conditions and, in turn, have a material adverse effect on our business, financial condition and results of operations.

We Are Subject to Risk Arising From The Soundness Of Other Financial Institutions and Counterparties

Financial services institutions are interrelated as a result of trading, clearing, counterparty, or other relationships. We have exposure to many different industries and counterparties, and routinely execute transactions with counterparties in the financial services industry, including commercial banks, brokers and dealers, investment banks, and other institutional clients. Many of these transactions expose us to credit risk in the event of a default by a counterparty or client. In addition, our credit risk may be exacerbated when the collateral held by us cannot be

realized upon or is liquidated at prices not sufficient to recover the full amount of the credit or derivative exposure due to us. Increased interconnectivity amongst financial institutions also increases the risk of cyber attacks and information system failures for financial institutions. Any such losses could have a material adverse effect on our business, financial condition and results of operations.

We Operate In A Highly Competitive Industry and Market Area

We face substantial competition in all areas of our operations from a variety of different competitors, many of which are larger and may have more financial resources than us. Such competitors primarily include national, regional, and community banks within the various markets where we operate. Recent regulation has reduced the regulatory burden of large bank holding companies, and raised the asset thresholds at which more onerous requirements apply, which could cause certain large bank holding companies with less than $250 billion in total consolidated assets, which were previously subject to more stringent enhanced prudential standards, to become more competitive or to pursue expansion more aggressively.

We also face competition from many other types of financial institutions, including, without limitation, savings and loans, credit unions, finance companies, brokerage firms, insurance companies and other financial intermediaries. The financial services industry could become even more competitive as a result of legislative, regulatory and technological changes and continued consolidation.

Also, technology and other changes have lowered barriers to entry and made it possible for non-banks to offer products and services traditionally provided by banks. In particular, the activity of fintechs/wealthtechs has grown significantly over recent years and is expected to continue to grow. Some fintechs/wealthtechs are not subject to the same regulation as we are, which may allow them to be more competitive. Fintechs/wealthtechs have and may continue to offer bank or bank-like products and a number of such organizations have applied for bank or industrial loan charters while others have partnered with existing banks to allow them to offer deposit products to their customers. Increased competition from fintechs/wealthechs and the growth of digital banking may also lead to pricing pressures as competitors offer more low-fee and no-fee products.

Additionally, consumers can maintain funds that would have historically been held as bank deposits in brokerage accounts or mutual funds. Consumers can also complete transactions such as paying bills and/or transferring funds directly without the assistance of banks. In addition, the emergence, adoption and evolution of new technologies that do not require intermediation, including distributed ledgers such as digital assets and blockchain, as well as advances in robotic process automation, could significantly affect the competition for financial services. The process of eliminating banks as intermediaries, known as “disintermediation,” could result in the loss of fee income, as well as the loss of customer deposits and the related income generated from those deposits. Further, many of our competitors have fewer regulatory constraints and may have lower cost structures than us. Additionally, due to their size, many competitors may be able to achieve economies of scale and, as a result, may offer a broader range of products and services as well as better pricing for those products and services than we can. Our ability to compete successfully depends on a number of factors, including, among other things, (i) the ability to develop, maintain and build long-term customer relationships based on top quality service, high ethical standards and safe, sound assets; (ii) the ability to expand within our marketplace and with our market position; (iii) the scope, relevance and pricing of products and services offered to meet customer needs and demands; (iv) the rate at which we introduce new products and services relative to our competitors; (v) customer satisfaction with our level of service; and (vi) industry and general economic trends. Failure to perform in any of these areas could significantly weaken our competitive position, which could adversely affect our growth and profitability, which, in turn, could have a material adverse effect on our business, financial condition and results of operations.

Compliance and Regulatory Risks

We Are Subject To Extensive Government Regulation and Supervision and Related Enforcement Powers and Other Legal Remedies

We, primarily through Cullen/Frost, Frost Bank and certain non-bank subsidiaries, are subject to extensive federal and state regulation and supervision, which vests a significant amount of discretion in the various regulatory authorities. Banking regulations are primarily intended to protect depositors’ funds, federal deposit insurance funds and the banking system as a whole, not shareholders. These regulations and supervisory guidance affect our lending practices, capital structure, investment practices, dividend policy and growth, among other things. Congress and federal regulatory agencies continually review banking laws, regulations and policies for possible changes. Changes

to statutes, regulations or regulatory policies or supervisory guidance, including changes in interpretation or implementation of statutes, regulations, policies or supervisory guidance, could affect us in substantial and unpredictable ways. Such changes could subject us to additional costs, limit the types of financial services and products we may offer, limit our ability to return capital to shareholders or conduct certain activities, and/or increase the ability of non-banks to offer competing financial services and products, among other things. Failure to comply with laws, regulations, policies or supervisory guidance could result in enforcement and other legal actions by Federal or state authorities, including criminal and civil penalties, the loss of FDIC insurance, the revocation of a banking charter, enforcement actions or sanctions by regulatory agencies, significant fines and civil money penalties and/or reputational damage. In this regard, government authorities, including the bank regulatory agencies, are pursuing aggressive enforcement actions with respect to compliance and other legal matters involving financial activities, which heightens the risks associated with actual and perceived compliance failures. Directives issued to enforce such actions may be confidential and thus, in some instances, we are not permitted to publicly disclose these actions. Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations. See the sections captioned “Supervision and Regulation” included in Item 1. Business and Note 9 - Capital and Regulatory Matters in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report.

The Repeal Of Federal Prohibitions On Payment Of Interest On Demand Deposits Could Increase Our Interest Expense

All federal prohibitions on the ability of financial institutions to pay interest on demand deposit accounts were repealed as part of the Dodd-Frank Act beginning on July 21, 2011. As a result, some financial institutions offer interest on demand deposits to compete for customers. Our interest expense will increase and our net interest margin will decrease if we begin offering interest on demand deposits to attract additional customers or maintain current customers, which could have a material adverse effect on our business, financial condition and results of operations.

We Are Subject To Government Regulation and Oversight Relating to Data and Privacy Protection

Our business requires the collection and retention of large volumes of customer data, including personally identifiable information in various information systems that we maintain and in those maintained by third parties with whom we contract to provide data services. We also maintain important internal company data such as personally identifiable information about our employees and information relating to our operations. The integrity and protection of that customer and company data is important to us. Our collection of such customer and company data is subject to extensive regulation and oversight.

We are subject to laws and regulations relating to the privacy of the information of our customers, employees and others, and any failure to comply with these laws and regulations could expose us to liability and/or reputational damage. As new privacy-related laws and regulations are implemented, the time and resources needed for us to comply with such laws and regulations, as well as our potential liability for non-compliance and reporting obligations in the case of data breaches, may significantly increase.

Risks Related to Acquisition Activity

Potential Acquisitions May Disrupt Our Business and Dilute Shareholder Value

We generally seek merger or acquisition partners that are culturally similar and have experienced management and possess either significant market presence or have potential for improved profitability through financial management, economies of scale or expanded services. Acquiring other banks, businesses, or branches involves various risks commonly associated with acquisitions, including, among other things, (i) potential exposure to unknown or contingent liabilities of the target company; (ii) exposure to potential asset quality issues of the target company; (iii) potential disruption to our business; (iv) potential diversion of our management’s time and attention; (v) the possible loss of key employees and customers of the target company; (vi) difficulty in estimating the value of the target company; and (vii) potential changes in banking or tax laws or regulations that may affect the target company.

Acquisitions typically involve the payment of a premium over book and market values, and, therefore, some dilution of our tangible book value and net income per common share may occur in connection with any future transaction. Acquisitions may also result in potential dilution to existing shareholders of our earnings per share if we issue common stock in connection with the acquisition. Furthermore, failure to realize the expected revenue

increases, cost savings, increases in geographic or product presence, and/or other projected benefits from an acquisition could have a material adverse effect on our business, financial condition and results of operations.

Acquisitions May Be Delayed, Impeded, Or Prohibited Due To Regulatory Issues

Acquisitions by financial institutions, including us, are subject to approval by a variety of federal and state regulatory agencies (collectively, “regulatory approvals”). The process for obtaining these required regulatory approvals has become substantially more difficult since the global financial crisis, and our ability to engage in certain merger or acquisition transactions depends on the bank regulators' views at the time as to our capital levels, quality of management, and overall condition, in addition to their assessment of a variety of other factors, including our compliance with law. Regulatory approvals could be delayed, impeded, restrictively conditioned or denied due to existing or new regulatory issues we have, or may have, with regulatory agencies, including, without limitation, issues related to Bank Secrecy Act compliance, Community Reinvestment Act issues, fair lending laws, fair housing laws, consumer protection laws, unfair, deceptive, or abusive acts or practices regulations and other laws and regulations. We may fail to pursue, evaluate or complete strategic and competitively significant acquisition opportunities as a result of our inability, or perceived or anticipated inability, to obtain regulatory approvals in a timely manner, under reasonable conditions or at all. Difficulties associated with potential acquisitions that may result from these factors could have a material adverse effect on our business, financial condition and results of operations.

Risks Associated With Our Common Stock and Preferred Stock

The Trading Volumes In Our Common Stock and Preferred Stock Are Less Than That Of Other Larger Financial Services Companies

Although our common stock and preferred stock are listed for trading on the NYSE, the trading volume in our common stock is less than that of other, larger financial services companies. A public trading market having the desired characteristics of depth, liquidity and orderliness depends on the presence in the marketplace of willing buyers and sellers of our common stock and preferred stock at any given time. This presence depends on the individual decisions of investors and general economic and market conditions over which we have no control. Given the lower trading volumes of our common stock and preferred stock, significant sales of our common stock or our preferred stock, or the expectation of these sales, could cause our stock prices to fall.

Cullen/Frost May Not Continue To Pay Dividends On Its Common Stock In The Future

Holders of Cullen/Frost common stock are only entitled to receive such dividends as its board of directors may declare out of funds legally available for such payments. Although Cullen/Frost has historically declared cash dividends on its common stock, it is not required to do so and may reduce or eliminate its common stock dividend in the future. This could adversely affect the market price of Cullen/Frost’s common stock. Also, Cullen/Frost is a bank holding company, and its ability to declare and pay dividends is dependent on certain federal regulatory considerations, including the guidelines of the Federal Reserve Board regarding capital adequacy and dividends.

As more fully discussed in Note 9 - Capital and Regulatory Matters in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report, our ability to declare or pay dividends on our common stock may also be subject to certain restrictions in the event that we elect to defer the payment of interest on our junior subordinated deferrable interest debentures or do not declare and pay dividends on our Series B Preferred Stock.

An Investment In Our Common Stock or Preferred Stock Is Not An Insured Deposit

Our common stock and preferred stock are not bank deposits and, therefore, are not insured against loss by the Federal Deposit Insurance Corporation (“FDIC”), any other deposit insurance fund or by any other public or private entity. Investment in our common stock or preferred stock is inherently risky for the reasons described in this “Risk Factors” section and elsewhere in this report and is subject to the same market forces that affect the price of common stock or preferred stock in any company. As a result, if you acquire our common stock or preferred stock, you could lose some or all of your investment.

Certain Banking Laws May Have An Anti-Takeover Effect

Provisions of federal banking laws, including regulatory approval requirements, could make it more difficult for a third party to acquire us, even if doing so would be perceived to be beneficial to our shareholders. These provisions effectively inhibit a non-negotiated merger or other business combination, which, in turn, could adversely affect the market price of our common stock.

General Risk Factors

We are Subject To Risk From Fluctuating Conditions In The Financial Markets and Economic and Political Conditions Generally

Our success depends, to a certain extent, upon local, national and global economic and political conditions, as well as governmental monetary policies. Our financial performance generally, and in particular the ability of borrowers to pay interest on and repay principal of outstanding loans and the value of collateral securing those loans, as well as demand for loans and other products and services we offer, is highly dependent upon the business environment in the markets where we operate, in the State of Texas and in the United States as a whole. A favorable business environment is generally characterized by, among other factors, economic growth, efficient capital markets, low inflation, low unemployment, high business and investor confidence, and strong business earnings. Unfavorable or uncertain economic and market conditions can be caused by a decline in economic growth both in the U.S. and internationally; declines in business activity or investor or business confidence; limitations on the availability of or increases in the cost of credit and capital; increases in inflation or interest rates; high unemployment; oil price volatility; natural disasters; trade policies and tariffs; or a combination of these or other factors. In addition, financial markets and global supply chains may be adversely affected by the current or anticipated impact of military conflict, including the current Russian invasion of Ukraine, terrorism or other geopolitical events. Current economic conditions are being heavily impacted by elevated levels of inflation and rising interest rates. A prolonged period of inflation may impact our profitability by negatively impacting our fixed costs and expenses. Economic and inflationary pressure on consumers and uncertainty regarding economic improvement could result in changes in consumer and business spending, borrowing and savings habits. Such conditions could have a material adverse effect on the credit quality of our loans and our business, financial condition and results of operations. Furthermore, evolving responses from federal and state governments and other regulators, and our customers or our third-party partners or vendors, to new challenges such as climate change have impacted and could continue to impact the economic and political conditions under which we operate which could have a material adverse effect on our business, financial condition and results of operations.

Changes In The Federal, State Or Local Tax Laws May Negatively Impact Our Financial Performance and We Are Subject To Examinations and Challenges By Tax Authorities

We are subject to federal and applicable state tax laws and regulations. Changes in these tax laws and regulations, some of which may be retroactive to previous periods, could increase our effective tax rates and, as a result, could negatively affect our current and future financial performance. Furthermore, tax laws and regulations are often complex and require interpretation. In the normal course of business, we are routinely subject to examinations and challenges from federal and applicable state tax authorities regarding the amount of taxes due in connection with investments we have made and the businesses in which we have engaged. Recently, federal and state taxing authorities have become increasingly aggressive in challenging tax positions taken by financial institutions. These tax positions may relate to tax compliance, sales and use, franchise, gross receipts, payroll, property and income tax issues, including tax base, apportionment and tax credit planning. The challenges made by tax authorities may result in adjustments to the timing or amount of taxable income or deductions or the allocation of income among tax jurisdictions. If any such challenges are made and are not resolved in our favor, they could have a material adverse effect on our business, financial condition and results of operations.

We May Need To Raise Additional Capital In The Future, and Such Capital May Not Be Available When Needed Or At All

We may need to raise additional capital in the future to provide us with sufficient capital resources and liquidity to meet our commitments and business needs, particularly if our asset quality or earnings were to deteriorate significantly. Our ability to raise additional capital, if needed, will depend on, among other things, conditions in the capital markets at that time, which are outside of our control, and our financial condition. Economic conditions and the loss of confidence in financial institutions may increase our cost of funding and limit access to certain customary

sources of capital, including inter-bank borrowings, repurchase agreements and borrowings from the discount window of the Federal Reserve.

We cannot assure that such capital will be available on acceptable terms or at all. Any occurrence that may limit our access to the capital markets, such as a decline in the confidence of debt purchasers, depositors of Frost Bank or counterparties participating in the capital markets, or a downgrade of Cullen/Frost's or Frost Bank's debt ratings, may adversely affect our capital costs and our ability to raise capital and, in turn, our liquidity. Moreover, if we need to raise capital in the future, we may have to do so when many other financial institutions are also seeking to raise capital and would have to compete with those institutions for investors. An inability to raise additional capital on acceptable terms when needed could have a materially adverse effect on our business, financial condition and results of operations.

Our Stock Price Can Be Volatile

Stock price volatility may make it more difficult for you to resell your common stock when you want and at prices you find attractive. Our stock price can fluctuate significantly in response to a variety of factors including, among other things, (i) actual or anticipated variations in quarterly results of operations; (ii) recommendations by securities analysts; (iii) operating and stock price performance of other companies that investors deem comparable to us; (iv) news reports relating to trends, concerns and other issues in the financial services industry; (v) perceptions in the marketplace regarding us and/or our competitors; (vi) new technology used, or services offered, by competitors; (vii) the issuance by us of additional securities, including common stock and securities that are convertible into or exchangeable for, or that represent the right to receive, common stock; (viii) sales of a large block of shares of our common stock or similar securities in the market after an equity offering, or the perception that such sales could occur; (ix) significant acquisitions or business combinations, strategic partnerships, joint ventures or capital commitments by or involving us or our competitors; (x) failure to integrate acquisitions or realize anticipated benefits from acquisitions; (xi) changes in government regulations; and (xii) geopolitical conditions such as acts or threats of terrorism or military conflicts.

General market fluctuations, including real or anticipated changes in the strength of the Texas economy; industry factors and general economic and political conditions and events, such as economic slowdowns or recessions; and interest rate changes, oil price volatility or credit loss trends could also cause our stock price to decrease regardless of operating results.

Changes In Accounting Standards Could Materially Impact Our Financial Statements

From time to time accounting standards setters change the financial accounting and reporting standards that govern the preparation of our financial statements. These changes can be difficult to predict and can materially impact how we record and report our financial condition and results of operations. In some cases, we could be required to apply a new or revised standard retroactively, resulting in changes to previously reported financial results or a cumulative charge to retained earnings. See Note 20 - Accounting Standards Updates in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report for further information regarding pending accounting standards updates.

We May Not Be Able To Attract and Retain Skilled People

Our success depends, in large part, on our ability to attract and retain key people. Competition for the best people in many activities engaged in by us is intense including with respect to compensation and emerging workplace practices, accommodations and remote work options, and we may not be able to hire people or to retain them. We do not currently have employment agreements or non-competition agreements with any of our senior officers. The unexpected loss of services of key personnel could have a material adverse impact on our business, financial condition and results of operations because of their customer relationships, skills, knowledge of our market, years of industry experience and the difficulty of promptly finding qualified replacement personnel. In addition, the scope and content of U.S. banking regulators' policies on incentive compensation, as well as changes to these policies, could adversely affect our ability to hire, retain and motivate our key employees.

Severe Weather, Natural Disasters, Acts Of War Or Terrorism and Other Adverse External Events Could Significantly Impact Our Business and Our Customers

Severe weather, natural disasters, acts of war or terrorism and other adverse external events could have a significant impact on our ability to conduct business. In addition, such events could affect the stability of our deposit base, impair the ability of borrowers to repay outstanding loans, impair the value of collateral securing loans, cause significant property damage, result in loss of revenue and/or cause us to incur additional expenses. Furthermore, the occurrence of any such event in the future could have a material adverse effect on our business, which, in turn, could have a material adverse effect on our financial condition and results of operations.

Climate Change Could Have a Material Negative Impact on Us and Our Customers

Our business, as well as the operations and activities of our customers, could be negatively impacted by climate change. Climate change presents both immediate and long-term risks to us and our customers and these risks are expected to increase over time. Climate changes presents multi-faceted risks, including (i) operational risk from the physical effects of climate events on our facilities and other assets as well as those of our customers; (ii) credit risk from borrowers with significant exposure to climate risk; and (iii) reputational risk from stakeholder concerns about our practices related to climate change, our carbon footprint and our business relationships with customers who operate in carbon-intensive industries. Our business, reputation and ability to attract and retain employees may also be harmed if our response to climate change is perceived to be ineffective or insufficient.

Climate change exposes us to physical risk as its effects may lead to more frequent and more extreme weather events, such as prolonged droughts or flooding, tornados, hurricanes, wildfires and extreme seasonal weather; and longer-term shifts, such as increasing average temperatures, ozone depletion and rising sea levels. Such events and long-term shifts may damage, destroy or otherwise impact the value or productivity of our properties and other assets; reduce the availability of insurance; and/or disrupt our operations and other activities through prolonged outages. Such events and long-term shifts may also have a significant impact on our customers, which could amplify credit risk by diminishing borrowers' repayment capacity or collateral values, and other businesses and counterparties with whom we transact, which could have a broader impact on the economy, supply chains and distribution networks.

Climate change also exposes us to transition risks associated with the transition to a less carbon-dependent economy. Transition risks may result from changes in policies; laws and regulations; technologies; and/or market preferences to address climate change. Such changes could materially, negatively impact our business, results of operations, financial condition and/or our reputation, in addition to having a similar impact on our customers. We have customers who operate in carbon-intensive industries like oil and gas that are exposed to climate risks, such as those risks related to the transition to a less carbon-dependent economy, as well as customers who operate in low-carbon industries that may be subject to risks associated with new technologies. Federal and state banking regulators and supervisory authorities, investors and other stakeholders have increasingly viewed financial institutions as important in helping to address the risks related to climate change both directly and with respect to their customers, which may result in financial institutions coming under increased pressure regarding the disclosure and management of their climate risks and related lending and investment activities. Given that climate change could impose systemic risks upon the financial sector, either via disruptions in economic activity resulting from the physical impacts of climate change or changes in policies as the economy transitions to a less carbon-intensive environment, we face regulatory risk of increasing focus on our resilience to climate-related risks, including in the context of stress testing for various climate stress scenarios. Ongoing legislative or regulatory uncertainties and changes regarding climate risk management and practices may result in higher regulatory, compliance, credit and reputational risks and costs.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None

ITEM 2. PROPERTIES

Our headquarters is located in downtown San Antonio, Texas. This facility, which we lease, houses our executive and primary administrative offices, as well as the principal banking headquarters of Frost Bank. We also own or lease other facilities within our primary market areas in the regions of Austin, Corpus Christi, Dallas, Fort Worth, Houston, Permian Basin, Rio Grande Valley and San Antonio. We consider our properties to be suitable and adequate for our present needs.

ITEM 3. LEGAL PROCEEDINGS

We are subject to various claims and legal actions that have arisen in the course of conducting business. Management does not expect the ultimate disposition of these matters to have a material adverse effect on our business, financial condition and results of operations.

ITEM 4. MINE SAFETY DISCLOSURES

None

PART II

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

Market for Our Common Stock

Our common stock is traded on the NYSE under the symbol "CFR". As of December 31, 2022, there were 64,354,695 shares of our common stock outstanding held by 1,020 holders of record. The closing price per share of common stock on December 30, 2022, the last trading day of our fiscal year, was $133.70.

Stock-Based Compensation Plans

Information regarding stock-based compensation awards outstanding and available for future grants as of December 31, 2022, segregated between stock-based compensation plans approved by shareholders and stock-based compensation plans not approved by shareholders, is presented in the table below. Additional information regarding stock-based compensation plans is presented in Note 11 - Employee Benefit Plans in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report.

Plan Category	Number of Shares to be Issued Upon Exercise of Outstanding Awards	Weighted-Average Exercise Price of Outstanding Awards	Number of Shares Available for Future Grants
Plans approved by shareholders	1,340,956 (1)	$ 71.27 (2)	505,456
Plans not approved by shareholders	—	—	—
Total	1,340,956	71.27	505,456

(1) Includes 616,227 shares related to stock options, 465,319 shares related to non-vested stock units, 45,661 shares related to director deferred stock units and 213,749 shares related to performance stock units (assuming attainment of the maximum payout rate as set forth by the performance criteria).

(2) Excludes outstanding stock units which are exercised for no consideration.

Stock Repurchase Plans

From time to time, our board of directors has authorized stock repurchase plans. In general, stock repurchase plans allow us to proactively manage our capital position and return excess capital to shareholders. Shares purchased under such plans also provide us with shares of common stock necessary to satisfy obligations related to stock compensation awards. On January 25, 2023, our board of directors authorized a $100.0 million stock repurchase plan, allowing us to repurchase shares of our common stock over a one-year period from time to time at various prices in the open market or through private transactions. Under a prior stock repurchase plan, we repurchased 177,834 shares at a total cost of $13.7 million during 2020. No shares were repurchased under a stock repurchase plan during 2022 or 2021.

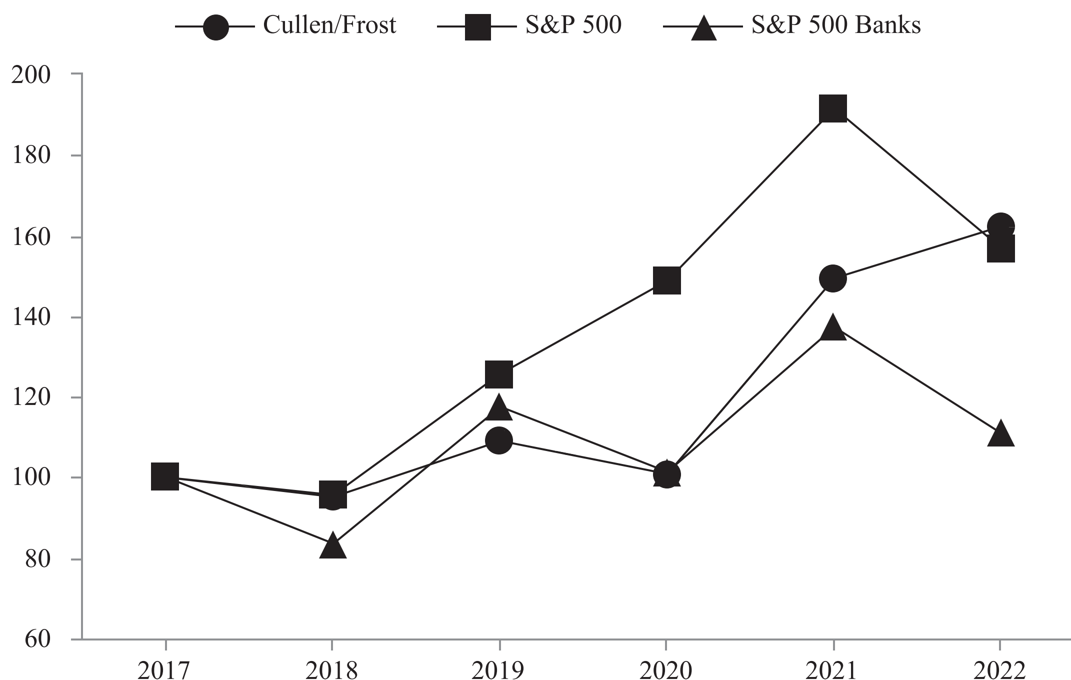
The following table provides information with respect to purchases made by or on behalf of us or any "affiliated purchaser" (as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934), of our common stock during the fourth quarter of 2022.

Period	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans	Maximum Number (or Approximate Dollar Value) of Shares That May Yet Be Purchased Under the Plans at the End of the Period
October 1, 2022 to October 31, 2022	23,892 (1)	$ 142.08	—	$ 100,000
November 1, 2022 to November 30, 2022	—	—	—	100,000
December 1, 2022 to December 31, 2022	—	—	—	100,000
Total	23,892		—	

(1) Repurchases made in connection with the vesting of certain share awards.

Performance Graph

The performance graph below compares the cumulative total shareholder return on Cullen/Frost Common Stock with the cumulative total return on the equity securities of companies included in the Standard & Poor's 500 Stock Index and the Standard and Poor's 500 Bank Index, measured at the last trading day of each year shown. The graph assumes an investment of $100 on December 31, 2017 and reinvestment of dividends on the date of payment without commissions. The performance graph represents past performance and should not be considered to be an indication of future performance.



	2017	2018	2019	2020	2021	2022
Cullen/Frost	$ 100.00	$ 95.16	$ 109.05	$ 100.84	$ 149.44	$ 162.32
S&P 500	100.00	95.62	125.72	148.85	191.58	156.88
S&P 500 Banks	100.00	83.56	117.52	101.35	137.28	110.91

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Forward-Looking Statements and Factors that Could Affect Future Results

Certain statements contained in this Annual Report on Form 10-K that are not statements of historical fact constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the "Act"), notwithstanding that such statements are not specifically identified as such. In addition, certain statements may be contained in our future filings with the SEC, in press releases, and in oral and written statements made by us or with our approval that are not statements of historical fact and constitute forward-looking statements within the meaning of the Act. Examples of forward-looking statements include, but are not limited to: (i) projections of revenues, expenses, income or loss, earnings or loss per share, the payment or nonpayment of dividends, capital structure and other financial items; (ii) statements of plans, objectives and expectations of Cullen/Frost or its management or Board of Directors, including those relating to products, services or operations; (iii) statements of future economic performance; and (iv) statements of assumptions underlying such statements. Words such as "believes", "anticipates", "expects", "intends", "targeted", "continue", "remain", "will", "should", "may" and other similar expressions are intended to identify forward-looking statements but are not the exclusive means of identifying such statements.

Forward-looking statements involve risks and uncertainties that may cause actual results to differ materially from those in such statements. Factors that could cause actual results to differ from those discussed in the forward-looking statements include, but are not limited to:

- The effects of and changes in trade and monetary and fiscal policies and laws, including the interest rate policies of the Federal Reserve Board.
- Inflation, interest rate, securities market and monetary fluctuations.
- Local, regional, national and international economic conditions and the impact they may have on us and our customers and our assessment of that impact.
- Changes in the financial performance and/or condition of our borrowers.
- Changes in the mix of loan geographies, sectors and types or the level of non-performing assets and charge-offs.
- Changes in estimates of future credit loss reserve requirements based upon the periodic review thereof under relevant regulatory and accounting requirements.
- Changes in our liquidity position.
- Impairment of our goodwill or other intangible assets.
- The timely development and acceptance of new products and services and perceived overall value of these products and services by users.
- Changes in consumer spending, borrowing and saving habits.
- Greater than expected costs or difficulties related to the integration of new products and lines of business.
- Technological changes.
- The cost and effects of cyber incidents or other failures, interruptions or security breaches of our systems or those of our customers or third-party providers.
- Acquisitions and integration of acquired businesses.
- Changes in the reliability of our vendors, internal control systems or information systems.
- Our ability to increase market share and control expenses.
- Our ability to attract and retain qualified employees.
- Changes in our organization, compensation and benefit plans.
- The soundness of other financial institutions.
- Volatility and disruption in national and international financial and commodity markets.
- Changes in the competitive environment in our markets and among banking organizations and other financial service providers.
- Government intervention in the U.S. financial system.
- Political instability.
- Acts of God or of war or terrorism.
- The potential impact of climate change.
- The impact of pandemics, epidemics or any other health-related crisis.

- The costs and effects of legal and regulatory developments, the resolution of legal proceedings or regulatory or other governmental inquiries, the results of regulatory examinations or reviews and the ability to obtain required regulatory approvals.
- The effect of changes in laws and regulations (including laws and regulations concerning taxes, banking, securities and insurance) and their application with which we and our subsidiaries must comply.
- The effect of changes in accounting policies and practices, as may be adopted by the regulatory agencies, as well as the Public Company Accounting Oversight Board, the Financial Accounting Standards Board and other accounting standard setters.
- Our success at managing the risks involved in the foregoing items.

In addition, financial markets and global supply chains may continue to be adversely affected by the current or anticipated impact of military conflict, including the current Russian invasion of Ukraine, terrorism or other geopolitical events.

Forward-looking statements speak only as of the date on which such statements are made. We do not undertake any obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement is made, or to reflect the occurrence of unanticipated events.

Application of Critical Accounting Policies and Accounting Estimates

We follow accounting and reporting policies that conform, in all material respects, to accounting principles generally accepted in the United States and to general practices within the financial services industry. The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. While we base estimates on historical experience, current information and other factors deemed to be relevant, actual results could differ from those estimates.

We consider accounting estimates to be critical to reported financial results if (i) the accounting estimate requires management to make assumptions about matters that are highly uncertain and (ii) different estimates that management reasonably could have used for the accounting estimate in the current period, or changes in the accounting estimate that are reasonably likely to occur from period to period, could have a material impact on our financial statements.

Accounting policies related to the allowance for credit losses on financial instruments including loans and off-balance-sheet credit exposures are considered to be critical as these policies involve considerable subjective judgment and estimation by management. As discussed in Note 1 - Summary of Significant Accounting Policies, our policies related to allowances for credit losses changed on January 1, 2020 in connection with the adoption of a new accounting standard update as codified in Accounting Standards Codification (“ASC”) Topic 326 (“ASC 326”) Financial Instruments - Credit Losses. In the case of loans, the allowance for credit losses is a contra-asset valuation account, calculated in accordance with ASC 326, that is deducted from the amortized cost basis of loans to present the net amount expected to be collected.

In the case of off-balance-sheet credit exposures, the allowance for credit losses is a liability account, calculated in accordance with ASC 326, reported as a component of accrued interest payable and other liabilities in our consolidated balance sheets. The amount of each allowance account represents management's best estimate of current expected credit losses on these financial instruments considering available information, from internal and external sources, relevant to assessing exposure to credit loss over the contractual term of the instrument. Relevant available information includes historical credit loss experience, current conditions and reasonable and supportable forecasts. While historical credit loss experience provides the basis for the estimation of expected credit losses, adjustments to historical loss information may be made for differences in current portfolio-specific risk characteristics, environmental conditions or other relevant factors. While management utilizes its best judgment and information available, the ultimate adequacy of our allowance accounts is dependent upon a variety of factors beyond our control, including the performance of our portfolios, the economy, changes in interest rates and the view of the regulatory authorities toward classification of assets. See the section captioned “Allowance for Credit Losses” elsewhere in this discussion as well as Note 1 - Summary of Significant Accounting Policies and Note 3 - Loans in the notes to consolidated financial statements included in Item 8. Financial Statements and Supplementary Data elsewhere in this report for further details of the risk factors considered by management in estimating the necessary level of the allowance for credit losses.

Overview

The following discussion and analysis presents the more significant factors that affected our financial condition as of December 31, 2022 and 2021 and results of operations for each of the years then ended. Refer to Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report on Form 10-K filed with the SEC on February 4, 2021 (the "2021 Form 10-K") for a discussion and analysis of the more significant factors that affected periods prior to 2021.

Certain reclassifications have been made to make prior periods comparable. This discussion and analysis should be read in conjunction with our consolidated financial statements, notes thereto and other financial information appearing elsewhere in this report. From time to time, we have acquired various small businesses through our insurance subsidiary. None of these acquisitions had a significant impact on our financial statements. We account for acquisitions using the acquisition method, and as such, the results of operations of acquired companies are included from the date of acquisition.

Taxable-equivalent adjustments are the result of increasing income from tax-free loans and investments by an amount equal to the taxes that would be paid if the income were fully taxable, thus making tax-exempt yields comparable to taxable asset yields. Taxable equivalent adjustments were based upon a 21% income tax rate.

Dollar amounts in tables are stated in thousands, except for per share amounts.

Results of Operations

Net income available to common shareholders totaled $572.5 million, or $8.81 diluted per common share, in 2022 compared to $435.9 million, or $6.76 diluted per common share, in 2021 and $323.6 million, or $5.10 diluted per common share, in 2020.

Selected income statement data, returns on average assets and average equity and dividends per share for the comparable periods were as follows:

	2022	2021	2020
Taxable-equivalent net interest income	$ 1,386,981	$ 1,077,315	$ 1,070,937
Taxable-equivalent adjustment	95,698	92,448	94,936
Net interest income	1,291,283	984,867	976,001
Credit loss expense	3,000	63	241,230
Non-interest income	404,818	386,728	465,454
Non-interest expense	1,024,274	881,994	848,904
Income before income taxes	668,827	489,538	351,321
Income tax expense	89,677	46,459	20,170
Net income	579,150	443,079	331,151
Preferred stock dividends	6,675	7,157	2,016
Redemption of preferred stock	—	—	5,514
Net income available to common shareholders	$ 572,475	$ 435,922	$ 323,621
Earnings per common share - basic	$ 8.84	$ 6.79	$ 5.11
Earnings per common share - diluted	8.81	6.76	5.10
Dividends per common share	3.24	2.94	2.85
Return on average assets	1.11 %	0.95 %	0.85 %
Return on average common equity	16.86	10.35	8.11
Average shareholders' equity to average assets	6.87	9.48	10.64

Net income available to common shareholders increased $136.6 million for 2022 compared to 2021. The increase was primarily the result of a $306.4 million increase in net interest income and a $18.1 million increase in non-interest income partly offset by a $142.3 million increase in non-interest expense and a $43.2 million increase in income tax expense.

Details of the changes in the various components of net income are further discussed below.

Net Interest Income

Net interest income is the difference between interest income on earning assets, such as loans and securities, and interest expense on liabilities, such as deposits and borrowings, which are used to fund those assets. Net interest income is our largest source of revenue, representing 76.1% of total revenue during 2022. Net interest margin is the ratio of taxable-equivalent net interest income to average earning assets for the period. The level of interest rates and the volume and mix of earning assets and interest-bearing liabilities impact net interest income and net interest margin.

The Federal Reserve influences the general market rates of interest, including the deposit and loan rates offered by many financial institutions. Our loan portfolio is significantly affected by changes in the prime interest rate. As of December 31, 2022, approximately 42.7% of our loans had a fixed interest rate, while the remaining loans had floating interest rates that were primarily tied to the prime interest rate (approximately 27.7%) or the London Interbank Offered Rate ("LIBOR") (approximately 8.2%). We discontinued originating LIBOR-based loans effective December 31, 2021 and have begun to negotiate loans using our preferred replacement index, the American Interbank Offered Rate ("AMERIBOR"), a benchmark developed by the American Financial Exchange, the Secured Overnight Financing Rate ("SOFR") or a benchmark developed by Bloomberg Index Services ("BSBY"). As of December 31, 2022, approximately, 21.4% of our loans were tied to one of these three indexes. For our currently outstanding LIBOR-based loans, the timing and manner in which each customer's contract transitions from LIBOR to another rate will vary on a case-by-case basis. Our goal is to complete all transitions by the end of first quarter of 2023.

Select average market rates for the periods indicated are presented in the table below.

	2022	2021	2020
Federal funds target rate upper bound	1.87 %	0.25 %	0.54 %
Effective federal funds rate	1.69	0.08	0.37
Interest on reserve balances	1.76	0.13	0.39
Prime	4.86	3.25	3.54
1-Month LIBOR	1.91	0.10	0.52
3-Month LIBOR	2.39	0.16	0.65
AMERIBOR Term-30[1]	1.79	0.11	0.54
AMERIBOR Term-90[1]	2.33	0.17	0.68
1-Month Term SOFR[2]	1.86	0.04	0.35
3-Month Term SOFR[2]	2.18	0.05	0.34
Bloomberg 1-Month Short-Term Bank Yield Index	1.81	0.07	0.50
Bloomberg 3-Month Short-Term Bank Yield Index	2.29	0.13	0.59

(1) AMERIBOR Term-30 and AMERIBOR Term-90 are published by the American Financial Exchange.

(2) 1-Month Term SOFR and 3-Month Term SOFR market data are the property of Chicago Mercantile Exchange, Inc. or its licensors as applicable. All rights reserved, or otherwise licensed by Chicago Mercantile Exchange, Inc.

As of December 31, 2022, the target range for the federal funds rate was 4.25% to 4.50%. In December 2022, the Federal Reserve released projections whereby the midpoint of the projected appropriate target range for the federal funds rate would rise to 5.1% by the end of 2023 and subsequently decrease to 4.1% by the end of 2024. While there can be no such assurance that any increases or decreases in the federal funds rate will occur, these projections imply up to a 75 basis point increase in the federal funds rate during 2023, followed by a 100 basis point decrease in 2024. The target range for the federal funds rate was increased 25 basis points to 4.50% to 4.75% effective February 2, 2023.

We are primarily funded by core deposits, with non-interest-bearing demand deposits historically being a significant source of funds. This lower-cost funding base is expected to have a positive impact on our net interest income and net interest margin in a rising interest rate environment. See Item 7A. Quantitative and Qualitative Disclosures About Market Risk elsewhere in this report for information about our sensitivity to interest rates. Further analysis of the components of our net interest margin is presented below.

The following table presents an analysis of net interest income and net interest spread for the periods indicated, including average outstanding balances for each major category of interest-earning assets and interest-bearing liabilities, the interest earned or paid on such amounts, and the average rate earned or paid on such assets or liabilities, respectively. The table also sets forth the net interest margin on average total interest-earning assets for the same periods. For these computations: (i) average balances are presented on a daily average basis, (ii) information is shown on a taxable-equivalent basis assuming a 21% tax rate, (iii) average loans include loans on non-accrual status, and (iv) average securities include unrealized gains and losses on securities available for sale, while yields are based on average amortized cost.

	2022			2021			2020		
	Average Balance	Interest Income/ Expense	Yield /Cost	Average Balance	Interest Income/ Expense	Yield /Cost	Average Balance	Interest Income/ Expense	Yield /Cost
Assets:									
Interest-bearing deposits	$ 12,783,536	$ 216,367	1.69 %	$ 13,530,312	$ 17,878	0.13 %	$ 5,302,616	$ 12,893	0.24 %
Federal funds sold	37,171	948	2.55	14,836	31	0.21	78,817	723	0.92
Resell agreements	17,079	592	3.47	6,611	16	0.24	20,923	172	0.82
Securities:									
Taxable	10,719,066	249,797	2.16	4,606,562	89,550	1.97	4,234,318	93,569	2.27
Tax-exempt	7,997,778	327,559	4.08	8,268,416	314,600	4.06	8,447,036	323,928	4.08
Total securities	18,716,844	577,356	2.95	12,874,978	404,150	3.29	12,681,354	417,497	3.46
Loans, net of unearned discount	16,738,780	776,156	4.64	16,769,631	679,142	4.05	17,164,453	684,686	3.99
Total earning assets and average rate earned	48,293,410	1,571,419	3.20	43,196,368	1,101,217	2.58	35,248,163	1,115,971	3.22
Cash and due from banks	646,510			564,564			527,875		
Allowance for credit losses	(242,059)			(258,668)			(232,596)		
Premises and equipment, net	1,061,937			1,038,034			1,043,789		
Accrued interest receivable and other assets	1,753,340			1,442,682			1,373,969		
Total assets	$ 51,513,138			$ 45,982,980			$ 37,961,200		
Liabilities:									
Non-interest-bearing demand deposits	$ 18,202,669			$ 16,670,807			$ 13,563,696		
Interest-bearing deposits:									
Savings and interest checking	12,160,482	12,055	0.10	10,682,149	1,365	0.01	8,283,665	2,467	0.03
Money market deposit accounts	12,727,533	114,797	0.90	9,990,626	9,462	0.09	8,457,263	15,417	0.18
Time accounts	1,480,088	13,624	0.92	1,129,041	3,693	0.33	1,133,648	14,134	1.25
Total interest-bearing deposits	26,368,103	140,476	0.53	21,801,816	14,520	0.07	17,874,576	32,018	0.18
Total deposits	44,570,772		0.32	38,472,623		0.04	31,438,272		0.10
Federal funds purchased	35,461	690	1.95	32,177	32	0.10	33,135	100	0.30
Repurchase agreements	2,335,326	34,443	1.47	2,115,276	2,209	0.10	1,436,833	4,382	0.30
Junior subordinated deferrable interest debentures	123,042	4,172	3.39	133,744	2,484	1.86	136,330	3,560	2.61
Subordinated notes	99,262	4,657	4.69	99,105	4,657	4.70	98,948	4,656	4.71
Federal Home Loan Bank advances	—	—	—	—	—	—	109,290	318	0.29
Total interest-bearing liabilities and average rate paid	28,961,194	184,438	0.64	24,182,118	23,902	0.10	19,689,112	45,034	0.23
Accrued interest payable and other liabilities	807,820			771,392			669,755		
Total liabilities	47,971,683			41,624,317			33,922,563		
Shareholders' equity	3,541,455			4,358,663			4,038,637		
Total liabilities and shareholders' equity	$ 51,513,138			$ 45,982,980			$ 37,961,200		
Net interest income		$1,386,981			$1,077,315			$1,070,937	
Net interest spread			2.56 %			2.48 %			2.99 %
Net interest income to total average earning assets			2.82 %			2.53 %			3.09 %

The following table presents the changes in taxable-equivalent net interest income and identifies the changes due to differences in the average volume of earning assets and interest-bearing liabilities and the changes due to changes in the average interest rate on those assets and liabilities. The changes in net interest income due to changes in both average volume and average interest rate have been allocated to the average volume change or the average interest rate change in proportion to the absolute amounts of the change in each. The comparison between 2021 and 2020 includes an additional change factor that shows the effect of the difference in the number of days (due to leap year in 2020) in each period for assets and liabilities that accrue interest based upon the actual number of days in the period, as further discussed below.

	2022 vs. 2021			2021 vs. 2020			
	Increase (Decrease) Due to Change in			Increase (Decrease) Due to Change in			
	Rate	Volume	Total	Rate	Volume	Days	Total
Interest-bearing deposits	$ 199,513	$ (1,024)	$ 198,489	$ (7,856)	$ 12,876	$ (35)	$ 4,985
Federal funds sold	808	109	917	(336)	(354)	(2)	(692)
Resell agreements	516	60	576	(79)	(77)	—	(156)
Securities:							
Taxable	9,418	150,829	160,247	(13,040)	9,021	—	(4,019)
Tax-exempt	1,607	11,352	12,959	(1,618)	(7,710)	—	(9,328)
Loans, net of unearned discounts	98,271	(1,257)	97,014	11,000	(14,673)	(1,871)	(5,544)
Total earning assets	310,133	160,069	470,202	(11,929)	(917)	(1,908)	(14,754)
Savings and interest checking	10,528	162	10,690	(1,767)	672	(7)	(1,102)
Money market deposit accounts	102,224	3,111	105,335	(8,389)	2,476	(42)	(5,955)
Time accounts	8,460	1,471	9,931	(10,344)	(58)	(39)	(10,441)
Federal funds purchased	655	3	658	(65)	(3)	—	(68)
Repurchase agreements	31,991	243	32,234	(3,646)	1,485	(12)	(2,173)
Junior subordinated deferrable interest debentures	1,901	(213)	1,688	(1,010)	(66)	—	(1,076)
Subordinated notes	(8)	8	—	(8)	9	—	1
Federal Home Loan Bank advances	—	—	—	—	(318)	—	(318)
Total interest-bearing liabilities	155,751	4,785	160,536	(25,229)	4,197	(100)	(21,132)
Net change	$ 154,382	$ 155,284	$ 309,666	$ 13,300	$ (5,114)	$ (1,808)	$ 6,378

Taxable-equivalent net interest income for 2022 increased $309.7 million, or 28.7%, compared to 2021. The increase in taxable-equivalent net interest income during 2022 was primarily related to an increase in the average yield on interest-bearing deposits (primarily amounts held in an interest-bearing account at the Federal Reserve); an increase in the average volume of, and to a much lesser extent, an increase in the yield on taxable securities; an increase in the average yield on loans; and an increase in the average volume of, and to a lesser extent, an increase in the average taxable-equivalent yield on tax-exempt securities. The impact of these items was partly offset by an increase in the average cost of interest-bearing deposit accounts (primarily money market deposit accounts) and an increase in the average cost of repurchase agreements, among other things. As a result of the aforementioned fluctuations, the taxable-equivalent net interest margin increased 29 basis points from 2.53% during 2021 to 2.82% during 2022.

The average volume of interest-earning assets for 2022 increased $5.1 billion, or 11.8%, compared to 2021. The increase in the average volume of interest-earning assets during 2022 included a $6.1 billion increase in average taxable securities, a $22.3 million increase in average federal funds sold and a $10.5 million increase in average resell agreements partly offset by a $746.8 million decrease in average interest-bearing deposits (primarily amounts held by us in an interest-bearing account at the Federal Reserve), a $270.6 million decrease in average tax-exempt securities, and a $30.9 million decrease in average loans (of which approximately $1.7 billion related to PPP loans, as further discussed below).

The average yield on interest-earning assets increased 62 basis points from 2.58% during 2021 to 3.20% during 2022 while the average rate paid on interest-bearing liabilities increased 54 basis points from 0.10% in 2021 to 0.64% in 2022. The average taxable-equivalent yields on interest-earning assets and the average rate paid on interest-bearing liabilities were primarily impacted by the aforementioned changes in market interest rates and changes in the volume and relative mix of interest-earning assets and interest-bearing liabilities.

The average taxable-equivalent yield on loans increased 59 basis points from 4.05% during 2021 to 4.64% during 2022. The average taxable-equivalent yield on loans during 2022 was positively impacted by recent increases in market interest rates. The average taxable-equivalent yield on loans during 2021 was positively impacted by a higher average proportion of higher-yielding PPP loans to total loans compared to 2022. The average volume of loans decreased $30.9 million, or 0.2%, in 2022 compared to 2021. The average volume of loans during 2022 was impacted by decrease in the average volume of PPP loans. Excluding PPP loans, average loans would have increased $1.7 billion, or 11.3%, during 2022 compared to 2021. Loans made up approximately 34.7% of average interest-earning assets during 2022 compared to 38.8% during 2021.

During 2022 and 2021, we recognized $2.6 million and $97.3 million, respectively, in PPP loan related deferred processing fees (net of amortization of related deferred origination costs) as a yield adjustment and this amount is included in interest income on loans. As a result of the inclusion of these net fees in interest income, the average yields on PPP loans were 2.84% and 6.26% during 2022 and 2021, respectively, compared to the stated interest rate of 1.0% on these loans.

The average taxable-equivalent yield on securities was 2.95% during 2022, decreasing 34 basis points compared to 3.29% during 2021 and was negatively impacted by a decrease in the relative proportion of higher-yielding tax-exempt securities to total securities. The average yield on taxable securities was 2.16% during 2022 compared to 1.97% during 2021, increasing 19 basis points, while the average yield on tax exempt securities was 4.08% during 2022 compared to 4.06% during 2021, increasing 2 basis points. Tax exempt securities made up approximately 42.7% of total average securities during 2022, compared to 64.2% during 2021. The average volume of total securities increased $5.8 billion, or 45.4%, during 2022 compared to 2021. Securities made up approximately 38.7% of average interest-earning assets in 2022 compared to 29.8% in 2021. The increase during 2022 was primarily related to the investment of available funds (primarily from growth in customer deposits and reinvestment of amounts held in an interest-bearing account at the Federal Reserve) into taxable securities.

Average interest-bearing deposits (primarily amounts held by us in an interest-bearing account at the Federal Reserve), during 2022 decreased $746.8 million, or 5.5%, compared to 2021. Interest-bearing deposits made up approximately 26.5% of average interest-earning assets during 2022 compared to approximately 31.3% in 2021. The decrease during 2022 was primarily related to the reinvestment of amounts held in an interest-bearing account at the Federal Reserve into taxable securities. The average yield on interest-bearing deposits was 1.69% during 2022 and 0.13% during 2021. The average yields on interest-bearing deposits during 2022 was impacted by higher interest rates paid on reserves held at the Federal Reserve, compared to 2021.

Average federal funds sold and resell agreements during 2022 increased $22.3 million, or 150.5%, and $10.5 million, or 158.3%, respectively, compared to 2021. Federal funds sold and resell agreements were not a significant component of interest-earning assets during the comparable periods. The average yields on federal funds sold and resell agreements were 2.55% and 3.47%, respectively, during 2022 compared to 0.21% and 0.24%, respectively, during 2021. The average yields on federal funds sold and resell agreements were positively impacted by higher average market interest rates during 2022 compared to 2021.

The average rate paid on interest-bearing liabilities was 0.64% during 2022, increasing 54 basis points from 0.10% during 2021. Average deposits increased $6.1 billion, or 15.9%, in 2022 compared to 2021. Average interest-bearing deposits increased $4.6 billion in 2022 compared to 2021, while average non-interest-bearing deposits increased $1.5 billion in 2022 compared to 2021. The ratio of average interest-bearing deposits to total average deposits was 59.2% in 2022 compared to 56.7% in 2021. The average cost of deposits is primarily impacted by changes in market interest rates as well as changes in the volume and relative mix of interest-bearing deposits. The average rates paid on interest-bearing deposits and total deposits were 0.53% and 0.32%, respectively, in 2022 compared to 0.07% and 0.04%, respectively, in 2021. The average cost of deposits during 2022 was impacted by an increase in the interest rates we pay on most of our interest-bearing deposit products as a result of the aforementioned increase in market interest rates.

Our taxable-equivalent net interest spread, which represents the difference between the average rate earned on earning assets and the average rate paid on interest-bearing liabilities, was 2.56% in 2022 compared to 2.48% in 2021. The net interest spread, as well as the net interest margin, will be impacted by future changes in short-term and long-term interest rate levels, as well as the impact from the competitive environment. A discussion of the effects of changing interest rates on net interest income is set forth in Item 7A. Quantitative and Qualitative Disclosures About Market Risk elsewhere in this report.

Our hedging policies permit the use of various derivative financial instruments, including interest rate swaps, swaptions, caps and floors, to manage exposure to changes in interest rates. Details of our derivatives and hedging activities are set forth in Note 15 - Derivative Financial Instruments in the accompanying notes to consolidated financial statements elsewhere in this report. Information regarding the impact of fluctuations in interest rates on our derivative financial instruments is set forth in Item 7A. Quantitative and Qualitative Disclosures About Market Risk elsewhere in this report.

Credit Loss Expense

Credit loss expense is determined by management as the amount to be added to the allowance for credit loss accounts for various types of financial instruments including loans, securities and off-balance-sheet credit exposure after net charge-offs have been deducted to bring the allowance to a level which, in management's best estimate, is necessary to absorb expected credit losses over the lives of the respective financial instruments.

The components of credit loss expense were as follows.

	2022	2021	2020
Credit loss expense related to:			
Loans	$ (5,279)	$ (6,097)	$ 237,010
Off-balance-sheet credit exposures	8,279	6,162	4,275
Securities held to maturity	—	(2)	(55)
Total	$ 3,000	$ 63	$ 241,230

See the section captioned "Allowance for Credit Losses" elsewhere in this discussion for further analysis of credit loss expense related to loans and off-balance-sheet credit exposures.

Non-Interest Income

Total non-interest income for 2022 increased $18.1 million, or 4.7%, compared to 2021. Changes in the various components of non-interest income are discussed in more detail below.

Trust and Investment Management Fees. Trust and investment management fee income for 2022 increased $5.7 million, or 3.8%, compared to 2021. Investment management fees are the most significant component of trust and investment management fees, making up approximately 77.1% and 82.3% of total trust and investment management fees in 2022 and 2021, respectively. The increase in trust and investment management fees during 2022 was primarily due to increases in oil and gas fees (up $6.1 million), real estate fees (up $2.0 million) and estate fees (up $976 thousand) partly offset by a decrease in investment management fees (down $3.4 million). Oil and gas fees during 2022 were impacted by increases in oil and gas prices. The increases in real estate fees and estate fees were primarily related to increased transaction volumes and transaction fees. Investment management fees are generally based on the market value of assets within an account and are thus impacted by volatility in the equity and bond markets. The decrease in investment management fees during 2022 was primarily related to lower average equity valuations, in part related to the sharp decline in equity valuations during 2022.

At December 31, 2022, trust assets, including both managed assets and custody assets, were primarily composed of equity securities (40.2% of trust assets), fixed income securities (33.8% of trust assets), alternative investments (8.7% of assets) and cash equivalents (10.2% of trust assets). The estimated fair value of trust assets was $43.6 billion (including managed assets of $21.4 billion and custody assets of $22.2 billion) at December 31, 2022 compared to $43.3 billion (including managed assets of $19.1 billion and custody assets of $24.2 billion) at December 31, 2021.

Service Charges on Deposit Accounts. Service charges on deposit accounts for 2022 increased $8.6 million, or 10.3%, compared to 2021. The increase was primarily related to increases in overdraft charges on consumer and commercial accounts (up $5.3 million and $2.3 million, respectively) and consumer service charges (up $1.0 million).

Overdraft charges totaled $38.3 million ($29.2 million consumer and $9.1 million commercial) during 2022 compared to $30.7 million ($23.9 million consumer and $6.8 million commercial) during 2021. The increase in overdraft charges during 2022 was impacted by increases in the volume of fee assessed overdrafts relative to 2021, in part due to growth in the number of accounts. The increase in consumer service charges during 2022 was partly related to increases in overall deposit accounts and volumes.

In April 2021, we implemented a new overdraft grace feature for certain consumer demand deposit accounts whereby no fees would be assessed on overdrafts of $100 or less, subject to certain qualifying conditions such as a minimum direct deposit. This new feature reduced overdraft charges on consumer accounts by approximately $3.2 million during 2021. In June 2022, we expanded the overdraft grace feature first implemented in April 2021. This feature, which was previously only available to certain consumer demand deposit accounts, is now available to all of our consumer demand deposit accounts, regardless of direct deposit status. With this feature, no fees will be assessed on overdrafts of $100 or less. Additionally, we also eliminated fees on non-sufficient and returned items for all consumer deposit accounts. We expect these changes will impact revenue by as much as $3.5 million on an annual basis.

Insurance Commissions and Fees. Insurance commissions and fees for 2022 increased $1.7 million, or 3.2%, compared to 2021. The increase was the result of an increase in commission income (up $2.7 million) partly offset by a decrease in contingent income (down $1.0 million). The increase in commission income was primarily related to increases in commercial and, to a lesser extent, personal lines property and casualty commissions. These increases were related to increased business volumes and increased market rates. The increases in property and casualty commissions were partly offset by a decreases in life insurance commissions and benefit plan commissions. These decreases were primarily due to decreased business volumes. The decrease in benefit plan commissions was partly offset by the impact of an increase in market rates.

Contingent income totaled $3.5 million in 2022 and $4.5 million in 2021. Contingent income primarily consists of amounts received from various property and casualty insurance carriers related to the loss performance of insurance policies previously placed. These performance related contingent payments are seasonal in nature and are mostly received during the first quarter of each year. This performance related contingent income totaled $1.9 million in 2022 and $3.2 million in 2021. The decrease in performance related contingent income during 2022 was related to low growth within the portfolio and a deterioration in the loss performance of insurance policies previously placed. This deterioration was impacted by a severe weather event in Texas during the first quarter of 2021 that resulted in a significant increase in property and casualty claims and losses. Contingent income also includes amounts received from various benefit plan insurance companies related to the volume of business generated and/or the subsequent retention of such business. This benefit plan related contingent income totaled $1.6 million in 2022 and $1.3 million in 2021.

Interchange and Card Transaction Fees. Interchange fees, or "swipe" fees, are charges that merchants pay to us and other card-issuing banks for processing electronic payment transactions. Interchange and card transaction fees consist of income from check card usage, point of sale income from PIN-based debit card transactions and ATM service fees. Interchange and card transaction fees are reported net of related network costs.

Net revenues from interchange and card transaction fees for 2022 increased $770 thousand, or 4.4%, compared to 2021 primarily due to increased transaction volumes as well as the impact of new card products partly offset by an increase in network costs. A comparison of gross and net interchange and card transaction fees for the reported periods is presented in the table below.

	2022	2021	2020
Income from debit card transactions	$ 32,457	$ 29,122	$ 23,763
ATM service fees	3,313	3,298	3,342
Gross interchange and debit card transaction fees	35,770	32,420	27,105
Network costs	17,539	14,959	13,635
Net interchange and debit card transaction fees	$ 18,231	$ 17,461	$ 13,470

Federal Reserve rules applicable to financial institutions that have assets of $10 billion or more provide that the maximum permissible interchange fee for an electronic debit transaction is the sum of 21 cents per transaction and 5 basis points multiplied by the value of the transaction. An upward adjustment of no more than 1 cent to an issuer's debit card interchange fee is allowed if the card issuer develops and implements policies and procedures reasonably designed to achieve certain fraud-prevention standards. The Federal Reserve also has rules governing routing and exclusivity that require issuers to offer two unaffiliated networks for routing transactions on each debit or prepaid product.

Other Charges, Commissions and Fees. Other charges, commissions and fees for 2022 increased $4.8 million, or 12.9%, compared to 2021. The increase was primarily related to increases in income from the placement of money market accounts (up $4.0 million), merchant services rebates/bonuses (up $1.3 million) and letter of credit fees (up $1.1 million), among other things, partly offset by a decrease in income from the sale of mutual funds (down $1.7 million), among other things.

Net Gain/Loss on Securities Transactions. There were no sales of securities during 2022. During 2021, we sold certain available-for-sale securities with amortized costs totaling $2.0 billion and realized a net gain of $69 thousand. These sales were primarily related to securities purchased during 2021 and subsequently sold in connection with our tax planning strategies related to the Texas franchise tax. The gross proceeds from the sales of these securities outside of Texas are included in total revenues/receipts from all sources reported for Texas franchise tax purposes, which results in a reduction in the overall percentage of revenues/receipts apportioned to Texas and subjected to taxation under the Texas franchise tax.

Other Non-Interest Income. Other non-interest income for 2022 decreased $3.3 million, or 6.8%, compared to 2021. The decrease was primarily related to a decrease in gains on the sale/exchange of assets (down $11.7 million) and, to a lesser extent, a decrease in income from customer derivative and securities trading transactions (down $2.3 million), among other things. These items were partly offset by increases in sundry and other miscellaneous income (up $9.2 million), public finance underwriting fees (up $1.7 million) and income from customer foreign exchange transactions (up $1.4 million), among other things. Gains on the sale/exchange of assets in 2021 included $9.7 million related to an exchange of a branch facility and $1.8 million related to the sale of certain parking lots in downtown San Antonio. The decrease in income from customer derivative transactions was primarily due to a decrease in transaction volume. Sundry income during 2022 included $6.3 million in card related incentives/rebates, $5.1 million related to a partnership interest and $1.4 million related to the recovery of prior write-offs, among other things, while sundry and other miscellaneous income during 2021 included $3.4 million in card related incentives/rebates and $519 thousand in recoveries of prior write-offs, among other things. The increases in public finance underwriting fees and income from customer foreign exchange transactions were primarily related to increases in transaction volumes.

Non-Interest Expense

Total non-interest expense for 2022 increased $142.3 million, or 16.1%, compared to 2021. Changes in the various components of non-interest expense are discussed below.

Salaries and Wages. Salaries and wages increased $96.6 million, or 24.4%, in 2022 compared to 2021. The increase in salaries and wages was primarily related to increases in salaries due to annual merit and market increases as well as the implementation of a $20 per hour minimum wage in December, 2021. We are also experiencing a competitive labor market which has resulted in and could continue to result in an increase in our staffing costs. Salaries and wages were also impacted by an increase in the number of employees, increases in incentive and stock-based compensation and commissions and a decrease in salary costs deferred in connection with loan originations as the first quarter of 2021 was impacted by the high volume of PPP loan originations. The increase in the number of employees was partly related to our investments in organic expansion in the Houston and Dallas markets as well as preparations for our mortgage loan product offering.

Employee Benefits. Employee benefits expense for 2022 increased $6.6 million, or 8.0%, compared to 2021. The increase was primarily related to increases in payroll taxes, medical benefits expense, 401(k) plan expense and other employee benefits, among other things, partly offset by an increase in the net periodic benefits related to our defined benefit retirement plan. Employee benefits expense was impacted by the aforementioned higher salary costs and increase in the number of employees.

Our defined benefit retirement and restoration plans were frozen in 2001 which has helped to reduce the volatility in retirement plan expense. We nonetheless still have funding obligations related to these plans and could recognize additional expense related to these plans in future years, which would be dependent on the return earned on plan assets, the level of interest rates and employee turnover. See Note 12 - Defined Benefit Plans for additional information related to our net periodic pension benefit/cost.

Net Occupancy. Net occupancy expense for 2022 increased $5.2 million, or 4.8%, compared to 2021. The increase was primarily related to increases in repairs and maintenance/service contracts expense (up $2.0 million), lease expense (up $1.8 million), depreciation on buildings and leasehold improvements (together up $1.3 million) and insurance expense (up $609 thousand), among other things, partly offset by a decrease in property taxes (down

$1.6 million). The increases in the aforementioned components of net occupancy expense were driven, in part, by our expansion within the Houston and Dallas market areas.

Technology, Furniture and Equipment. Technology, furniture and equipment expense for 2022 increased $8.0 million, or 7.1%, compared to 2021. The increase was primarily related to increases in cloud services expense (up $3.9 million), service contracts expense (up $1.4 million), software maintenance (up $1.3 million) and depreciation of furniture and equipment (up $989 thousand), among other things.

Deposit Insurance. Deposit insurance expense totaled $15.6 million in 2022 compared to $12.2 million in 2021. The increase was primarily related to an increase in total assets. In October 2022, the Federal Deposit Insurance Corporation adopted a final rule to increase the initial base deposit insurance assessment rate schedules uniformly by 2 basis points beginning with the first quarterly assessment period of 2023.

Other Non-Interest Expense. Other non-interest expense for 2022 increased $22.8 million, or 13.3%, compared to 2021. The increase included increases in professional services expense (up $6.2 million); advertising/promotions expense (up $5.5 million); travel, meals and entertainment (up $5.4 million); fraud losses (up $5.0 million); business development expense (up $1.3 million); sundry and other miscellaneous expense (up $1.1 million); and stationery, printing and supplies expense (up $1.0 million), among other things. Other non-interest expense during 2022 was also impacted by a decrease in costs deferred as loan origination costs (down $1.3 million) as the first quarter of 2021 was impacted by a large volume of PPP loan originations. The impact of the aforementioned items was partly offset by a decrease in donations expense (down $9.0 million), which was impacted by $8.8 million in contributions to the Frost Charitable Foundation during 2021, among other things. Sundry and other miscellaneous expense in 2022 included accruals totaling $5.9 million, which included $4.0 million related to a license negotiation and $1.9 million related to other matters. Sundry and other miscellaneous expense in 2021 included $4.7 million related to the write-off of certain assets.

Results of Segment Operations

We are managed under a matrix organizational structure whereby our two primary operating segments, Banking and Frost Wealth Advisors, overlap a regional reporting structure. A third operating segment, Non-Banks, is for the most part the parent holding company, as well as certain other insignificant non-bank subsidiaries of the parent that, for the most part, have little or no activity. A description of each business and the methodologies used to measure financial performance is described in Note 18 - Operating Segments in the accompanying notes to consolidated financial statements elsewhere in this report. Net income (loss) by operating segment is presented below:

Banking

Net income for 2022 increased $136.5 million, or 32.9%, compared to 2021. The increase was primarily the result of a $305.6 million increase in net interest income and a $10.2 million increase in non-interest income partly offset by a $132.7 million increase in non-interest expense, a $43.6 million increase in income tax expense and a $2.9 million increase in credit loss expense.

Net interest income for 2022 increased $305.6 million, or 30.9%, compared to 2021. The increase was primarily related to an increase in the average yield on interest-bearing deposits (primarily amounts held in an interest-bearing account at the Federal Reserve); an increase in the average volume of, and to a lesser extent, an increase in the yield on taxable securities; an increase in the average yield on loans; and an increase in the average volume of, and to a lesser extent, an increase in the average taxable-equivalent yield on tax-exempt securities. The impact of these items was partly offset by an increase in the average cost of interest-bearing deposit accounts (primarily money market deposit accounts) and an increase in the average cost of repurchase agreements, among other things. See the analysis of net interest income included in the section captioned “Net Interest Income” elsewhere in this discussion.

Credit loss expense for 2022 totaled $3.0 million compared to $54 thousand in 2021. See the sections captioned “Credit Loss Expense” and “Allowance for Credit Losses” elsewhere in this discussion for further analysis of credit loss expense related to loans and off-balance-sheet commitments.

Non-interest income for 2022 increased $10.2 million, or 4.6%, compared to 2021. The increase was primarily related to increases in service charges on deposit accounts; other charges commission and fees; and insurance commissions and fees partly offset by a decrease in other non-interest income. The increase in service charges on deposit accounts was primarily related to increases in overdraft charges on consumer and commercial accounts and consumer service charges. The increase in overdraft charges during 2022 was impacted by increases in the volume

of fee assessed overdrafts relative to 2021, in part due to growth in the number of accounts. The increase in consumer service charges during 2022 was partly related to increases in overall deposit accounts and volumes. The increase in other charges commission and fees was primarily related to increases in merchant services rebates/ bonuses and letter of credit fees, among other things. The increase in insurance commissions and fees was the result of an increase in commission income partly offset by a decrease in contingent income which is further discussed below in relation to Frost Insurance Agency. The decrease in other non-interest income was primarily related to a decrease gains on the sale/exchange of assets and, to a lesser extent, a decrease in income from customer derivative and securities trading transactions, among other things. These items were partly offset by increases in sundry and other miscellaneous income; public finance underwriting fees; and income from customer foreign exchange transactions, among other things. Gains on the sale/exchange of assets in 2021 included $9.7 million related to an exchange of a branch facility and $1.8 million related to the sale of certain parking lots in downtown San Antonio. Sundry and other miscellaneous income during 2022 included $6.3 million in card related incentives/rebates, $5.1 million related to a partnership interest, $1.4 million related to the recovery of prior write-offs and $458 thousand related to a contract fee, among other things, while sundry and other miscellaneous income during 2021 included $3.4 million in card related incentives/rebates and $519 thousand in recoveries of prior write-offs, among other things. The fluctuations in income from public finance underwriting fees; customer derivative and securities trading transactions and customer foreign exchange transactions were primarily related to fluctuations in transaction volumes. See the analysis of these categories of non-interest income included in the section captioned "Non-Interest Income" included elsewhere in this discussion.

Non-interest expense for 2022 increased $132.7 million, or 17.6%, compared to 2021. The increase was primarily due to increases in salaries and wages; other non-interest expense; technology, furniture and equipment expense; employee benefit expense; net occupancy expense and deposit insurance expense. The increase in salaries and wages was primarily related to an increase in in salaries due to annual merit and market increases as well as the implementation of a $20 per hour minimum wage in December, 2021. Salaries and wages were also impacted by an increase in the number of employees, increases in incentive and stock-based compensation and commissions and a decrease in salary costs deferred in connection with loan originations as the first quarter of 2021 was impacted by the high volume of PPP loan originations. The increase in other non-interest expense was primarily due to increases in professional services expense; advertising/promotions expense; travel, meals and entertainment; fraud losses; business development expense; sundry and other miscellaneous expense; and stationery, printing and supplies expense, among other things. Other non-interest expense during 2022 was also impacted by a decrease in costs deferred as loan origination costs as the first quarter of 2021 was impacted by a large volume of PPP loan originations. The impact of the aforementioned items was partly offset by a decrease in donations expense, which was impacted by $8.8 million in contributions to the Frost Charitable Foundation during 2021, among other things. The increase in technology, furniture and equipment expense was primarily related to increases in cloud services expense, service contracts expense, software maintenance and depreciation of furniture and equipment, among other things. The increase in employee benefit expense was primarily related to increases in payroll taxes, medical benefits expense, 401(k) plan expense and other employee benefits, among other things, partly offset by an increase in the net periodic benefits related to our defined benefit retirement plan. The increase in net occupancy expense was increases in repairs and maintenance/service contracts expense, lease expense, depreciation on buildings and leasehold improvements and insurance expense, among other things, partly offset by a decrease in property taxes. The increases in the aforementioned components of net occupancy expense were impacted, in part, by our expansion within the Houston and Dallas market areas. The increase in deposit insurance was primarily related to an increase in total assets. See the analysis of these categories of non-interest expense included in the section captioned "Non-Interest Expense" included elsewhere in this discussion.

Income tax expense for 2022 increased $43.6 million, or 105.2%, compared to 2021. See the section captioned "Income Taxes" elsewhere in this discussion.

Frost Insurance Agency, which is included in the Banking operating segment, had gross commission revenues of $54.2 million during 2022 compared to $52.5 million during 2021. The increase in gross commission revenues was the result of an increase in commission income partly offset by a decrease in contingent income. The increase in gross commission income was primarily related to increases in commercial and, to a lesser extent, personal lines property and casualty commissions, due to increases in business volumes and market rates. The increases in property and casualty commissions were partly offset by decreases in life insurance commissions and benefit plan commissions, primarily due to decreased business volume. The decrease in contingent income was primarily related to a decrease in performance related contingent payments due to low growth within the portfolio and a deterioration

in the loss performance of insurance policies previously placed. This decrease was partly offset by an increase in contingent commissions received from various benefit plan insurance companies. See the analysis of insurance commissions and fees included in the section captioned “Non-Interest Income” included elsewhere in this discussion.

Frost Wealth Advisors

Net income for 2022 increased $1.5 million, or 4.1%, compared to 2021. The increase was primarily due to an $8.4 million increase in non-interest income and a $2.5 million increase in net interest income partly offset by a $9.0 million increase in non-interest expense and a $401 thousand increase in income tax expense.

Net interest income for 2022 increased $2.5 million, or 117.3%, compared to 2021. This increase was primarily due to an increase in the average volume of funds provided by Frost Wealth Advisors and an increase in the average funds transfer price allocated to such funds. See the analysis of net interest income included in the section captioned “Net Interest Income” included elsewhere in this discussion.

Non-interest income for 2022 increased $8.4 million, or 5.0%, compared to 2021. The increase was primarily related to increases in trust and investment management fees; other charges, commissions and fees; and other non-interest income. Trust and investment management fee income is the most significant income component for Frost Wealth Advisors. Investment management fees are the most significant component of trust and investment management fees, making up approximately 77.1% and 82.3% of total trust and investment management fees for 2022 and 2021, respectively. The increase in trust and investment management fees was primarily due to increases in oil and gas fees, real estate fees and estate fees partly offset by a decrease in investment management fees. Oil and gas fees during 2022 were impacted by increases in oil and gas prices. The increases in real estate fees and estate fees were primarily related to increased transaction volumes and transaction fees. The decrease in investment management fees during 2022 was primarily related to lower average equity valuations, in part related to the sharp decline in equity valuations during 2022. The increase in other charges, commissions and fees was primarily related to an increase in income from the placement of money market accounts, among other things, partly offset by a decrease in income from the sale of mutual funds, among other things. The increase in other non-interest income was primarily related to an increase in income from customer securities trading transactions partly offset by a decrease in sundry and other miscellaneous income. See the analysis of trust and investment management fees and other charges, commissions and fees included in the section captioned “Non-Interest Income” included elsewhere in this discussion.

Non-interest expense for 2022 increased $9.0 million, or 7.3%, compared to 2021. The increase was primarily due to increases in salaries and wages and other non-interest expense, and to a lesser extent, increase in employee benefit expense and technology, furniture and equipment expense. The increase in salaries and wages was primarily due to increases in salaries, due to annual merit and market increases, as well as increases in commissions and incentive compensation. The increase in other non-interest expense was primarily due to an increase in sundry and other miscellaneous expense, which was primarily due to the write-off of certain assets; research and platform fees; and travel, meals and entertainment; among other things. The increase in employee benefits was primarily due to increases in 401(k) plan expense, medical expense and payroll taxes. The increase in technology, furniture and equipment expense was primarily due to an increase in cloud service expense.

Non-Banks

The Non-Banks operating segment had a net loss of $11.0 million for 2022 compared to a net loss of $9.0 million in 2021. The increased net loss was primarily due to an increase in net interest expense, a decrease in other non-interest income and an increase in other non-interest expense partly offset by an increase in income tax benefit. The increase in net interest expense was primarily related to an increase in the average rate paid on our long-term borrowings partly offset by the impact of the redemption, during the fourth quarter of 2021, of $13.4 million of junior subordinated deferrable interest debentures issued to WNB Capital Trust I. The decrease in other non-interest income was primarily due to a decrease in mineral interest income as the related mineral interest assets were donated to the Frost Charitable Foundation during the third quarter of 2021. The increase in other non-interest expense was primarily due to an increase in travel, meals and entertainment expense, among other things.

Income Taxes

We recognized income tax expense of $89.7 million, for an effective tax rate of 13.4%, in 2022 compared to $46.5 million, for an effective tax rate of 9.5%, in 2021. The effective income tax rates differed from the U.S. statutory federal income tax rate of 21% during 2022 and 2021 primarily due to the effect of tax-exempt income from loans, securities and life insurance policies and the income tax effects associated with stock-based compensation, among other things, and their relative proportion to total pre-tax net income. The increase in the effective tax rate during 2022 was primarily related to an increase in pre-tax net income, and, to a lesser extent, a decrease in discrete tax benefits associated with stock-based compensation. See Note 13 - Income Taxes in the accompanying notes to consolidated financial statements elsewhere in this report.

Sources and Uses of Funds

The following table illustrates, during the years presented, the mix of our funding sources and the assets in which those funds are invested as a percentage of our average total assets for the period indicated. Average assets totaled $51.5 billion in 2022 compared to $46.0 billion in 2021.

	2022	2021	2020
Sources of Funds:			
Deposits:			
Non-interest-bearing	35.3 %	36.2 %	35.7 %
Interest-bearing	51.2	47.4	47.1
Federal funds purchased	0.1	0.1	0.1
Repurchase agreements	4.5	4.6	3.8
Long-term debt and other borrowings	0.4	0.5	0.9
Other non-interest-bearing liabilities	1.6	1.7	1.8
Equity capital	6.9	9.5	10.6
Total	100.0 %	100.0 %	100.0 %
Uses of Funds:			
Loans	32.5 %	36.5 %	45.2 %
Securities	36.3	28.0	33.4
Interest-bearing deposits	24.8	29.4	14.0
Federal funds sold	0.1	—	0.2
Resell agreements	—	—	0.1
Other non-interest-earning assets	6.3	6.1	7.1
Total	100.0 %	100.0 %	100.0 %

Deposits continue to be our primary source of funding. Average deposits increased $6.1 billion, or 15.9%, in 2022 compared to 2021. Non-interest-bearing deposits remain a significant source of funding, which has been a key factor in maintaining our relatively low cost of funds. Average non-interest-bearing deposits totaled 40.8% of total average deposits in 2022 compared to 43.3% in 2021.

We primarily invest funds in loans, securities and interest-bearing deposits (primarily amounts held by us in an interest-bearing account at the Federal Reserve). Average loans decreased $30.9 million, or 0.2%, (increased $1.7 billion, or 11.3% excluding PPP loans) in 2022 compared to 2021 while average securities increased $5.8 billion, or 45.4%, in 2022 compared to 2021. Average interest-bearing deposits (primarily amounts held by us in an interest-bearing account at the Federal Reserve) decreased $746.8 million, or 5.5%, in 2022 compared to 2021, primarily related to the reinvestment of a portion of these funds into taxable securities.

Loans

Overview. Details of our loan portfolio are presented in Note 3 - Loans in the accompanying notes to consolidated financial statements included elsewhere in this report. Year-end total loans increased $818.6 million, or 5.0%, during 2022 compared to 2021 ($1.2 billion, or 7.6% excluding PPP loans). The majority of our loan portfolio is comprised of commercial and industrial loans, energy loans and real estate loans. Commercial and industrial loans made up 33.1% and 32.9% (33.1% and 33.7% excluding PPP loans) of total loans at December 31, 2022 and 2021 while energy loans made up 5.4% and 6.6% (5.4% and 6.8% excluding PPP loans) of total loans at both December 31, 2022 and 2021 and real estate loans made up 58.4% and 55.0% (58.6% and 56.5% excluding PPP loans) of total loans at December 31, 2022 and 2021. Energy loans include commercial and industrial loans, leases and real estate

loans to borrowers in the energy industry. Real estate loans include both commercial and consumer balances.

Loan Origination/Risk Management. We have certain lending policies and procedures in place that are designed to maximize loan income within an acceptable level of risk. Management reviews and approves these policies and procedures on a regular basis. A reporting system supplements the review process by providing management with frequent reports related to loan production, loan quality, concentrations of credit, loan delinquencies and non-performing and potential problem loans. Diversification in the loan portfolio is a means of managing risk associated with fluctuations in economic conditions. We have begun to explore the credit and reputational risks associated with climate change and their potential impact on the foregoing and are also closely monitoring regulatory developments on climate risk. This includes, among other things, researching and developing a formalized approach to considering climate change related risks in our underwriting processes. This approach will be impacted, in part, by the accessibility and reliability of both customer climate risk data and climate risk data in general. One of the objectives of these efforts is to enable us to better understand the climate change related risks associated with our customers' business activities and to be able to monitor their response to those risks and their ultimate impact on our customers.

Commercial and industrial loans are underwritten after evaluating and understanding the borrower's ability to operate profitably and prudently expand its business. Underwriting standards are designed to promote relationship banking rather than transactional banking. Once it is determined that the borrower's management possesses sound ethics and solid business acumen, our management examines current and projected cash flows to determine the ability of the borrower to repay their obligations as agreed. Commercial and industrial loans are primarily made based on the identified cash flows of the borrower and secondarily on the underlying collateral provided by the borrower. The cash flows of borrowers, however, may not be as expected and the collateral securing these loans may fluctuate in value. Most commercial and industrial loans are secured by the assets being financed or other business assets such as accounts receivable or inventory and may incorporate a personal guarantee; however, some short-term loans may be made on an unsecured basis. In the case of loans secured by accounts receivable, the availability of funds for the repayment of these loans may be substantially dependent on the ability of the borrower to collect amounts due from its customers.

Our energy loan portfolio includes loans for production, energy services and other energy loans, which includes private clients, transportation and equipment providers, manufacturers, refiners and traders. The origination process for energy loans is similar to that of commercial and industrial loans. Because, however, of the average loan size, the significance of the portfolio and the specialized nature of the energy industry, our energy lending requires a highly prescriptive underwriting policy. Production loans are secured by proven, developed and producing reserves. Loan proceeds for these types of loans are typically used for the development and drilling of additional wells, the acquisition of additional production, and/or the acquisition of additional properties to be developed and drilled. Our customers in this sector are generally large, independent, private owner-producers or large corporate producers. These borrowers typically have large capital requirements for drilling and acquisitions, and as such, loans in this portfolio are generally greater than $10 million. Production loans are collateralized by the oil and gas interests of the borrower. Collateral values are determined by the risk-adjusted and limited discounted future net revenue of the reserves. Our valuations take into consideration geographic and reservoir differentials as well as cost structures associated with each borrower. Collateral value is calculated at least semi-annually using third-party engineer-prepared reserve studies. These reserve studies are conducted using a discount factor and base case assumptions for the current and future value of oil and gas. To qualify as collateral, typically reserves must be proven, developed and producing. For certain borrowers, collateral may include up to 20% proven, non-producing reserves. Loan commitments are limited to 65% of estimated reserve value. Cash flows must be sufficient to amortize the loan commitment within 120% of the half-life of the underlying reserves. Loan commitments generally must also be 100% covered by the risk-adjusted and limited discounted future net revenue of the reserves when stressed at 75% of our base case price assumptions. In addition, the ratio of the borrower's debt to earnings before interest, taxes, depreciation and amortization ("EBITDA") should generally not exceed 350%. We generally require production borrowers to maintain an active hedging program to manage risk and to have at least 50% of their production hedged for two years.

Oil and gas service, transportation, and equipment providers are economically aligned due to their reliance on drilling and active oil and gas development. Income for these borrowers is highly dependent on the level of drilling activity and rig utilization, both of which are driven by the current and future outlook for the price of oil and gas. We mitigate the credit risk in this sector through conservative concentration limits and guidelines on the profile of eligible borrowers. Guidelines require that the companies have extensive experience through several industry cycles, and that they be supported by financially competent and committed guarantors who provide a significant secondary source of repayment. Borrowers in this sector are typically privately-owned, middle-market companies with annual

sales of less than $100 million. The services provided by companies in this sector are highly diversified, and include down-hole testing and maintenance, providing and threading drilling pipe, hydraulic fracturing services or equipment, seismic testing and equipment and other direct or indirect providers to the oil and gas production sector.

We also have a small portfolio of loans to energy trading companies that serve as intermediaries that buy and sell oil, gas, other petrochemicals, and ethanol. These companies are not dependent on drilling or development. As a general policy, we do not lend to energy traders; however, we have made an exception to this policy for certain customers based upon their underlying business models which minimize risk as commodities are bought only to fill existing orders (back-to-back trading). As such, the commodity price risk and sale risk are eliminated.

PPP loans, which were originated in 2020 and early 2021, are loans to qualified small businesses under the PPP administered by the SBA under the provisions of the CARES Act. Loans covered by the PPP may be eligible for loan forgiveness for certain costs incurred related to payroll, group health care benefit costs and qualifying mortgage, rent and utility payments. The remaining loan balance after forgiveness of any amounts is still fully guaranteed by the SBA. Terms of the PPP loans include the following (i) maximum amount limited to the lesser of $10 million or an amount calculated using a payroll-based formula, (ii) maximum loan term of five years, (iii) interest rate of 1.00%, (iv) no collateral or personal guarantees are required, (v) no payments are required until the date on which the forgiveness amount relating to the loan is remitted to the lender and (vi) loan forgiveness up to the full principal amount of the loan and any accrued interest, subject to certain requirements including that no more than 40% of the loan forgiveness amount may be attributable to non-payroll costs. In return for processing and booking a PPP loan, the SBA paid lenders a processing fee tiered by the size of the loan (5% for loans of not more than $350 thousand; 3% for loans of more than $350 thousand and less than $2 million; and 1% for loans of at least $2 million).

Commercial real estate loans are subject to underwriting standards and processes similar to commercial and industrial loans, in addition to those of real estate loans. These loans are viewed primarily as cash flow loans and secondarily as loans secured by real estate. Commercial real estate lending typically involves higher loan principal amounts and the repayment of these loans is generally largely dependent on the successful operation of the property securing the loan or the business conducted on the property securing the loan. Commercial real estate loans may be more adversely affected by conditions in the real estate markets or in the general economy. The properties securing our commercial real estate portfolio are diverse in terms of type and geographic location. This diversity helps reduce our exposure to adverse economic events that affect any single market or industry. Management monitors and evaluates commercial real estate loans based on collateral, geography and risk grade criteria. As a general rule, we avoid financing single-purpose projects unless other underwriting factors are present to help mitigate risk. We also utilize third-party experts to provide insight and guidance about economic conditions and trends affecting market areas we serve. In addition, management tracks the level of owner-occupied commercial real estate loans versus non-owner occupied loans. At December 31, 2022, approximately 49.6% of the outstanding principal balance of our commercial real estate loans were secured by owner-occupied properties.

With respect to loans to developers and builders that are secured by non-owner occupied properties that we may originate from time to time, we generally require the borrower to have had an existing relationship with us and have a proven record of success. Construction loans are underwritten utilizing feasibility studies, independent appraisal reviews, sensitivity analysis of absorption and lease rates and financial analysis of the developers and property owners. Construction loans are generally based upon estimates of costs and value associated with the completed project. These estimates may be inaccurate. Construction loans often involve the disbursement of substantial funds with repayment substantially dependent on the success of the ultimate project. Sources of repayment for these types of loans may be pre-committed permanent loans from approved long-term lenders, sales of developed property or an interim loan commitment from us until permanent financing is obtained. These loans are closely monitored by on-site inspections and are considered to have higher risks than other real estate loans due to their ultimate repayment being sensitive to interest rate changes, governmental regulation of real property, general economic conditions and the availability of long-term financing.

We originate consumer loans utilizing a credit scoring analysis to supplement the underwriting process. To monitor and manage consumer loan risk, policies and procedures are developed and modified, as needed, jointly by line and staff personnel. This activity, coupled with relatively small loan amounts that are spread across many individual borrowers, minimizes risk. Additionally, trend and outlook reports are reviewed by management on a regular basis. Underwriting standards for home equity loans are heavily influenced by statutory requirements, which include, but are not limited to, loan-to-value limitations, collection remedies, the number of such loans a borrower can have at one time and documentation requirements.

We maintain an independent loan review department that reviews and validates the credit risk program on a periodic basis. Results of these reviews are presented to management and the appropriate committees of our board of directors. The loan review process complements and reinforces the risk identification and assessment decisions made by lenders and credit personnel, as well as our policies and procedures.

Commercial and Industrial. Commercial and industrial loans increased $309.8 million, or 5.8%, during 2022 compared to 2021. Our commercial and industrial loans are a diverse group of loans to small, medium and large businesses. The purpose of these loans varies from supporting seasonal working capital needs to term financing of equipment. While some short-term loans may be made on an unsecured basis, most are secured by the assets being financed with collateral margins that are consistent with our loan policy guidelines. The commercial and industrial loan portfolio also includes the commercial lease and purchased shared national credits.

Energy. Energy loans include loans to entities and individuals that are engaged in various energy-related activities including (i) the development and production of oil or natural gas, (ii) providing oil and gas field servicing, (iii) providing energy-related transportation services (iv) providing equipment to support oil and gas drilling (v) refining petrochemicals, or (vi) trading oil, gas and related commodities. Energy loans decreased $152.1 million, or 14.1%, during 2022 compared to 2021. The average loan size, the significance of the portfolio and the specialized nature of the energy industry requires a highly prescriptive underwriting policy. Exceptions to this policy are rarely granted. Due to the large borrowing requirements of this customer base, the energy loan portfolio includes participations and purchased shared national credits.

Paycheck Protection Program. PPP loans include loans to businesses and other entities that would otherwise be reported as commercial and industrial loans and, to a lesser extent, energy loans, originated under the guidelines discussed above. We funded approximately $1.4 billion and $3.3 billion of SBA-approved PPP loans during 2021 and 2020, respectively. During 2022 and 2021, we recognized approximately $2.6 million and $97.3 million in PPP loan related deferred processing fees (net of amortization of related deferred origination costs), respectively, as yield adjustments and these amounts are included in interest income on loans. As a result of the inclusion of these net fees in interest income, the average yields on PPP loans were 2.84% during 2022 and 6.26% during 2021, compared to the stated interest rate of 1.0% on these loans.

Industry Concentrations. As of December 31, 2022 and 2021, there were no concentrations of loans related to any single industry, as segregated by Standard Industrial Classification code (“SIC code”), in excess of 10% of total loans. The SIC code system is a federally designed standard industrial numbering system used by us to categorize loans by the borrower’s type of business. The following table summarizes the industry concentrations of our loan portfolio, as segregated by SIC code, stated as a percentage of year-end total loans as of December 31, 2022 and 2021.

	2022	2021
Industry Concentrations		
Energy	5.4 %	6.6 %
Automobile dealers	5.4	4.1
Public finance	4.6	4.9
Medical services	3.9	3.7
Building materials and contractors	3.8	3.7
General and specific trade contractors	3.6	3.2
Manufacturing, other	3.4	2.8
Investor	2.8	2.7
Services	2.3	2.4
Religion	1.8	2.0
Paycheck Protection Program	0.2	2.6
All other	62.8	61.3
Total loans	100.0 %	100.0 %

Large Credit Relationships. The market areas served by us include three of the top ten most populated cities in the United States. These market areas are also home to a significant number of Fortune 500 companies. As a result, we originate and maintain large credit relationships with numerous commercial customers in the ordinary course of business. We consider large credit relationships to be those with commitments equal to or in excess of $50.0 million, excluding treasury management lines exposure, prior to any portion being sold. Large relationships also include loan participations purchased if the credit relationship with the agent is equal to or in excess of $50.0 million. In addition to our normal policies and procedures related to the origination of large credits, one of our Regional Credit Committees must approve all new credit facilities and renewals of such credit facilities with exposures between $20.0 million and $30.0 million. Our Central Credit Committee must approve all new credit facilities which are part of large credit relationships and renewals of such credit facilities with exposures that exceed $30.0 million. The Regional and Central Credit Committees meet regularly to review large credit relationship activity and discuss the current pipeline, among other things.

The following table provides additional information on our large credit relationships with committed amounts in excess of $50.0 million as of year-end.

	2022			2021		
	Number of Relationships	Period-End Balances		Number of Relationships	Period-End Balances	
		Committed	Outstanding		Committed	Outstanding
Amount outstanding	103	$ 9,710,866	$ 5,030,717	87	$ 7,578,271	$ 4,300,304
Average		94,280	48,842		87,107	49,429

Purchased Shared National Credits ("SNCs"). Purchased SNCs are participations purchased from upstream financial organizations and tend to be larger in size than our originated portfolio. Our purchased SNC portfolio totaled $790.5 million at December 31, 2022 increasing $92.1 million, or 13.2%, from $698.4 million at December 31, 2021. At December 31, 2022, 32.8% of outstanding purchased SNCs were related to the construction industry, 22.7% were related to the energy industry, 11.9% were related to the financial services industry and 11.4% were related to the real estate management industry. The remaining purchased SNCs were diversified throughout various other industries, with no other single industry exceeding 10% of the total purchased SNC portfolio. Additionally, almost all of the outstanding balance of purchased SNCs was included in the energy and commercial and industrial portfolios, with the remainder included in the real estate categories. SNC participations are originated in the normal course of business to meet the needs of our customers. As a matter of policy, we generally only participate in SNCs for companies headquartered in or which have significant operations within our market areas. In addition, we must have direct access to the company's management, an existing banking relationship or the expectation of broadening the relationship with other banking products and services within the following 12 to 24 months. SNCs are reviewed at least quarterly for credit quality and business development successes.

The following table provides additional information about certain credits within our purchased SNCs portfolio with committed amounts in excess of $50.0 million as of year-end.

	2022			2021		
	Number of Relationships	Period-End Balances		Number of Relationships	Period-End Balances	
		Committed	Outstanding		Committed	Outstanding
Amount outstanding	13	$ 855,331	$ 354,097	10	$ 630,575	$ 224,939
Average		65,795	27,238		63,058	22,494

Real Estate Loans. Real estate loans increased $1.0 billion, or 11.6%, during 2022 compared to 2021. Real estate loans include both commercial and consumer balances. Commercial real estate loans totaled $8.2 billion, or 81.6% of total real estate loans, at December 31, 2022 and $7.6 billion, or 84.3% of total real estate loans, at December 31, 2021. The majority of this portfolio consists of commercial real estate mortgages, which includes both permanent and intermediate term loans. Loans secured by owner-occupied properties make up a significant portion of our commercial real estate portfolio. These loans are viewed primarily as cash flow loans and secondarily as loans secured by real estate. Consequently, these loans must undergo the analysis and underwriting process of a commercial and industrial loan, as well as that of a real estate loan.

The following tables summarize our commercial real estate loan portfolio, including commercial real estate loans reported as a component of our energy loan portfolio segment, as segregated by (i) the type of property securing the credit and (ii) the geographic region in which the loans were originated. Property type concentrations are stated as a percentage of year-end total commercial real estate loans as of December 31, 2022 and 2021:

	2022	2021
Property type:		
Office building	22.4 %	24.0 %
Office/warehouse	19.1	18.4
Retail	11.2	10.2
Multifamily	6.5	6.6
Dealerships	6.3	5.1
Medical offices and services	4.2	3.7
1-4 family construction	4.1	3.7
Non-farm/non-residential	3.9	4.8
Hotel	3.3	3.8
Religious	3.0	3.3
Raw land	2.4	2.2
Land in development	2.1	1.6
Land developed	2.0	1.6
Restaurant	1.9	2.0
Strip centers	1.5	2.3
All other	6.1	6.7
Total commercial real estate loans	100.0 %	100.0 %

	2022	2021
Geographic region:		
San Antonio	25.7 %	26.6 %
Houston	24.9	23.5
Dallas	16.0	15.6
Fort Worth	14.4	16.4
Austin	12.4	11.0
Rio Grande Valley	3.0	3.1
Permian Basin	1.9	1.8
Corpus Christi	1.7	2.0
Total commercial real estate loans	100.0 %	100.0 %

Consumer Loans. The consumer loan portfolio at December 31, 2022 increased $448.1 million, or 23.7%, from December 31, 2021. As the following table illustrates, the consumer loan portfolio has two distinct segments, including consumer real estate and consumer and other.

	2022	2021
Consumer real estate:		
Home equity lines of credit	$ 691,841	$ 519,098
Home equity loans	449,507	324,157
Home improvement	577,377	428,069
Other	124,814	139,466
Total consumer real estate	1,843,539	1,410,790
Consumer and other	492,726	477,369
Total consumer loans	$ 2,336,265	$ 1,888,159

Consumer real estate loans at December 31, 2022 increased $432.7 million, or 30.7%, from December 31, 2021. Combined, home equity loans and lines of credit made up 61.9% and 59.8% of the consumer real estate loan total at December 31, 2022 and 2021, respectively. We offer home equity loans up to 80% of the estimated value of the personal residence of the borrower, less the value of existing mortgages and home improvement loans. We have not generally originated 1-4 family mortgage loans since 2000; however, from time to time, we invested in such loans to

meet the needs of our customers or for other regulatory compliance purposes. Nonetheless, we expect to begin regular production of 1-4 family mortgage loans for portfolio investment purposes in 2023. The consumer and other loan portfolio at December 31, 2022 increased $15.4 million, or 3.2%, from December 31, 2021. This portfolio primarily consists of automobile loans, unsecured revolving credit products, personal loans secured by cash and cash equivalents, and other similar types of credit facilities.

Foreign Loans. We make U.S. dollar-denominated loans and commitments to borrowers in Mexico. The outstanding balance of these loans and the unfunded amounts available under these commitments were not significant at December 31, 2022 or 2021.

Maturities and Sensitivities of Loans to Changes in Interest Rates. The following table presents the maturity distribution of our loan portfolio at December 31, 2022. The table also presents the portion of loans that have fixed interest rates or variable interest rates that fluctuate over the life of the loans in accordance with changes in an interest rate index.

	Due in One Year or Less	After One, but Within Five Years	After Five but Within Fifteen Years	After Fifteen Years	Total
Commercial and industrial	$ 2,066,713	$ 2,548,938	$ 921,961	$ 137,186	$ 5,674,798
Energy	424,917	464,368	35,841	603	925,729
Paycheck Protection Program	3,707	31,145	—	—	34,852
Commercial real estate					
Buildings, land and other	867,013	2,745,770	2,936,721	156,574	6,706,078
Construction	341,466	735,979	355,595	44,207	1,477,247
Consumer Real Estate	8,839	17,755	609,145	1,207,800	1,843,539
Consumer and Other	246,590	228,177	17,959	—	492,726
Total	$ 3,959,245	$ 6,772,132	$ 4,877,222	$ 1,546,370	$ 17,154,969
Loans with fixed interest rates:					
Commercial and industrial	$ 285,755	$ 1,032,431	$ 624,191	$ 109,795	$ 2,052,172
Energy	17,944	51,884	35,585	603	106,016
Paycheck Protection Program	3,707	31,145	—	—	34,852
Commercial real estate:					
Buildings, land and other	147,080	1,252,698	2,257,057	49,318	3,706,153
Construction	1,065	52,910	138,924	679	193,578
Consumer Real Estate	8,023	16,043	536,339	591,066	1,151,471
Consumer and Other	22,517	42,402	13,630	—	78,549
Total	$ 486,091	$ 2,479,513	$ 3,605,726	$ 751,461	$ 7,322,791
Loans with floating interest rates:					
Commercial and industrial	$ 1,780,958	$ 1,516,507	$ 297,770	$ 27,391	$ 3,622,626
Energy	406,973	412,484	256	—	819,713
Paycheck Protection Program	—	—	—	—	—
Commercial real estate:					
Buildings, land and other	719,933	1,493,072	679,664	107,256	2,999,925
Construction	340,401	683,069	216,671	43,528	1,283,669
Consumer Real Estate	816	1,712	72,806	616,734	692,068
Consumer and Other	224,073	185,775	4,329	—	414,177
Total	$ 3,473,154	$ 4,292,619	$ 1,271,496	$ 794,909	$ 9,832,178

We generally structure commercial loans with shorter-term maturities in order to match our funding sources and to enable us to effectively manage the loan portfolio by providing the flexibility to respond to liquidity needs, changes in interest rates and changes in underwriting standards and loan structures, among other things. Due to the shorter-term nature of such loans, from time to time in the ordinary course of business and without any contractual obligation on our part, we will renew/extend maturing lines of credit or refinance existing loans at their maturity dates. Some loans may renew multiple times in a given year as a result of general customer practice and need. These renewals, extensions and refinancings are made in the ordinary course of business for customers that meet our normal level of credit standards. Such borrowers typically request renewals to support their on-going working capital needs to finance their operations. Such borrowers are not experiencing financial difficulties and generally

could obtain similar financing from another financial institution. In connection with each renewal, extension or refinancing, we may require a principal reduction, adjust the rate of interest and/or modify the structure and other terms to reflect the current market pricing/structuring for such loans or to maintain competitiveness with other financial institutions. In such cases, we do not generally grant concessions, and, except for those reported in Note 3 - Loans, any such renewals, extensions or refinancings that occurred during the reported periods were not deemed to be troubled debt restructurings pursuant to applicable accounting guidance. Loans exceeding $1.0 million undergo a complete underwriting process at each renewal.

Accruing Past Due Loans. Accruing past due loans are presented in the following table. Also see Note 3 - Loans in the accompanying notes to consolidated financial statements included elsewhere in this report.

		Accruing Loans 30-89 Days Past Due		Accruing Loans 90 or More Days Past Due		Total Accruing Past Due Loans	
	Total Loans	Amount	Percent of Loans in Category	Amount	Percent of Loans in Category	Amount	Percent of Loans in Category
December 31, 2022							
Commercial and industrial	$ 5,674,798	$ 30,769	0.54 %	$ 5,560	0.10 %	$ 36,329	0.64 %
Energy	925,729	1,472	0.16	—	—	1,472	0.16
Paycheck Protection Program	34,852	5,321	15.27	13,867	39.79	19,188	55.06
Commercial real estate:							
Buildings, land and other	6,706,078	23,561	0.35	5,664	0.08	29,225	0.43
Construction	1,477,247	—	—	—	—	—	—
Consumer real estate	1,843,539	7,856	0.43	2,398	0.13	10,254	0.56
Consumer and other	492,726	5,155	1.05	311	0.06	5,466	1.11
Total	$ 17,154,969	$ 74,134	0.43	$ 27,800	0.16	$ 101,934	0.59
Excluding PPP loans	$ 17,120,117	$ 68,813	0.40	$ 13,933	0.08	$ 82,746	0.48
December 31, 2021							
Commercial and industrial	$ 5,364,954	$ 29,491	0.55 %	$ 7,802	0.15 %	$ 37,293	0.70 %
Energy	1,077,792	1,353	0.13	215	0.02	1,568	0.15
Paycheck Protection Program	428,882	4,979	1.16	18,766	4.38	23,745	5.54
Commercial real estate:							
Buildings, land and other	6,272,339	37,033	0.59	8,687	0.14	45,720	0.73
Construction	1,304,271	188	0.01	—	—	188	0.01
Consumer real estate	1,410,790	4,866	0.34	2,177	0.15	7,043	0.49
Consumer and other	477,369	4,185	0.88	1,076	0.23	5,261	1.11
Total	$ 16,336,397	$ 82,095	0.50	$ 38,723	0.24	$ 120,818	0.74
Excluding PPP loans	$ 15,907,515	$ 77,116	0.48	$ 19,957	0.13	$ 97,073	0.61

Accruing past due loans at December 31, 2022 decreased $18.9 million compared to December 31, 2021. The decrease was primarily due to decreases in past due non-construction related commercial real estate loans (down $16.5 million), past due PPP loans (down $4.6 million) and past due commercial and industrial loans (down $1.0 million) partly offset by an increase in past due consumer real estate loans (up $3.2 million). PPP loans are fully guaranteed by the SBA and we expect to collect all amounts due related to these loans. Excluding PPP loans, accruing past due loans decreased $14.3 million.

Non-Accrual Loans. Non-accrual loans are presented in the tables below. Also see Note 3 - Loans in the accompanying notes to consolidated financial statements included elsewhere in this report.

	December 31, 2022			December 31, 2021		
		Non-Accrual Loans			Non-Accrual Loans	
	Total Loans	Amount	Percent of Loans in Category	Total Loans	Amount	Percent of Loans in Category
Commercial and industrial	$ 5,674,798	$ 18,130	0.32 %	$ 5,364,954	$ 22,582	0.42 %
Energy	925,729	15,224	1.64	1,077,792	14,433	1.34
Paycheck Protection Program	34,852	—	—	428,882	—	—
Commercial real estate:						
Buildings, land and other	6,706,078	3,552	0.05	6,272,339	15,297	0.24
Construction	1,477,247	—	—	1,304,271	948	0.07
Consumer real estate	1,843,539	927	0.05	1,410,790	440	0.03
Consumer and other	492,726	—	—	477,369	13	—
Total	$ 17,154,969	$ 37,833	0.22	$ 16,336,397	$ 53,713	0.33
Excluding PPP loans	$ 17,120,117	$ 37,833	0.22	$ 15,907,515	$ 53,713	0.34
Allowance for credit losses on loans		$227,621			$248,666	
Ratio of allowance for credit losses on loans to non-accrual loans		601.65 %			462.95 %	

Non-accrual loans at December 31, 2022 decreased $15.9 million from December 31, 2021 primarily due to decreases in non-accrual commercial real estate loans and commercial and industrial loans. The decreases were primarily related to principal payments, loans returning to accrual status and charge-offs.

Generally, loans are placed on non-accrual status if principal or interest payments become 90 days past due and/or management deems the collectibility of the principal and/or interest to be in question, as well as when required by regulatory requirements. Once interest accruals are discontinued, accrued but uncollected interest is charged to current year operations. Subsequent receipts on non-accrual loans are recorded as a reduction of principal, and interest income is recorded only after principal recovery is reasonably assured. Classification of a loan as non-accrual does not preclude the ultimate collection of loan principal or interest. There were no non-accrual commercial and industrial loans in excess of $5.0 million at December 31, 2022 or December 31, 2021. Non-accrual energy loans included two credit relationship in excess of $5 million totaling $11.1 million at December 31, 2022. One of these relationships was previously reported as non-accrual with an aggregate balance of $9.6 million at December 31, 2021. The aggregate balance of this credit relationship decreased $3.6 million in 2022 as a result of principal payments made by the borrower. Non-accrual real estate loans primarily consist of land development, 1-4 family residential construction credit relationships and loans secured by office buildings and religious facilities. There were no non-accrual commercial real estate loans in excess of $5.0 million at December 31, 2022 or December 31, 2021.

Allowance For Credit Losses

As discussed in Note 1 - Summary of Significant Accounting Policies in the accompanying notes to consolidated financial statements, our policies and procedures related to accounting for credit losses changed on January 1, 2020 in connection with the adoption of a new accounting standard update as codified in Accounting Standards Codification ("ASC") Topic 326 ("ASC 326") Financial Instruments - Credit Losses. In the case of off-balance-sheet credit exposures, the allowance for credit losses is a liability account, calculated in accordance with ASC 326, reported as a component of accrued interest payable and other liabilities in our consolidated balance sheets. The amount of each allowance account represents management's best estimate of current expected credit losses ("CECL") on these financial instruments considering available information, from internal and external sources, relevant to assessing exposure to credit loss over the contractual term of the instrument. Relevant available information includes historical credit loss experience, current conditions and reasonable and supportable forecasts. While historical credit loss experience provides the basis for the estimation of expected credit losses, adjustments to historical loss information may be made for differences in current portfolio-specific risk characteristics, environmental conditions or other relevant factors. While management utilizes its best judgment and information

available, the ultimate adequacy of our allowance accounts is dependent upon a variety of factors beyond our control, including the performance of our portfolios, the economy, changes in interest rates and the view of the regulatory authorities toward classification of assets. For additional information regarding our accounting policies related to credit losses, refer to Note 1 - Summary of Significant Accounting Policies and Note 3 - Loans in the accompanying notes to consolidated financial statements.

Allowance for Credit Losses - Loans. The table below provides an allocation of the year-end allowance for credit losses on loans by loan portfolio segment; however, allocation of a portion of the allowance to one segment does not preclude its availability to absorb losses in other segments.

	Amount of Allowance Allocated	Percent of Loans in Each Category to Total Loans	Total Loans	Ratio of Allowance Allocated to Loans in Each Category
December 31, 2022				
Commercial and industrial	$ 104,237	33.1 %	$ 5,674,798	1.84 %
Energy	18,062	5.4	925,729	1.95
Paycheck Protection Program	—	0.2	34,852	—
Commercial real estate	90,301	47.7	8,183,325	1.10
Consumer real estate	8,004	10.7	1,843,539	0.43
Consumer and other	7,017	2.9	492,726	1.42
Total	$ 227,621	100.0 %	$ 17,154,969	1.33
Excluding PPP loans	$ 227,621		$ 17,120,117	1.33
December 31, 2021				
Commercial and industrial	$ 72,091	32.9 %	$ 5,364,954	1.34 %
Energy	17,217	6.6	1,077,792	1.60
Paycheck Protection Program	—	2.6	428,882	—
Commercial real estate	144,936	46.4	7,576,610	1.91
Consumer real estate	6,585	8.6	1,410,790	0.47
Consumer and other	7,837	2.9	477,369	1.64
Total	$ 248,666	100.0 %	$ 16,336,397	1.52
Excluding PPP loans	$ 248,666		$ 15,907,515	1.56

The allowance allocated to commercial and industrial loans totaled $104.2 million, or 1.84% of total commercial and industrial loans, at December 31, 2022 increasing $32.1 million, or 44.6%, compared to $72.1 million, or 1.34% of total commercial and industrial loans at December 31, 2021. Modeled expected credit losses increased $15.0 million while qualitative factor (“Q-Factor”) and other qualitative adjustments related to commercial and industrial loans increased $21.6 million. Specific allocations for commercial and industrial loans that were evaluated for expected credit losses on an individual basis decreased $4.5 million, or 42.3%, from $10.5 million at December 31, 2021 to $6.1 million at December 31, 2022. The decrease in specific allocations for commercial and industrial loans was primarily related to principal payments received and the recognition of charge-offs.

The allowance allocated to energy loans totaled $18.1 million, or 1.95% of total energy loans, at December 31, 2022 decreasing $845 thousand, or 4.9%, compared to $17.2 million, or 1.60% of total energy loans at December 31, 2021. Modeled expected credit losses related to energy loans increased $2.2 million while Q-Factor and other qualitative adjustments related to energy loans decreased $226 thousand. Specific allocations for energy loans that were evaluated for expected credit losses on an individual basis totaled $4.4 million at December 31, 2022 decreasing $1.1 million, or 20.0%, compared to $5.5 million at December 31, 2021.

The allowance allocated to commercial real estate loans totaled $90.3 million, or 1.10% of total commercial real estate loans, at December 31, 2022 decreasing $54.6 million, or 37.7%, compared to $144.9 million, or 1.91% of total commercial real estate loans at December 31, 2021. Modeled expected credit losses related to commercial real estate loans increased $10.3 million while Q-Factor and other qualitative adjustments related to commercial real estate loans decreased $66.3 million. Specific allocations for commercial real estate loans that were evaluated for expected credit losses on an individual basis increased from $400 thousand at December 31, 2021 to $1.7 million at December 31, 2022.

The allowance allocated to consumer real estate loans totaled $8.0 million, or 0.43% of total consumer real estate loans, at December 31, 2022 increasing $1.4 million, or 21.5%, compared to $6.6 million, or 0.47% of total consumer real estate loans at December 31, 2021 primarily due to modeled expected credit losses which increased $1.4 million.

The allowance allocated to consumer loans totaled $7.0 million, or 1.42% of total consumer loans, at December 31, 2022 decreasing $820 thousand, or 10.5%, compared to $7.8 million, or 1.64% of total consumer loans at December 31, 2021. Modeled expected credit losses related to consumer loans decreased $1.4 million while Q-Factor and other qualitative adjustments related to consumer loans increased $594 thousand.

As more fully described in Note 3 - Loans in the accompanying consolidated financial statements, we measure expected credit losses over the life of each loan utilizing a combination of models which measure probability of default and loss given default, among other things. The measurement of expected credit losses is impacted by loan/borrower attributes and certain macroeconomic variables. Models are adjusted to reflect the current impact of certain macroeconomic variables as well as their expected changes over a reasonable and supportable forecast period.

In estimating expected credit losses as of December 31, 2022, we utilized the Moody's Analytics December 2022 Baseline Scenario (the "December 2022 Baseline Scenario") to forecast the macroeconomic variables used in our models. The December 2022 Baseline Scenario was based on the review of a variety of surveys of baseline forecasts of the U.S. economy. The December 2022 Baseline Scenario projections included, among other things, (i) U.S. Nominal Gross Domestic Product annualized quarterly growth rate of 2.65% in the first quarter of 2023, followed by annualized quarterly growth rates in the range of 3.62% to 4.50% during the remainder of 2023 and an average annualized growth rate of 4.79% through the end of the forecast period in the fourth quarter of 2024; (ii) U.S. unemployment rate of 3.80% in the first quarter of 2023 and an average quarterly U.S. unemployment rate of 4.06% through the end of the forecast period in the fourth quarter of 2024; (iii) Texas unemployment rate of 4.10% in the first quarter of 2023 and an average quarterly Texas unemployment rate of 4.04% through the end of the forecast period in the fourth quarter of 2024; (iv) projected average 10 year Treasury rate of 4.03% in the first quarter of 2023 and average projected rates of 4.25% during the remainder of 2023 and 3.96% in 2024; and (v) average oil price of $93 per barrel in the first quarter of 2023 decreasing to $67 per barrel by the end of the forecast period in the fourth quarter of 2024.

In estimating expected credit losses as of December 31, 2021, we utilized the Moody's Analytics December 2021 Consensus Scenario (the "December 2021 Consensus Scenario") to forecast the macroeconomic variables used in our models. The December 2021 Consensus Scenario was based on the review of a variety of surveys of baseline forecasts of the U.S. economy. The December 2021 Consensus Scenario projections included, among other things, (i) U.S. Nominal Gross Domestic Product annualized quarterly growth rate of 6.40% in the first quarter of 2022, followed by annualized quarterly growth rates in the range of 3.83% to 5.35% during the remainder of 2022 and an average annualized growth rate of 4.76% through the end of the forecast period in the fourth quarter of 2023; (ii) U.S. unemployment rate of 4.33% in the first quarter of 2022 improving to 3.69% by the end of the forecast period in the fourth quarter of 2023 with Texas unemployment rates slightly higher at those dates; (iii) projected average 10 year Treasury rate of 1.59% in the first quarter of 2022, increasing to average projected rates of 1.75% during the remainder of 2022 and 2.10% in 2023; and (iv) average oil price in the range of approximately $62 to $66 per barrel through the end of the forecast period in the fourth quarter of 2023.

The overall loan portfolio, excluding PPP loans which are fully guaranteed by the SBA, as of December 31, 2022 increased $1.2 billion, or 7.6%, compared to December 31, 2021. This increase included a $606.7 million, or 8.0%, increase in commercial real estate loans, a $309.8 million, or 5.8%, increase in commercial and industrial loans and a $432.7 million, or 30.7%, increase in consumer real estate loans and a $15.4 million, or 3.2%, increase in consumer and other loans partly offset by a $152.1 million, or 14.1%, decrease in energy loans. The weighted average risk grade for commercial and industrial loans increased to 6.39 at December 31, 2022 compared to 6.22 at December 31, 2021. Commercial and industrial loans graded "watch" and "special mention" (risk grades 9 and 10) decreased $63.2 million during 2022 while classified commercial and industrial loans increased $993 thousand. Classified loans consist of loans having a risk grade of 11, 12 or 13. The weighted-average risk grade for energy loans decreased to 5.67 at December 31, 2022 from 6.06 at December 31, 2021. The decrease in the weighted average risk grade was impacted by a decrease in the weighted-average risk grade of pass grade energy loans from 5.78 at December 31, 2021 to 5.44 at December 31, 2022. Additionally, energy loans graded "watch" and "special mention" (risk grades 9 and 10) decreased $26.6 million while classified energy loans decreased $4.2 million. The weighted average risk grade for commercial real estate loans decreased from 7.19 at December 31, 2021 to 7.10 at

December 31, 2022. Pass grade commercial real estate loans increased $932.9 million while commercial real estate loans graded as "watch" and "special mention" decreased $315.3 million and classified commercial real estate loans decreased $10.9 million.

As noted above our credit loss models utilized the economic forecasts in the Moody's Baseline Scenario for December 2022 for our estimated expected credit losses as of December 31, 2022 and the Moody's Consensus Scenario for December 2021 for our estimate of expected credit losses as of December 31, 2021. We qualitatively adjusted the model results based on these scenarios for various risk factors that are not considered within our modeling processes but are nonetheless relevant in assessing the expected credit losses within our loan pools. These Q-Factor and other qualitative adjustments are discussed below.

Q-Factor adjustments are based upon management judgment and current assessment as to the impact of risks related to changes in lending policies and procedures; economic and business conditions; loan portfolio attributes and credit concentrations; and external factors, among other things, that are not already captured within the modeling inputs, assumptions and other processes. Management assesses the potential impact of such items within a range of severely negative impact to positive impact and adjusts the modeled expected credit loss by an aggregate adjustment percentage based upon the assessment. As a result of this assessment as of December 31, 2022, modeled expected credit losses were adjusted upwards by a weighted-average Q-Factor adjustment of approximately 2.2%, resulting in a $2.3 million total adjustment, up from approximately 2.3% at December 31, 2021, which resulted in a $1.8 million total adjustment. The weighted-average Q-Factor adjustment at December 31, 2022 was based on a limited negative expected impact on our non-owner occupied and construction commercial real estate loan portfolios related to changes in loan portfolio concentrations (no expected impact related to our commercial and industrial portfolio); a limited negative expected impact on all of our loan portfolios related to changes in the volumes and severity of loan delinquencies, changes in risk grades and adverse classifications; a limited negative expected impact on our commercial and consumer real estate portfolios related to the potential deterioration of collateral values (no expected impact related to our commercial and industrial and consumer portfolios); a negative expected impact associated with national, regional and local economic and business conditions and developments that affect the collectability of loans; a severely negative expected impact from other risk factors associated with our commercial real estate construction and land loan portfolios, particularly the risks related to expected extensions; and limited negative impact to our commercial real estate construction and non-owner occupied loan portfolios, as well as a negative impact to our consumer loan portfolio related to changes in lending policies, procedures, underwriting standards and loan portfolio attributes, among other things. The weighted-average Q-Factor adjustment at December 31, 2021 was based on a limited negative expected impact on our commercial loan portfolios related to changes in lending policies procedures and underwriting standards and changes in loan portfolio concentrations; a negative expected impact associated with national, regional and local economic and business conditions and developments that affect the collectability of loans; a severely negative expected impact from other risk factors associated with our commercial real estate construction and land loan portfolios, particularly the risks related to expected extensions; and no impact to changes in loan portfolio attributes, changes in risk grades, changes in the volumes and severity of loan delinquencies and adverse classifications and potential deterioration of collateral values.

We have also provided additional qualitative adjustments, or management overlays, as of December 31, 2022 as management believes there are still significant risks impacting certain categories of our loan portfolio. Q-Factor and other qualitative adjustments as of December 31, 2022 are detailed in the table below.

	Q-Factor Adjustment	Model Overlays	Office Building Overlays	Down-Side Scenario Overlay	Credit Concentration Overlays	Consumer Overlay	Total
Commercial and industrial	$ 929	$ —	$ —	$ 29,632	$ 5,676	$ —	$ 36,237
Energy	128	—	—	—	5,020	—	5,148
Commercial real estate:							
Owner occupied	318	19,708	—	—	1,718	—	21,744
Non-owner occupied	95	10,472	16,557	—	487	—	27,611
Construction	660	7,905	3,122	—	530	—	12,217
Consumer real estate	157	—	—	—	—	—	157
Consumer and other	34	—	—	—	—	2,000	2,034
Total	$ 2,321	$ 38,085	$ 19,679	$ 29,632	$ 13,431	$ 2,000	$ 105,148

Model overlays are qualitative adjustments to address the effect of risks not captured within our commercial real estate credit loss models. These adjustments are determined based upon minimum reserve ratios for our commercial real estate - owner occupied, commercial real estate - non-owner occupied and commercial real estate - construction loan portfolios.

Office building overlays are qualitative adjustments to address longer-term concerns over the utilization of commercial office space which could impact the long-term performance and collateral valuations of some types of office properties within our commercial real estate loan portfolio. These adjustments are determined based upon minimum reserve ratios for loans within our commercial real estate - non-owner occupied and commercial real estate - construction loan portfolios that have risk grades of 8 or worse.

The down-side scenario overlay is a qualitative adjustment for our commercial and industrial loan portfolio to address the significant risk of economic recession as a result of inflation; rising interest rates; labor shortages; disruption in financial markets and global supply chains; further oil price volatility; and the current or anticipated impact of military conflict, including the current war between Russia and Ukraine, terrorism or other geopolitical events. Factors such as these are outside of our control but nonetheless affect customer income levels and could alter anticipated customer behavior, including borrowing, repayment, investment and deposit practices. To determine this qualitative adjustment, we use an alternative, more pessimistic economic scenario to forecast the macroeconomic variables used in our models. As of December 31, 2022, we used the Moody’s Analytics November 2022 S3 Alternative Scenario Downside - 90th Percentile (the “November 2022 S3 Scenario”). In modeling expected credit losses using this scenario, we also assume each loan within our modeled loan pools is downgraded by one risk grade level. The qualitative adjustment is based upon the amount by which the alternative scenario modeling results exceed those of the primary scenario used in estimating credit loss expense, adjusted based upon management's assessment of the probability that this more pessimistic economic scenario will occur.

Credit concentration overlays are qualitative adjustments based upon statistical analysis to address relationship exposure concentrations within our loan portfolio. Variations in loan portfolio concentrations over time cause expected credit losses within our existing portfolio to differ from historical loss experience. Given that the allowance for credit losses on loans reflects expected credit losses within our loan portfolio and the fact that these expected credit losses are uncertain as to nature, timing and amount, management believes that segments with higher concentration risk are more likely to experience a high loss event. Due to the fact that a significant portion of our loan portfolio is concentrated in large credit relationships and because of large, concentrated credit losses in recent years, management made the qualitative adjustments detailed in the table above to address the risk associated with such a relationship deteriorating to a loss event.

The consumer overlay is a qualitative adjustment for our consumer and other loan portfolio to address the risk associated with the level of unsecured loans within this portfolio and other risk factors. Unsecured consumer loans have an elevated risk of loss in times of economic stress as these loans lack a secondary source of repayment in the form of hard collateral. This adjustment was determined by analyzing our consumer loan charge-off trends as well as those of the general banking industry. Management deemed it appropriate to consider an additional overlay to the modeled forecasted losses for the unsecured consumer portfolio.

As of December 31, 2021, we provided qualitative adjustments, as detailed in the table below. Further information regarding these qualitative adjustments is provided in our 2021 Form 10-K.

	Q-Factor Adjustment	Model Overlays	Office Building Overlays	Small Business Overlay	COVID-19 Related Overlays	Credit Concentration Overlays	Consumer Overlay	Total
Commercial and industrial	$ 939	$ —	$ —	$ 3,956	$ 4,715	$ 4,999	$ —	$ 14,609
Energy	127	—	—	—	—	5,247	—	5,374
Commercial real estate:								
Owner occupied	198	31,806	—	—	7,397	1,320	—	40,721
Non-owner occupied	45	7,762	27,860	—	30,940	731	—	67,338
Construction	383	11,212	5,544	—	2,151	511	—	19,801
Consumer real estate	65	—	—	—	—	—	—	65
Consumer and other	8	—	—	—	—	—	1,432	1,440
Total	$ 1,765	$ 50,780	$ 33,404	$ 3,956	$ 45,203	$ 12,808	$ 1,432	$149,348

Additional information related to credit loss expense and net (charge-offs) recoveries is presented in the tables below. Also see Note 3 - Loans in the accompanying notes to consolidated financial statements included elsewhere in this report.

	Credit Loss Expense (Benefit)	Net (Charge-Offs) Recoveries	Average Loans	Ratio of Annualized Net (Charge-Offs) Recoveries to Average Loans
2022				
Commercial and industrial	$ 34,479	$ (2,333)	$ 5,526,484	(0.04)%
Energy	(313)	1,158	992,051	0.12
Paycheck Protection Program	—	—	139,126	—
Commercial real estate	(54,775)	140	8,004,345	—
Consumer real estate	1,813	(394)	1,584,435	(0.02)
Consumer and other	13,517	(14,337)	492,339	(2.91)
Total	$ (5,279)	$ (15,766)	$ 16,738,780	(0.09)
Excluding PPP loans	$ (5,279)	$ (15,766)	$ 16,599,654	(0.09)
2021				
Commercial and industrial	$ (2,160)	$ 408	$ 4,854,465	0.01 %
Energy	(19,207)	(3,129)	1,049,540	(0.30)
Paycheck Protection Program	—	—	1,851,765	—
Commercial real estate	8,101	1,943	7,189,325	0.03
Consumer real estate	(3,061)	1,720	1,350,554	0.13
Consumer and other	10,230	(9,356)	473,982	(1.97)
Total	$ (6,097)	$ (8,414)	$ 16,769,631	(0.05)
Excluding PPP loans	$ (6,097)	$ (8,414)	$ 14,917,866	(0.06)
2020				
Commercial and industrial	$ 15,156	$ (14,169)	$ 5,068,730	(0.28)%
Energy	85,889	(73,265)	1,459,450	(5.02)
Paycheck Protection Program	—	—	2,158,477	—
Commercial real estate	124,427	(7,053)	6,705,206	(0.11)
Consumer real estate	1,906	(485)	1,260,556	(0.04)
Consumer and other	9,632	(8,463)	512,034	(1.65)
Total	$ 237,010	$ (103,435)	$ 17,164,453	(0.60)
Excluding PPP loans	$ 237,010	$ (103,435)	$ 15,005,976	(0.69)

We recorded a net credit loss benefit related to loans totaling $5.3 million in 2022 and $6.1 million in 2021 and a net credit loss expense related to loans totaling $237.0 million in 2020. Net credit loss expense/benefit for each portfolio segment reflects the amount needed to adjust the allowance for credit losses allocated to that segment to the level of expected credit losses determined under our allowance methodology after net charge-offs have been recognized.

The net credit loss benefit related to loans during 2022 primarily reflects a decrease in expected credit losses associated with commercial real estate loans, primarily related to a decrease in expected credit losses related to certain pandemic impacted industries and a reduction in the minimum reserve ratio for our commercial real estate - owner occupied portfolio. The impact of this decrease was partly offset by an increase in expected credit losses associated with commercial and industrial loans, primarily related to the down-side scenario overlay discussed above, and increases in modeled losses for our commercial and industrial, energy, commercial real estate and consumer real estate portfolios. The net credit loss benefit related to loans during 2021 primarily reflects improvements in forecasted economic conditions and oil price trends relative to the prevailing conditions in 2020 as well as a decrease in net charge-offs. Credit loss expense related to loans during 2020 reflected the uncertain future impacts associated with the COVID-19 pandemic and the significant volatility in oil prices as well as the level of net charge-offs, the expected deterioration in credit quality and other changes within the loan portfolio. The ratio of the allowance for credit losses on loans to total loans was 1.33% (also 1.33% excluding PPP loans) at December 31, 2022 compared to 1.52% (1.56% excluding PPP loans) at December 31, 2021. Management believes the recorded amount of the allowance for credit losses on loans is appropriate based upon management's best estimate of current expected credit losses within the existing portfolio of loans. Should any of the factors considered by management in making this estimate change, our estimate of current expect credit losses could also change, which could affect the level of future credit loss expense related to loans.

Allowance for Credit Losses - Off-Balance-Sheet Credit Exposures. The allowance for credit losses on off-balance-sheet credit exposures totaled $58.6 million and $50.3 million at December 31, 2022 and December 31, 2020, respectively. The level of the allowance for credit losses on off-balance-sheet credit exposures depends upon the volume of outstanding commitments, underlying risk grades, the expected utilization of available funds and forecasted economic conditions impacting our loan portfolio. Credit loss expense related to off-balance-sheet credit exposures totaled $8.3 million during 2022 compared to $6.2 million during 2021 and $4.3 million during 2020. The increase in credit loss expense during the comparable periods primarily reflects increases in overall off-balance-sheet credit exposures. Credit loss expense for off-balance-sheet credit exposures in 2021 was also partly impacted by the down-grade of a large credit commitment within our SNC portfolio. Further information regarding our policies and methodology used to estimate the allowance for credit losses on off-balance-sheet credit exposures is presented in Note 8 - Off-Balance-Sheet Arrangements, Commitments, Guarantees and Contingencies in the accompanying notes to consolidated financial statements.

Securities

The following tables summarize the maturity distribution schedule with corresponding weighted-average yields of securities held to maturity and securities available for sale as of December 31, 2022. Weighted-average yields have been computed on a fully taxable-equivalent basis using a tax rate of 21%. Mortgage-backed securities are included in maturity categories based on their stated maturity date. Expected maturities may differ from contractual maturities because issuers may have the right to call or prepay obligations. Other securities classified as available for sale include stock in the Federal Reserve Bank and the Federal Home Loan Bank, which have no maturity date. These securities have been included in the total column only. Held-to-maturity securities are presented at amortized cost before any allowance for credit losses.

	Within 1 Year		1-5 Years		5-10 Years		After 10 Years		Total	
	Amount	Weighted Average Yield	Amount	Weighted Average Yield	Amount	Weighted Average Yield	Amount	Weighted Average Yield	Amount	Weighted Average Yield
Held to maturity:										
Residential mortgage-backed securities	$ —	— %	$ —	— %	$ 514,059	2.28 %	$ 12,063	2.60 %	$ 526,122	2.28 %
States and political subdivisions	123,591	3.55	24,339	4.67	8,297	2.92	1,955,392	4.70	2,111,619	4.63
Other	—	—	1,500	1.97	—	—	—	—	1,500	1.97
Total	$ 123,591	3.55	$ 25,839	4.51	$ 522,356	2.29	$ 1,967,455	4.69	$ 2,639,241	4.16
Available for sale:										
U.S. Treasury	$ 240,361	1.01 %	$ 3,424,023	2.17 %	$ 1,244,812	1.52 %	$ 142,391	2.15 %	$ 5,051,587	1.95 %
Residential mortgage-backed securities	8	2.49	7,527	3.24	15,892	4.51	6,352,809	2.90	6,376,236	2.90
States and political subdivisions	261,888	4.32	1,470,098	3.78	918,563	3.35	4,122,806	3.44	6,773,355	3.53
Other	—	—	—	—	—	—	—	—	42,427	—
Total	$ 502,257	2.70	$ 4,901,648	2.64	$ 2,179,267	2.26	$10,618,006	3.09	$ 18,243,605	2.86

All mortgage-backed securities included in the above tables were issued by U.S. government agencies and corporations. At December 31, 2022, all of the securities in our municipal bond portfolio were issued by the State of Texas or political subdivisions or agencies within the State of Texas, of which approximately 75.6% are either guaranteed by the Texas Permanent School Fund, which has a "triple-A" insurer financial strength rating, or secured by U.S. Treasury securities via defeasance of the debt by the issuers.

The average taxable-equivalent yield on the securities portfolio based on a 21% tax rate was 2.95% in 2022 compared to 3.29% in 2021. Tax-exempt municipal securities totaled 42.7% of average securities in 2022 compared to 64.2% in 2021. The average yield on taxable securities was 2.16% in 2022 compared to 1.97% in 2021, while the average taxable-equivalent yield on tax-exempt securities was 4.08% in 2022 compared to 4.06% in 2021. See the section captioned "Net Interest Income" elsewhere in this discussion.

Deposits

The table below presents the daily average balances of deposits by type and weighted-average rates paid thereon during the years presented:

	2022		2021		2020	
	Average Balance	Average Rate Paid	Average Balance	Average Rate Paid	Average Balance	Average Rate Paid
Non-interest-bearing demand deposits	$ 18,202,669		$ 16,670,807		$ 13,563,696	
Interest-bearing deposits:						
Savings and interest checking	12,160,482	0.10 %	10,682,149	0.01 %	8,283,665	0.03 %
Money market accounts	12,727,533	0.90	9,990,626	0.09	8,457,263	0.18
Time accounts	1,480,088	0.92	1,129,041	0.33	1,133,648	1.25
Total interest-bearing deposits	26,368,103	0.53	21,801,816	0.07	17,874,576	0.18
Total deposits	$ 44,570,772	0.32	$ 38,472,623	0.04	$ 31,438,272	0.10

Average deposits increased $6.1 billion, or 15.9%, in 2022 compared to 2021. The most significant volume growth during 2022 compared to 2021 was in money market deposits; non-interest bearing deposits; and savings and interest checking deposits. The ratio of average interest-bearing deposits to total average deposits was 59.2% in 2022

compared to 56.7% in 2021. The average rates paid on interest-bearing deposits and total deposits were 0.53% and 0.32%, respectively, during 2022 compared to 0.07% and 0.04%, respectively, during 2021. The average rate paid on interest-bearing deposits during 2022 was impacted by an increase in the interest rates we pay on most of our interest-bearing deposit products as a result of increases in market interest rates.

Geographic Concentrations. The following table summarizes our average total deposit portfolio, as segregated by the geographic region from which the deposit accounts were originated. Certain accounts, such as correspondent bank deposits and deposits allocated to certain statewide operational units, are recorded at the statewide level.

	2022	Percent of Total	2021	Percent of Total	2020	Percent of Total
San Antonio	$ 13,402,978	30.1 %	$ 11,140,600	29.0 %	$ 9,147,078	29.1 %
Houston	8,317,538	18.7	7,360,930	19.1	5,715,514	18.2
Fort Worth	7,498,616	16.8	6,650,164	17.3	5,615,584	17.9
Austin	5,752,901	12.9	4,931,275	12.8	3,882,661	12.3
Dallas	3,678,111	8.3	3,181,252	8.3	2,553,571	8.1
Corpus Christi	2,152,544	4.8	1,965,158	5.1	1,655,395	5.3
Permian Basin	2,043,713	4.6	1,694,366	4.4	1,518,781	4.8
Rio Grande Valley	1,198,377	2.7	1,055,427	2.7	895,653	2.8
Statewide	525,994	1.1	493,451	1.3	454,035	1.5
Total	$ 44,570,772	100.0 %	$ 38,472,623	100.0 %	$ 31,438,272	100.0 %

Foreign Deposits. Mexico has historically been considered a part of the natural trade territory of our banking offices. Accordingly, U.S. dollar-denominated foreign deposits from sources within Mexico have traditionally been a significant source of funding. Average deposits from foreign sources, primarily Mexico, totaled $1.1 billion in 2022 and $933.3 million in 2021.

Brokered Deposits. From time to time, we have obtained interest-bearing deposits through brokered transactions including participation in the Certificate of Deposit Account Registry Service ("CDARS"). Brokered deposits were not significant during the reported periods.

Capital and Liquidity

Capital. Shareholders' equity totaled $3.1 billion at December 31, 2022 and $4.4 billion at December 31, 2021. In addition to net income of $579.2 million, other sources of capital during 2022 included $16.7 million in proceeds from stock option exercises and $18.3 million related to stock-based compensation. Uses of capital during 2022 included an other comprehensive loss, net of tax, of $1.7 billion, $216.5 million of dividends paid on preferred and common stock and $4.4 million of treasury stock purchases.

The accumulated other comprehensive income/loss component of shareholders' equity totaled a net, after-tax, unrealized loss of $1.3 billion at December 31, 2022 compared to a net, after-tax, unrealized gain of $347.3 million at December 31, 2021. The decrease was primarily due to a $1.7 billion net, after-tax, decrease in the fair value of securities available for sale.

Under the Basel III Capital Rules, we elected to opt-out of the requirement to include most components of accumulated other comprehensive income in regulatory capital. Accordingly, amounts reported as accumulated other comprehensive income/loss related to securities available for sale, effective cash flow hedges and defined benefit post-retirement benefit plans do not increase or reduce regulatory capital and are not included in the calculation of risk-based capital and leverage ratios. In connection with the adoption of ASC 326 on January 1, 2020, we also elected to exclude, for a transitional period, the effects of credit loss accounting under CECL in the calculation of our regulatory capital and regulatory capital ratios. Regulatory agencies for banks and bank holding companies utilize capital guidelines designed to measure capital and take into consideration the risk inherent in both on-balance sheet and off-balance sheet items. See Note 9 - Capital and Regulatory Matters in the accompanying notes to consolidated financial statements elsewhere in this report.

We paid quarterly dividends of $0.75, $0.75, $0.87 and $0.87 per common share during the first, second, third and fourth quarters of 2022, respectively, and quarterly dividends of $0.72, $0.72, $0.75 and $0.75 per common share during the first, second, third and fourth quarters of 2021, respectively. This equates to a dividend payout ratio

of 36.6% in 2022 and 43.3% in 2021. The amount of dividend, if any, we may pay may be limited as more fully discussed in Note 9 - Capital and Regulatory Matters in the accompanying notes to consolidated financial statements elsewhere in this report.

Preferred Stock. On March 16, 2020, we redeemed all 6,000,000 shares of our 5.375% Non-Cumulative Perpetual Preferred Stock, Series A, ("Series A Preferred Stock") at a redemption price of $25 per share, or an aggregate redemption of $150.0 million. On November 19, 2020 we issued 150,000 shares, or $150.0 million in aggregate liquidation preference, of our 4.450% Non-Cumulative Perpetual Preferred Stock, Series B, par value $0.01 and liquidation preference $1,000 per share ("Series B Preferred Stock"). Each share of Series B Preferred Stock issued and outstanding is represented by 40 depositary shares, each representing a 1/40th ownership interest in a share of the Series B Preferred Stock (equivalent to a liquidation preference of $25 per share). Additional details about our preferred stock are included in Note 9 - Capital and Regulatory Matters in the accompanying notes to consolidated financial statements elsewhere in this report.

Stock Repurchase Plans. From time to time, our board of directors has authorized stock repurchase plans. In general, stock repurchase plans allow us to proactively manage our capital position and return excess capital to shareholders. Shares purchased under such plans also provide us with shares of common stock necessary to satisfy obligations related to stock compensation awards. On January 25, 2023, our board of directors authorized a $100.0 million stock repurchase plan, allowing us to repurchase shares of our common stock over a one-year period from time to time at various prices in the open market or through private transactions. No shares were repurchased under a stock repurchase plan during 2022 or 2021. Under a prior stock repurchase plan, we repurchased 177,834 shares at a total cost of $13.7 million during 2020.

Liquidity. Liquidity measures the ability to meet current and future cash flow needs as they become due. The liquidity of a financial institution reflects its ability to meet loan requests, to accommodate possible outflows in deposits and to take advantage of interest rate market opportunities. The ability of a financial institution to meet its current financial obligations is a function of its balance sheet structure, its ability to liquidate assets and its access to alternative sources of funds. The objective of our liquidity management is to manage cash flow and liquidity reserves so that they are adequate to fund our operations and to meet obligations and other commitments on a timely basis and at a reasonable cost. We seek to achieve this objective and ensure that funding needs are met by maintaining an appropriate level of liquid funds through asset/liability management, which includes managing the mix and time to maturity of financial assets and financial liabilities on our balance sheet. Our liquidity position is enhanced by our ability to raise additional funds as needed in the wholesale markets.

Asset liquidity is provided by liquid assets which are readily marketable or pledgeable or which will mature in the near future. Liquid assets include cash, interest-bearing deposits in banks, securities available for sale, maturities and cash flow from securities held to maturity, and federal funds sold and resell agreements. Liability liquidity is provided by access to funding sources which include core deposits and correspondent banks in our natural trade area that maintain accounts with and sell federal funds to Frost Bank, as well as federal funds purchased and repurchase agreements from upstream banks and deposits obtained through financial intermediaries.

Our liquidity position is continuously monitored and adjustments are made to the balance between sources and uses of funds as deemed appropriate. Liquidity risk management is an important element in our asset/liability management process. We regularly model liquidity stress scenarios to assess potential liquidity outflows or funding problems resulting from economic disruptions, volatility in the financial markets, unexpected credit events or other significant occurrences deemed problematic by management. These scenarios are incorporated into our contingency funding plan, which provides the basis for the identification of our liquidity needs. As of December 31, 2022, we had approximately $11.1 billion held in an interest-bearing account at the Federal Reserve. We also have the ability to borrow funds as a member of the Federal Home Loan Bank ("FHLB"). As of December 31, 2022, based upon available, pledgeable collateral, our total borrowing capacity with the FHLB was approximately $3.4 billion. Furthermore, at December 31, 2022, we had approximately $12.7 billion in securities that were unencumbered by a pledge and could be used to support additional borrowings through repurchase agreements or the Federal Reserve discount window, as needed. As of December 31, 2022, management is not aware of any events that are reasonably likely to have a material adverse effect on our liquidity, capital resources or operations. In addition, management is not aware of any regulatory recommendations regarding liquidity that would have a material adverse effect on us.

In the ordinary course of business we have entered into contractual obligations and have made other commitments to make future payments. Refer to the accompanying notes to consolidated financial statements elsewhere in this report for the expected timing of such payments as of December 31, 2022. These include payments related to

(i) long-term borrowings (Note 7 - Borrowed Funds), (ii) operating leases (Note 4 - Premises and Equipment and Lease Commitments), (iii) time deposits with stated maturity dates (Note 6 - Deposits) and (iv) commitments to extend credit and standby letters of credit (Note 8 - Off-Balance-Sheet Arrangements, Commitments, Guarantees and Contingencies).

Since Cullen/Frost is a holding company and does not conduct operations, its primary sources of liquidity are dividends upstreamed from Frost Bank and borrowings from outside sources. Banking regulations may limit the amount of dividends that may be paid by Frost Bank. See Note 9 - Capital and Regulatory Matters in the accompanying notes to consolidated financial statements elsewhere in this report regarding such dividends. At December 31, 2022, Cullen/Frost had liquid assets, including cash and resell agreements, totaling $311.9 million.

Regulatory and Economic Policies

Our business and earnings are affected by general and local economic conditions and by the monetary and fiscal policies of the United States government, its agencies and various other governmental regulatory authorities, among other things. The Federal Reserve Board regulates the supply of money in order to influence general economic conditions. Among the instruments of monetary policy historically available to the Federal Reserve Board are (i) conducting open market operations in United States government obligations, (ii) changing the discount rate on financial institution borrowings, (iii) imposing or changing reserve requirements against financial institution deposits, and (iv) restricting certain borrowings and imposing or changing reserve requirements against certain borrowings by financial institutions and their affiliates. These methods are used in varying degrees and combinations to affect directly the availability of bank loans and deposits, as well as the interest rates charged on loans and paid on deposits. For that reason alone, the policies of the Federal Reserve Board have a material effect on our earnings.

Governmental policies have had a significant effect on the operating results of commercial banks in the past and are expected to continue to do so in the future; however, we cannot accurately predict the nature, timing or extent of any effect such policies may have on our future business and earnings.

Accounting Standards Updates

See Note 20 - Accounting Standards Updates in the accompanying notes to consolidated financial statements elsewhere in this report for details of recently issued accounting pronouncements and their expected impact on our financial statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The disclosures set forth in this item are qualified by Item 1A. Risk Factors and the section captioned "Forward-Looking Statements and Factors that Could Affect Future Results" included in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, of this report, and other cautionary statements set forth elsewhere in this report.

Market risk refers to the risk of loss arising from adverse changes in interest rates, foreign currency exchange rates, commodity prices, and other relevant market rates and prices, such as equity prices. The risk of loss can be assessed from the perspective of adverse changes in fair values, cash flows, and future earnings. Due to the nature of our operations, we are primarily exposed to interest rate risk and, to a lesser extent, liquidity risk.

Interest rate risk on our balance sheets consists of reprice, option, and basis risks. Reprice risk results from differences in the maturity, or repricing, of asset and liability portfolios. Option risk arises from "embedded options" present in many financial instruments such as loan prepayment options, deposit early withdrawal options and interest rate options. These options allow customers opportunities to benefit when market interest rates change, which typically results in higher costs or lower revenue for us. Basis risk refers to the potential for changes in the underlying relationship between market rates and indices, which subsequently result in a narrowing of the profit spread on an earning asset or liability. Basis risk is also present in administered rate liabilities, such as savings accounts, negotiable order of withdrawal accounts, and money market accounts where historical pricing relationships to market rates may change due to the level or directional change in market interest rates.

We seek to avoid fluctuations in our net interest margin and to maximize net interest income within acceptable levels of risk through periods of changing interest rates. Accordingly, our interest rate sensitivity and liquidity are monitored on an ongoing basis by our Asset and Liability Committee ("ALCO"), which oversees market risk

management and establishes risk measures, limits and policy guidelines for managing the amount of interest rate risk and its effect on net interest income and capital. A variety of measures are used to provide for a comprehensive view of the magnitude of interest rate risk, the distribution of risk, the level of risk over time and the exposure to changes in certain interest rate relationships.

We utilize an earnings simulation model as the primary quantitative tool in measuring the amount of interest rate risk associated with changing market rates. The model quantifies the effects of various interest rate scenarios on projected net interest income and net income over the next 12 months. The model measures the impact on net interest income relative to a flat-rate case scenario of hypothetical fluctuations in interest rates over the next 12 months. These simulations incorporate assumptions regarding balance sheet growth and mix, pricing and the repricing and maturity characteristics of the existing and projected balance sheet. The impact of interest rate derivatives, such as interest rate swaps, caps and floors, is also included in the model. Other interest rate-related risks such as prepayment, basis and option risk are also considered.

ALCO continuously monitors and manages the balance between interest rate-sensitive assets and liabilities. The objective is to manage the impact of fluctuating market rates on net interest income within acceptable levels. In order to meet this objective, management may lengthen or shorten the duration of assets or liabilities or enter into derivative contracts to mitigate potential market risk.

For modeling purposes, as of December 31, 2022, the model simulations projected that 100 and 200 basis point ratable increases in interest rates would result in positive variances in net interest income of 0.2% and 1.4%, respectively, relative to the flat-rate case over the next 12 months, while 100 and 200 basis point ratable decreases in interest rates would result in a negative variance in net interest income of 0.2% and 1.4%, respectively, relative to the flat-rate case over the next 12 months. For modeling purposes, as of December 31, 2021, the model simulations projected that 100 and 200 basis point ratable increases in interest rates would result in positive variances in net interest income of 2.8% and 7.1%, respectively, relative to the flat-rate case over the next 12 months, while a 25 basis point ratable decrease in interest rates would result in a negative variance in net interest income of 3.0% relative to the flat-rate case over the next 12 months. The likelihood of a decrease in interest rates beyond 25 basis points as of December 31, 2021 was considered to be remote given prevailing interest rate levels.

We do not currently pay interest on a significant portion of our commercial demand deposits. Any interest rate that would ultimately be paid on these commercial demand deposits would likely depend upon a variety of factors, some of which are beyond our control. Our December 31, 2022 model simulations do not assume any payment of interest on commercial demand deposits (those not already receiving an earnings credit) while our modeling simulations as of December 31, 2021 assumed we would make interest payments on commercial demand deposits (those not already receiving an earnings credit) with such payments assumed to begin in the first quarter of 2022. This pricing structure on commercial demand deposits assumed a deposit pricing beta of 25%. The pricing beta is a measure of how much deposit rates reprice, up or down, given a defined change in market rates. As of December 31, 2022, management believes, based on our experience during the last interest rate cycle, that it is less likely we will pay interest on these deposits as rates increase.

The model simulations as of December 31, 2022 indicate that our projected balance sheet is less asset sensitive in comparison to our balance sheet as of December 31, 2021. The decreased asset sensitivity was partly due to a decrease in the relative proportion of interest-bearing deposits (primarily amounts held in an interest-bearing account at the Federal Reserve) and federal funds sold to projected average interest-earning assets combined with an increase in the relative proportion of fixed-rate taxable securities to projected average interest-earning assets. Interest-bearing deposits and federal funds sold are more immediately impacted by changes in interest rates in comparison to our other categories of earning assets.

As of December 31, 2022, the effects of a 200 basis point increase and a 200 basis point decrease in interest rates on our derivative holdings would not result in a significant variance in our net interest income.

The effects of hypothetical fluctuations in interest rates on our securities classified as “trading” under ASC Topic 320, “Investments - Debt and Equity Securities” are not significant, and, as such, separate quantitative disclosure is not presented.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Cullen/Frost Bankers, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Cullen/Frost Bankers, Inc. (the Company) as of December 31, 2022 and 2021, and the related consolidated statements of income, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2022, 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, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with 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, 2022, based on 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 3, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

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

Allowances for Credit Losses

Description of the Matter

The Company's loan portfolio totaled $17.2 billion as of December 31, 2022 and the associated allowance for credit losses on loans was $227.6 million. The Company's unfunded loan commitments totaled $12.5 billion, with an associated allowance for credit loss of $58.6 million. Together these amounts represent the allowances for credit losses ("ACL"). As discussed in Notes 1, and 3 to the consolidated financial statements, in the cases of loans, the allowance for credit losses is a contra-asset valuation account, calculated in accordance with ASC 326, that is deducted from the amortized cost basis of loans to present the net amount expected to be collected. As discussed in Notes 1, 3, and 8 to the consolidated financial statements, in the case of unfunded loan commitments, the allowance for credit losses is a liability account, calculated in accordance with ASC 326, reported as a component of accrued interest payable and other liabilities. The amount of each allowance account represented management's best estimate of current expected credit losses on these financial instruments considering all available information, from internal and external sources, relevant to assessing exposure to credit loss over the contractual term of the instrument. In calculating the allowance for credit losses, most loans were segmented into pools based upon similar characteristics and risk profiles. For each loan pool, management measured expected credit losses over the life of each loan utilizing a combination of models which measured probability of default ("PD"), probability of attrition ("PA"), loss given default ("LGD"), and exposure at default ("EAD"). Modeled expected credit losses were calculated as the product of PD (adjusted for attrition), LGD, and EAD. PD and PA were estimated by analyzing internally sourced data related to historical performance of each loan pool over a complete economic cycle. PD and PA were adjusted to reflect the current impact of certain macroeconomic variables as well as their expected changes over a reasonable and supportable forecast period. After the reasonable and supportable forecast period, the forecasted macroeconomic variables were reverted to their historical mean utilizing a rational, systematic basis. The LGD was based on historical recovery averages for each loan pool, adjusted to reflect the current impact of certain macroeconomic variables as well as their expected changes over the reasonable and supportable forecast period. EAD was estimated using a linear regression model that estimates the average percentage of the loan balance that remains at the time of default. In some cases, management determined that an individual loan exhibited unique risk characteristics which differentiated the loan from other loans with the identified loan pools. In such cases, the loans were evaluated for expected credit losses on an individual basis and excluded from the collective evaluation. Management qualitatively adjusted model results for risk factors that were not considered within the modeling processes but were nonetheless relevant in assessing the expected credit losses within the loan pools. These qualitative factor adjustments modified management's estimate of expected credit losses by a calculated percentage or amount based upon the estimated level of risk.

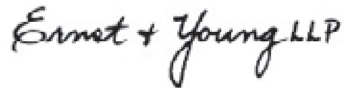
Auditing management's estimate of the ACL involved a high degree of subjectivity due to the nature of the qualitative factor adjustments included in the allowances for credit losses and complexity due to the utilization of the PD, PA, LGD, and EAD models (the "Models"). Management's identification and measurement of the qualitative factor adjustments is highly judgmental and could have a significant effect on the ACL.

How We Addressed the Matter in Our Audit

We obtained an understanding of the Company's process for establishing the ACL, including the utilization of Models and the qualitative factor adjustments of the ACL. We evaluated the design and tested the operating effectiveness of related controls over the reliability and accuracy of data used to calculate and estimate the various components of the ACL, the accuracy of the calculation of the ACL, management's review and approval of methodologies used to establish the ACL, validation procedures over the Models, analysis of changes in various components of the ACL relative to changes in the Company's loan portfolio and economy and evaluation of the overall reasonableness and appropriateness of the ACL. In doing so, we tested the operating effectiveness of review and approval controls in the Company's governance process designed to identify and assess the qualitative factor adjustments which is meant to measure expected credit losses associated with factors not captured fully in the other components of the ACL.

To test the reasonableness of the qualitative factor adjustments, we performed audit procedures that included, among others testing the appropriateness of the methodologies used by the Company to estimate the ACL, testing the completeness and accuracy of data and information used by the Company in estimating the components of the ACL, assessing the reasonableness of the Models, evaluating the appropriateness of assumptions used in estimating the qualitative factor adjustments, analyzing the changes in assumptions and various components of the ACL

relative to changes in the Company's loan portfolio and the economy and evaluating the appropriateness and level of the qualitative factor adjustments. For example, we 1) evaluated the inherent limitations of the Company's modeled components of the ACL and hence the need for and levels of the qualitative factor adjustments; 2) involved modeling specialists to test the appropriateness of the design and operation of the Models; 3) analyzed the changes, assumptions and modifications made to the qualitative factor adjustments; and 4) evaluated the appropriateness and completeness of risk factors used in determining the amount of the qualitative factor adjustments. We also evaluated the data and information utilized by management to estimate the qualitative factor adjustments by independently obtaining internal and external data and information to assess the appropriateness of the data and information used by management and to consider the existence of new and potentially contradictory information used. In addition, we evaluated the overall ACL amounts, inclusive of the adjustments for the qualitative factor adjustments, and whether the amount appropriately reflects losses expected in the loan portfolio as of the consolidated balance sheet date by comparing the overall ACL to those established by similar banking institutions with similar loan portfolios. We also reviewed subsequent events and transactions and considered whether they corroborate or contradict the Company's conclusion.



We have served as the Company's auditor since 1969.
San Antonio, Texas
February 3, 2023

Cullen/Frost Bankers, Inc.
Consolidated Balance Sheets
(Dollars in thousands, except per share amounts)

	December 31,	
	2022	**2021**
Assets:		
Cash and due from banks	$ 691,553	$ 555,778
Interest-bearing deposits	11,128,902	15,985,244
Federal funds sold	120,527	34,075
Resell agreements	87,150	7,903
Total cash and cash equivalents	12,028,132	16,583,000
Securities held to maturity, net of allowance for credit losses of $158 in 2022 and $158 in 2021	2,639,083	1,749,179
Securities available for sale, at estimated fair value	18,243,605	13,924,628
Trading account securities	28,045	25,162
Loans, net of unearned discounts	17,154,969	16,336,397
Less: Allowance for credit losses on loans	(227,621)	(248,666)
Net loans	16,927,348	16,087,731
Premises and equipment, net	1,102,695	1,050,331
Goodwill	654,952	654,952
Other intangible assets, net	386	866
Cash surrender value of life insurance policies	190,188	190,139
Accrued interest receivable and other assets	1,077,942	612,502
Total assets	$ 52,892,376	$ 50,878,490
Liabilities:		
Deposits:		
Non-interest-bearing demand deposits	$ 17,598,234	$ 18,423,018
Interest-bearing deposits	26,355,962	24,272,678
Total deposits	43,954,196	42,695,696
Federal funds purchased	51,650	25,925
Repurchase agreements	4,660,641	2,740,799
Junior subordinated deferrable interest debentures, net of unamortized issuance costs	123,069	123,011
Subordinated notes, net of unamortized issuance costs	99,335	99,178
Accrued interest payable and other liabilities	866,257	754,326
Total liabilities	49,755,148	46,438,935
Shareholders' Equity:		
Preferred stock, par value $0.01 per share; 10,000,000 shares authorized; 150,000 Series B shares ($1,000 liquidation preference) issued in 2022 and 2021	145,452	145,452
Common stock, par value $0.01 per share; 210,000,000 shares authorized; 64,354,695 shares issued in 2022 and 64,236,306 shares issued in 2021	643	642
Additional paid-in capital	1,029,756	1,009,921
Retained earnings	3,309,671	2,956,966
Accumulated other comprehensive income, net of tax	(1,348,294)	347,318
Treasury stock, at cost; 250,070 shares in 2021	—	(20,744)
Total shareholders' equity	3,137,228	4,439,555
Total liabilities and shareholders' equity	$ 52,892,376	$ 50,878,490

See accompanying Notes to Consolidated Financial Statements.

Cullen/Frost Bankers, Inc.
Consolidated Statements of Income
(Dollars in thousands, except per share amounts)

	Year Ended December 31,		
	2022	2021	2020
Interest income:			
Loans, including fees	$ 770,391	$ 674,611	$ 680,064
Securities:			
Taxable	249,797	89,550	93,569
Tax-exempt	237,626	226,683	233,614
Interest-bearing deposits	216,367	17,878	12,893
Federal funds sold	948	31	723
Resell agreements	592	16	172
Total interest income	1,475,721	1,008,769	1,021,035
Interest expense:			
Deposits	140,476	14,520	32,018
Federal funds purchased	690	32	100
Repurchase agreements	34,443	2,209	4,382
Junior subordinated deferrable interest debentures	4,172	2,484	3,560
Subordinated notes	4,657	4,657	4,656
Federal Home Loan Bank advances	—	—	318
Total interest expense	184,438	23,902	45,034
Net interest income	1,291,283	984,867	976,001
Credit loss expense	3,000	63	241,230
Net interest income after credit loss expense	1,288,283	984,804	734,771
Non-interest income:			
Trust and investment management fees	154,679	148,994	129,272
Service charges on deposit accounts	91,891	83,292	80,873
Insurance commissions and fees	53,210	51,548	50,313
Interchange and card transaction fees	18,231	17,461	13,470
Other charges, commissions and fees	41,590	36,836	34,825
Net gain (loss) on securities transactions	—	69	108,989
Other	45,217	48,528	47,712
Total non-interest income	404,818	386,728	465,454
Non-interest expense:			
Salaries and wages	492,096	395,497	387,328
Employee benefits	88,608	82,029	75,676
Net occupancy	112,495	107,344	102,938
Technology, furniture and equipment	120,771	112,738	105,232
Deposit insurance	15,603	12,232	10,502
Intangible amortization	480	697	918
Other	194,221	171,457	166,310
Total non-interest expense	1,024,274	881,994	848,904
Income before income taxes	668,827	489,538	351,321
Income taxes	89,677	46,459	20,170
Net income	579,150	443,079	331,151
Preferred stock dividends	6,675	7,157	2,016
Redemption of preferred stock	—	—	5,514
Net income available to common shareholders	$ 572,475	$ 435,922	$ 323,621
Earnings per common share:			
Basic	$ 8.84	$ 6.79	$ 5.11
Diluted	8.81	6.76	5.10

See accompanying Notes to Consolidated Financial Statements.

Cullen/Frost Bankers, Inc.
Consolidated Statements of Comprehensive Income
(Dollars in thousands)

	Year Ended December 31,		
	2022	2021	2020
Net income	$ 579,150	$ 443,079	$ 331,151
Other comprehensive income (loss), before tax:			
Securities available for sale and transferred securities:			
Change in net unrealized gain/loss during the period	(2,143,567)	(231,355)	427,331
Change in net unrealized gain on securities transferred to held to maturity	(737)	(971)	(1,256)
Reclassification adjustment for net (gains) losses included in net income	—	(69)	(108,989)
Total securities available for sale and transferred securities	(2,144,304)	(232,395)	317,086
Defined-benefit post-retirement benefit plans:			
Change in the net actuarial gain/loss	(5,005)	16,593	(11,518)
Reclassification adjustment for net amortization of actuarial gain/loss included in net income as a component of net periodic cost (benefit)	2,964	6,116	5,319
Total defined-benefit post-retirement benefit plans	(2,041)	22,709	(6,199)
Other comprehensive income (loss), before tax	(2,146,345)	(209,686)	310,887
Deferred tax expense (benefit)	(450,733)	(44,034)	65,287
Other comprehensive income (loss), net of tax	(1,695,612)	(165,652)	245,600
Comprehensive income	$ (1,116,462)	$ 277,427	$ 576,751

See accompanying Notes to Consolidated Financial Statements.

Cullen/Frost Bankers, Inc.
Consolidated Statement of Changes in Shareholders' Equity
(Dollars in thousands, except per share amounts)

	Preferred Stock	Common Stock	Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss), Net of Tax	Treasury Stock	Total
Balance at January 1, 2020	$144,486	$ 642	$ 983,250	$2,667,534	$ 267,370	$(151,614)	$3,911,668
Cumulative effect of accounting change	—	—	—	(29,252)	—	—	(29,252)
Adjusted beginning balance	144,486	642	983,250	2,638,282	267,370	(151,614)	3,882,416
Net income	—	—	—	331,151	—	—	331,151
Other comprehensive income, net of tax	—	—	—	—	245,600	—	245,600
Stock option exercises/stock unit conversions (408,563 shares)	—	—	—	(27,214)	—	39,771	12,557
Stock-based compensation expense recognized in earnings	—	—	13,918	—	—	—	13,918
Redemption of series A preferred stock (6,000,000 shares)	(144,486)	—	—	(5,514)	—	—	(150,000)
Issuance of series B preferred stock (150,000 shares)	145,452	—	—	—	—	—	145,452
Purchase of treasury stock (206,951 shares)	—	—	—	—	—	(15,785)	(15,785)
Treasury stock issued to the 401(k) stock purchase plan (140,264 shares)	—	—	—	(3,382)	—	13,689	10,307
Cash dividends - preferred stock (approximately $0.34 per share)	—	—	—	(2,016)	—	—	(2,016)
Cash dividends – common stock ($2.85 per share)	—	—	—	(180,584)	—	—	(180,584)
Balance at December 31, 2020	145,452	642	997,168	2,750,723	512,970	(113,939)	4,293,016
Net income	—	—	—	443,079	—	—	443,079
Other comprehensive income, net of tax	—	—	—	—	(165,652)	—	(165,652)
Stock option exercises/stock unit conversions (987,758 shares)	—	—	—	(40,836)	—	95,253	54,417
Stock-based compensation expense recognized in earnings	—	—	12,753	—	—	—	12,753
Purchase of treasury stock (31,317 shares)	—	—	—	—	—	(3,864)	(3,864)
Treasury stock issued to the 401(k) stock purchase plan (18,555 shares)	—	—	—	(57)	—	1,806	1,749
Cash dividends – Series B preferred stock (approximately $47.71 per share which is equivalent to approximately $1.19 per depositary share)	—	—	—	(7,157)	—	—	(7,157)
Cash dividends – common stock ($2.94 per share)	—	—	—	(188,786)	—	—	(188,786)
Balance at December 31, 2021	145,452	642	1,009,921	2,956,966	347,318	(20,744)	4,439,555
Net income	—	—	—	579,150	—	—	579,150
Other comprehensive income, net of tax	—	—	—	—	(1,695,612)	—	(1,695,612)
Stock option exercises/stock unit conversions (399,810 shares)	—	1	1,513	(9,990)	—	25,135	16,659
Stock-based compensation expense recognized in earnings	—	—	18,322	—	—	—	18,322
Purchase of treasury stock (31,351 shares)	—	—	—	—	—	(4,391)	(4,391)
Cash dividends – Series B preferred stock (approximately $44.50 per share which is equivalent to approximately $1.11 per depositary share)	—	—	—	(6,675)	—	—	(6,675)
Cash dividends – common stock ($3.24 per share)	—	—	—	(209,780)	—	—	(209,780)
Balance at December 31, 2022	$145,452	$ 643	$1,029,756	$3,309,671	$ (1,348,294)	$ —	$3,137,228

See accompanying Notes to Consolidated Financial Statements

Cullen/Frost Bankers, Inc.
Consolidated Statements of Cash Flows
(Dollars in thousands)

	Year Ended December 31,		
	2022	2021	2020
Operating Activities:			
Net income	$ 579,150	$ 443,079	$ 331,151
Adjustments to reconcile net income to net cash from operating activities:			
Credit loss expense	3,000	63	241,230
Deferred tax expense (benefit)	(4,918)	7,784	(15,832)
Accretion of loan discounts	(12,921)	(12,890)	(15,692)
Securities premium amortization (discount accretion), net	97,400	119,242	123,785
Net (gain) loss on securities transactions	—	(69)	(108,989)
Depreciation and amortization	71,344	69,289	64,370
Net (gain) loss on sale/exchange/write-down of assets/foreclosed assets	109	(11,578)	524
Stock-based compensation	18,322	12,753	13,918
Net tax benefit from stock-based compensation	4,602	7,877	852
Earnings on life insurance policies	(2,096)	(2,462)	(3,731)
Net change in:			
Trading account securities	(716)	(560)	(158)
Lease right-of-use assets	24,409	23,504	23,933
Accrued interest receivable and other assets	(116,243)	(46,560)	(158,264)
Accrued interest payable and other liabilities	61,140	38,821	27,146
Net cash from operating activities	722,582	648,293	524,243
Investing Activities:			
Securities held to maturity:			
Purchases	(1,424,105)	—	(1,500)
Maturities, calls and principal repayments	561,388	177,593	63,577
Securities available for sale:			
Purchases	(22,178,248)	(24,217,841)	(20,841,622)
Sales	—	1,999,891	1,162,352
Maturities, calls and principal repayments	15,683,097	18,425,108	20,893,464
Proceeds from sale of loans	2,365	—	37,535
Net change in loans	(824,021)	1,145,924	(2,856,395)
Benefits received on life insurance policies	2,047	2,307	903
Proceeds from sales of premises and equipment	63	7,044	5,988
Purchases of premises and equipment	(102,501)	(65,850)	(95,422)
Proceeds from sales of repossessed properties	2,585	809	73
Net cash from investing activities	(8,277,330)	(2,525,015)	(1,631,047)
Financing Activities:			
Net change in deposits	1,258,500	7,679,935	7,376,197
Net change in short-term borrowings	1,945,567	649,727	421,655
Proceeds from Federal Home Loan Bank advances	—	—	1,250,000
Principal payments on Federal Home Loan Bank advances	—	—	(1,250,000)
Principal payments on long-term borrowings	—	(13,403)	—
Redemption of Series A preferred stock	—	—	(150,000)
Proceeds from issuance of Series B preferred stock	—	—	145,452
Proceeds from stock option exercises	16,659	54,417	12,557
Purchase of treasury stock	(4,391)	(3,864)	(15,785)
Cash dividends paid on preferred stock	(6,675)	(7,157)	(2,016)
Cash dividends paid on common stock	(209,780)	(188,786)	(180,584)
Net cash from financing activities	2,999,880	8,170,869	7,607,476
Net change in cash and cash equivalents	(4,554,868)	6,294,147	6,500,672
Cash and cash equivalents at beginning of year	16,583,000	10,288,853	3,788,181
Cash and cash equivalents at end of year	$ 12,028,132	$ 16,583,000	$ 10,288,853

See accompanying Notes to Consolidated Financial Statements.

Cullen/Frost Bankers, Inc.
Notes To Consolidated Financial Statements
(Table amounts in thousands, except share and per share amounts)

Note 1 - Summary of Significant Accounting Policies

Nature of Operations. Cullen/Frost Bankers, Inc. ("Cullen/Frost") is a financial holding company and a bank holding company headquartered in San Antonio, Texas that provides, through its subsidiaries, a broad array of products and services throughout numerous Texas markets. The terms "Cullen/Frost," "the Corporation," "we," "us" and "our" mean Cullen/Frost Bankers, Inc. and its subsidiaries, when appropriate. In addition to general commercial and consumer banking, other products and services offered include trust and investment management, insurance, brokerage, mutual funds, leasing, treasury management, capital markets advisory and item processing.

Basis of Presentation. The consolidated financial statements include the accounts of Cullen/Frost and all other entities in which Cullen/Frost has a controlling financial interest. All significant intercompany balances and transactions have been eliminated in consolidation. The accounting and financial reporting policies we follow conform, in all material respects, to accounting principles generally accepted in the United States and to general practices within the financial services industry.

We determine whether we have a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity ("VIE") under accounting principles generally accepted in the United States. Voting interest entities are entities in which the total equity investment at risk is sufficient to enable the entity to finance itself independently and provides the equity holders with the obligation to absorb losses, the right to receive residual returns and the right to make decisions about the entity's activities. We consolidate voting interest entities in which we have all, or at least a majority of, the voting interest. As defined in applicable accounting standards, VIEs are entities that lack one or more of the characteristics of a voting interest entity. A controlling financial interest in a VIE is present when an enterprise has both the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and an obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE. The enterprise with a controlling financial interest, known as the primary beneficiary, consolidates the VIE. Our wholly-owned subsidiary, Cullen/Frost Capital Trust II, is a VIE for which we are not the primary beneficiary and, as such, its accounts are not included in our consolidated financial statements.

Acquisitions are accounted for using the purchase method with the operating results of the acquired companies included with our results of operations since their respective dates of acquisition.

We have evaluated subsequent events for potential recognition and/or disclosure through the date these consolidated financial statements were issued.

Use of Estimates. The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. Actual results could differ from those estimates. The allowance for credit losses on loans and off-balance-sheet credit exposures, the fair values of financial instruments and the status of contingencies are particularly subject to change.

Concentrations and Restrictions on Cash and Cash Equivalents. We maintain deposits with other financial institutions in amounts that exceed federal deposit insurance coverage. Furthermore, federal funds sold are essentially uncollateralized loans to other financial institutions. Management regularly evaluates the credit risk associated with the counterparties to these transactions and believes that we are not exposed to any significant credit risks on cash and cash equivalents.

As of December 31, 2022 and 2021, we had $3.2 million and $110.3 million in cash collateral on deposit with other financial institution counterparties to interest rate swap transactions.

Cash Flow Reporting. Cash and cash equivalents include cash, deposits with other financial institutions that have an initial maturity of less than 90 days when acquired by us, federal funds sold and resell agreements. Net cash flows are reported for loans, deposit transactions and short-term borrowings. Additional cash flow information was as follows:

	Year Ended December 31,		
	2022	2021	2020
Cash paid for interest	$ 169,020	$ 29,003	$ 49,300
Cash paid for income tax	100,000	39,852	44,140
Significant non-cash transactions:			
Exchange of real estate	—	11,036	—
Unsettled securities transactions	94,884	27,032	57,783
Loans foreclosed and transferred to other real estate owned and foreclosed assets	239	3,464	140
Right-of-use lease assets obtained in exchange for lessee operating lease liabilities	31,787	12,854	18,284
Treasury stock issued to 401(k) stock purchase plan	—	1,749	10,307

Repurchase/Resell Agreements. We purchase certain securities under agreements to resell. The amounts advanced under these agreements represent short-term loans and are reflected as assets in the accompanying consolidated balance sheets. The securities underlying these agreements are book-entry securities. We also sell certain securities under agreements to repurchase. The agreements are treated as collateralized financing transactions and the obligations to repurchase securities sold are reflected as a liability in the accompanying consolidated balance sheets. The dollar amount of the securities underlying the agreements remains in the asset accounts.

Securities. Securities are classified as held to maturity and carried at amortized cost when management has the positive intent and ability to hold them until maturity. Securities to be held for indefinite periods of time are classified as available for sale and carried at fair value, with the unrealized holding gains and losses (those for which no allowance for credit losses are recorded) reported as a component of other comprehensive income, net of tax. Securities held for resale in anticipation of short-term market movements are classified as trading and are carried at fair value, with changes in unrealized holding gains and losses included in income. Management determines the appropriate classification of securities at the time of purchase. Securities with limited marketability, such as stock in the Federal Reserve Bank and the Federal Home Loan Bank, are carried at cost.

Interest income on securities includes amortization of purchase premiums and discounts. Premiums and discounts on securities are generally amortized using the interest method with a constant effective yield without anticipating prepayments, except for mortgage-backed securities where prepayments are anticipated. Premiums on callable securities are amortized to their earliest call date. A security is placed on non-accrual status if (i) principal or interest has been in default for a period of 90 days or more or (ii) full payment of principal and interest is not expected. Interest accrued but not received for a security placed on non-accrual status is reversed against interest income. Gains and losses on sales are recorded on the trade date and are derived from the amortized cost of the security sold.

Loans. Loans are reported at the principal balance outstanding net of unearned discounts. Interest income on loans is reported on the level-yield method and includes amortization of deferred loan fees and costs over the terms of the individual loans to which they relate, or, in certain cases, over the average expected term for loans where deferred fees and costs are accounted for on a pooled basis. Net loan commitment fees or costs for commitment periods greater than one year are deferred and amortized into fee income or other expense on a straight-line basis over the commitment period. Income on direct financing leases is recognized on a basis that achieves a constant periodic rate of return on the outstanding investment. Further information regarding our accounting policies related to past due loans, non-accrual loans, impaired loans and troubled-debt restructurings is presented in Note 3 - Loans.

Allowance for Credit Losses. As further discussed below, we adopted Accounting Standards Update ("ASU") 2016-13, "Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments," on January 1, 2020. Accounting Standards Codification ("ASC") Topic 326 ("ASC 326") replaced the previous "incurred loss" model for measuring credit losses, which encompassed allowances for current known and inherent losses within the portfolio, with an "expected loss" model, which encompasses allowances for losses expected to be incurred over the life of the portfolio. The new current expected credit loss ("CECL") model requires the measurement of all expected credit losses for financial assets measured at amortized cost and certain off-balance-

sheet credit exposures based on historical experience, current conditions, and reasonable and supportable forecasts. In connection with the adoption of ASC 326, we revised certain accounting policies and implemented certain accounting policy elections. The revised accounting policies are described below.

Allowance For Credit Losses - Held-to-Maturity Securities: The allowance for credit losses on held-to-maturity securities is a contra-asset valuation account, calculated in accordance with ASC 326, that is deducted from the amortized cost basis of held-to-maturity securities to present management's best estimate of the net amount expected to be collected. Held-to-maturity securities are charged-off against the allowance when deemed uncollectible by management. Adjustments to the allowance are reported in our income statement as a component of credit loss expense. Management measures expected credit losses on held-to-maturity securities on a collective basis by major security type with each type sharing similar risk characteristics and considers historical credit loss information that is adjusted for current conditions and reasonable and supportable forecasts. Management has made the accounting policy election to exclude accrued interest receivable on held-to-maturity securities from the estimate of credit losses. Further information regarding our policies and methodology used to estimate the allowance for credit losses on held-to-maturity securities is presented in Note 2 - Securities.

Allowance For Credit Losses - Available-for-Sale Securities: For available-for-sale securities in an unrealized loss position, we first assess whether (i) we intend to sell or (ii) it is more likely than not that we will be required to sell the security before recovery of its amortized cost basis. If either case is affirmative, any previously recognized allowances are charged-off and the security's amortized cost is written down to fair value through income. If neither case is affirmative, the security is evaluated to determine whether the decline in fair value has resulted from credit losses or other factors. In making this assessment, management considers the extent to which fair value is less than amortized cost, any changes to the rating of the security by a rating agency and any adverse conditions specifically related to the security, among other factors. If this assessment indicates that a credit loss exists, the present value of cash flows expected to be collected from the security are compared to the amortized cost basis of the security. If the present value of cash flows expected to be collected is less than the amortized cost basis, a credit loss exists and an allowance for credit losses is recorded for the credit loss, limited by the amount that the fair value is less than the amortized cost basis. Any impairment that has not been recorded through an allowance for credit losses is recognized in other comprehensive income. Adjustments to the allowance are reported in our income statement as a component of credit loss expense. Management has made the accounting policy election to exclude accrued interest receivable on available-for-sale securities from the estimate of credit losses. Available-for-sale securities are charged-off against the allowance or, in the absence of any allowance, written down through income when deemed uncollectible by management or when either of the aforementioned criteria regarding intent or requirement to sell is met.

Prior to the adoption of ASU 2016-13, declines in the fair value of held-to-maturity and available-for-sale securities below their cost that were deemed to be other than temporary were reflected in earnings as realized losses. In estimating other-than-temporary impairment losses prior to January 1, 2020, management considered, among other things, (i) the length of time and the extent to which the fair value had been less than cost, (ii) the financial condition and near-term prospects of the issuer and (iii) the intent and our ability to retain our investment in the issuer for a period of time sufficient to allow for any anticipated recovery in fair value.

Allowance for Credit Losses - Loans: The allowance for credit losses on loans is a contra-asset valuation account, calculated in accordance with ASC 326, that is deducted from the amortized cost basis of loans to present management's best estimate of the net amount expected to be collected. Loans are charged-off against the allowance when deemed uncollectible by management. Expected recoveries do not exceed the aggregate of amounts previously charged-off and expected to be charged-off. Adjustments to the allowance are reported in our income statement as a component of credit loss expense. Management has made the accounting policy election to exclude accrued interest receivable on loans from the estimate of credit losses. Further information regarding our policies and methodology used to estimate the allowance for credit losses on loans is presented in Note 3 - Loans.

Allowance For Credit Losses - Off-Balance-Sheet Credit Exposures: The allowance for credit losses on off-balance-sheet credit exposures is a liability account, calculated in accordance with ASC 326, representing expected credit losses over the contractual period for which we are exposed to credit risk resulting from a contractual obligation to extend credit. No allowance is recognized if we have the unconditional right to cancel the obligation. The allowance is reported as a component of accrued interest payable and other liabilities in our consolidated balance sheets. Adjustments to the allowance are reported in our income statement as a component of credit loss expense. Further information regarding our policies and methodology used to estimate the allowance for credit

losses on off-balance-sheet credit exposures is presented in Note 8 - Off-Balance-Sheet Arrangements, Commitments, Guarantees and Contingencies.

Premises and Equipment. Land is carried at cost. Building and improvements, and furniture and equipment are carried at cost, less accumulated depreciation, computed principally by the straight-line method based on the estimated useful lives of the related property. Leasehold improvements are generally depreciated over the lesser of the term of the respective leases or the estimated useful lives of the improvements.

We lease certain office facilities and office equipment under operating leases. We also own certain office facilities which we lease to outside parties under operating lessor leases; however, such leases are not significant. For operating leases other than those considered to be short-term, we recognize lease right-of-use assets and related lease liabilities. Such amounts are reported as components of premises and equipment and accrued interest payable and other liabilities, respectively, on our accompanying consolidated balance sheet. We do not recognize short-term operating leases on our balance sheet. A short-term operating lease has an original term of 12 months or less and does not have a purchase option that is likely to be exercised.

In recognizing lease right-of-use assets and related lease liabilities, we account for lease and non-lease components (such as taxes, insurance, and common area maintenance costs) separately as such amounts are generally readily determinable under our lease contracts. Lease payments over the expected term are discounted using our incremental borrowing rate referenced to the Federal Home Loan Bank Secure Connect advance rates for borrowings of similar term. We also consider renewal and termination options in the determination of the term of the lease. If it is reasonably certain that a renewal or termination option will be exercised, the effects of such options are included in the determination of the expected lease term. Generally, we cannot be reasonably certain about whether or not we will renew a lease until such time the lease is within the last two years of the existing lease term. However, renewal options related to our regional headquarters facilities or operations centers are evaluated on a case-by-case basis, typically in advance of such time frame. When we are reasonably certain that a renewal option will be exercised, we measure/remeasure the right-of-use asset and related lease liability using the lease payments specified for the renewal period or, if such amounts are unspecified, we generally assume an increase (evaluated on a case-by-case basis in light of prevailing market conditions) in the lease payment over the final period of the existing lease term.

Foreclosed Assets. Assets acquired through or instead of loan foreclosure are held for sale and are initially recorded at fair value less estimated selling costs when acquired, establishing a new cost basis. Write-downs occurring at acquisition are charged against the allowance for credit losses on loans. Foreclosed assets are included in other assets in the accompanying consolidated balance sheets and totaled $964 thousand and $3.4 million at December 31, 2022 and 2021. Regulatory guidelines require us to reevaluate the fair value of foreclosed assets on at least an annual basis. Our policy is to comply with the regulatory guidelines. If the fair value of the asset declines, a write-down is recorded through other non-interest expense along with other expenses related to maintaining the properties. The valuation of foreclosed assets is subjective in nature and may be adjusted in the future because of changes in economic conditions. There were no write-downs of foreclosed assets in 2022, while write-downs of foreclosed assets totaled $14 thousand in 2021 and $231 thousand in 2020. There were no significant concentrations of any properties, to which the aforementioned write-downs relate, in any single geographic region.

Goodwill. Goodwill represents the excess of the cost of businesses acquired over the fair value of the net assets acquired. Goodwill is assigned to reporting units and tested for impairment at least annually on October 1st, or on an interim basis if an event occurs or circumstances change that would more likely than not reduce the fair value of the reporting unit below its carrying value. See Note 5 - Goodwill and Other Intangible Assets.

Intangibles and Other Long-Lived Assets. Intangible assets are acquired assets that lack physical substance but can be distinguished from goodwill because of contractual or other legal rights or because the asset is capable of being sold or exchanged either on its own or in combination with a related contract, asset, or liability. Our intangible assets relate to core deposits, non-compete agreements and customer relationships. Intangible assets with definite useful lives are amortized on an accelerated basis over their estimated life. Intangible assets with indefinite useful lives are not amortized until their lives are determined to be definite. Intangible assets, premises and equipment and other long-lived assets are tested for impairment whenever events or changes in circumstances indicate the carrying amount of the assets may not be recoverable from future undiscounted cash flows. If impaired, the assets are recorded at fair value. See Note 5 - Goodwill and Other Intangible Assets.

Revenue Recognition. In general, for revenue not associated with financial instruments, guarantees and lease contracts, we apply the following steps when recognizing revenue from contracts with customers: (i) identify the contract, (ii) identify the performance obligations, (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations and (v) recognize revenue when a performance obligation is satisfied. Our contracts with customers are generally short term in nature, typically due within one year or less or cancellable by us or our customer upon a short notice period. Performance obligations for our customer contracts are generally satisfied at a single point in time, typically when the transaction is complete, or over time. For performance obligations satisfied over time, we primarily use the output method, directly measuring the value of the products/services transferred to the customer, to determine when performance obligations have been satisfied. We typically receive payment from customers and recognize revenue concurrent with the satisfaction of our performance obligations. In most cases, this occurs within a single financial reporting period. For payments received in advance of the satisfaction of performance obligations, revenue recognition is deferred until such time as the performance obligations have been satisfied. In cases where we have not received payment despite satisfaction of our performance obligations, we accrue an estimate of the amount due in the period our performance obligations have been satisfied. For contracts with variable components, only amounts for which collection is probable are accrued. We generally act in a principal capacity, on our own behalf, in most of our contracts with customers. In such transactions, we recognize revenue and the related costs to provide our services on a gross basis in our financial statements. In some cases, we act in an agent capacity, deriving revenue through assisting other entities in transactions with our customers. In such transactions, we recognize revenue and the related costs to provide our services on a net basis in our financial statements. These transactions recognized on a net basis primarily relate to insurance and brokerage commissions and fees derived from our customers' use of various interchange and ATM/debit card networks.

Share-Based Payments. Compensation expense for stock options, non-vested stock awards/stock units and deferred stock units is based on the fair value of the award on the measurement date, which, for us, is the date of the grant and is recognized ratably over the service period of the award. Compensation expense for performance stock units is based on the fair value of the award on the measurement date, which, for us, is the date of the grant and is recognized over the service period of the award based upon the probable number of units expected to vest. The fair value of stock options is estimated using a binomial lattice-based valuation model. The fair value of non-vested stock awards/stock units and deferred stock units is generally the market price of our stock on the date of grant. The fair value of performance stock units is generally the market price of our stock on the date of grant discounted by the present value of the dividends expected to be paid on our common stock during the service period of the award because dividend equivalent payments on performance stock units are deferred until such time that the units vest and shares are issued. The impact of forfeitures of share-based payment awards on compensation expense is recognized as forfeitures occur.

Advertising Costs. Advertising costs are expensed as incurred.

Income Taxes. Income tax expense is the total of the current year income tax due or refundable and the change in deferred tax assets and liabilities (excluding deferred tax assets and liabilities related to business combinations or components of other comprehensive income). Deferred tax assets and liabilities are the expected future tax amounts for the temporary differences between carrying amounts and tax bases of assets and liabilities, computed using enacted tax rates. A valuation allowance, if needed, reduces deferred tax assets to the expected amount most likely to be realized. Realization of deferred tax assets is dependent upon the generation of a sufficient level of future taxable income. Although realization is not assured, management believes it is more likely than not that all of the deferred tax assets will be realized. Interest and/or penalties related to income taxes are reported as a component of income tax expense. The income tax effects related to settlements of share-based payment awards are reported in earnings as an increase (or decrease) to income tax expense. See Note 13 - Income Taxes.

We file a consolidated income tax return with our subsidiaries. Federal income tax expense or benefit has been allocated to subsidiaries on a separate return basis.

Basic and Diluted Earnings Per Common Share. Earnings per common share is computed using the two-class method prescribed under ASC Topic 260, “Earnings Per Share.” ASC 260 provides that unvested share-based payment awards that contain nonforfeitable rights to dividends or dividend equivalents (whether paid or unpaid) are participating securities and shall be included in the computation of earnings per share pursuant to the two-class method. We have determined that our outstanding non-vested stock awards/stock units and deferred stock units are participating securities.

Under the two-class method, basic earnings per common share is computed by dividing net earnings allocated to common stock by the weighted-average number of common shares outstanding during the applicable period, excluding outstanding participating securities. Diluted earnings per common share is computed using the weighted-average number of shares determined for the basic earnings per common share computation plus the dilutive effect of stock compensation using the treasury stock method. A reconciliation of the weighted-average shares used in calculating basic earnings per common share and the weighted average common shares used in calculating diluted earnings per common share for the reported periods is provided in Note 10 - Earnings Per Common Share.

Comprehensive Income. Comprehensive income includes all changes in shareholders' equity during a period, except those resulting from transactions with shareholders. Besides net income, other components of our comprehensive income include the after tax effect of changes in the net unrealized gain/loss on securities available for sale, changes in the net unrealized gain on securities transferred to held to maturity and changes in the net actuarial gain/loss on defined benefit post-retirement benefit plans. See Note 14 - Other Comprehensive Income (Loss).

Derivative Financial Instruments. Our hedging policies permit the use of various derivative financial instruments to manage interest rate risk or to hedge specified assets and liabilities. All derivatives are recorded at fair value on our balance sheet. Derivatives executed with the same counterparty are generally subject to master netting arrangements, however, fair value amounts recognized for derivatives and fair value amounts recognized for the right/obligation to reclaim/return cash collateral are not offset for financial reporting purposes. We may be required to recognize certain contracts and commitments as derivatives when the characteristics of those contracts and commitments meet the definition of a derivative.

To qualify for hedge accounting, derivatives must be highly effective at reducing the risk associated with the exposure being hedged and must be designated as a hedge at the inception of the derivative contract. We consider a hedge to be highly effective if the change in fair value of the derivative hedging instrument is within 80% to 125% of the opposite change in the fair value of the hedged item attributable to the hedged risk. If derivative instruments are designated as hedges of fair values, and such hedges are highly effective, both the change in the fair value of the hedge and the hedged item are included in current earnings. Fair value adjustments related to cash flow hedges are recorded in other comprehensive income and are reclassified to earnings when the hedged transaction is reflected in earnings. Ineffective portions of hedges are reflected in earnings as they occur. Actual cash receipts and/or payments and related accruals on derivatives related to hedges are recorded as adjustments to the interest income or interest expense associated with the hedged item. During the life of the hedge, we formally assess whether derivatives designated as hedging instruments continue to be highly effective in offsetting changes in the fair value or cash flows of hedged items. If it is determined that a hedge has ceased to be highly effective, we will discontinue hedge accounting prospectively. At such time, previous adjustments to the carrying value of the hedged item are reversed into current earnings and the derivative instrument is reclassified to a trading position recorded at fair value.

Fair Value Measurements. In general, fair values of financial instruments are based upon quoted market prices, where available. If such quoted market prices are not available, fair value is based upon internally developed models that primarily use, as inputs, observable market-based parameters. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value. These adjustments may include amounts to reflect counterparty credit quality and our creditworthiness, among other things, as well as unobservable parameters. Any such valuation adjustments are applied consistently over time. See Note 17 - Fair Value Measurements.

Transfers of Financial Assets. Transfers of financial assets are accounted for as sales when control over the assets has been surrendered. Control over transferred assets is deemed to be surrendered when (i) the assets have been isolated from us, (ii) the transferee obtains the right (free of conditions that constrain it from taking advantage of that right) to pledge or exchange the transferred assets, and (iii) we do not maintain effective control over the transferred assets through an agreement to repurchase them before their maturity.

Loss Contingencies. Loss contingencies, including claims and legal actions arising in the ordinary course of business are recorded as liabilities when the likelihood of loss is probable and an amount or range of loss can be reasonably estimated.

Trust Assets. Assets of our trust department, other than cash on deposit at Frost Bank, are not included in the accompanying financial statements because they are not our assets.

Accounting Changes, Reclassifications and Restatements. Certain items in prior financial statements have been reclassified to conform to the current presentation.

As discussed above, on January 1, 2020 we adopted the provisions of ASC 326 using the modified retrospective method for all financial assets measured at amortized cost and off-balance-sheet credit exposures. Upon adoption, we recognized an after-tax cumulative effect reduction to retained earnings totaling $29.3 million, as detailed in the table below.

The following table details the impact of the adoption of ASC 326 on the allowance for credit losses as of January 1, 2020.

	January 1, 2020			
	Pre-Adoption Allowance	Impact of Adoption	Post-Adoption Allowance	Cumulative Effect on Retained Earnings
Securities held to maturity:				
U.S. Treasury	$ —	$ —	$ —	$ —
Residential mortgage-backed securities	—	—	—	—
States and political subdivisions	—	215	215	(170)
Other	—	—	—	—
Total	$ —	$ 215	$ 215	$ (170)
Loans:				
Commercial and industrial	$ 51,593	$ 21,263	$ 72,856	$ (16,798)
Energy	37,382	(10,453)	26,929	8,258
Commercial real estate	31,037	(13,519)	17,518	10,680
Consumer real estate	4,113	2,392	6,505	(1,890)
Consumer and other	8,042	(2,248)	5,794	1,776
Total	$ 132,167	$ (2,565)	$ 129,602	$ 2,026
Off-balance-sheet credit exposures	$ 500	$ 39,377	$ 39,877	$ (31,108)

Note 2 - Securities

Securities - Held to Maturity. A summary of the amortized cost, fair value and allowance for credit losses related to securities held to maturity as of December 31, 2022 and 2021 is presented below.

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	Allowance for Credit Losses	Net Carrying Amount
December 31, 2022						
Residential mortgage-backed securities	$ 526,122	$ —	$ 65,322	$ 460,800	$ —	$ 526,122
States and political subdivisions	2,111,619	13,048	119,033	2,005,634	(158)	2,111,461
Other	1,500	—	69	1,431	—	1,500
Total	$ 2,639,241	$ 13,048	$ 184,424	$ 2,467,865	$ (158)	$ 2,639,083
December 31, 2021						
Residential mortgage-backed securities	$ 527,264	$ 18,766	$ —	$ 546,030	$ —	$ 527,264
States and political subdivisions	1,220,573	41,141	101	1,261,613	(158)	1,220,415
Other	1,500	—	—	1,500	—	1,500
Total	$ 1,749,337	$ 59,907	$ 101	$ 1,809,143	$ (158)	$ 1,749,179

All mortgage-backed securities included in the above table were issued by U.S. government agencies and corporations. The carrying value of held-to-maturity securities pledged to secure public funds, trust deposits, repurchase agreements and for other purposes, as required or permitted by law was $256.3 million and $642.3 million at December 31, 2022 and 2021, respectively. Accrued interest receivable on held-to-maturity securities totaled $30.2 million and $18.4 million at December 31, 2022 and 2021, respectively and is included in accrued interest receivable and other assets in the accompanying consolidated balance sheets.

From time to time, we have reclassified certain securities from available for sale to held to maturity. The net unamortized, unrealized gain remaining on securities transferred in years prior to 2020 included in accumulated other comprehensive income in the accompanying balance sheet totaled $1.8 million ($1.4 million, net of tax) at December 31, 2022 and $2.5 million ($2.0 million, net of tax) at December 31, 2021. This amount will be amortized out of accumulated other comprehensive income over the remaining life of the underlying securities as an adjustment of the yield on those securities.

The allowance for credit losses on held-to-maturity securities is a contra-asset valuation account that is deducted from the amortized cost basis of held-to-maturity securities to present the net amount expected to be collected. Management measures expected credit losses on held-to-maturity securities on a collective basis by major security type with each type sharing similar risk characteristics, and considers historical credit loss information that is adjusted for current conditions and reasonable and supportable forecasts. With regard to U.S. Treasury and residential mortgage-backed securities issued by the U.S. government, or agencies thereof, it is expected that the securities will not be settled at prices less than the amortized cost bases of the securities as such securities are backed by the full faith and credit of and/or guaranteed by the U.S. government. Accordingly, no allowance for credit losses has been recorded for these securities. With regard to securities issued by States and political subdivisions and other held-to-maturity securities, management considers (i) issuer bond ratings, (ii) historical loss rates for given bond ratings, (iii) whether issuers continue to make timely principal and interest payments under the contractual terms of the securities, (iv) internal forecasts and (v) whether or not such securities are guaranteed by the Texas Permanent School Fund ("PSF") or pre-refunded by the issuers.

The following table summarizes Moody's and/or Standard & Poor's bond ratings for our portfolio of held-to-maturity securities issued by States and political subdivisions and other securities as of December 31, 2022:

	States and Political Subdivisions				
	Not Guaranteed or Pre-Refunded	Guaranteed by the Texas PSF	Pre-Refunded	Total	Other Securities
Aaa/AAA	$ 273,201	$ 1,422,442	$ 121,961	$ 1,817,604	$ —
Aa/AA	294,015	—	—	294,015	—
Not rated	—	—	—	—	1,500
Total	$ 567,216	$ 1,422,442	$ 121,961	$ 2,111,619	$ 1,500

Historical loss rates associated with securities having similar grades as those in our portfolio have generally not been significant. Furthermore, as of December 31, 2022, there were no past due principal or interest payments associated with these securities. The PSF is a sovereign wealth fund which serves to provide revenues for funding of public primary and secondary education in the State of Texas. Based upon (i) the PSF's AAA insurer financial strength rating, (ii) the PSF's substantial capitalization and excess guarantee capacity and (iii) a zero historical loss rate, no allowance for credit losses has been recorded for securities guaranteed by the PSF as there is no current expectation of credit losses related to these securities. Pre-refunded securities have been defeased by the issuer and are fully secured by cash and/or U.S. Treasury securities held in escrow for payment to holders when the underlying call dates of the securities are reached. Accordingly, no allowance for credit losses has been recorded for securities that have been defeased as there is no current expectation of credit losses related to these securities.

The following table details activity in the allowance for credit losses on held-to-maturity securities.

	2022	2021	2020
Beginning balance	$ 158	$ 160	$ —
Impact of adopting ASC 326	—	—	215
Credit loss expense (benefit)	—	(2)	(55)
Ending balance	$ 158	$ 158	$ 160

Securities - Available for Sale. A summary of the amortized cost, fair value and allowance for credit losses related to securities available for sale as of December 31, 2022 and 2021 is presented below.

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Allowance for Credit Losses	Estimated Fair Value
December 31, 2022					
U.S. Treasury	$ 5,450,546	$ —	$ 398,959	$ —	$ 5,051,587
Residential mortgage-backed securities	7,316,824	8,050	948,638	—	6,376,236
States and political subdivisions	7,098,635	9,108	334,388	—	6,773,355
Other	42,427	—	—	—	42,427
Total	$ 19,908,432	$ 17,158	$ 1,681,985	$ —	$ 18,243,605
December 31, 2021					
U.S. Treasury	$ 2,165,702	$ 23,333	$ 9,602	$ —	$ 2,179,433
Residential mortgage-backed securities	4,059,692	31,662	25,089	—	4,066,265
States and political subdivisions	7,178,135	463,810	5,374	—	7,636,571
Other	42,359	—	—	—	42,359
Total	$ 13,445,888	$ 518,805	$ 40,065	$ —	$ 13,924,628

All mortgage-backed securities included in the above table were issued by U.S. government agencies and corporations. At December 31, 2022 all of the securities in our available for sale municipal bond portfolio were issued by the State of Texas or political subdivisions or agencies within the State of Texas, of which approximately 75.9% are either guaranteed by the PSF or have been pre-refunded. Securities with limited marketability, such as stock in the Federal Reserve Bank and the Federal Home Loan Bank, are carried at cost and are reported as other available for sale securities in the table above. The carrying value of available-for-sale securities pledged to secure public funds, trust deposits, repurchase agreements and for other purposes, as required or permitted by law was $8.0 billion and $5.8 billion at December 31, 2022 and 2021, respectively. Accrued interest receivable on available-for-sale securities totaled $140.6 million and $120.5 million at December 31, 2022 and 2021, respectively, and is included in accrued interest receivable and other assets in the accompanying consolidated balance sheets.

The table below summarizes, as of December 31, 2022, securities available for sale in an unrealized loss position for which an allowance for credit losses has not been recorded, aggregated by type of security and length of time in a continuous unrealized loss position.

	Less than 12 Months		More than 12 Months		Total	
	Estimated Fair Value	Unrealized Losses	Estimated Fair Value	Unrealized Losses	Estimated Fair Value	Unrealized Losses
U.S. Treasury	$ 2,012,129	$ 63,515	$ 3,039,458	$ 335,444	$ 5,051,587	$ 398,959
Residential mortgage-backed securities	3,265,658	345,307	2,495,906	603,331	5,761,564	948,638
States and political subdivisions	3,923,159	136,957	681,677	197,431	4,604,836	334,388
Total	$ 9,200,946	$ 545,779	$ 6,217,041	$ 1,136,206	$15,417,987	$ 1,681,985

As of December 31, 2022, no allowance for credit losses has been recognized on available for sale securities in an unrealized loss position as management does not believe any of the securities are impaired due to reasons of credit quality. This is based upon our analysis of the underlying risk characteristics, including credit ratings, and other qualitative factors related to our available for sale securities and in consideration of our historical credit loss experience and internal forecasts. The issuers of these securities continue to make timely principal and interest

payments under the contractual terms of the securities. Furthermore, management does not have the intent to sell any of the securities classified as available for sale in the table above and believes that it is more likely than not that we will not have to sell any such securities before a recovery of cost. The unrealized losses are due to increases in market interest rates over the yields available at the time the underlying securities were purchased. The fair value is expected to recover as the securities approach their maturity date or repricing date or if market yields for such investments decline.

Contractual Maturities. The following table summarizes the maturity distribution schedule of securities held to maturity and securities available for sale as of December 31, 2022. Mortgage-backed securities are included in maturity categories based on their stated maturity date. Expected maturities may differ from contractual maturities because issuers may have the right to call or prepay obligations. Other securities classified as available for sale include stock in the Federal Reserve Bank and the Federal Home Loan Bank, which have no maturity date. These securities have been included in the total column only.

	Within 1 Year	1 - 5 Years	5 - 10 Years	After 10 Years	Total
Held To Maturity					
Amortized Cost					
Residential mortgage-backed securities	$ —	$ —	$ 514,059	$ 12,063	$ 526,122
States and political subdivisions	123,591	24,339	8,297	1,955,392	2,111,619
Other	—	1,500	—	—	1,500
Total	$ 123,591	$ 25,839	$ 522,356	$ 1,967,455	$ 2,639,241
Estimated Fair Value					
Residential mortgage-backed securities	$ —	$ —	$ 450,961	$ 9,839	$ 460,800
States and political subdivisions	123,505	24,292	8,286	1,849,551	2,005,634
Other	—	1,431	—	—	1,431
Total	$ 123,505	$ 25,723	$ 459,247	$ 1,859,390	$ 2,467,865
Available For Sale					
Amortized Cost					
U. S. Treasury	$ 249,363	$ 3,574,630	$ 1,434,504	$ 192,049	$ 5,450,546
Residential mortgage-backed securities	8	7,729	16,025	7,293,062	7,316,824
States and political subdivisions	261,477	1,464,493	937,127	4,435,538	7,098,635
Other	—	—	—	—	42,427
Total	$ 510,848	$ 5,046,852	$ 2,387,656	$ 11,920,649	$ 19,908,432
Estimated Fair Value					
U. S. Treasury	$ 240,361	$ 3,424,023	$ 1,244,812	$ 142,391	$ 5,051,587
Residential mortgage-backed securities	8	7,527	15,892	6,352,809	6,376,236
States and political subdivisions	261,888	1,470,098	918,563	4,122,806	6,773,355
Other	—	—	—	—	42,427
Total	$ 502,257	$ 4,901,648	$ 2,179,267	$ 10,618,006	$ 18,243,605

Sales of Securities. Sales of securities available for sale were as follows:

	2022	2021	2020
Proceeds from sales	$ —	$ 1,999,891	$ 1,162,352
Gross realized gains	—	69	108,989
Gross realized losses	—	—	—
Tax benefit (expense) related to securities gains/losses	—	(14)	(22,888)

Premiums and Discounts. Premium amortization and discount accretion included in interest income on securities was as follows:

	2022	2021	2020
Premium amortization	$ (110,997)	$ (121,994)	$ (126,210)
Discount accretion	13,597	2,752	2,425
Net (premium amortization) discount accretion	$ (97,400)	$ (119,242)	$ (123,785)

Trading Account Securities. Year-end trading account securities, at estimated fair value, were as follows:

	2022	2021
U.S. Treasury	$ 25,879	$ 24,237
States and political subdivisions	2,166	925
Total	$ 28,045	$ 25,162

Net gains and losses on trading account securities were as follows:

	2022	2021	2020
Net gain on sales transactions	$ 3,129	$ 1,014	$ 1,102
Net mark-to-market gains (losses)	(230)	(75)	85
Net gain on trading account securities	$ 2,899	$ 939	$ 1,187

Note 3 - Loans

Year-end loans, including leases net of unearned discounts, consisted of the following:

	2022	2021
Commercial and industrial	$ 5,674,798	$ 5,364,954
Energy:		
Production	696,570	878,436
Service	133,542	105,901
Other	95,617	93,455
Total energy	925,729	1,077,792
Paycheck Protection Program	34,852	428,882
Commercial real estate:		
Commercial mortgages	6,168,910	5,867,062
Construction	1,477,247	1,304,271
Land	537,168	405,277
Total commercial real estate	8,183,325	7,576,610
Consumer real estate:		
Home equity lines of credit	691,841	519,098
Home equity loans	449,507	324,157
Home improvement loans	577,377	428,069
Other	124,814	139,466
Total consumer real estate	1,843,539	1,410,790
Total real estate	10,026,864	8,987,400
Consumer and other	492,726	477,369
Total loans	$ 17,154,969	$ 16,336,397

Concentrations of Credit. Most of our lending activity occurs within the State of Texas, including the four largest metropolitan areas of Austin, Dallas/Ft. Worth, Houston and San Antonio, as well as other markets. The majority of our loan portfolio consists of commercial and industrial and commercial real estate loans. As of December 31, 2022 and 2021, there were no concentrations of loans related to any single industry in excess of 10% of total loans. At such dates, the largest industry concentration was related to the energy industry, which totaled 5.4% of total loans at December 31, 2022 and 6.6% of total loans at December 31, 2021. Unfunded commitments to extend credit and standby letters of credit issued to customers in the energy industry totaled $997.1 million and $103.4 million, respectively, as of December 31, 2022.

Foreign Loans. We have U.S. dollar denominated loans and commitments to borrowers in Mexico. The outstanding balance of these loans and the unfunded amounts available under these commitments were not significant at December 31, 2022 or 2021.

Overdrafts. Deposit account overdrafts reported as loans totaled $10.3 million and $7.8 million at December 31, 2022 and 2021.

Related Party Loans. In the ordinary course of business, we have granted loans to certain directors, executive officers and their affiliates (collectively referred to as "related parties"). Activity in related party loans during 2022 is presented in the following table. Other changes were primarily related to changes in related-party status.

Balance outstanding at December 31, 2021	$ 350,538
Principal additions	337,700
Principal payments	(294,857)
Other changes	(2,126)
Balance outstanding at December 31, 2022	$ 391,255

Accrued Interest Receivable. Accrued interest receivable on loans totaled $68.7 million and $40.0 million at December 31, 2022 and 2021, respectively and is included in accrued interest receivable and other assets in the accompany consolidated balance sheets.

Non-Accrual and Past Due Loans. Loans are considered past due if the required principal and interest payments have not been received as of the date such payments were due. Loans are placed on non-accrual status when, in management's opinion, the borrower may be unable to meet payment obligations as they become due, as well as when required by regulatory provisions. In determining whether or not a borrower may be unable to meet payment obligations for each class of loans, we consider the borrower's debt service capacity through the analysis of current financial information, if available, and/or current information with regards to our collateral position. Regulatory provisions would typically require the placement of a loan on non-accrual status if (i) principal or interest has been in default for a period of 90 days or more unless the loan is both well secured and in the process of collection or (ii) full payment of principal and interest is not expected. Loans may be placed on non-accrual status regardless of whether or not such loans are considered past due. When interest accrual is discontinued, all unpaid accrued interest is reversed. Interest income on non-accrual loans is recognized only to the extent that cash payments are received in excess of principal due. A loan may be returned to accrual status when all the principal and interest amounts contractually due are brought current and future principal and interest amounts contractually due are reasonably assured, which is typically evidenced by a sustained period (at least six months) of repayment performance by the borrower.

Year-end non-accrual loans, segregated by class of loans, were as follows:

	December 31, 2022		December 31, 2021	
	Total Non-Accrual	Non-Accrual with No Credit Loss Allowance	Total Non-Accrual	Non-Accrual with No Credit Loss Allowance
Commercial and industrial	$ 18,130	$ 8,514	$ 22,582	$ 4,701
Energy	15,224	7,139	14,433	8,533
Commercial real estate:				
Buildings, land and other	3,552	1,991	15,297	13,817
Construction	—	—	948	—
Consumer real estate	927	927	440	138
Consumer and other	—	—	13	13
Total	$ 37,833	$ 18,571	$ 53,713	$ 27,202

The following tables present non-accrual loans as of December 31, 2022 and December 31, 2021 by class and year of origination.

	December 31, 2022								
	2022	2021	2020	2019	2018	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Commercial and industrial	$ —	$ 1,252	$ 1,089	$ 3,242	$ 1,197	$ 191	$ 2,973	$ 8,186	$ 18,130
Energy	4,657	—	72	1,386	10	—	7,631	1,468	15,224
Commercial real estate:									
Buildings, land and other	1,644	—	—	217	266	1,425	—	—	3,552
Construction	—	—	—	—	—	—	—	—	—
Consumer real estate	—	258	—	—	—	84	—	585	927
Consumer and other	—	—	—	—	—	—	—	—	—
Total	$ 6,301	$ 1,510	$ 1,161	$ 4,845	$ 1,473	$ 1,700	$ 10,604	$ 10,239	$ 37,833

	December 31, 2021								
	2021	2020	2019	2018	2017	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Commercial and industrial	$ 636	$ 3,856	$ 5,047	$ 1,820	$ 765	$ 353	$ 4,635	$ 5,470	$ 22,582
Energy	—	—	5,358	1,325	—	—	6,931	819	14,433
Commercial real estate:									
Buildings, land and other	6,038	307	3,446	814	2,030	2,662	—	—	15,297
Construction	—	948	—	—	—	—	—	—	948
Consumer real estate	—	—	—	—	—	408	—	32	440
Consumer and other	13	—	—	—	—	—	—	—	13
Total	$ 6,687	$ 5,111	$ 13,851	$ 3,959	$ 2,795	$ 3,423	$ 11,566	$ 6,321	$ 53,713

In the tables above, loans reported as 2022 originations as of December 31, 2022 and loans reported as 2021 originations as of December 31, 2021 were, for the most part, first originated in various years prior to 2022 and 2021, respectively, but were renewed in the respective year. Had non-accrual loans performed in accordance with their original contract terms, we would have recognized additional interest income, net of tax, of approximately $1.7 million in 2022, $1.8 million in 2021 and $2.9 million in 2020.

An age analysis of past due loans (including both accruing and non-accruing loans), segregated by class of loans, as of December 31, 2022 is presented in the following table. Despite their past due status, Paycheck Protection Plan loans are fully guaranteed by the SBA.

	Loans 30-89 Days Past Due	Loans 90 or More Days Past Due	Total Past Due Loans	Current Loans	Total Loans	Accruing Loans 90 or More Days Past Due
Commercial and industrial	$ 36,167	$ 12,853	$ 49,020	$ 5,625,778	$ 5,674,798	$ 5,560
Energy	2,880	7,680	10,560	915,169	925,729	—
Paycheck Protection Program	5,321	13,867	19,188	15,664	34,852	13,867
Commercial real estate:						
Buildings, land and other	23,561	5,869	29,430	6,676,648	6,706,078	5,664
Construction	—	—	—	1,477,247	1,477,247	—
Consumer real estate	7,856	2,690	10,546	1,832,993	1,843,539	2,398
Consumer and other	5,155	311	5,466	487,260	492,726	311
Total	$ 80,940	$ 43,270	$ 124,210	$17,030,759	$17,154,969	$ 27,800

Troubled Debt Restructurings. The restructuring of a loan is considered a "troubled debt restructuring" if both (i) the borrower is experiencing financial difficulties and (ii) the creditor has granted a concession. Concessions may include interest rate reductions or below market interest rates, principal forgiveness, restructuring amortization schedules, reductions in collateral and other actions intended to minimize potential losses. Troubled debt restructurings that occurred during 2022, 2021 and 2020 are set forth in the following table.

	2022		2021		2020	
	Balance at Restructure	Balance at Year-end	Balance at Restructure	Balance at Year-end	Balance at Restructure	Balance at Year-end
Commercial and industrial	$ —	$ —	$ 1,312	$ 1,162	$ 3,661	$ 192
Energy	—	—	3,817	721	2,432	2,421
Commercial real estate:						
Buildings, land and other	1,155	1,051	1,888	1,862	9,310	4,922
Construction	—	—	—	—	1,017	1,017
Consumer real estate	—	—	—	—	—	—
Consumer and other	—	—	—	—	1,104	—
	$ 1,155	$ 1,051	$ 7,017	$ 3,745	$ 17,524	$ 8,552

Loan modifications are typically related to extending amortization periods, converting loans to interest only for a limited period of time, deferral of interest payments, waiver of certain covenants, consolidating notes and/or reducing collateral or interest rates. The modifications during the reported periods did not significantly impact our determination of the allowance for credit losses on loans.

Additional information related to restructured loans was as follows:

	2022	2021	2020
Restructured loans past due in excess of 90 days at period-end:			
Number of loans	—	2	1
Dollar amount of loans	$ —	$ 1,027	$ 2,008
Restructured loans on non-accrual status at period end	1,051	3,439	8,552
Charge-offs of restructured loans:			
Recognized in connection with restructuring	—	—	337
Recognized on previously restructured loans	723	4,278	3,894
Proceeds from sale of restructured loans	1,070	—	—

Credit Quality Indicators. As part of the on-going monitoring of the credit quality of our loan portfolio, management tracks certain credit quality indicators including trends related to (i) the weighted-average risk grade of commercial loans, (ii) the level of classified commercial loans, (iii) the delinquency status of consumer loans (iv) non-performing loans (see details above) and (vi) the general economic conditions in the State of Texas.

We utilize a risk grading matrix to assign a risk grade to each of our commercial loans. Loans are graded on a scale of 1 to 14. A description of the general characteristics of the 14 risk grades is as follows:

- *Grades 1, 2 and 3* - These grades include loans to very high credit quality borrowers of investment or near investment grade. These borrowers are generally publicly traded (grades 1 and 2), have significant capital strength, moderate leverage, stable earnings and growth, and readily available financing alternatives. Smaller entities, regardless of strength, would generally not fit in these grades.
- *Grades 4 and 5* - These grades include loans to borrowers of solid credit quality with moderate risk. Borrowers in these grades are differentiated from higher grades on the basis of size (capital and/or revenue), leverage, asset quality and the stability of the industry or market area.
- *Grades 6, 7 and 8* - These grades include "pass grade" loans to borrowers of acceptable credit quality and risk. Such borrowers are differentiated from Grades 4 and 5 in terms of size, secondary sources of repayment or they are of lesser stature in other key credit metrics in that they may be over-leveraged, under capitalized, inconsistent in performance or in an industry or an economic area that is known to have a higher level of risk, volatility, or susceptibility to weaknesses in the economy.
- *Grade 9* - This grade includes loans on management's "watch list" and is intended to be utilized on a temporary basis for pass grade borrowers where a significant risk-modifying action is anticipated in the near term.
- *Grade 10* - This grade is for "Other Assets Especially Mentioned" in accordance with regulatory guidelines. This grade is intended to be temporary and includes loans to borrowers whose credit quality has clearly deteriorated and are at risk of further decline unless active measures are taken to correct the situation.
- *Grade 11* - This grade includes "Substandard" loans, in accordance with regulatory guidelines, for which the accrual of interest has not been stopped. By definition under regulatory guidelines, a "Substandard" loan has defined weaknesses which make payment default or principal exposure likely, but not yet certain. Such loans are apt to be dependent upon collateral liquidation, a secondary source of repayment or an event outside of the normal course of business.
- *Grade 12* - This grade includes "Substandard" loans, in accordance with regulatory guidelines, for which the accrual of interest has been stopped. This grade includes loans where interest is more than 120 days past due and not fully secured and loans where a specific valuation allowance may be necessary, but generally does not exceed 30% of the principal balance.
- *Grade 13* - This grade includes "Doubtful" loans in accordance with regulatory guidelines. Such loans are placed on non-accrual status and may be dependent upon collateral having a value that is difficult to determine or upon some near-term event which lacks certainty. Additionally, these loans generally have a specific valuation allowance in excess of 30% of the principal balance.
- *Grade 14* - This grade includes "Loss" loans in accordance with regulatory guidelines. Such loans are to be charged-off or charged-down when payment is acknowledged to be uncertain or when the timing or value of payments cannot be determined. "Loss" is not intended to imply that the loan or some portion of it will never be paid, nor does it in any way imply that there has been a forgiveness of debt.

In monitoring credit quality trends in the context of assessing the appropriate level of the allowance for credit losses on loans, we monitor portfolio credit quality by the weighted-average risk grade of each class of commercial loan. Individual relationship managers, under the oversight of credit administration, review updated financial information for all pass grade loans to reassess the risk grade on at least an annual basis. When a loan has a risk grade of 9, it is still considered a pass grade loan; however, it is considered to be on management's "watch list," where a significant risk-modifying action is anticipated in the near term. When a loan has a risk grade of 10 or higher, a special assets officer monitors the loan on an on-going basis.

The following tables present weighted-average risk grades for all commercial loans, by class and year of origination/renewal as of December 31, 2022 and 2021. Paycheck Protection Program ("PPP") loans are excluded as such loans are fully guaranteed by the Small Business Administration ("SBA").

	December 31, 2022								
	2022	2021	2020	2019	2018	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Commercial and industrial									
Risk grades 1-8	$1,667,274	$ 618,756	$ 485,908	$ 226,835	$ 123,768	$ 192,791	$2,068,891	$ 51,694	$5,435,917
Risk grade 9	31,275	34,950	3,651	5,400	11,006	1,014	54,856	4,040	146,192
Risk grade 10	2,294	724	845	4,713	1,341	114	23,880	3,685	37,596
Risk grade 11	2,342	1,357	6,720	1,807	1,229	1,644	19,582	2,282	36,963
Risk grade 12	—	1,052	866	2,972	1,177	191	673	5,590	12,521
Risk grade 13	—	200	223	270	20	—	2,300	2,596	5,609
	$1,703,185	$ 657,039	$ 498,213	$ 241,997	$ 138,541	$ 195,754	$2,170,182	$ 69,887	$5,674,798
W/A risk grade	6.37	7.05	6.01	6.59	6.87	5.55	6.26	7.68	6.39
Energy									
Risk grades 1-8	$ 338,050	$ 99,089	$ 4,917	$ 3,138	$ 2,020	$ 2,850	$ 393,957	$ 43,161	$ 887,182
Risk grade 9	1,561	1,611	166	562	748	—	6,434	30	11,112
Risk grade 10	—	—	—	428	214	—	—	—	642
Risk grade 11	7,956	162	157	3,145	86	63	—	—	11,569
Risk grade 12	3,995	—	72	1,386	10	—	4,571	806	10,840
Risk grade 13	662	—	—	—	—	—	3,060	662	4,384
	$ 352,224	$ 100,862	$ 5,312	$ 8,659	$ 3,078	$ 2,913	$ 408,022	$ 44,659	$ 925,729
W/A risk grade	6.09	5.65	7.65	9.64	8.02	6.59	5.18	5.69	5.67
Commercial real estate:									
Buildings, land, other									
Risk grades 1-8	$1,811,069	$1,484,811	$ 956,567	$ 708,942	$ 360,154	$ 800,944	$ 111,778	$ 105,763	$6,340,028
Risk grade 9	52,288	13,139	36,264	22,086	17,699	45,590	652	2,210	189,928
Risk grade 10	26,688	11,150	3,735	9,008	29,683	5,221	5,535	—	91,020
Risk grade 11	10,199	19,073	12,631	4,778	2,525	28,841	2,993	510	81,550
Risk grade 12	1,049	—	—	217	266	1,425	—	—	2,957
Risk grade 13	595	—	—	—	—	—	—	—	595
	$1,901,888	$1,528,173	$1,009,197	$ 745,031	$ 410,327	$ 882,021	$ 120,958	$ 108,483	$6,706,078
W/A risk grade	7.01	7.26	7.14	7.01	7.33	6.94	7.38	6.43	7.09
Construction									
Risk grades 1-8	$ 640,948	$ 489,391	$ 128,788	$ 2,236	$ 486	$ 1,726	$ 163,293	$ 3,144	$1,430,012
Risk grade 9	12,865	2,100	2,100	—	—	—	17,887	—	34,952
Risk grade 10	859	72	—	—	—	—	—	—	931
Risk grade 11	11,352	—	—	—	—	—	—	—	11,352
Risk grade 12	—	—	—	—	—	—	—	—	—
Risk grade 13	—	—	—	—	—	—	—	—	—
	$ 666,024	$ 491,563	$ 130,888	$ 2,236	$ 486	$ 1,726	$ 181,180	$ 3,144	$1,477,247
W/A risk grade	7.29	7.03	6.43	7.04	6.00	6.76	7.23	5.03	7.12
Total commercial real estate	$2,567,912	$2,019,736	$1,140,085	$ 747,267	$ 410,813	$ 883,747	$ 302,138	$ 111,627	$8,183,325
W/A risk grade	7.08	7.20	7.06	7.01	7.33	6.94	7.29	6.39	7.10

	December 31, 2021								
	2021	2020	2019	2018	2017	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Commercial and industrial									
Risk grades 1-8	$1,567,883	$ 657,529	$ 350,563	$ 179,209	$ 146,064	$ 131,201	$1,987,061	$ 44,337	$5,063,847
Risk grade 9	32,866	21,094	24,683	26,327	612	11,419	65,131	5,738	187,870
Risk grade 10	27,961	6,273	4,047	4,357	1,021	98	14,091	1,289	59,137
Risk grade 11	1,178	4,572	8,068	2,450	2,460	221	4,714	7,855	31,518
Risk grade 12	456	2,495	3,828	1,756	347	353	613	2,687	12,535
Risk grade 13	180	1,361	1,219	64	418	—	4,022	2,783	10,047
	$1,630,524	$ 693,324	$ 392,408	$ 214,163	$ 150,922	$ 143,292	$2,075,632	$ 64,689	$5,364,954
W/A risk grade	5.91	6.30	6.89	7.06	5.91	5.80	6.21	8.04	6.22
Energy									
Risk grades 1-8	$ 445,489	$ 8,075	$ 9,259	$ 6,441	$ 3,110	$ 4,368	$ 464,454	$ 67,174	$1,008,370
Risk grade 9	19,274	611	1,775	187	—	724	11,635	2,416	36,622
Risk grade 10	—	101	631	511	—	—	—	530	1,773
Risk grade 11	10,260	752	3,968	1,016	—	546	—	52	16,594
Risk grade 12	—	—	3,888	246	—	—	4,000	819	8,953
Risk grade 13	—	—	1,470	1,079	—	—	2,931	—	5,480
	$ 475,023	$ 9,539	$ 20,991	$ 9,480	$ 3,110	$ 5,638	$ 483,020	$ 70,991	$1,077,792
W/A risk grade	6.21	7.81	9.34	8.60	7.12	7.63	5.61	6.46	6.06
Commercial real estate:									
Buildings, land, other									
Risk grades 1-8	$1,707,550	$1,096,274	$ 874,130	$ 533,362	$ 492,492	$ 713,268	$ 52,150	$ 105,696	$5,574,922
Risk grade 9	16,302	145,340	52,427	43,806	27,188	27,767	4,445	4,258	321,533
Risk grade 10	28,209	13,813	69,643	46,250	64,950	46,582	—	—	269,447
Risk grade 11	3,455	1,321	8,720	7,788	26,107	34,970	3,000	5,779	91,140
Risk grade 12	5,838	307	3,446	814	2,030	2,662	—	—	15,097
Risk grade 13	200	—	—	—	—	—	—	—	200
	$1,761,554	$1,257,055	$1,008,366	$ 632,020	$ 612,767	$ 825,249	$ 59,595	$ 115,733	$6,272,339
W/A risk grade	7.19	7.18	7.35	7.39	7.34	7.01	7.06	7.02	7.22
Construction									
Risk grades 1-8	$ 657,471	$ 262,176	$ 178,226	$ 2,339	$ 38	$ 1,930	$ 160,020	$ —	$1,262,200
Risk grade 9	35,721	4,956	—	—	446	—	—	—	41,123
Risk grade 10	—	—	—	—	—	—	—	—	—
Risk grade 11	—	—	—	—	—	—	—	—	—
Risk grade 12	—	748	—	—	—	—	—	—	748
Risk grade 13	—	200	—	—	—	—	—	—	200
	$ 693,192	$ 268,080	$ 178,226	$ 2,339	$ 484	$ 1,930	$ 160,020	$ —	$1,304,271
W/A risk grade	7.17	6.56	7.60	7.51	8.92	6.73	6.79	—	7.06
Total commercial real estate	$2,454,746	$1,525,135	$1,186,592	$ 634,359	$ 613,251	$ 827,179	$ 219,615	$ 115,733	$7,576,610
W/A risk grade	7.18	7.07	7.39	7.39	7.34	7.00	6.86	7.02	7.19

At December 31, 2022 and 2021, the weighted-average risk grades for “pass grade” (risk grades 1-8) loans were 6.24 and 6.01, respectively, for commercial and industrial; 5.44 and 5.78, respectively, for energy; 6.94 and 6.91, respectively, for commercial real estate - buildings, land and other; and 7.04 and 6.99, respectively, for commercial real estate - construction. Furthermore, in the tables above, there are loans reported as 2022 originations as of December 31, 2022 and 2021 originations as of December 31, 2021 that have risk grades of 11 or higher. These loans were, for the most part, first originated in various years prior to 2022 and 2021, respectively, but were renewed in the respective year.

Information about the payment status of consumer loans, segregated by portfolio segment and year of origination, as of December 31, 2022 and December 31, 2021 was as follows:

	December 31, 2022								
	2022	2021	2020	2019	2018	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Consumer real estate:									
Past due 30-89 days	$ 793	$ 1,125	$ 645	$ 936	$ 503	$ 2,087	$ 565	$ 1,202	$ 7,856
Past due 90 or more days	95	258	28	—	129	919	347	914	2,690
Total past due	888	1,383	673	936	632	3,006	912	2,116	10,546
Current loans	403,587	313,222	194,900	70,723	38,904	122,585	678,418	10,654	1,832,993
Total	$ 404,475	$ 314,605	$ 195,573	$ 71,659	$ 39,536	$ 125,591	$ 679,330	$ 12,770	$ 1,843,539
Consumer and other:									
Past due 30-89 days	$ 2,673	$ 511	$ 128	$ 51	$ 4	$ 31	$ 314	$ 1,443	$ 5,155
Past due 90 or more days	77	2	—	13	—	—	25	194	311
Total past due	2,750	513	128	64	4	31	339	1,637	5,466
Current loans	59,886	20,887	6,475	2,897	1,271	1,632	372,117	22,095	487,260
Total	$ 62,636	$ 21,400	$ 6,603	$ 2,961	$ 1,275	$ 1,663	$ 372,456	$ 23,732	$ 492,726

	December 31, 2021								
	2021	2020	2019	2018	2017	Prior	Revolving Loans	Revolving Loans Converted to Term	Total
Consumer real estate:									
Past due 30-89 days	$ 280	$ 204	$ 406	$ 489	$ 296	$ 1,344	$ 126	$ 1,732	$ 4,877
Past due 90 or more days	—	—	—	154	355	828	991	185	2,513
Total past due	280	204	406	643	651	2,172	1,117	1,917	7,390
Current loans	319,042	251,160	95,900	55,893	48,841	116,423	505,333	10,808	1,403,400
Total	$ 319,322	$ 251,364	$ 96,306	$ 56,536	$ 49,492	$ 118,595	$ 506,450	$ 12,725	$ 1,410,790
Consumer and other:									
Past due 30-89 days	$ 1,600	$ 91	$ 120	$ 38	$ 51	$ 17	$ 325	$ 1,943	$ 4,185
Past due 90 or more days	548	—	45	—	—	—	34	449	1,076
Total past due	2,148	91	165	38	51	17	359	2,392	5,261
Current loans	46,708	17,843	6,215	2,684	1,708	1,158	371,866	23,926	472,108
Total	$ 48,856	$ 17,934	$ 6,380	$ 2,722	$ 1,759	$ 1,175	$ 372,225	$ 26,318	$ 477,369

Revolving loans that converted to term during 2022 and 2021 were as follows:

	2022	2021
Commercial and industrial	$ 34,247	$ 40,099
Energy	3,295	54,996
Commercial real estate:		
Buildings, land and other	12,174	68,337
Construction	3,144	—
Consumer real estate	5,381	1,156
Consumer and other	9,200	8,367
Total	$ 67,441	$ 172,955

In assessing the general economic conditions in the State of Texas, management monitors and tracks the Texas Leading Index ("TLI"), which is produced by the Federal Reserve Bank of Dallas. The TLI is a single summary statistic that is designed to signal the likelihood of the Texas economy's transition from expansion to recession and vice versa. Management believes this index provides a reliable indication of the direction of overall credit quality. The TLI is a composite of the following eight leading indicators: (i) Texas Value of the Dollar, (ii) U.S. Leading

Index, (iii) real oil prices (iv) well permits, (v) initial claims for unemployment insurance, (vi) Texas Stock Index, (vii) Help-Wanted Index and (viii) average weekly hours worked in manufacturing. The TLI totaled 129.7 at December 31, 2022 and 135.7 at December 31, 2021. A lower TLI value implies less favorable economic conditions.

Allowance For Credit Losses - Loans. The allowance for credit losses on loans is a contra-asset valuation account, calculated in accordance with ASC 326, that is deducted from the amortized cost basis of loans to present the net amount expected to be collected. The amount of the allowance represents management's best estimate of current expected credit losses on loans considering available information, from internal and external sources, relevant to assessing collectibility over the loans' contractual terms, adjusted for expected prepayments when appropriate. The contractual term excludes expected extensions, renewals and modifications unless (i) management has a reasonable expectation that a loan to an individual borrower that is experiencing financial difficulty will be modified or (ii) such extension or renewal options are not unconditionally cancellable by us and, in such cases, the borrower is likely to meet applicable conditions and likely to request extension or renewal. Relevant available information includes historical credit loss experience, current conditions and reasonable and supportable forecasts. While historical credit loss experience provides the basis for the estimation of expected credit losses, adjustments to historical loss information may be made for differences in current portfolio-specific risk characteristics, environmental conditions or other relevant factors. The allowance for credit losses is measured on a collective basis for portfolios of loans when similar risk characteristics exist. Loans that do not share risk characteristics are evaluated for expected credit losses on an individual basis and excluded from the collective evaluation. Expected credit losses for collateral dependent loans, including loans where the borrower is experiencing financial difficulty but foreclosure is not probable, are based on the fair value of the collateral at the reporting date, adjusted for selling costs as appropriate.

Credit loss expense related to loans reflects the totality of actions taken on all loans for a particular period including any necessary increases or decreases in the allowance related to changes in credit loss expectations associated with specific loans or pools of loans. Portions of the allowance may be allocated for specific credits; however, the entire allowance is available for any credit that, in management's judgment, should be charged off. While management utilizes its best judgment and information available, the ultimate appropriateness of the allowance is dependent upon a variety of factors beyond our control, including the performance of our loan portfolio, the economy, changes in interest rates and the view of the regulatory authorities toward loan classifications.

In calculating the allowance for credit losses, most loans are segmented into pools based upon similar characteristics and risk profiles. Common characteristics and risk profiles include the type/purpose of loan, underlying collateral, geographical similarity and historical/expected credit loss patterns. In developing these loan pools for the purposes of modeling expected credit losses, we also analyzed the degree of correlation in how loans within each portfolio respond when subjected to varying economic conditions and scenarios as well as other portfolio stress factors. For modeling purposes, our loan pools include (i) commercial and industrial and energy - non-revolving, (ii) commercial and industrial and energy - revolving, (iii) commercial real estate - owner occupied, (iv) commercial real estate - non-owner occupied, (v) commercial real estate - construction/land development, (vi) consumer real estate and (vii) consumer and other. We periodically reassess each pool to ensure the loans within the pool continue to share similar characteristics and risk profiles and to determine whether further segmentation is necessary.

For each loan pool, we measure expected credit losses over the life of each loan utilizing a combination of models which measure (i) probability of default ("PD"), which is the likelihood that loan will stop performing/default, (ii) probability of attrition ("PA"), which is the likelihood that a loan will pay-off prior to maturity, (iii) loss given default ("LGD"), which is the expected loss rate for loans in default and (iv) exposure at default ("EAD"), which is the estimated outstanding principal balance of the loans upon default, including the expected funding of unfunded commitments outstanding as of the measurement date. For certain commercial loan portfolios, the PD is calculated using a transition matrix to determine the likelihood of a customer's risk grade migrating from one specified range of risk grades to a different specified range. Expected credit losses are calculated as the product of PD (adjusted for attrition), LGD and EAD. This methodology builds on default probabilities already incorporated into our risk grading process by utilizing pool-specific historical loss rates to calculate expected credit losses. These pool-specific historical loss rates may be adjusted for current macroeconomic assumptions, as further discussed below, and other factors such as differences in underwriting standards, portfolio mix, or when historical asset terms do not reflect the contractual terms of the financial assets being evaluated as of the measurement date. Each time we measure expected

credit losses, we assess the relevancy of historical loss information and consider any necessary adjustments to address any differences in asset-specific characteristics. Due to their short-term nature, expected credit losses for overdrafts included in consumer and other loans are based solely upon a weighting of recent historical charge-offs over a period of three years.

The measurement of expected credit losses is impacted by loan/borrower attributes and certain macroeconomic variables. Significant loan/borrower attributes utilized in our modeling processes include, among other things, (i) origination date, (ii) maturity date, (iii) payment type, (iv) collateral type and amount, (v) current risk grade, (vi) current unpaid balance and commitment utilization rate, (vii) payment status/delinquency history and (viii) expected recoveries of previously charged-off amounts. Significant macroeconomic variables utilized in our modeling processes include, among other things, (i) Gross State Product for Texas and U.S. Gross Domestic Product, (ii) selected market interest rates including U.S. Treasury rates, bank prime rate, 30-year fixed mortgage rate, BBB corporate bond rate, among others, (iii) unemployment rates, (iv) commercial and residential property prices in Texas and the U.S. as a whole, (v) West Texas Intermediate crude oil price and (vi) total stock market index.

PD and PA were estimated by analyzing internally-sourced data related to historical performance of each loan pool over a complete economic cycle. PD and PA are adjusted to reflect the current impact of certain macroeconomic variables as well as their expected changes over a reasonable and supportable forecast period. We have determined that we are reasonably able to forecast the macroeconomic variables used in our modeling processes with an acceptable degree of confidence for a total of two years with the last twelve months of the forecast period encompassing a reversion process whereby the forecasted macroeconomic variables are reverted to their historical mean utilizing a rational, systematic basis. The macroeconomic variables utilized as inputs in our modeling processes were subjected to a variety of analysis procedures and were selected primarily based on statistical relevancy and correlation to our historical credit losses. By reverting these modeling inputs to their historical mean and considering loan/borrower specific attributes, our models are intended to yield a measurement of expected credit losses that reflects our average historical loss rates for periods subsequent to the twelve-month reversion period. The LGD is based on historical recovery averages for each loan pool, adjusted to reflect the current impact of certain macroeconomic variables as well as their expected changes over a two-year forecast period, with the final twelve months of the forecast period encompassing a reversion process, which management considers to be both reasonable and supportable. This same forecast/reversion period is used for all macroeconomic variables used in all of our models. EAD is estimated using a linear regression model that estimates the average percentage of the loan balance that remains at the time of a default event.

Management qualitatively adjusts model results for risk factors that are not considered within our modeling processes but are nonetheless relevant in assessing the expected credit losses within our loan pools. These qualitative factor ("Q-Factor") and other qualitative adjustments may increase or decrease management's estimate of expected credit losses by a calculated percentage or amount based upon the estimated level of risk. The various risks that may be considered in making Q-Factor and other qualitative adjustments include, among other things, the impact of (i) changes in lending policies and procedures, including changes in underwriting standards and practices for collections, write-offs, and recoveries, (ii) actual and expected changes in international, national, regional, and local economic and business conditions and developments that affect the collectibility of the loan pools, (iii) changes in the nature and volume of the loan pools and in the terms of the underlying loans, (iv) changes in the experience, ability, and depth of our lending management and staff, (v) changes in volume and severity of past due financial assets, the volume of non-accrual assets, and the volume and severity of adversely classified or graded assets, (vi) changes in the quality of our credit review function, (vii) changes in the value of the underlying collateral for loans that are non-collateral dependent, (viii) the existence, growth, and effect of any concentrations of credit and (ix) other factors such as the regulatory, legal and technological environments; competition; and events such as natural disasters or health pandemics.

In some cases, management may determine that an individual loan exhibits unique risk characteristics which differentiate the loan from other loans within our loan pools. In such cases, the loans are evaluated for expected credit losses on an individual basis and excluded from the collective evaluation. Specific allocations of the allowance for credit losses are determined by analyzing the borrower's ability to repay amounts owed, collateral deficiencies, the relative risk grade of the loan and economic conditions affecting the borrower's industry, among other things. A loan is considered to be collateral dependent when, based upon management's assessment, the borrower is experiencing financial difficulty and repayment is expected to be provided substantially through the operation or sale of the collateral. In such cases, expected credit losses are based on the fair value of the collateral at

the measurement date, adjusted for estimated selling costs if satisfaction of the loan depends on the sale of the collateral. We reevaluate the fair value of collateral supporting collateral dependent loans on a quarterly basis. The fair value of real estate collateral supporting collateral dependent loans is evaluated by our internal appraisal services using a methodology that is consistent with the Uniform Standards of Professional Appraisal Practice. The fair value of collateral supporting collateral dependent construction loans is based on an "as is" valuation.

The following table presents details of the allowance for credit losses on loans segregated by loan portfolio segment as of December 31, 2022 and 2021, calculated in accordance with the CECL methodology described above. No allowance for credit losses has been recognized for PPP loans as such loans are fully guaranteed by the SBA.

	Commercial and Industrial	Energy	Commercial Real Estate	Consumer Real Estate	Consumer and Other	Total
December 31, 2022						
Modeled expected credit losses	$ 61,918	$ 8,531	$ 27,013	$ 7,847	$ 4,983	$ 110,292
Q-Factor and other qualitative adjustments	36,237	5,148	61,572	157	2,034	105,148
Specific allocations	6,082	4,383	1,716	—	—	12,181
Total	$ 104,237	$ 18,062	$ 90,301	$ 8,004	$ 7,017	$ 227,621
December 31, 2021						
Modeled expected credit losses	$ 46,946	$ 6,363	$ 16,676	$ 6,484	$ 6,397	$ 82,866
Q-Factor and other qualitative adjustments	14,609	5,374	127,860	65	1,440	149,348
Specific allocations	10,536	5,480	400	36	—	16,452
Total	$ 72,091	$ 17,217	$ 144,936	$ 6,585	$ 7,837	$ 248,666

The following table details activity in the allowance for credit losses on loans by portfolio segment for 2022, 2021 and 2020. Allocation of a portion of the allowance to one category of loans does not preclude its availability to absorb losses in other categories. No allowance for credit losses has been recognized for PPP loans as such loans are fully guaranteed by the SBA.

	Commercial and Industrial	Energy	Commercial Real Estate	Consumer Real Estate	Consumer and Other	Total
2022						
Beginning balance	$ 72,091	$ 17,217	$ 144,936	$ 6,585	$ 7,837	$ 248,666
Credit loss expense (benefit)	34,479	(313)	(54,775)	1,813	13,517	(5,279)
Charge-offs	(6,575)	(371)	(702)	(912)	(24,388)	(32,948)
Recoveries	4,242	1,529	842	518	10,051	17,182
Net (charge-offs) recoveries	(2,333)	1,158	140	(394)	(14,337)	(15,766)
Ending balance	$ 104,237	$ 18,062	$ 90,301	$ 8,004	$ 7,017	$ 227,621
2021						
Beginning balance	$ 73,843	$ 39,553	$ 134,892	$ 7,926	$ 6,963	$ 263,177
Credit loss expense (benefit)	(2,160)	(19,207)	8,101	(3,061)	10,230	(6,097)
Charge-offs	(5,513)	(5,331)	(399)	(829)	(18,614)	(30,686)
Recoveries	5,921	2,202	2,342	2,549	9,258	22,272
Net (charge-offs) recoveries	408	(3,129)	1,943	1,720	(9,356)	(8,414)
Ending balance	$ 72,091	$ 17,217	$ 144,936	$ 6,585	$ 7,837	$ 248,666
2020						
Beginning balance	$ 51,593	$ 37,382	$ 31,037	$ 4,113	$ 8,042	$ 132,167
Impacting of adopting ASC 326	21,263	(10,453)	(13,519)	2,392	(2,248)	(2,565)
Credit loss expense (benefit)	15,156	85,889	124,427	1,906	9,632	237,010
Charge-offs	(18,908)	(76,107)	(7,499)	(2,186)	(17,830)	(122,530)
Recoveries	4,739	2,842	446	1,701	9,367	19,095
Net (charge-offs) recoveries	(14,169)	(73,265)	(7,053)	(485)	(8,463)	(103,435)
Ending balance	$ 73,843	$ 39,553	$ 134,892	$ 7,926	$ 6,963	$ 263,177

Generally, a commercial loan, or a portion thereof, is charged-off immediately when it is determined, through the analysis of any available current financial information with regards to the borrower, that the borrower is incapable of servicing unsecured debt, there is little or no prospect for near term improvement and no realistic strengthening action of significance is pending or, in the case of secured debt, when it is determined, through analysis of current information with regards to our collateral position, that amounts due from the borrower are in excess of the calculated current fair value of the collateral. Notwithstanding the foregoing, generally, commercial loans that become past due 180 cumulative days are charged-off. Generally, a consumer loan, or a portion thereof, is charged-off in accordance with regulatory guidelines which provide that such loans be charged-off when we become aware of the loss, such as from a triggering event that may include new information about a borrower's intent/ability to repay the loan, bankruptcy, fraud or death, among other things, but in any event the charge-off must be taken within specified delinquency time frames. Such delinquency time frames state that closed-end retail loans (loans with pre-defined maturity dates, such as real estate mortgages, home equity loans and consumer installment loans) that become past due 120 cumulative days and open-end retail loans (loans that roll-over at the end of each term, such as home equity lines of credit) that become past due 180 cumulative days should be classified as a loss and charged-off.

The following table presents loans that were evaluated for expected credit losses on an individual basis and the related specific allocations, by loan portfolio segment as of December 31, 2022 and December 31, 2021.

	December 31, 2022		December 31, 2021	
	Loan Balance	Specific Allocations	Loan Balance	Specific Allocations
Commercial and industrial	$ 18,980	$ 6,082	$ 24,523	$ 10,536
Energy	15,058	4,383	16,393	5,480
Paycheck Protection Program	—	—	—	—
Commercial real estate:				
Buildings, land and other	17,711	1,716	24,670	200
Construction	—	—	948	200
Consumer real estate	827	—	303	36
Consumer and other	—	—	—	—
Total	$ 52,576	$ 12,181	$ 66,837	$ 16,452

Note 4 - Premises and Equipment and Lease Commitments

Year-end premises and equipment were as follows:

	2022	2021
Land	$ 170,938	$ 152,219
Buildings	521,280	495,903
Technology, furniture and equipment	236,440	256,323
Leasehold improvements	209,398	192,207
Construction and projects in progress	39,506	14,513
Lease right-of-use assets	288,816	281,438
	1,466,378	1,392,603
Less accumulated depreciation and amortization	(363,683)	(342,272)
Total premises and equipment, net	$ 1,102,695	$ 1,050,331

Depreciation of premises and equipment totaled $57.4 million in 2022, $55.1 million 2021 and $49.9 million in 2020.

Lease Commitments. We lease certain office facilities and office equipment under operating leases. Rent expense for all operating leases totaled $47.7 million in 2022, $45.6 million in 2021 and $46.0 million in 2020.

The components of total lease expense in 2022 and 2021 were as follows:

	2022	2021
Amortization of lease right-of-use assets	$ 33,285	$ 32,811
Short-term lease expense	2,208	1,595
Non-lease components (including taxes, insurance, common maintenance, etc.)	12,172	11,203
Total	$ 47,665	$ 45,609

Right-of-use lease assets totaled $288.8 million and $281.4 million at December 31, 2022 and 2021, respectively, and are reported as a component of premises and equipment on our accompanying consolidated balance sheets. The related lease liabilities totaled $321.9 million and $313.4 million at December 31, 2022 and 2021, respectively, and are reported as a component of accrued interest payable and other liabilities in the accompanying consolidated balance sheets. Lease payments under operating leases that were applied to our operating lease liability totaled $32.9 million during 2022 and $32.1 million during 2021. The following table reconciles future undiscounted lease payments due under non-cancelable operating leases (those amounts subject to recognition) to the aggregate operating lessee lease liability as of December 31, 2022:

Future lease payments	
2023	$ 33,685
2024	33,651
2025	33,990
2026	33,600
2027	32,023
Thereafter	232,905
Total undiscounted operating lease liability	399,854
Imputed interest	77,909
Total operating lease liability included in the accompanying balance sheet	$ 321,945
Weighted-average lease term in years	13.62
Weighted-average discount rate	3.13%

We lease certain buildings and branch facilities from various entities which are controlled by or affiliated with certain directors. Payments related to these leases totaled $327 thousand in 2022, $322 thousand in 2021 and $9.8 million in 2020. The decrease in these lease payments during 2021 compared to 2020 was the result of a director who did not stand for re-election and who has a controlling interest in the entity from which we lease our headquarters building.

Note 5 - Goodwill and Other Intangible Assets

Goodwill. Year-end goodwill was as follows:

	2022	2021
Goodwill	$ 654,952	$ 654,952

Other Intangible Assets. Year-end other intangible assets were as follows:

	Gross Intangible Assets	Accumulated Amortization	Net Intangible Assets
2022			
Core deposits	$ 9,300	$ (8,990)	$ 310
Customer relationships	1,521	(1,445)	76
	$ 10,821	$ (10,435)	$ 386
2021			
Core deposits	$ 9,300	$ (8,582)	$ 718
Customer relationships	2,385	(2,237)	148
	$ 11,685	$ (10,819)	$ 866

Other intangible assets are amortized on an accelerated basis over their estimated lives, which range from 5 to 10 years. Amortization expense related to intangible assets totaled $480 thousand in 2022, $697 thousand in 2021, and $918 thousand in 2020. The estimated aggregate future amortization expense for intangible assets remaining as of December 31, 2022 is as follows:

2023	$ 283
2024	87
2025	11
2026	5
	$ 386

Note 6 - Deposits

Year-end deposits were as follows:

	2022	2021
Non-interest-bearing demand deposits	$ 17,598,234	$ 18,423,018
Interest-bearing deposits:		
Savings and interest checking	12,333,675	11,930,959
Money market accounts	12,227,247	11,228,815
Time accounts	1,795,040	1,112,904
Total interest-bearing deposits	26,355,962	24,272,678
Total deposits	$ 43,954,196	$ 42,695,696

The following table presents additional information about our year-end deposits:

	2022	2021
Deposits from foreign sources (primarily Mexico)	$ 1,048,943	$ 993,479
Non-interest-bearing public funds deposits	788,040	1,235,026
Interest-bearing public funds deposits	758,761	810,863
Total deposits not covered by deposit insurance	23,839,797	24,125,359
Time deposits not covered by deposit insurance	430,128	238,608
Deposits from certain directors, executive officers and their affiliates	153,083	276,556

Scheduled maturities of time deposits at December 31, 2022 were as follows:

2023	$ 1,381,519
2024	413,521
	$ 1,795,040

Scheduled maturities of time deposits not covered by deposit insurance at December 31, 2022, were as follows:

Due within 3 months or less	$ 87,254
Due after 3 months and within 6 months	87,035
Due after 6 months and within 12 months	131,503
Due after 12 months	124,336
	$ 430,128

Note 7 - Borrowed Funds

Federal Funds Purchased and Securities Sold Under Agreements to Repurchase. Federal funds purchased are short-term borrowings that typically mature within one to ninety days. Federal funds purchased totaled $51.7 million and $25.9 million at December 31, 2022 and 2021. Securities sold under agreements to repurchase are secured short-term borrowings that typically mature overnight or within thirty to ninety days. Securities sold under agreements to repurchase are stated at the amount of cash received in connection with the transaction. We may be required to provide additional collateral based on the fair value of the underlying securities. Securities sold under agreements to repurchase totaled $4.7 billion and $2.7 billion at December 31, 2022 and 2021.

Subordinated Notes. In March 2017, we issued $100 million of 4.50% subordinated notes that mature on March 17, 2027. The notes, which qualify as Tier 2 capital for Cullen/Frost, bear interest at the rate of 4.50% per annum, payable semi-annually on each March 17 and September 17. The notes are unsecured and subordinated in right of payment to the payment of our existing and future senior indebtedness and structurally subordinated to all existing and future indebtedness of our subsidiaries. Unamortized debt issuance costs related to these notes, totaled approximately $665 thousand and $822 thousand December 31, 2022 and 2021. Proceeds from sale of the notes were used for general corporate purposes.

Junior Subordinated Deferrable Interest Debentures. At December 31, 2022 and 2021, we had $123.7 million of junior subordinated deferrable interest debentures issued to Cullen/Frost Capital Trust II ("Trust II"), a wholly owned Delaware statutory business trust. Unamortized debt issuance costs related to Trust II totaled $643 thousand and $701 thousand at December 31, 2022 and 2021. In October 2021, we redeemed $13.4 million of junior subordinated deferrable interest debentures issued to WNB Capital Trust I ("WNB Trust"), a wholly owned Delaware statutory business trust acquired in connection with the acquisition of WNB Bancshares, Inc. ("WNB") in 2014. Trust II is a variable interest entity for which we are not the primary beneficiary and, as such, its accounts are not included in our consolidated financial statements. This was also the case with WNB Trust prior to its dissolution in 2021. See Note 1 - Summary of Significant Accounting Policies for additional information about our consolidation policy. Details of our transactions with the capital trust are presented below.

Trust II was formed in 2004 for the purpose of issuing $120.0 million of floating rate (three-month LIBOR plus a margin of 1.55%) trust preferred securities, which represent beneficial interests in the assets of the trust. The trust preferred securities will mature on March 1, 2034 and are currently redeemable with the approval of the Federal Reserve Board in whole or in part at our option. Distributions on the trust preferred securities are payable quarterly in arrears on March 1, June 1, September 1 and December 1 of each year. Trust II also issued $3.7 million of common equity securities to Cullen/Frost. The proceeds of the offering of the trust preferred securities and common equity securities were used to purchase $123.7 million of floating rate (three-month LIBOR plus a margin of 1.55%, which was equal to 6.31% and 1.72% at December 31, 2022 and 2021) junior subordinated deferrable interest debentures issued by us, which have terms substantially similar to the trust preferred securities.

We have the right at any time during the term of the debentures issued to Trust II to defer payments of interest at any time or from time to time for an extension period not exceeding 20 consecutive quarterly periods with respect to each extension period. Under the terms of the debentures, in the event that under certain circumstances there is an event of default under the debentures or we have elected to defer interest on the debentures, we may not, with certain exceptions, declare or pay any dividends or distributions on our capital stock or purchase or acquire any of our capital stock.

Payments of distributions on the trust preferred securities and payments on redemption of the trust preferred securities are guaranteed by us on a limited basis. We are obligated by agreement to pay any costs, expenses or liabilities of Trust II other than those arising under the trust preferred securities. Our obligations under the junior subordinated debentures, the related indenture, the trust agreement establishing the trust, the guarantee and the agreement as to expenses and liabilities, in the aggregate, constitute a full and unconditional guarantee by us of Trust II's obligations under the trust preferred securities.

Although the accounts of Trust II are not included in our consolidated financial statements, the trust preferred securities issued by Trust II are included in the capital of Cullen/Frost for regulatory capital purposes. See Note 9 - Capital and Regulatory Matters.

Note 8 - Off-Balance-Sheet Arrangements, Commitments, Guarantees and Contingencies

Financial Instruments with Off-Balance-Sheet Risk. In the normal course of business, we enter into various transactions, which, in accordance with generally accepted accounting principles in the United States, are not included in our consolidated balance sheets. We enter into these transactions to meet the financing needs of our customers. These transactions include commitments to extend credit and standby letters of credit, which involve, to varying degrees, elements of credit risk and interest rate risk in excess of the amounts recognized in the consolidated balance sheets. We minimize our exposure to loss under these commitments by subjecting them to credit approval and monitoring procedures.

We enter into contractual commitments to extend credit, normally with fixed expiration dates or termination clauses, at specified rates and for specific purposes. Substantially all of our commitments to extend credit are contingent upon customers maintaining specific credit standards at the time of loan funding. Standby letters of credit are written conditional commitments issued by us to guarantee the performance of a customer to a third party. In the event the customer does not perform in accordance with the terms of the agreement with the third party, we would be required to fund the commitment. The maximum potential amount of future payments we could be required to make is represented by the contractual amount of the commitment. If the commitment were funded, we would be entitled to seek recovery from the customer. Our policies generally require that standby letter of credit arrangements contain security and debt covenants similar to those contained in loan agreements.

We consider the fees collected in connection with the issuance of standby letters of credit to be representative of the fair value of our obligation undertaken in issuing the guarantee. In accordance with applicable accounting standards related to guarantees, we defer fees collected in connection with the issuance of standby letters of credit. The fees are then recognized in income proportionately over the life of the standby letter of credit agreement. The deferred standby letter of credit fees represent the fair value of our potential obligations under the standby letter of credit guarantees.

Year-end financial instruments with off-balance-sheet risk are presented in the following table. Commitments and standby letters of credit are presented at contractual amounts; however, since many of these commitments are expected to expire unused or only partially used, the total amounts of these commitments do not necessarily reflect future cash requirements.

	2022	2021
Commitments to extend credit	$ 12,137,957	$ 10,420,142
Standby letters of credit	383,851	238,690
Deferred standby letter of credit fees	2,236	2,072

Allowance For Credit Losses - Off-Balance-Sheet Credit Exposures. The allowance for credit losses on off-balance-sheet credit exposures is a liability account, calculated in accordance with ASC 326, representing expected credit losses over the contractual period for which we are exposed to credit risk resulting from a contractual obligation to extend credit. No allowance is recognized if we have the unconditional right to cancel the obligation. Off-balance-sheet credit exposures primarily consist of amounts available under outstanding lines of credit and letters of credit detailed in the table above. For the period of exposure, the estimate of expected credit losses considers both the likelihood that funding will occur and the amount expected to be funded over the estimated remaining life of the commitment or other off-balance-sheet exposure. The likelihood and expected amount of funding are based on historical utilization rates. The amount of the allowance represents management's best estimate of expected credit losses on commitments expected to be funded over the contractual life of the commitment. Estimating credit losses on amounts expected to be funded uses the same methodology as described for loans in Note 3 - Loans as if such commitments were funded.

The following table details activity in the allowance for credit losses on off-balance-sheet credit exposures.

	2022	2021	2020
Beginning balance	$ 50,314	$ 44,152	$ 500
Impact of adopting ASC 326	—	—	39,377
Credit loss expense	8,279	6,162	4,275
Ending balance	$ 58,593	$ 50,314	$ 44,152

Credit Card Guarantees. We guarantee the credit card debt of certain customers to the merchant bank that issues the cards. At December 31, 2022 and 2021, the guarantees totaled approximately $8.0 million and $8.6 million, of which amounts, $897 thousand and $962 thousand were fully collateralized.

Trust Accounts. We hold certain assets which are not included in our consolidated balance sheets including assets held in fiduciary or custodial capacity on behalf of our trust customers. The estimated fair value of trust assets was approximately $43.6 billion and $43.3 billion at December 31, 2022 and 2021, respectively. These assets are primarily composed of equity securities, fixed income securities, alternative investments and cash equivalents, among other things.

Executive Change-In-Control Severance Plan. We maintain a change-in-control severance plan for the benefit of certain executive officers. Under this plan, each covered person could receive, upon the effectiveness of a change-in-control, two to three times (depending on the person) their base compensation plus the target bonus established for the year, and any unpaid base salary and pro rata target bonus for the year in which the termination occurs, including vacation pay. Additionally, the executive's insurance benefits will continue for two to three full years after the termination and all long-term incentive awards will immediately vest.

Litigation. We are subject to various claims and legal actions that have arisen in the course of conducting business. Management does not expect the ultimate disposition of these matters to have a material adverse impact on our financial statements.

Note 9 - Capital and Regulatory Matters

Banks and bank holding companies are subject to various regulatory capital requirements administered by state and federal banking agencies. Capital adequacy guidelines and, additionally for banks, 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 about components, risk weighting and other factors.

Cullen/Frost and Frost Bank are each required to comply with applicable capital adequacy standards established by the Federal Reserve Board (the "Basel III Capital Rules"). Quantitative measures established by the Basel III Capital Rules designed to ensure capital adequacy require the maintenance of minimum amounts and ratios (set forth below) of Common Equity Tier 1 capital, Tier 1 capital and Total capital (as defined in the regulations) to risk-weighted assets (as defined), and of Tier 1 capital to adjusted quarterly average assets (as defined).

Cullen/Frost's and Frost Bank's Common Equity Tier 1 capital includes common stock and related paid-in capital, net of treasury stock, and retained earnings. In connection with the adoption of the Basel III Capital Rules, we elected to opt-out of the requirement to include most components of accumulated other comprehensive income in Common Equity Tier 1. We also elected to delay, for a five-year transitional period, the effects of credit loss accounting under CECL from Common Equity Tier 1, as further discussed below. Common Equity Tier 1 for both Cullen/Frost and Frost Bank is reduced by goodwill and other intangible assets, net of associated deferred tax liabilities. Frost Bank's Common Equity Tier 1 is also reduced by its equity investment in its financial subsidiary, Frost Insurance Agency ("FIA").

Tier 1 capital includes Common Equity Tier 1 capital and additional Tier 1 capital. For Cullen/Frost, additional Tier 1 capital at December 31, 2022 and 2021 included $145.5 million of 4.450% non-cumulative perpetual preferred stock, the details of which is are further discussed below. Frost Bank did not have any additional Tier 1 capital beyond Common Equity Tier 1 at December 31, 2022 or 2021.

Total capital includes Tier 1 capital and Tier 2 capital. Tier 2 capital for both Cullen/Frost and Frost Bank includes a permissible portion of the allowance for credit losses on securities, loans and off-balance sheet exposures. Tier 2 capital for Cullen/Frost also includes trust preferred securities that were excluded from Tier 1 capital and qualified subordinated debt. Cullen/Frost's Tier 2 capital included $120.0 million of trust preferred securities at both December 31, 2022 and 2021. Cullen/Frost's Tier 2 Capital also included $80.0 million at December 31, 2022 and $100.0 million at December 31, 2021 related to the permissible portion of our aggregate $100 million of 4.50% subordinated notes. The permissible portion of qualified subordinated notes decreases 20% per year during the final five years of the term of the notes.

The Common Equity Tier 1, Tier 1 and Total capital ratios are calculated by dividing the respective capital amounts by risk-weighted assets. Risk-weighted assets are calculated based on regulatory requirements and include

total assets, with certain exclusions, allocated by risk weight category, and certain off-balance-sheet items, among other things. The leverage ratio is calculated by dividing Tier 1 capital by adjusted quarterly average total assets, which exclude goodwill and other intangible assets, among other things.

The Basel III Capital Rules require Cullen/Frost and Frost Bank to maintain (i) a minimum ratio of Common Equity Tier 1 capital to risk-weighted assets of at least 4.5%, plus a 2.5% “capital conservation buffer” (which is added to the 4.5% Common Equity Tier 1 capital ratio, effectively resulting in a minimum ratio of Common Equity Tier 1 capital to risk-weighted assets of at least 7.0%), (ii) a minimum ratio of Tier 1 capital to risk-weighted assets of at least 6.0%, plus the capital conservation buffer (which is added to the 6.0% Tier 1 capital ratio, effectively resulting in a minimum Tier 1 capital ratio of 8.5%), (iii) a minimum ratio of Total capital (that is, Tier 1 plus Tier 2) to risk-weighted assets of at least 8.0%, plus the capital conservation buffer (which is added to the 8.0% total capital ratio, effectively resulting in a minimum total capital ratio of 10.5%) and (iv) a minimum leverage ratio of 4.0%, calculated as the ratio of Tier 1 capital to average quarterly assets.

The capital conservation buffer is designed to absorb losses during periods of economic stress and, as detailed above, effectively increases the minimum required risk-weighted capital ratios. Banking institutions with a ratio of Common Equity Tier 1 capital to risk-weighted assets below the effective minimum (4.5% plus the capital conservation buffer and, if applicable, the “countercyclical capital buffer,” which is discussed below) will face constraints on dividends, equity repurchases and compensation based on the amount of the shortfall and the institution's “eligible retained income” (that is, four quarter trailing net income, net of distributions and tax effects not reflected in net income). The countercyclical capital buffer is applicable to only certain covered institutions and does not have any current applicability to Cullen/Frost or Frost Bank.

As discussed in Note 1 - Significant Accounting Policies, in connection with the adoption of ASC 326, we recognized an after-tax cumulative effect reduction to retained earnings totaling $29.3 million on January 1, 2020. In February 2019, the federal bank regulatory agencies issued a final rule (the “2019 CECL Rule”) that revised certain capital regulations to account for changes to credit loss accounting under U.S. GAAP. The 2019 CECL Rule included a transition option that allows banking organizations to phase in, over a three-year period, the day-one adverse effects of CECL on their regulatory capital ratios (three-year transition option). In March 2020, the federal bank regulatory agencies issued an interim final rule that maintains the three-year transition option of the 2019 CECL Rule and also provides banking organizations that were required under U.S. GAAP (as of January 2020) to implement CECL before the end of 2020 the option to delay for two years an estimate of the effect of CECL on regulatory capital, relative to the incurred loss methodology’s effect on regulatory capital, followed by a three-year transition period (five-year transition option). We elected to adopt the five-year transition option. Accordingly, CECL transitional amounts have been added back to CET1 totaling $46.2 million and $61.6 million at December 31, 2022 and 2021, respectively.

In April 2020, we began originating loans to qualified small businesses under the PPP administered by the SBA. Federal bank regulatory agencies have issued an interim final rule that permits banks to neutralize the regulatory capital effects of participating in the Paycheck Protection Program Lending Facility (the “PPP Facility”) and clarify that PPP loans have a zero percent risk weight under applicable risk-based capital rules. Specifically, a bank may exclude all PPP loans pledged as collateral to the PPP Facility from its average total consolidated assets for the purposes of calculating its leverage ratio, while PPP loans that are not pledged as collateral to the PPP Facility will be included. Our PPP loans are included in the calculation of our leverage ratio as of December 31, 2022 and 2021 as we did not utilize the PPP Facility for funding purposes.

The following table presents actual and required capital ratios as of December 31, 2022 and December 31, 2021 for Cullen/Frost and Frost Bank under the Basel III Capital Rules. Capital levels required to be considered well capitalized are based upon prompt corrective action regulations, as amended to reflect the changes under the Basel III Capital Rules.

	Actual		Minimum Capital Required Plus Capital Conservation Buffer		Required to be Considered Well Capitalized[(1)]	
	Capital Amount	Ratio	Capital Amount	Ratio	Capital Amount	Ratio
2022						
Common Equity Tier 1 to Risk-Weighted Assets						
Cullen/Frost	$ 3,751,200	12.85 %	$ 2,042,876	7.00 %	N/A	N/A
Frost Bank	3,789,056	13.00	2,040,388	7.00	$ 1,894,646	6.50 %
Tier 1 Capital to Risk-Weighted Assets						
Cullen/Frost	3,896,652	13.35	2,480,635	8.50	1,751,036	6.00
Frost Bank	3,789,056	13.00	2,477,614	8.50	2,331,872	8.00
Total Capital to Risk-Weighted Assets						
Cullen/Frost	4,330,982	14.84	3,064,313	10.50	2,918,394	10.00
Frost Bank	4,023,386	13.80	3,060,583	10.50	2,914,841	10.00
Leverage Ratio						
Cullen/Frost	3,896,652	7.29	2,136,680	4.00	N/A	N/A
Frost Bank	3,789,056	7.09	2,136,316	4.00	2,670,395	5.00
2021						
Common Equity Tier 1 to Risk-Weighted Assets						
Cullen/Frost	$ 3,371,043	13.13 %	$ 1,796,549	7.00 %	N/A	N/A
Frost Bank	3,261,532	12.72	1,795,221	7.00	$ 1,666,991	6.50 %
Tier 1 Capital to Risk-Weighted Assets						
Cullen/Frost	3,516,495	13.70	2,181,523	8.50	1,539,899	6.00
Frost Bank	3,261,532	12.72	2,179,911	8.50	2,051,681	8.00
Total Capital to Risk-Weighted Assets						
Cullen/Frost	3,966,244	15.45	2,694,823	10.50	2,566,498	10.00
Frost Bank	3,491,281	13.61	2,692,831	10.50	2,564,601	10.00
Leverage Ratio						
Cullen/Frost	3,516,495	7.34	1,917,533	4.00	N/A	N/A
Frost Bank	3,261,532	6.80	1,917,679	4.00	2,397,099	5.00

(1) "Well-capitalized" minimum Common Equity Tier 1 to Risk-Weighted Assets and Leverage Ratio are not formally defined under applicable banking regulations for bank holding companies.

As of December 31, 2022, capital levels for Cullen/Frost and Frost Bank exceed all capital adequacy requirements under the Basel III Capital Rules. Based on the ratios presented above, capital levels as of December 31, 2022 for Cullen/Frost and Frost Bank exceed the minimum levels necessary to be considered "well capitalized."

Cullen/Frost and Frost Bank are subject to the regulatory capital requirements administered by the Federal Reserve Board and, for Frost Bank, the Federal Deposit Insurance Corporation ("FDIC"). Regulatory authorities can initiate certain mandatory actions if Cullen/Frost or Frost Bank fail to meet the minimum capital requirements, which could have a direct material effect on our financial statements. Management believes, as of December 31, 2022, that Cullen/Frost and Frost Bank meet all capital adequacy requirements to which they are subject.

Series B Preferred Stock. On November 19, 2020, we issued 150,000 shares, or $150.0 million in aggregate liquidation preference, of our 4.450% Non-Cumulative Perpetual Preferred Stock, Series B, par value $0.01 and liquidation preference $1,000 per share ("Series B Preferred Stock"). Each share of Series B Preferred Stock issued and outstanding is represented by 40 depositary shares, each representing a 1/40th ownership interest in a share of the Series B Preferred Stock (equivalent to a liquidation preference of $25 per share). Each holder of depositary shares will be entitled, in proportion to the applicable fraction of a share of Series B Preferred Stock represented by

such depositary shares, to all rights and preferences of the Series B Preferred Stock represented thereby (including dividend, voting, redemption, and liquidation rights). Such rights must be exercised through the depositary. Dividends on the Series B Preferred Stock will be non-cumulative and, if declared, accrue and are payable quarterly, in arrears, at a rate of 4.450% per annum. The Series B Preferred Stock qualifies as Tier 1 capital for the purposes of the regulatory capital calculations. The net proceeds from the issuance and sale of the Series B Preferred Stock, after deducting $4.5 million of issuance costs including the underwriting discount and professional service fees, among other things, were approximately $145.5 million.

The Series B Preferred Stock is perpetual and has no maturity date. We may redeem the Series B Preferred Stock at our option (i) in whole or in part, from time to time, on any dividend payment date on or after December 15, 2025 or (ii) in whole but not in part, within 90 days following certain changes in laws or regulations impacting the regulatory capital treatment of the Series B Preferred Stock, in either case, at a redemption price equal to $1,000 per share of Series B Preferred Stock (equivalent to $25 per depositary share), plus any declared and unpaid dividends for prior dividend periods and accrued but unpaid dividends (whether or not declared) for the then-current dividend period prior to but excluding the redemption date. If we redeem the Series B Preferred Stock, the depositary is expected redeem a proportionate number of depositary shares. Neither the holders of Series B Preferred Stock nor holders of depositary shares will have the right to require the redemption or repurchase of the Series B Preferred Stock or the depositary shares.

Series A Preferred Stock. On February 15, 2013, we issued and sold 6,000,000 shares, or $150.0 million in aggregate liquidation preference, of our 5.375% Non-Cumulative Perpetual Preferred Stock, Series A, par value $0.01 and liquidation preference $25 per share ("Series A Preferred Stock"). On March 16, 2020, we redeemed all of the outstanding shares of our Series A Preferred Stock at a redemption price of $25 per share, or an aggregate redemption of $150.0 million. When issued, the net proceeds of the Series A Preferred Stock totaled $144.5 million after deducting $5.5 million of issuance costs including the underwriting discount and professional service fees, among other things. Upon redemption, these issuance costs were reclassified to retained earnings and reported as a reduction of net income available to common shareholders. Prior to redemption, dividends on the Series A Preferred Stock were paid quarterly, in arrears, at a rate of 5.375% per annum and the Series A Preferred Stock qualified as Tier 1 capital for the purposes of regulatory capital calculations.

Stock Repurchase Plans. From time to time, our board of directors has authorized stock repurchase plans. In general, stock repurchase plans allow us to proactively manage our capital position and return excess capital to shareholders. Shares purchased under such plans also provide us with shares of common stock necessary to satisfy obligations related to stock compensation awards. On January 25, 2023, our board of directors authorized a $100.0 million stock repurchase plan, allowing us to repurchase shares of our common stock over a one-year period from time to time at various prices in the open market or through private transactions. No shares were repurchased under a stock repurchase plan during 2022 or 2021. Under a prior stock repurchase plan, we repurchased, 177,834 shares at a total cost of $13.7 million during 2020.

In July 2019, the federal bank regulators adopted final rules (the "Capital Simplifications Rules") that, among other things, eliminated the standalone prior approval requirement in the Basel III Capital Rules for any repurchase of common stock. In certain circumstances, Cullen/Frost's repurchases of its common stock may be subject to a prior approval or notice requirement under other regulations, policies or supervisory expectations of the Federal Reserve Board. Any redemption or repurchase of preferred stock or subordinated debt remains subject to the prior approval of the Federal Reserve Board.

In August 2022, the Inflation Reduction Act of 2022 (the "IRA") was enacted. Among other things, the IRA imposes a new 1% excise tax on the fair market value of stock repurchased after December 31, 2022 by publicly traded U.S. corporations. With certain exceptions, the value of stock repurchased is determined net of stock issued in the year, including shares issued pursuant to compensatory arrangements.

Dividend Restrictions. In the ordinary course of business, Cullen/Frost is dependent upon dividends from Frost Bank to provide funds for the payment of dividends to shareholders and to provide for other cash requirements, including to repurchase its common stock. Banking regulations may limit the amount of dividends that may be paid. Approval by regulatory authorities is required if the effect of dividends declared would cause the regulatory capital of Frost Bank to fall below specified minimum levels. Approval is also required if dividends declared exceed the net profits for that year combined with the retained net profits for the preceding two years. Under the foregoing dividend

restrictions and while maintaining its "well capitalized" status, at December 31, 2022, Frost Bank could pay aggregate dividends of up to $813.6 million to Cullen/Frost without prior regulatory approval.

Under the terms of the junior subordinated deferrable interest debentures that Cullen/Frost has issued to Cullen/Frost Capital Trust II, Cullen/Frost has the right at any time during the term of the debentures to defer the payment of interest at any time or from time to time for an extension period not exceeding 20 consecutive quarterly periods with respect to each extension period. In the event that we have elected to defer interest on the debentures, we may not, with certain exceptions, declare or pay any dividends or distributions on our capital stock or purchase or acquire any of our capital stock.

Under the terms of the Series B Preferred Stock, in the event that we do not declare and pay dividends on the Series B Preferred Stock for the most recent dividend period, we may not, with certain exceptions, declare or pay dividends on, or purchase, redeem or otherwise acquire, shares of our common stock or any of our securities that rank junior to the Series B Preferred Stock.

Note 10 - Earnings Per Common Share

Earnings Per Common Share. Earnings per common share is computed using the two-class method. Basic earnings per common share is computed by dividing net earnings allocated to common stock by the weighted-average number of common shares outstanding during the applicable period, excluding outstanding participating securities. Participating securities include non-vested stock awards/stock units, deferred stock units and performance stock units (during the performance period), though no actual shares of common stock related to any type of stock unit have been issued. Non-vested stock awards/stock units and deferred stock units are considered participating securities because holders of these securities receive non-forfeitable dividends at the same rate as holders of our common stock. Holders of performance stock units receive dividend equivalent payments for dividends paid during the performance period at the vesting date of the award based upon the number of units that ultimately vest. Diluted earnings per common share is computed using the weighted-average number of shares determined for the basic earnings per common share computation plus the dilutive effect of stock compensation using the treasury stock method.

The following table presents a reconciliation of net income available to common shareholders, net earnings allocated to common stock and the number of shares used in the calculation of basic and diluted earnings per common share.

	2022	2021	2020
Net Income	$ 579,150	$ 443,079	$ 331,151
Less: Preferred stock dividends	6,675	7,157	2,016
Redemption of preferred stock	—	—	5,514
Net income available to common shareholders	572,475	435,922	323,621
Less: Earnings allocated to participating securities	5,210	3,881	3,136
Net earnings allocated to common stock	$ 567,265	$ 432,041	$ 320,485
Distributed earnings allocated to common stock	$ 207,924	$ 187,202	$ 178,863
Undistributed earnings allocated to common stock	359,341	244,839	141,622
Net earnings allocated to common stock	$ 567,265	$ 432,041	$ 320,485
Weighted-average shares outstanding for basic earnings per common share	64,156,870	63,612,658	62,727,053
Dilutive effect of stock compensation	363,648	489,462	276,784
Weighted-average shares outstanding for diluted earnings per common share	64,520,518	64,102,120	63,003,837

Note 11 - Employee Benefit Plans

Retirement Plans

Retirement Plan and Restoration Plan. We maintain a non-contributory defined benefit plan (the "Retirement Plan") that was frozen as of December 31, 2001. The plan provides pension and death benefits to substantially all employees who were at least 21 years of age and had completed at least one year of service prior to December 31, 2001. Defined benefits are provided based on an employee's final average compensation and years of service at the time the plan was frozen and age at retirement. The freezing of the plan provides that future salary increases will not be considered. Our funding policy is to contribute yearly, at least the amount necessary to satisfy the funding standards of the Employee Retirement Income Security Act ("ERISA").

Our Restoration of Retirement Income Plan (the "Restoration Plan") provides benefits for eligible employees that are in excess of the limits under Section 415 of the Internal Revenue Code of 1986, as amended, that apply to the Retirement Plan. The Restoration Plan is designed to comply with the requirements of ERISA. The entire cost of the plan, which was also frozen as of December 31, 2001, is supported by our contributions.

We use a December 31 measurement date for our defined benefit plans. Combined activity in our defined benefit pension plans was as follows:

	2022	2021	2020
Change in plan assets:			
Fair value of plan assets at beginning of year	$ 197,747	$ 182,088	$ 174,173
Actual return on plan assets	(26,108)	24,908	16,599
Employer contributions	1,114	1,236	1,201
Benefits paid	(10,930)	(10,485)	(9,885)
Fair value of plan assets at end of year	161,823	197,747	182,088
Change in benefit obligation:			
Benefit obligation at beginning of year	185,925	197,593	186,641
Interest cost	4,017	3,341	5,010
Actuarial (gain) loss	(35,068)	(4,524)	15,827
Benefits paid	(10,930)	(10,485)	(9,885)
Benefit obligation at end of year	143,944	185,925	197,593
Funded status of the plan at end of year and accrued benefit (liability) recognized	$ 17,879	$ 11,822	$ (15,505)
Accumulated benefit obligation at end of year	$ 143,944	$ 185,925	$ 197,593

Certain disaggregated information related to our defined benefit pension plans as of year-end was as follows:

	Retirement Plan		Restoration Plan	
	2022	2021	2022	2021
Projected benefit obligation	$ 131,648	$ 170,389	$ 12,296	$ 15,536
Accumulated benefit obligation	131,648	170,389	12,296	15,536
Fair value of plan assets	161,823	197,747	—	—
Funded status of the plan at end of year and accrued benefit (liability) recognized	30,175	27,358	(12,296)	(15,536)

The components of the combined net periodic cost (benefit) for our defined benefit pension plans are presented in the table below.

	2022	2021	2020
Expected return on plan assets, net of expenses	$ (13,966)	$ (12,839)	$ (12,289)
Interest cost on projected benefit obligation	4,017	3,341	5,010
Net amortization and deferral	2,964	6,116	5,319
Net periodic expense (benefit)	$ (6,985)	$ (3,382)	$ (1,960)

Amounts related to our defined benefit pension plans recognized as a component of other comprehensive income were as follows:

	2022	2021	2020
Net actuarial gain (loss)	$ (2,041)	$ 22,709	$ (6,199)
Deferred tax (expense) benefit	429	(4,769)	1,302
Other comprehensive income (loss), net of tax	$ (1,612)	$ 17,940	$ (4,897)

Amounts recognized as a component of accumulated other comprehensive loss as of year-end that have not been recognized as a component of the combined net periodic benefit cost of our defined benefit pension plans are presented in the following table.

	2022	2021
Net actuarial loss	$ (43,675)	$ (41,634)
Deferred tax benefit	9,172	8,743
Amounts included in accumulated other comprehensive income/loss, net of tax	(34,503)	(32,891)

The weighted-average assumptions used to determine the benefit obligations as of the end of the years indicated and the net periodic benefit cost for the years indicated are presented in the table below. Because the plans were frozen, increases in compensation are not considered after 2001.

	2022	2021	2020
Benefit obligations:			
Discount rate	5.14 %	2.79 %	2.43 %
Net periodic benefit cost:			
Discount rate	2.79 %	2.43 %	3.20 %
Expected return on plan assets	7.25	7.25	7.25

Management uses an asset allocation optimization model to analyze the potential risks and rewards associated with various asset allocation strategies on a quarterly basis. As of December 31, 2022, management's investment objective for our defined benefit plans is to achieve long-term growth. This strategy provides for a target asset allocation of approximately 64% invested in equity securities, approximately 31% invested in fixed income debt securities with any remainder invested in cash or short-term cash equivalents. The asset allocation optimization process provides portfolio allocations which best represent the potential risk associated with a given asset allocation over a full market cycle. This is used to help management determine an appropriate mix of assets in order to achieve the plan's long term investment goals. The plan assets are reviewed annually to determine if the obligations can be met with the current investment mix and funding strategy.

The major categories of assets in our Retirement Plan as of year-end are presented in the following table. Assets are segregated by the level of the valuation inputs within the fair value hierarchy established by ASC Topic 820 "Fair Value Measurements and Disclosures," utilized to measure fair value (see Note 17 - Fair Value Measurements). Our Restoration Plan is unfunded.

	2022	2021
Level 1:		
Mutual funds	$ 154,391	$ 195,452
Cash and cash equivalents	7,432	2,295
Total fair value of plan assets	$ 161,823	$ 197,747

Mutual funds include various equity, fixed-income and blended funds with varying investment strategies. Approximately 67% of mutual fund investments consist of equity investments as of December 31, 2022. The investment objective of equity funds is long-term capital appreciation with current income. The remaining mutual fund investments consist of U.S. fixed-income securities, including investment-grade U.S. Treasury securities, U.S. government agency securities and mortgage-backed securities, corporate bonds and notes and collateralized mortgage obligations. The investment objective of fixed-income funds is to maximize investment return while preserving investment principal. Our investment strategies prohibit selling assets short and the use of derivatives. Additionally, our defined benefit plans do not directly invest in real estate, commodities, or private investments.

The asset allocation optimization model is used to estimate the expected long-term rate of return for a given asset allocation strategy. Expectations of returns for each asset class are based on comprehensive reviews of historical data and economic/financial market theory. During periods with volatile interest rates and equity security prices, the model may call for changes in the allocation of plan investments to achieve desired returns. Management assumed a long-term rate of return of 7.25% in the determination of the net periodic benefit cost for 2022. The expected long-term rate of return on assets was selected from within the reasonable range of rates determined by historical real returns, net of inflation, for the asset classes covered by the plan's investment policy and projections of inflation over the long-term period during which benefits are payable to plan participants.

As of December 31, 2022, expected future benefit payments related to our defined benefit plans were as follows:

2023	$ 11,864
2024	12,128
2025	12,059
2026	11,995
2027	11,848
2028 through 2032	55,245
	$ 115,139

We expect to contribute $1.2 million to the defined benefit plans during 2023.

Savings Plans

401(k) Stock Purchase Plan and Other Plans. We maintain a 401(k) stock purchase plan that permits each participant to make before-tax contributions in an amount not less than 2% and not exceeding 50% of eligible compensation and subject to dollar limits from Internal Revenue Service regulations. We match 100% of the employee's contributions to the plan based on the amount of each participant's contributions up to a maximum of 6% of eligible compensation. Eligible employees must complete 30 days of service in order to enroll and vest in our matching contributions immediately. Our matching contribution is initially invested in the common stock of Cullen/Frost. Employees may immediately reallocate our matching portion, as well as invest their individual contribution, to any of a variety of investment alternatives offered under the 401(k) Plan. We may also make discretionary profit sharing contributions to eligible participants.

All profit sharing contributions to the plan are made at our discretion and may be made without regard to current or accumulated profits. Contributions are generally allocated to eligible participants uniformly, based upon compensation, age and/or other factors. Plan participants self-direct the investment of allocated contributions by choosing from a menu of investment options. Profit sharing contributions are subject to withdrawal restrictions and participants vest in their allocated contributions after three years of service. Expense related to the plan totaled $28.0 million in 2022, $23.8 million in 2021 and $17.9 million in 2020.

We maintain a thrift incentive stock purchase plan and a separate non-qualified profit sharing plan to offer certain employees, whose participation in the 401(k) plan is limited, an alternative means of receiving comparable benefits. Expense related to these plans was not significant during 2022, 2021 and 2020.

Stock Compensation Plans

We have three active stock compensation plans (the 2005 Omnibus Incentive Plan, the 2007 Outside Directors Incentive Plan and the 2015 Omnibus Incentive Plan). All of the plans have been approved by our shareholders. During 2015, the 2015 Omnibus Incentive Plan ("2015 Plan") was established to replace both the 2005 Omnibus Incentive Plan ("2005 Plan") and the 2007 Outside Directors Incentive Plan (the "2007 Directors Plan"). All remaining shares authorized for grant under the superseded 2005 Plan and 2007 Directors Plan were transferred to the 2015 Plan. Our stock compensation plans were established to (i) motivate superior performance by means of performance-related incentives, (ii) encourage and provide for the acquisition of an ownership interest in our company by employees and non-employee directors and (iii) enable us to attract and retain qualified and competent persons as employees and to serve as members of our board of directors.

Under the 2015 Plan, we may grant, among other things, nonqualified stock options, incentive stock options, stock awards, stock appreciation rights, restricted stock units, performance share units or any combination thereof to certain employees and non-employee directors. Any of the authorized shares may be used for any type of award

allowable under the Plan. The Compensation and Benefits Committee ("Committee") of our Board of Directors has sole authority to (i) establish the awards to be issued, (ii) select the employees and non-employee directors to receive awards, and (iii) approve the terms and conditions of each award contract. Each award under the stock plans is evidenced by an award agreement that specifies the award price, the duration of the award, the number of shares to which the award pertains, and such other provisions as the Committee determines. For stock options, the option price for each grant is at least equal to the fair market value of a share of Cullen/Frost's common stock on the date of grant. Options granted expire at such time as the Committee determines at the date of grant and in no event does the exercise period exceed a maximum of ten years. As defined in the plans, outstanding awards may immediately vest upon a change-in-control of Cullen/Frost and, in the case of awards granted under the 2015 Plan, subsequent termination resulting from the change in control.

A combined summary of activity in our active stock plans is presented in the table. Performance stock units outstanding are presented assuming attainment of the maximum payout rate as set forth by the performance criteria. The target award level for performance stock units granted in 2022, 2021 and 2020 was 35,015, 30,723 and 48,409, respectively. As of December 31, 2022, there were 505,456 shares remaining available for grant for future awards.

	Director Deferred Stock Units Outstanding		Non-Vested Stock Awards/Stock Units Outstanding		Performance Stock Units Outstanding		Stock Options Outstanding	
	Number of Units	Weighted-Average Fair Value at Grant	Number of Shares/ Units	Weighted-Average Fair Value at Grant	Number of Units	Weighted-Average Fair Value at Grant	Number of Shares	Weighted-Average Exercise Price
January 1, 2020	55,370	$ 74.76	440,647	$ 90.22	177,288	$ 83.48	1,980,866	$ 64.60
Granted	10,428	73.84	151,038	66.79	72,618	57.89	—	—
Exercised/vested	(12,938)	71.09	(117,990)	76.07	(41,755)	69.70	(235,880)	53.23
Forfeited/expired	—	—	(3,336)	91.07	(6,894)	81.33	(5,427)	75.74
December 31, 2020	52,860	75.47	470,359	86.24	201,257	77.18	1,739,559	66.11
Granted	5,940	117.90	95,258	130.36	46,086	121.46	—	—
Exercised/vested	(2,499)	92.03	(88,250)	98.90	(35,131)	92.27	(861,878)	63.14
Forfeited/expired	—	—	(28,030)	87.08	(9,752)	75.70	—	—
December 31, 2021	56,301	79.21	449,337	93.05	202,460	84.71	877,681	69.02
Granted	5,382	133.67	119,176	142.56	52,527	133.40	—	—
Exercised/vested	(16,022)	74.89	(97,154)	94.81	(25,180)	87.18	(261,454)	63.72
Forfeited/expired	—	—	(6,040)	93.28	(16,058)	87.18	—	—
December 31, 2022	45,661	87.15	465,319	105.36	213,749	96.20	616,227	71.27

Options awarded to employees generally have a ten-year life and vest in equal annual installments over a four-year period. Non-vested stock awards/stock units awarded to employees generally have a three-year-cliff vesting period for awards granted in 2022 and 2021 and a four-year-cliff vesting period for awards granted prior to 2021. Deferred stock units awarded to non-employee directors generally have immediate vesting. Upon retirement from our board of directors, non-employee directors will receive one share of our common stock for each deferred stock unit held. Outstanding non-vested stock units and deferred stock units receive equivalent dividend payments as such dividends are declared on our common stock.

Performance stock units represent shares potentially issuable in the future. For performance stock units granted in 2022 and 2021, issuance is based upon the measure of our achievement of growth in adjusted net revenue, averaged over the three-year performance period, compared to the 2022 and 2021 base-year amounts, respectively. Adjusted net revenue for each three-year performance period is calculated as the sum of taxable-equivalent net interest income (excluding the effects of PPP lending) and non-interest income, reduced by non-interest expense (excluding the effects of PPP lending) and net charge-offs. The 2022 and 2021 base-year adjusted net revenue amounts of approximately $713.8 million and $415.9 million, respectively, were calculated as the sum of taxable-equivalent net interest income (excluding the effects of PPP lending) and non-interest income, reduced by non-interest expense (excluding the effects of PPP lending) and the product of average total loans (excluding PPP loans) and 0.30%. The ultimate number of shares issuable under each performance award is the product of the award target and the award payout percentage for the given level of achievement. The level of achievement is measured as the amount by which adjusted net revenue, averaged over a three-year performance period, exceeds the 2022 and 2021 base-year amounts, as applicable, stated as an average growth percentage. The award payout percentages by level of achievement for

both the 2022 and 2021 awards are as follows: (i) less than 13% average growth pays out at 0% of target, (ii) 13% average growth pays out at 50% of target, (iii) 19% average growth pays out at 100% of target and (iv) 25% average growth or more pays out at 150% of target. Achievement between the aforementioned average growth percentages will result in an award payout percentage determined based on straight-line interpolation between the percentages.

For performance stock units granted prior to 2021, issuance is based upon the measure of our achievement of relative return on assets over a three-year performance period compared to an identified peer group's achievement of relative return on assets over the same three-year performance period. The ultimate number of shares issuable under each performance award is the product of the award target and the award payout percentage for the given level of achievement. The level of achievement is measured as the percentile rank of relative return on assets among the peer group. The award payout percentages by level of achievement are as follows: (i) less than 25th percentile pays out at 0% of target, (ii) 25th percentile pays out at 50% of target, (iii) 50th percentile pays out at 100% of target and (iv) 75th percentile or more pays out at 150% of target. Achievement between the aforementioned percentiles will result in an award payout percentage determined based on straight-line interpolation between the percentiles.

Performance stock units are eligible to receive equivalent dividend payments as such dividends are declared on our common stock during the performance period. Equivalent dividend payments are based upon the ultimate number of shares issued under each performance award and are deferred until such time that the units vest and shares are issued.

Other information regarding options outstanding and exercisable as of December 31, 2022 is as follows:

Range of Exercise Prices	Options Outstanding: Number of Shares	Options Outstanding: Weighted-Average Exercise Price	Options Outstanding: Weighted-Average Remaining Contractual Life in Years	Options Exercisable: Number of Shares	Options Exercisable: Weighted-Average Exercise Price
$ 65.01 to $ 70.00	277,131	$ 65.11	2.82	277,131	$ 65.11
70.01 to 75.00	117,686	71.39	0.83	117,686	71.39
75.01 to 80.00	221,410	78.92	1.83	221,410	78.92
Total	616,227	71.27	2.08	616,227	71.27
Total intrinsic value	$ 38,470			$ 38,470	

Shares issued in connection with stock compensation awards are issued from available treasury shares. If no treasury shares are available, new shares are issued from available authorized shares. Shares issued in connection with stock compensation awards along with other related information were as follows:

	2022	2021	2020
New shares issued from available authorized shares	118,389	—	—
Shares issued from available treasury stock	281,421	987,758	408,563
Total	399,810	987,758	408,563
Proceeds from stock option exercises	$ 16,659	$ 54,417	$ 12,557
Intrinsic value of stock options exercised	19,616	43,904	5,365
Fair value of stock awards/units vested	19,308	15,751	12,773

Stock-based Compensation Expense. Stock-based compensation expense is recognized ratably over the requisite service period for all awards. For most stock option awards, the service period generally matches the vesting period. For stock options granted to certain executive officers and for non-vested stock units granted to all participants, the service period does not extend past the date the participant reaches 65 years of age. Deferred stock units granted to non-employee directors generally have immediate vesting and the related expense is fully recognized on the date of grant. For performance stock units, the service period generally matches the three-year performance period specified by the award, however, the service period does not extend past the date the participant reaches 65 years of age. Expense recognized each period is dependent upon our estimate of the number of shares that will ultimately be issued.

Stock-based compensation expense and the related income tax benefit is presented in the following table. The service period for performance stock units granted each year begins on January 1 of the following year.

	2022	2021	2020
Non-vested stock awards/stock units	$ 13,162	$ 9,977	$ 10,240
Deferred stock-units	720	700	770
Performance stock units	4,440	2,076	2,908
Total	$ 18,322	$ 12,753	$ 13,918
Income tax benefit	$ 2,969	$ 1,713	$ 2,142

Unrecognized stock-based compensation expense and the weighted-average period over which the expense is expected to be recognized at December 31, 2022 is presented in the table below. Unrecognized stock-based compensation expense related to performance stock units is presented assuming attainment of the maximum payout rate as set forth by the performance criteria.

	Unrecognized Expense	Weighted-Average Number of Years for Expense Recognition
Non-vested stock awards/stock units	$ 21,770	2.15
Performance stock units	11,078	1.80
Total	$ 32,848	

Valuation of Stock-Based Compensation. For the purposes of recognizing stock-based compensation expense, the fair value of non-vested stock awards/stock units and deferred stock units is generally the market price of the stock on the measurement date, which, for us, is the date of the award. The fair value of performance stock units is determined in a similar manner except that the market price of the stock on the measurement date is discounted by the present value of the dividends expected to be paid on our common stock during the service period of the award because dividend equivalent payments on performance stock units are deferred until such time that the units vest and shares are issued. In applying this discount to the market price of our stock on the measurement date, we assumed we would pay a flat quarterly dividend during the service period equal to our most recent dividend payment, which was $0.87, $0.75 and $0.72 in 2022, 2021 and 2020, respectively, discounted at a weighted-average risk-free rate of 4.45%, 0.77% and 0.19% in 2022, 2021 and 2020, respectively.

The fair value of employee stock options granted is estimated on the measurement date, which, for us, is the date of grant. The fair value of stock options is estimated using a binomial lattice-based valuation model that takes into account employee exercise patterns based on changes in our stock price and other variables, and allows for the use of dynamic assumptions about interest rates and expected volatility. No stock options have been granted since 2015.

Note 12 - Other Non-Interest Income and Expense

Other non-interest income and expense totals are presented in the following table. Components of these totals exceeding 1% of the aggregate of total net interest income and total non-interest income for any of the years presented are stated separately.

	2022	2021	2020
Other non-interest income:			
Other	$ 45,217	$ 48,528	$ 47,712
Total	$ 45,217	$ 48,528	$ 47,712
Other non-interest expense:			
Professional services	$ 40,908	$ 34,747	$ 37,253
Advertising, promotions and public relations	39,994	34,539	34,390
Other	113,319	102,171	94,667
Total	$ 194,221	$ 171,457	$ 166,310

In the ordinary course of business, we transact with certain directors and/or their affiliates. Payments for services provided totaled $545 thousand in 2022, $257 thousand in 2021 and $551 thousand in 2020.

Note 13 - Income Taxes

Income tax expense was as follows:

	2022	2021	2020
Current income tax expense	$ 94,595	$ 38,675	$ 36,002
Deferred income tax expense (benefit)	(4,918)	7,784	(15,832)
Income tax expense, as reported	$ 89,677	$ 46,459	$ 20,170
Effective tax rate	13.4 %	9.5 %	5.7 %

A reconciliation between reported income tax expense and the amounts computed by applying the U.S. federal statutory income tax rate of 21% to income before income taxes is presented in the following table.

	2022	2021	2020
Income tax expense computed at the statutory rate	$ 140,454	$ 102,803	$ 73,777
Effect of tax-exempt interest	(50,602)	(50,740)	(51,624)
Net tax benefit from stock-based compensation	(4,602)	(7,877)	(852)
Tax benefit on dividends paid in our 401k plan	(1,854)	(1,764)	(1,851)
Bank owned life insurance income	(440)	(517)	(783)
Non-deductible FDIC premiums	3,277	2,629	1,790
Non-deductible compensation	2,250	1,773	1,123
Non-deductible meals and entertainment	683	625	786
Asset contribution to a charitable trust	—	—	(2,556)
Tax basis adjustment of premises and equipment	—	(1,026)	—
Other	511	553	360
Income tax expense, as reported	$ 89,677	$ 46,459	$ 20,170

There were no unrecognized tax benefits during any of the reported periods. Interest and/or penalties related to income taxes are reported as a component of income tax expense. Such amounts were not significant during the reported periods.

Year-end deferred taxes are presented in the table below. Deferred taxes are based on the U.S. statutory federal income tax rate of 21%.

	2022	2021
Deferred tax assets:		
Lease liabilities under operating leases	$ 67,608	$ 65,815
Net unrealized loss on securities available for sale and transferred securities	349,237	—
Allowance for credit losses	60,137	62,819
Net actuarial loss on defined benefit post-retirement benefit plans	9,172	8,743
Stock-based compensation	6,622	6,989
Bonus accrual	11,204	7,506
Deferred loan and lease origination fees	3,675	3,118
Other	6,109	3,834
Total gross deferred tax assets	513,764	158,824
Deferred tax liabilities:		
Net unrealized gain on securities available for sale and transferred securities	—	(101,067)
Right-of-use assets under operating leases	(60,651)	(59,415)
Premises and equipment	(45,647)	(49,645)
Intangible assets	(17,732)	(16,595)
Defined benefit post-retirement benefit plans	(12,730)	(11,027)
Other	(2,601)	(2,323)
Total gross deferred tax liabilities	(139,361)	(240,072)
Net deferred tax asset (liability)	$ 374,403	$ (81,248)

No valuation allowance for deferred tax assets was recorded at December 31, 2022 and 2021 as management believes it is more likely than not that all of the deferred tax assets will be realized against deferred tax liabilities and projected future taxable income. There were no unrecognized tax benefits during any of the reported periods.

We file income tax returns in the U.S. federal jurisdiction. We are no longer subject to U.S. federal income tax examinations by tax authorities for years before 2019.

Note 14 - Other Comprehensive Income (Loss)

The tax effects allocated to each component of other comprehensive income (loss) were as follows:

	Before Tax Amount	Tax Expense, (Benefit)	Net of Tax Amount
2022			
Securities available for sale and transferred securities:			
Change in net unrealized gain/loss during the period	$(2,143,567)	$ (450,149)	$(1,693,418)
Change in net unrealized gain on securities transferred to held to maturity	(737)	(155)	(582)
Reclassification adjustment for net (gains) losses included in net income	—	—	—
Total securities available for sale and transferred securities	(2,144,304)	(450,304)	(1,694,000)
Defined-benefit post-retirement benefit plans:			
Change in the net actuarial gain/loss	(5,005)	(1,051)	(3,954)
Reclassification adjustment for net amortization of actuarial gain/loss included in net income as a component of net periodic cost (benefit)	2,964	622	2,342
Total defined-benefit post-retirement benefit plans	(2,041)	(429)	(1,612)
Total other comprehensive income (loss)	$(2,146,345)	$ (450,733)	$(1,695,612)
2021			
Securities available for sale and transferred securities:			
Change in net unrealized gain/loss during the period	$ (231,355)	$ (48,585)	$ (182,770)
Change in net unrealized gain on securities transferred to held to maturity	(971)	(204)	(767)
Reclassification adjustment for net (gains) losses included in net income	(69)	(14)	(55)
Total securities available for sale and transferred securities	(232,395)	(48,803)	(183,592)
Defined-benefit post-retirement benefit plans:			
Change in the net actuarial gain/loss	16,593	3,485	13,108
Reclassification adjustment for net amortization of actuarial gain/loss included in net income as a component of net periodic cost (benefit)	6,116	1,284	4,832
Total defined-benefit post-retirement benefit plans	22,709	4,769	17,940
Total other comprehensive income (loss)	$ (209,686)	$ (44,034)	$ (165,652)
2020			
Securities available for sale and transferred securities:			
Change in net unrealized gain/loss during the period	$ 427,331	$ 89,741	$ 337,590
Change in net unrealized gain on securities transferred to held to maturity	(1,256)	(264)	(992)
Reclassification adjustment for net (gains) losses included in net income	(108,989)	(22,888)	(86,101)
Total securities available for sale and transferred securities	317,086	66,589	250,497
Defined-benefit post-retirement benefit plans:			
Change in the net actuarial gain/loss	(11,518)	(2,419)	(9,099)
Reclassification adjustment for net amortization of actuarial gain/loss included in net income as a component of net periodic cost (benefit)	5,319	1,117	4,202
Total defined-benefit post-retirement benefit plans	(6,199)	(1,302)	(4,897)
Total other comprehensive income (loss)	$ 310,887	$ 65,287	$ 245,600

Activity in accumulated other comprehensive income, net of tax, was as follows:

	Securities Available For Sale	Defined Benefit Plans	Accumulated Other Comprehensive Income
Balance January 1, 2022	$ 380,209	$ (32,891)	$ 347,318
Other comprehensive income (loss) before reclassification	(1,694,000)	(3,954)	(1,697,954)
Reclassification of amounts included in net income	—	2,342	2,342
Net other comprehensive income (loss) during period	(1,694,000)	(1,612)	(1,695,612)
Balance December 31, 2022	$(1,313,791)	$ (34,503)	$ (1,348,294)
Balance January 1, 2021	$ 563,801	$ (50,831)	$ 512,970
Other comprehensive income (loss) before reclassification	(183,537)	13,108	(170,429)
Reclassification of amounts included in net income	(55)	4,832	4,777
Net other comprehensive income (loss) during period	(183,592)	17,940	(165,652)
Balance December 31, 2021	$ 380,209	$ (32,891)	$ 347,318
Balance January 1, 2020	$ 313,304	$ (45,934)	$ 267,370
Other comprehensive income (loss) before reclassification	336,598	(9,099)	327,499
Reclassification of amounts included in net income	(86,101)	4,202	(81,899)
Net other comprehensive income (loss) during period	250,497	(4,897)	245,600
Balance December 31, 2020	$ 563,801	$ (50,831)	$ 512,970

Note 15 - Derivative Financial Instruments

The fair value of derivative positions outstanding is included in accrued interest receivable and other assets and accrued interest payable and other liabilities in the accompanying consolidated balance sheets and in the net change in each of these financial statement line items in the accompanying consolidated statements of cash flows.

Interest Rate Derivatives. We utilize interest rate swaps, caps and floors to mitigate exposure to interest rate risk and to facilitate the needs of our customers. Our objectives for utilizing these derivative instruments are described below:

We have entered into certain interest rate swap contracts that are matched to specific fixed-rate commercial loans or leases that we have entered into with our customers. These contracts have been designated as hedging instruments to hedge the risk of changes in the fair value of the underlying commercial loan/lease due to changes in interest rates. The related contracts are structured so that the notional amounts reduce over time to generally match the expected amortization of the underlying loan/lease.

We have entered into certain interest rate swap, cap and floor contracts that are not designated as hedging instruments. These derivative contracts relate to transactions in which we enter into an interest rate swap, cap and/or floor with a customer while at the same time entering into an offsetting interest rate swap, cap and/or floor with a third-party financial institution. In connection with each swap transaction, we agree to pay interest to the customer on a notional amount at a variable interest rate and receive interest from the customer on a similar notional amount at a fixed interest rate. At the same time, we agree to pay a third-party financial institution the same fixed interest rate on the same notional amount and receive the same variable interest rate on the same notional amount. The transaction allows our customer to effectively convert a variable rate loan to a fixed rate. Because we act as an intermediary for our customer, changes in the fair value of the underlying derivative contracts for the most part offset each other and do not significantly impact our results of operations.

The notional amounts and estimated fair values of interest rate derivative contracts outstanding at December 31, 2022 and 2021 are presented in the following table. The fair values of interest rate derivative contracts are estimated utilizing internal valuation methods with observable market data inputs, or as determined by the Chicago Mercantile Exchange ("CME") for centrally cleared derivative contracts. CME rules legally characterize variation margin payments for centrally cleared derivatives as settlements of the derivatives' exposure rather than collateral. As a result, the variation margin payment and the related derivative instruments are considered a single unit of account for accounting and financial reporting purposes. Variation margin, as determined by the CME, is settled daily. As a result, derivative contracts that clear through the CME have an estimated fair value of zero as of December 31, 2022 and 2021.

	December 31, 2022		December 31, 2021	
	Notional Amount	Estimated Fair Value	Notional Amount	Estimated Fair Value
Derivatives designated as hedges of fair value:				
Financial institution counterparties:				
Loan/lease interest rate swaps - assets	$ 1,614	$ 19	$ —	$ —
Loan/lease interest rate swaps - liabilities	—	—	2,426	(34)
Non-hedging interest rate derivatives:				
Financial institution counterparties:				
Loan/lease interest rate swaps - assets	1,165,812	70,416	247,592	1,207
Loan/lease interest rate swaps - liabilities	78,798	(1,102)	928,756	(19,142)
Loan/lease interest rate caps - assets	246,442	15,256	270,431	3,239
Customer counterparties:				
Loan/lease interest rate swaps - assets	53,570	1,102	928,756	39,864
Loan/lease interest rate swaps - liabilities	1,175,563	(79,175)	247,592	(2,846)
Loan/lease interest rate caps - liabilities	246,442	(15,256)	270,431	(3,239)

The weighted-average rates paid and received for interest rate swaps outstanding at December 31, 2022 were as follows:

	Weighted-Average	
	Interest Rate Paid	Interest Rate Received
Interest rate swaps:		
Fair value hedge loan/lease interest rate swaps	1.58 %	4.12 %
Non-hedging interest rate swaps - financial institution counterparties	3.73	5.29
Non-hedging interest rate swaps - customer counterparties	5.28	3.72

The weighted-average strike rate for outstanding interest rate caps was 3.26% at December 31, 2022.

Commodity Derivatives. We enter into commodity swaps and option contracts that are not designated as hedging instruments primarily to accommodate the business needs of our customers. Upon the origination of a commodity swap or option contract with a customer, we simultaneously enter into an offsetting contract with a third-party financial institution to mitigate the exposure to fluctuations in commodity prices.

The notional amounts and estimated fair values of non-hedging commodity swap and option derivative positions outstanding are presented in the following table. We obtain dealer quotations and use internal valuation methods with observable market data inputs to value our commodity derivative positions.

		December 31, 2022		December 31, 2021	
	Notional Units	Notional Amount	Estimated Fair Value	Notional Amount	Estimated Fair Value
Financial institution counterparties:					
Oil - assets	Barrels	4,024	$ 27,082	4,809	$ 14,721
Oil - liabilities	Barrels	6,068	(53,579)	7,032	(73,594)
Natural gas - assets	MMBTUs	16,539	6,220	15,947	4,143
Natural gas - liabilities	MMBTUs	15,682	(19,138)	29,446	(21,249)
Customer counterparties:					
Oil - assets	Barrels	6,068	54,219	7,046	74,437
Oil - liabilities	Barrels	4,024	(26,551)	4,796	(14,294)
Natural gas - assets	MMBTUs	15,682	19,164	29,446	21,456
Natural gas - liabilities	MMBTUs	16,539	(6,124)	15,947	(4,124)

Foreign Currency Derivatives. We enter into foreign currency forward and option contracts that are not designated as hedging instruments primarily to accommodate the business needs of our customers. Upon the origination of a foreign currency denominated transaction with a customer, we simultaneously enter into an offsetting contract with a third-party financial institution to negate the exposure to fluctuations in foreign currency exchange rates. We also utilize foreign currency forward contracts that are not designated as hedging instruments to mitigate the economic effect of fluctuations in foreign currency exchange rates on foreign currency holdings and certain short-term, non-U.S. dollar denominated loans. The notional amounts and fair values of open foreign currency forward contracts were as follows:

		December 31, 2022		December 31, 2021	
	Notional Currency	Notional Amount	Estimated Fair Value	Notional Amount	Estimated Fair Value
Financial institution counterparties:					
Forward/option contracts - assets	EUR	875	$ 1	1,900	$ 29
Forward/option contracts - assets	CAD	—	—	658	—
Forward/option contracts - liabilities	EUR	875	(10)	—	—
Customer counterparties:					
Forward/option contracts - assets	EUR	875	10	—	—
Forward/option contracts - assets	CAD	—	—	658	4
Forward/option contracts - liabilities	EUR	875	(1)	1,900	(55)

Gains, Losses and Derivative Cash Flows. For fair value hedges, the changes in the fair value of both the derivative hedging instrument and the hedged item are included in other non-interest income or other non-interest expense. The extent that such changes in fair value do not offset represents hedge ineffectiveness. Net cash flows from interest rate swaps on commercial loans/leases designated as hedging instruments in effective hedges of fair value are included in interest income on loans. For non-hedging derivative instruments, gains and losses due to changes in fair value and all cash flows are included in other non-interest income and other non-interest expense.

Amounts included in the consolidated statements of income related to interest rate derivatives designated as hedges of fair value were as follows:

	2022	2021	2020
Commercial loan/lease interest rate swaps:			
Amount of gain (loss) included in interest income on loans	$ (7)	$ (91)	$ (111)
Amount of (gain) loss included in other non-interest expense	6	10	9

As stated above, we enter into non-hedge related derivative positions primarily to accommodate the business needs of our customers. Upon the origination of a derivative contract with a customer, we simultaneously enter into an offsetting derivative contract with a third-party financial institution. We recognize immediate income based upon the difference in the bid/ask spread of the underlying transactions with our customers and the third party. Because we act only as an intermediary for our customer, subsequent changes in the fair value of the underlying derivative contracts for the most part offset each other and do not significantly impact our results of operations.

Amounts included in the consolidated statements of income related to non-hedging interest rate, commodity, foreign currency and other derivative instruments are presented in the table below.

	2022	2021	2020
Non-hedging interest rate derivatives:			
Other non-interest income	$ 1,742	$ 4,285	$ 3,413
Other non-interest expense	—	(1)	1
Non-hedging commodity derivatives:			
Other non-interest income	2,297	4,052	1,768
Non-hedging foreign currency derivatives:			
Other non-interest income	63	39	28
Non-hedging other derivatives:			
Other non-interest income	—	—	5,992

During 2020, we sold certain non-hedge related, short-term put options on U.S. Treasury securities and realized gains totaling approximately $6.0 million in connection with the sales. The put options expired without being exercised. These gains are included in the table above as a component of non-hedging other derivatives.

Counterparty Credit Risk. Derivative contracts involve the risk of dealing with both bank customers and institutional derivative counterparties and their ability to meet contractual terms. Institutional counterparties must have an investment grade credit rating and be approved by our Asset/Liability Management Committee. Our credit exposure on derivative contracts is limited to the net favorable value of all contracts by each counterparty. Credit exposure may be reduced by the amount of collateral pledged by the counterparty. There are no credit-risk-related contingent features associated with any of our derivative contracts. Certain derivative contracts with upstream financial institution counterparties may be terminated with respect to a party in the transaction, if such party does not have at least a minimum level rating assigned to either its senior unsecured long-term debt or its deposit obligations by certain third-party rating agencies.

Our credit exposure relating to interest rate swaps, commodity swaps/options and foreign currency forward contracts with bank customers was approximately $43.6 million at December 31, 2022. This credit exposure is partly mitigated as transactions with customers are generally secured by the collateral, if any, securing the underlying transaction being hedged. Our credit exposure, net of collateral pledged, relating to interest rate swaps, commodity swaps/options and foreign currency forward contracts with upstream financial institution counterparties was approximately $2.9 million at December 31, 2022. This amount was primarily related to excess collateral we posted to counterparties. Collateral levels for upstream financial institution counterparties are monitored and adjusted as necessary. See Note 16 – Balance Sheet Offsetting and Repurchase Agreements for additional information regarding our credit exposure with upstream financial institution counterparties. At December 31, 2022, the aggregate fair value of securities we posted as collateral related to derivative contracts totaled $8.5 million. We also had $3.2 million in cash collateral related to derivative contracts on deposit with other financial institution counterparties at December 31, 2022.

Note 16 - Balance Sheet Offsetting and Repurchase Agreements

Balance Sheet Offsetting. Certain financial instruments, including resell and repurchase agreements and derivatives, may be eligible for offset in the consolidated balance sheet and/or subject to master netting arrangements or similar agreements. Our derivative transactions with upstream financial institution counterparties are generally executed under International Swaps and Derivative Association ("ISDA") master agreements which include "right of set-off" provisions. In such cases there is generally a legally enforceable right to offset recognized amounts and there may be an intention to settle such amounts on a net basis. Nonetheless, we do not generally offset such financial instruments for financial reporting purposes.

Information about financial instruments that are eligible for offset in the consolidated balance sheet as of December 31, 2022 is presented in the following tables.

	Gross Amount Recognized	Gross Amount Offset	Net Amount Recognized
December 31, 2022			
Financial assets:			
Derivatives:			
Loan/lease interest rate swaps and caps	$ 85,691	$ —	$ 85,691
Commodity swaps and options	33,302	—	33,302
Foreign currency forward/option contracts	1	—	1
Total derivatives	118,994	—	118,994
Resell agreements	87,150	—	87,150
Total	$ 206,144	$ —	$ 206,144
Financial liabilities:			
Derivatives:			
Loan/lease interest rate swaps	$ 1,102	$ —	$ 1,102
Commodity swaps and options	72,717	—	72,717
Foreign currency forward/option contracts	10	—	10
Total derivatives	73,829	—	73,829
Repurchase agreements	4,660,641	—	4,660,641
Total	$ 4,734,470	$ —	$ 4,734,470

	Net Amount Recognized	Gross Amounts Not Offset		Net Amount
		Financial Instruments	Collateral	
December 31, 2022				
Financial assets:				
Derivatives:				
Counterparty B	$ 39,370	$ (24,500)	$ (14,870)	$ —
Counterparty E	14,430	(47)	(14,131)	252
Counterparty F	17,297	(17,297)	—	—
Counterparty G	10,660	—	(10,660)	—
Other counterparties	37,237	(20,684)	(16,307)	246
Total derivatives	118,994	(62,528)	(55,968)	498
Resell agreements	87,150	—	(87,150)	—
Total	$ 206,144	$ (62,528)	$ (143,118)	$ 498
Financial liabilities:				
Derivatives:				
Counterparty B	$ 24,500	$ (24,500)	$ —	$ —
Counterparty E	47	(47)	—	—
Counterparty F	27,747	(17,297)	(8,479)	1,971
Counterparty G	—	—	—	—
Other counterparties	21,535	(20,684)	(851)	—
Total derivatives	73,829	(62,528)	(9,330)	1,971
Repurchase agreements	4,660,641	—	(4,660,641)	—
Total	$ 4,734,470	$ (62,528)	$ (4,669,971)	$ 1,971

Information about financial instruments that are eligible for offset in the consolidated balance sheet as of December 31, 2021 is presented in the following tables.

	Gross Amount Recognized	Gross Amount Offset	Net Amount Recognized
December 31, 2021			
Financial assets:			
Derivatives:			
Loan/lease interest rate swaps and caps	$ 4,446	$ —	$ 4,446
Commodity swaps and options	18,864	—	18,864
Foreign currency forward/option contracts	29	—	29
Total derivatives	23,339	—	23,339
Resell agreements	7,903	—	7,903
Total	$ 31,242	$ —	$ 31,242
Financial liabilities:			
Derivatives:			
Loan/lease interest rate swaps	$ 19,176	$ —	$ 19,176
Commodity swaps and options	94,843	—	94,843
Total derivatives	114,019	—	114,019
Repurchase agreements	2,740,799	—	2,740,799
Total	$ 2,854,818	$ —	$ 2,854,818

	Net Amount Recognized	Gross Amounts Not Offset		Net Amount
		Financial Instruments	Collateral	
December 31, 2021				
Financial assets:				
Derivatives:				
Counterparty B	$ 7,655	$ (7,655)	$ —	$ —
Counterparty E	411	(411)	—	—
Counterparty F	12,078	(12,078)	—	—
Counterparty G	1,783	(1,783)	—	—
Other counterparties	1,412	(1,412)	—	—
Total derivatives	23,339	(23,339)	—	—
Resell agreements	7,903	—	(7,903)	—
Total	$ 31,242	$ (23,339)	$ (7,903)	$ —
Financial liabilities:				
Derivatives:				
Counterparty B	$ 28,130	$ (7,655)	$ (20,475)	$ —
Counterparty E	601	(411)	(190)	—
Counterparty F	20,813	(12,078)	(8,735)	—
Counterparty G	1,789	(1,783)	(6)	—
Other counterparties	62,686	(1,412)	(61,167)	107
Total derivatives	114,019	(23,339)	(90,573)	107
Repurchase agreements	2,740,799	—	(2,740,799)	—
Total	$ 2,854,818	$ (23,339)	$ (2,831,372)	$ 107

Repurchase Agreements. We utilize securities sold under agreements to repurchase to facilitate the needs of our customers and to facilitate secured short-term funding needs. Securities sold under agreements to repurchase are stated at the amount of cash received in connection with the transaction. We monitor collateral levels on a continuous basis. We may be required to provide additional collateral based on the fair value of the underlying securities. Securities pledged as collateral under repurchase agreements are maintained with our safekeeping agents.

The remaining contractual maturity of repurchase agreements in the consolidated balance sheets as of December 31, 2022 and December 31, 2021 is presented in the following tables.

	Remaining Contractual Maturity of the Agreements				
	Overnight and Continuous	Up to 30 Days	30-90 Days	Greater than 90 Days	Total
December 31, 2022					
Repurchase agreements:					
U.S. Treasury	$ 3,735,061	$ —	$ —	$ —	$ 3,735,061
Residential mortgage-backed securities	925,580	—	—	—	925,580
Total borrowings	$ 4,660,641	$ —	$ —	$ —	$ 4,660,641
Gross amount of recognized liabilities for repurchase agreements					$ 4,660,641
Amounts related to agreements not included in offsetting disclosures above					$ —
December 31, 2021					
Repurchase agreements:					
U.S. Treasury	$ 1,342,591	$ —	$ —	$ —	$ 1,342,591
Residential mortgage-backed securities	1,398,208	—	—	—	1,398,208
Total borrowings	$ 2,740,799	$ —	$ —	$ —	$ 2,740,799
Gross amount of recognized liabilities for repurchase agreements					$ 2,740,799
Amounts related to agreements not included in offsetting disclosures above					$ —

Note 17 - Fair Value Measurements

The fair value of an asset or liability is the price that would be received to sell that asset or paid to transfer that liability in an orderly transaction occurring in the principal market (or most advantageous market in the absence of a principal market) for such asset or liability. In estimating fair value, we utilize valuation techniques that are consistent with the market approach, the income approach and/or the cost approach. Such valuation techniques are consistently applied. Inputs to valuation techniques include the assumptions that market participants would use in pricing an asset or liability. ASC Topic 820 establishes a fair value hierarchy for valuation inputs that gives the highest priority to quoted prices in active markets for identical assets or liabilities and the lowest priority to unobservable inputs. The fair value hierarchy is as follows:

- *Level 1 Inputs* - Unadjusted quoted prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date.
- *Level 2 Inputs* - Inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly. These might include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability (such as interest rates, volatilities, prepayment speeds, credit risks, etc.) or inputs that are derived principally from or corroborated by market data by correlation or other means.
- *Level 3 Inputs* - Unobservable inputs for determining the fair values of assets or liabilities that reflect an entity's own assumptions about the assumptions that market participants would use in pricing the assets or liabilities.

In general, fair value is based upon quoted market prices, where available. If such quoted market prices are not available, fair value is based upon internally developed models that primarily use, as inputs, observable market-based parameters. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value. These adjustments may include amounts to reflect counterparty credit quality and our creditworthiness, among other things, as well as unobservable parameters. Any such valuation adjustments are applied consistently over time. Our valuation methodologies may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. While management believes our valuation methodologies are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different estimate of fair value at the reporting date. Furthermore, the reported fair value amounts have not been comprehensively revalued since the presentation dates, and therefore, estimates of fair value after the balance sheet date may differ significantly from the amounts presented herein. A more detailed description of the valuation methodologies used for assets and liabilities measured at fair value is set forth below. Transfers between levels of the fair value hierarchy are recognized on the actual date of the event or circumstances that caused the transfer, which generally coincides with our monthly and/or quarterly valuation process.

Financial Assets and Financial Liabilities: Financial assets and financial liabilities measured at fair value on a recurring basis include the following:

Securities Available for Sale. U.S. Treasury securities are reported at fair value utilizing Level 1 inputs. Other securities classified as available for sale are reported at fair value utilizing Level 2 inputs. For these securities, we obtain fair value measurements from an independent pricing service. The fair value measurements consider observable data that may include dealer quotes, market spreads, cash flows, the U.S. Treasury yield curve, live trading levels, trade execution data, market consensus prepayment speeds, credit information and the bond's terms and conditions, among other things.

We review the prices supplied by the independent pricing service, as well as their underlying pricing methodologies, for reasonableness and to ensure such prices are aligned with traditional pricing matrices. In general, we do not purchase investment portfolio securities that are esoteric or that have a complicated structure. Our entire portfolio consists of traditional investments, nearly all of which are U.S. Treasury obligations, federal agency bullet or mortgage pass-through securities, or general obligation or revenue based municipal bonds. Pricing for such instruments is fairly generic and is easily obtained. From time to time, we will validate prices supplied by the independent pricing service by comparison to prices obtained from third-party sources or derived using internal models.

Trading Securities. U.S. Treasury securities and exchange-listed common stock are reported at fair value utilizing Level 1 inputs. Other securities classified as trading are reported at fair value utilizing Level 2 inputs in the same manner as described above for securities available for sale.

Derivatives. Derivatives are generally reported at fair value utilizing Level 2 inputs, except for foreign currency contracts, which are reported at fair value utilizing Level 1 inputs. We obtain dealer quotations and utilize internally developed valuation models to value commodity swaps/options. We utilize internally developed valuation models and/or third-party models with observable market data inputs to validate the valuations provided by the dealers. Though there has never been a significant discrepancy in the valuations, should such a significant discrepancy arise, we would obtain price verification from a third-party dealer. We utilize internal valuation methods with observable market data inputs to estimate fair values of customer interest rate swaps, caps and floors. We also obtain dealer quotations for these derivatives for comparative purposes to assess the reasonableness of the model valuations. In cases where significant credit valuation adjustments are incorporated into the estimation of fair value, reported amounts are considered to have been derived utilizing Level 3 inputs.

For purposes of potential valuation adjustments to our derivative positions, we evaluate the credit risk of our counterparties as well as ours. Accordingly, we have considered factors such as the likelihood of our default and the default of our counterparties, our net exposures and remaining contractual life, among other things, in determining if any fair value adjustments related to credit risk are required. Counterparty exposure is evaluated by netting positions that are subject to master netting arrangements, as well as considering the amount of collateral securing the position. We review our counterparty exposure on a regular basis, and, when necessary, appropriate business actions are taken to adjust the exposure. We also utilize this approach to estimate our own credit risk on derivative liability positions. To date, we have not realized any significant losses due to a counterparty's inability to pay any net uncollateralized position. The change in value of derivative assets and derivative liabilities attributable to credit risk was not significant during the reported periods.

The following tables summarize financial assets and financial liabilities measured at fair value on a recurring basis as of December 31, 2022 and 2021, segregated by the level of the valuation inputs within the fair value hierarchy utilized to measure fair value:

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Total Fair Value
2022				
Securities available for sale:				
U.S. Treasury	$ 5,051,587	$ —	$ —	$ 5,051,587
Residential mortgage-backed securities	—	6,376,236	—	6,376,236
States and political subdivisions	—	6,773,355	—	6,773,355
Other	—	42,427	—	42,427
Trading account securities:				
U.S. Treasury	25,879	—	—	25,879
States and political subdivisions	—	2,166	—	2,166
Derivative assets:				
Interest rate swaps, caps and floors	—	86,793	—	86,793
Commodity swaps and options	—	106,685	—	106,685
Foreign currency forward/option contracts	11	—	—	11
Derivative liabilities:				
Interest rate swaps, caps and floors	—	95,533	—	95,533
Commodity swaps and options	—	105,392	—	105,392
Foreign currency forward/option contracts	11	—	—	11

	Level 1 Inputs	Level 2 Inputs	Level 3 Inputs	Total Fair Value
2021				
Securities available for sale:				
U.S. Treasury	$ 2,179,433	$ —	$ —	$ 2,179,433
Residential mortgage-backed securities	—	4,066,265	—	4,066,265
States and political subdivisions	—	7,636,571	—	7,636,571
Other	—	42,359	—	42,359
Trading account securities:				
U.S. Treasury	24,237	—	—	24,237
States and political subdivisions	—	925	—	925
Derivative assets:				
Interest rate swaps, caps and floors	—	44,310	—	44,310
Commodity swaps and options	—	114,757	—	114,757
Foreign currency forward contracts	33	—	—	33
Derivative liabilities:				
Interest rate swaps, caps and floors	—	25,261	—	25,261
Commodity swaps and options	—	113,261	—	113,261
Foreign currency forward contracts	55	—	—	55

Certain financial assets and financial liabilities are measured at fair value on a nonrecurring basis; that is, the instruments are not measured at fair value on an ongoing basis but are subject to fair value adjustments in certain circumstances (for example, when there is evidence of impairment). Financial assets measured at fair value on a non-recurring basis during the reported periods include certain impaired loans reported at the fair value of the underlying collateral if repayment is expected solely from the collateral. Collateral values are estimated using Level 2 inputs based on observable market data, typically in the case of real estate collateral, or Level 3 inputs based on customized discounting criteria, typically in the case of non-real estate collateral such as inventory, oil and gas reserves, accounts receivable, equipment or other business assets.

The following table presents collateral dependent loans that were remeasured and reported at fair value through a specific allocation of the allowance for credit losses on loans based upon the fair value of the underlying collateral:

	2022	2021	2020
Level 2			
Carrying value before allocations	$ 6,237	$ 1,333	$ 1,559
Specific (allocations) reversals of prior allocations	(1,480)	214	(450)
Fair value	$ 4,757	$ 1,547	$ 1,109
Level 3			
Carrying value before allocations	$ 8,156	$ 16,074	$ 34,302
Specific (allocations) reversals of prior allocations	625	(5,178)	(11,151)
Fair value	$ 8,781	$ 10,896	$ 23,151

Non-Financial Assets and Non-Financial Liabilities: We do not have any non-financial assets or non-financial liabilities measured at fair value on a recurring basis. From time to time, non-financial assets measured at fair value on a non-recurring basis may include certain foreclosed assets which, upon initial recognition, were remeasured and reported at fair value through a charge-off to the allowance for loan losses and certain foreclosed assets which, subsequent to their initial recognition, were remeasured at fair value through a write-down included in other non-interest expense. Such fair value measurements were not significant during the reported periods. Charge-offs recognized upon loan foreclosures are generally offset by general or specific allocations of the allowance for credit losses on loans and generally do not, and did not during the reported periods, significantly impact our credit loss expense. Regulatory guidelines require us to reevaluate the fair value of other real estate owned on at least an annual basis. While our policy is to comply with the regulatory guidelines, our general practice is to reevaluate the fair value of collateral supporting impaired collateral dependent loans on a quarterly basis. Thus, appraisals are generally not considered to be outdated, and we typically do not make any adjustments to the appraised values.

ASC Topic 825, “Financial Instruments,” requires disclosure of the fair value of financial assets and financial liabilities, including those financial assets and financial liabilities that are not measured and reported at fair value on

a recurring basis or non-recurring basis. The estimated fair value approximates carrying value for cash and cash equivalents, accrued interest and the cash surrender value of life insurance policies. The methodologies for other financial assets and financial liabilities that are not measured and reported at fair value on a recurring basis or non-recurring basis are discussed below:

Loans. The estimated fair value approximates carrying value for variable-rate loans that reprice frequently and with no significant change in credit risk. The fair value of fixed-rate loans and variable-rate loans which reprice on an infrequent basis is estimated by discounting future cash flows using the current interest rates at which similar loans with similar terms would be made to borrowers of similar credit quality. An overall valuation adjustment is made for specific credit risks as well as general portfolio credit risk.

Deposits. The estimated fair value approximates carrying value for demand deposits. The fair value of fixed-rate deposit liabilities with defined maturities is estimated by discounting future cash flows using the interest rates currently offered for deposits of similar remaining maturities. The estimated fair value of deposits does not take into account the value of our long-term relationships with depositors, commonly known as core deposit intangibles, which are separate intangible assets, and not considered financial instruments. Nonetheless, we would likely realize a core deposit premium if our deposit portfolio were sold in the principal market for such deposits.

Borrowed Funds. The estimated fair value approximates carrying value for short-term borrowings. The fair value of long-term fixed-rate borrowings is estimated using quoted market prices, if available, or by discounting future cash flows using current interest rates for similar financial instruments. The estimated fair value approximates carrying value for variable-rate junior subordinated deferrable interest debentures that reprice quarterly.

Loan Commitments, Standby and Commercial *Letters of Credit*. Our lending commitments have variable interest rates and "escape" clauses if the customer's credit quality deteriorates. Therefore, the fair values of these items are not significant and are not included in the following table.

The estimated fair values of financial instruments that are reported at amortized cost in our consolidated balance sheets, segregated by the level of valuation inputs within the fair value hierarchy utilized to measure fair value, were as follows:

	December 31, 2022		December 31, 2021	
	Carrying Amount	Estimated Fair Value	Carrying Amount	Estimated Fair Value
Financial assets:				
Level 2 inputs:				
Cash and cash equivalents	$ 12,028,132	$ 12,028,132	$ 16,583,000	$ 16,583,000
Securities held to maturity	2,639,083	2,467,865	1,749,179	1,809,143
Cash surrender value of life insurance policies	190,188	190,188	190,139	190,139
Accrued interest receivable	243,682	243,682	179,111	179,111
Level 3 inputs:				
Loans, net	16,927,348	16,343,417	16,087,731	16,079,454
Financial liabilities:				
Level 2 inputs:				
Deposits	43,954,196	43,920,741	42,695,696	41,343,426
Federal funds purchased	51,650	51,650	25,925	25,925
Repurchase agreements	4,660,641	4,660,641	2,740,799	2,740,799
Junior subordinated deferrable interest debentures	123,069	123,712	123,011	123,712
Subordinated notes	99,335	97,014	99,178	111,430
Accrued interest payable	18,444	18,444	3,026	3,026

Under ASC Topic 825, entities may choose to measure eligible financial instruments at fair value at specified election dates. The fair value measurement option (i) may be applied instrument by instrument, with certain exceptions, (ii) is generally irrevocable and (iii) is applied only to entire instruments and not to portions of instruments. Unrealized gains and losses on items for which the fair value measurement option has been elected must be reported in earnings at each subsequent reporting date. During the reported periods, we had no financial instruments measured at fair value under the fair value measurement option.

Note 18 - Operating Segments

We are managed under a matrix organizational structure whereby our two primary operating segments, Banking and Frost Wealth Advisors, overlap a regional reporting structure. The regions are primarily based upon geographic location and include Austin, Corpus Christi, Dallas, Fort Worth, Houston, Permian Basin, Rio Grande Valley, San Antonio and Statewide. We are primarily managed based on the line of business structure. In that regard, all regions have the same lines of business, which have the same product and service offerings, have similar types and classes of customers and utilize similar service delivery methods. Pricing guidelines for products and services are the same across all regions. The regional reporting structure is primarily a means to scale the lines of business to provide a local, community focus for customer relations and business development.

Banking and Frost Wealth Advisors are delineated by the products and services that each segment offers. The Banking operating segment includes both commercial and consumer banking services and Frost Insurance Agency. Commercial banking services are provided to corporations and other business clients and include a wide array of lending and cash management products. Consumer banking services include direct lending and depository services. Frost Insurance Agency provides insurance brokerage services to individuals and businesses covering corporate and personal property and casualty products, as well as group health and life insurance products. The Frost Wealth Advisors operating segment includes fee-based services within private trust, retirement services, and financial management services, including personal wealth management and securities brokerage services. A third operating segment, Non-Banks, is for the most part the parent holding company, as well as certain other insignificant non-bank subsidiaries of the parent that, for the most part, have little or no activity. The parent company's principal activities include the direct and indirect ownership of our banking and non-banking subsidiaries and the issuance of debt and equity. Our principal source of revenue is dividends from our subsidiaries.

The accounting policies of each reportable segment are the same as those of our consolidated entity except for the following items, which impact the Banking and Frost Wealth Advisors segments: (i) expenses for consolidated back-office operations and general overhead-type expenses such as executive administration, accounting and internal audit are allocated to operating segments based on estimated uses of those services, (ii) income tax expense for the individual segments is calculated essentially at the statutory rate, and (iii) the parent company records the tax expense or benefit necessary to reconcile to the consolidated total.

We use a match-funded transfer pricing process to assess operating segment performance. The process helps us to (i) identify the cost or opportunity value of funds within each business segment, (ii) measure the profitability of a particular business segment by relating appropriate costs to revenues, (iii) evaluate each business segment in a manner consistent with its economic impact on consolidated earnings, and (iv) enhance asset and liability pricing decisions.

Financial results by operating segment are detailed below. Certain prior period amounts have been reclassified to conform to the current presentation. Frost Wealth Advisors excludes off-balance-sheet managed and custody assets with a total fair value of $43.6 billion, $43.3 billion and $38.6 billion at December 31, 2022, 2021 and 2020.

	Banking	Frost Wealth Advisors	Non-Banks	Consolidated
2022				
Net interest income (expense)	$ 1,295,467	$ 4,645	$ (8,829)	$ 1,291,283
Credit loss expense	3,000	—	—	3,000
Non-interest income	230,876	175,874	(1,932)	404,818
Non-interest expense	886,421	132,009	5,844	1,024,274
Income (loss) before income taxes	636,922	48,510	(16,605)	668,827
Income tax expense (benefit)	85,127	10,187	(5,637)	89,677
Net income (loss)	551,795	38,323	(10,968)	579,150
Preferred stock dividends	—	—	6,675	6,675
Net income (loss) available to common shareholders	$ 551,795	$ 38,323	$ (17,643)	$ 572,475
Revenues from (expenses to) external customers	$ 1,526,343	$ 180,519	$ (10,761)	$ 1,696,101
Average assets (in millions)	$ 51,448	$ 57	$ 8	$ 51,513

	Banking	Frost Wealth Advisors	Non-Banks	Consolidated
2021				
Net interest income (expense)	$ 989,870	$ 2,138	$ (7,141)	$ 984,867
Credit loss expense	54	9	—	63
Non-interest income	220,662	167,442	(1,376)	386,728
Non-interest expense	753,719	122,972	5,303	881,994
Income (loss) before income taxes	456,759	46,599	(13,820)	489,538
Income tax expense (benefit)	41,483	9,786	(4,810)	46,459
Net income (loss)	415,276	36,813	(9,010)	443,079
Preferred stock dividends	—	—	7,157	7,157
Net income (loss) available to common shareholders	$ 415,276	$ 36,813	$ (16,167)	$ 435,922
Revenues from (expenses to) external customers	$ 1,210,532	$ 169,580	$ (8,517)	$ 1,371,595
Average assets (in millions)	$ 45,903	$ 70	$ 10	$ 45,983
2020				
Net interest income (expense)	$ 981,441	$ 2,776	$ (8,216)	$ 976,001
Credit loss expense	241,230	—	—	241,230
Non-interest income	321,136	145,268	(950)	465,454
Non-interest expense	718,519	123,630	6,755	848,904
Income (loss) before income taxes	342,828	24,414	(15,921)	351,321
Income tax expense (benefit)	20,347	5,127	(5,304)	20,170
Net income (loss)	322,481	19,287	(10,617)	331,151
Preferred stock dividends	—	—	2,016	2,016
Redemption of preferred stock	—	—	5,514	5,514
Net income (loss) available to common shareholders	$ 322,481	$ 19,287	$ (18,147)	$ 323,621
Revenues from (expenses to) external customers	$ 1,302,577	$ 148,044	$ (9,166)	$ 1,441,455
Average assets (in millions)	$ 37,892	$ 59	$ 10	$ 37,961

Note 19 - Condensed Financial Statements of Parent Company

Condensed financial statements pertaining only to Cullen/Frost Bankers, Inc. are presented below. Investments in subsidiaries are stated using the equity method of accounting.

Condensed Balance Sheets

	December 31,	
	2022	2021
Assets:		
Cash	$ 311,944	$ 471,875
Total cash and cash equivalents	311,944	471,875
Investment in subsidiaries	3,065,114	4,222,288
Accrued interest receivable and other assets	1,142	2,228
Total assets	$ 3,378,200	$ 4,696,391
Liabilities:		
Junior subordinated deferrable interest debentures, net of unamortized issuance costs	$ 123,069	$ 123,011
Subordinated notes, net of unamortized issuance costs	99,335	99,178
Accrued interest payable and other liabilities	18,568	34,647
Total liabilities	240,972	256,836
Shareholders' Equity	3,137,228	4,439,555
Total liabilities and shareholders' equity	$ 3,378,200	$ 4,696,391

Condensed Statements of Income

	Year Ended December 31,		
	2022	2021	2020
Income:			
Dividend income paid by Frost Bank	$ 51,711	$ 219,386	$ 298,884
Dividend income paid by non-banks	109	473	736
Interest and other income	—	101	446
Total income	51,820	219,960	300,066
Expenses:			
Interest expense	8,829	7,141	8,216
Salaries and employee benefits	1,605	1,499	1,581
Other	6,316	5,867	6,833
Total expenses	16,750	14,507	16,630
Income before income taxes and equity in undistributed earnings of subsidiaries	35,070	205,453	283,436
Income tax benefit	5,641	4,899	5,406
Equity in undistributed earnings of subsidiaries	538,439	232,727	42,309
Net income	579,150	443,079	331,151
Preferred stock dividends	6,675	7,157	2,016
Redemption of preferred stock	—	—	5,514
Net income available to common shareholders	$ 572,475	$ 435,922	$ 323,621

Condensed Statements of Cash Flows

	Year Ended December 31,		
	2022	2021	2020
Operating Activities:			
Net income	$ 579,150	$ 443,079	$ 331,151
Adjustments to reconcile net income to net cash provided by operating activities:			
Equity in undistributed earnings of subsidiaries	(538,439)	(232,727)	(42,309)
Stock-based compensation	720	700	770
Net tax benefit from stock-based compensation	472	278	370
Net change in other assets and other liabilities	(15,249)	23,890	(8,937)
Net cash from operating activities	26,654	235,220	281,045
Investing Activities:			
Redemption of investment in non-bank subsidiary	—	406	—
Net cash from investing activities	—	406	—
Financing Activities:			
Principal payments on long-term borrowings	—	(13,403)	—
Redemption of Series A preferred stock	—	—	(150,000)
Proceeds from issuance of Series B preferred stock	—	—	145,452
Proceeds from stock option exercises	16,659	54,417	12,557
Proceeds from stock-based compensation activities of subsidiaries	17,602	12,053	13,148
Purchase of treasury stock	(4,391)	(3,864)	(15,785)
Treasury stock issued to 401(k) stock purchase plan	—	1,749	10,307
Cash dividends paid on preferred stock	(6,675)	(7,157)	(2,016)
Cash dividends paid on common stock	(209,780)	(188,786)	(180,584)
Net cash from financing activities	(186,585)	(144,991)	(166,921)
Net change in cash and cash equivalents	(159,931)	90,635	114,124
Cash and cash equivalents at beginning of year	471,875	381,240	267,116
Cash and cash equivalents at end of year	$ 311,944	$ 471,875	$ 381,240

Note 20 - Accounting Standards Updates

ASU 2016-13, "Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments." ASU 2016-13 requires the measurement of all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts and requires enhanced disclosures related to the significant estimates and judgments used in estimating credit losses, as well as the credit quality and underwriting standards of an organization's portfolio. We adopted ASU 2016-13, as subsequently updated for certain clarifications, targeted relief and codification improvements, as of January 1, 2020 and recognized a cumulative effect adjustment reducing retained earnings by $29.3 million. See Note 1 - Summary of Significant Accounting Policies for additional information.

ASU 2017-04, "Intangibles - Goodwill and Other (Topic 350) - Simplifying the Test for Goodwill Impairment." ASU 2017-04 eliminates Step 2 from the goodwill impairment test which required entities to compute the implied fair value of goodwill. Under ASU 2017-04, an entity should perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An entity should recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. ASU 2017-04 became effective for us on January 1, 2020 and did not have a significant impact on our financial statements.

ASU 2018-13, "Fair Value Measurement (Topic 820) - Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement." ASU 2018-13 modifies the disclosure requirements on fair value measurements in Topic 820. The amendments in this update remove disclosures that no longer are considered cost beneficial, modify/clarify the specific requirements of certain disclosures, and add disclosure requirements identified as relevant. ASU 2018-13 became effective for us on January 1, 2020 and did not have a significant impact on our financial statements.

ASU 2018-14, "Compensation - Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20)." ASU 2018-14 amends and modifies the disclosure requirements for employers that sponsor defined benefit pension or other post-retirement plans. The amendments in this update remove disclosures that no longer are considered cost beneficial, clarify the specific requirements of disclosures, and add disclosure requirements identified as relevant. ASU 2018-14 became effective for the year ended December 31, 2020 and did not have a significant impact on our financial statements.

ASU 2018-15, "Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40) - Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract." ASU 2018-15 clarifies certain aspects of ASU 2015-05, "Customer's Accounting for Fees Paid in a Cloud Computing Arrangement," which was issued in April 2015. Specifically, ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). ASU 2018-15 does not affect the accounting for the service element of a hosting arrangement that is a service contract. ASU 2018-15 became effective for us on January 1, 2020 and did not have a significant impact on our financial statements.

ASU 2019-12, "Income Taxes (Topic 740) - Simplifying the Accounting for Income Taxes." The guidance issued in this update simplifies the accounting for income taxes by eliminating certain exceptions to the guidance in ASC 740 related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition for deferred tax liabilities for outside basis differences. ASU 2019-12 also simplifies aspects of the accounting for franchise taxes and enacted changes in tax laws or rates and clarifies the accounting for transactions that result in a step-up in the tax basis of goodwill. ASU 2019-12 became effective for us on January 1, 2021 and did not have a significant impact on our financial statements.

ASU 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting." ASU 2020-04 provides optional expedients and exceptions for accounting related to contracts, hedging relationships and other transactions affected by reference rate reform if certain criteria are met. ASU 2020-04 applies only to contracts, hedging relationships, and other transactions that reference LIBOR or another reference rate expected to be discontinued because of reference rate reform and do not apply to contract modifications made and hedging relationships entered into or evaluated after December 31, 2022, except for hedging relationships existing as of December 31, 2022, that an entity has elected certain optional expedients for and that are retained through the end of the hedging relationship. ASU 2020-04 was effective upon issuance and, based upon the amendments provided in ASU 2022-06 discussed below, can generally be applied through December 31, 2024. The adoption of ASU 2020-04 did not significantly impact our financial statements.

ASU 2020-08, "Codification Improvements to Subtopic 310-20, Receivables - Nonrefundable Fees and Other Costs." ASU 2020-08 clarifies the accounting for the amortization of purchase premiums for callable debt securities with multiple call dates. ASU 2020-8 became effective for us on January 1, 2021 and did not have a significant impact on our financial statements.

ASU 2020-09, "Debt (Topic 470): Amendments to SEC Paragraphs Pursuant to SEC Release No. 33-10762." ASU 2020-9 amends the ASC to reflect the issuance of an SEC rule related to financial disclosure requirements for subsidiary issuers and guarantors of registered debt securities and affiliates whose securities are pledged as collateral for registered securities. ASU 2020-09 became effective for us on January 4, 2021, concurrent with the effective date of the SEC release, and did not have a significant impact on our financial statements.

ASU 2021-01, "Reference Rate Reform (Topic 848): Scope." ASU 2021-01 clarifies that certain optional expedients and exceptions in ASC 848 for contract modifications and hedge accounting apply to derivatives that are affected by the discounting transition. ASU 2021-01 also amends the expedients and exceptions in ASC 848 to capture the incremental consequences of the scope clarification and to tailor the existing guidance to derivative instruments affected by the discounting transition. ASU 2021-01 was effective upon issuance and, based upon the amendments provided in ASU 2022-06 discussed below, can generally be applied through December 31, 2024. The adoption of ASU 2021-01 did not significantly impact our financial statements.

ASU 2022-01, "Derivatives and Hedging (Topic 815): Fair Value Hedging - Portfolio Layer Method." Under prior guidance, entities can apply the last-of-layer hedging method to hedge the exposure of a closed portfolio of prepayable financial assets to fair value changes due to changes in interest rates for a portion of the portfolio that is not expected to be affected by prepayments, defaults, and other events affecting the timing and amount of cash flows. ASU 2022-01 expands the last-of-layer method, which permits only one hedge layer, to allow multiple hedged layers of a single closed portfolio. To reflect that expansion, the last-of-layer method is renamed the portfolio layer method. ASU 2022-01 also (i) expands the scope of the portfolio layer method to include non-prepayable financial assets, (ii) specifies eligible hedging instruments in a single-layer hedge, (iii) provides additional guidance on the accounting for and disclosure of hedge basis adjustments under the portfolio layer method and (iv) specifies how hedge basis adjustments should be considered when determining credit losses for the assets included in the closed portfolio. ASU 2022-01 will be effective for us on January 1, 2023. The adoption of ASU 2022-01 is not expected to have a significant impact on our financial statements.

ASU 2022-02, "Financial Instruments - Credit Losses (Topic 326): Troubled Debt Restructurings and Vintage Disclosures." ASU 2022-02 eliminates the accounting guidance for troubled debt restructurings in Accounting Standards Codification ("ASC") Subtopic 310-40, Receivables - Troubled Debt Restructurings by Creditors, while enhancing disclosure requirements for certain loan refinancings and restructurings by creditors when a borrower is experiencing financial difficulty. Additionally, ASU 2022-02 requires entities to disclose current-period gross write-offs by year of origination for financing receivables and net investments in leases within the scope of ASC Subtopic 3126-20, Financial Instruments - Credit Losses - Measured at Amortized Cost. ASU 2022-02 will be effective for us on January 1, 2023. The adoption of ASU 2022-02 is not expected to have a significant impact on our financial statements.

ASU 2022-03, "Fair Value Measurement (Topic 820): Fair Value Measurement of Equity Securities Subject to Contractual Sale Restrictions." ASU 2022-03 clarifies that a contractual restriction on the sale of an equity security is not considered part of the unit of account of the equity security and, therefore, is not considered in measuring fair value. ASU 2022-03 also clarifies that an entity cannot, as a separate unit of account, recognize and measure a contractual sale restriction and requires certain new disclosures for equity securities subject to contractual sale restrictions. ASU 2022-03 will be effective for us on January 1, 2024 though early adoption is permitted. The adoption of ASU 2022-03 is not expected to have a significant impact on our financial statements.

ASU No. 2022-06, "Reference Rate Reform (Topic 848): Deferral of the Sunset Date of Topic 848." ASU 2022-06 extends the period of time preparers can utilize the reference rate reform relief guidance provided by ASU 2020-04 and ASU 2021-01, which are discussed above. ASU 2022-06, which was effective upon issuance, defers the sunset date of this prior guidance from December 31, 2022 to December 31, 2024, after which entities will no longer be permitted to apply the relief guidance in Topic 848. The adoption of ASU 2022-06 did not significantly impact our financial statements.

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 Annual Report on Form 10-K, an evaluation was carried out by our management, with the participation of our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934). Based upon that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that the disclosure controls and procedures were effective as of the end of the period covered by this report. No changes were made to our internal control over financial reporting (as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934) during the last fiscal quarter that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

The management of Cullen/Frost Bankers, Inc. is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed under the supervision of our Chief Executive Officer and Chief Financial Officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles.

As of December 31, 2022, management assessed the effectiveness of our internal control over financial reporting based on the criteria for effective internal control over financial reporting established in "Internal Control - Integrated Framework," issued by the Committee of Sponsoring Organizations ("COSO") of the Treadway Commission ("2013 framework"). Based on the assessment, management determined that we maintained effective internal control over financial reporting as of December 31, 2022, based on those criteria.

Ernst & Young LLP, San Antonio, Texas, (U.S. PCAOB Auditor Firm I.D.: 42), the independent registered public accounting firm that audited our consolidated financial statements included in this Annual Report on Form 10-K, has issued an attestation report on the effectiveness of our internal control over financial reporting as of December 31, 2022. The report, which expresses an unqualified opinion on the effectiveness of our internal control over financial reporting as of December 31, 2022, is included in this Item under the heading "Attestation Report of Independent Registered Public Accounting Firm."

Attestation Report of Independent Registered Public Accounting Firm

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Cullen/Frost Bankers, Inc.

Opinion on Internal Control over Financial Reporting

We have audited Cullen/Frost Bankers, Inc.'s internal control over financial reporting as of December 31, 2022, 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, Cullen/Frost Bankers, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, 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 the Company as of December 31, 2022 and 2021, and the related consolidated statements of income, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2022, and the related notes and our report dated February 3, 2023 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 Management's Report 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.

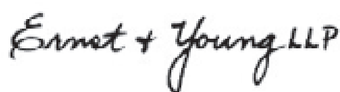
We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

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.



San Antonio, Texas
February 3, 2023

ITEM 9B. OTHER INFORMATION

None

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

None

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Certain information regarding executive officers is included under the section captioned “Executive Officers of the Registrant” in Part I, Item 1, elsewhere in this Annual Report on Form 10-K. Other information required by this Item is incorporated herein by reference to our Proxy Statement (Schedule 14A) for our 2023 Annual Meeting of Shareholders to be filed with the SEC within 120 days of our fiscal year-end.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated herein by reference to our Proxy Statement (Schedule 14A) for our 2023 Annual Meeting of Shareholders to be filed with the SEC within 120 days of our fiscal year-end.

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

Certain information regarding securities authorized for issuance under our equity compensation plans is included under the section captioned “Stock-Based Compensation Plans” in Part II, Item 5, elsewhere in this Annual Report on Form 10-K. Other information required by this Item is incorporated herein by reference to our Proxy Statement (Schedule 14A) for our 2023 Annual Meeting of Shareholders to be filed with the SEC within 120 days of our fiscal year-end.

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

The information required by this Item is incorporated herein by reference to our Proxy Statement (Schedule 14A) for our 2023 Annual Meeting of Shareholders to be filed with the SEC within 120 days of our fiscal year-end.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item is incorporated herein by reference to our Proxy Statement (Schedule 14A) for our 2023 Annual Meeting of Shareholders to be filed with the SEC within 120 days of our fiscal year-end.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this Annual Report on Form 10-K:

1. *Consolidated Financial Statements.* Reference is made to Part II, Item 8, of this Annual Report on Form 10-K.
2. *Consolidated Financial Statement Schedules.* These schedules are omitted as the required information is inapplicable or the information is presented in the consolidated financial statements or related notes.
3. *Exhibits.* The exhibits to this Annual Report on Form 10-K listed below have been included only with the copy of this report filed with the Securities and Exchange Commission.

			Incorporated by Reference			
Exhibit Number	Exhibit Description	Filed Herewith	Form	File No.	Exhibit	Filing Date
3.1	Restated Articles of Incorporation of Cullen/ Frost Bankers, Inc.		10-Q	001-13221	3.1	7/26/2006
3.2	Amended and Restated Bylaws of Cullen/Frost Bankers, Inc.		8-K	001-13221	3.1	7/31/2020
3.3	Certificate of Designations of 4.450% Non-Cumulative Perpetual Perpetual Preferred Stock, Series B		8-A	001-13221	3.3	11/19/2020
4.1	Description of Registrant's Securities	X				
4.2P[1]	Instruments Defining the Rights of Holders of Long-Term Debt					
10.1[2]	Cullen/Frost Bankers, Inc. Restoration Plan		10-K	001-13221	10.1	2/6/2019
10.2[2]	Amendment No. 1 to the Cullen/Frost Bankers, Inc. Restoration Plan		10-K	001-13221	10.2	2/6/2019
10.3[2]	Thrift Incentive Stock Purchase Plan for Certain Employees of Cullen/Frost Bankers, Inc.		10-K	001-13221	10.3	2/6/2019
10.4[2]	Cullen/Frost Restoration Profit Sharing Plan		10-K	001-13221	10.7	2/6/2019
10.5[2]	Amendment No. 1 to the Cullen/Frost Restoration Profit Sharing Plan		10-K	001-13221	10.8	2/6/2019
10.6[2]	2005 Omnibus Incentive Plan		DEF 14A	001-13221	Annex A	3/20/2013
10.7[2]	2007 Outside Director Incentive Plan		S-8	333-143397	4.4	5/31/2007
10.8[2]	2015 Omnibus Incentive Plan		DEF 14A	001-13221	Annex A	3/23/2015
10.9[2]	Amendment to the 2015 Omnibus Incentive Plan		10-K	001-13221	10.12	2/3/2017
10.10[2]	Form of Non-Qualified Stock Option Award Agreement - 2005 Plan		10-Q	001-13221	10.1	7/28/2022
10.11[2]	Form of Non-Qualified Stock Option Award Agreement - 2015 Plan		10-Q	001-13221	10.2	7/28/2022
10.12[2]	Form of Restricted Stock Unit Award Agreement - 4 Year Award		10-Q	001-13221	10.3	7/28/2022
10.13[2]	Form of Restricted Stock Unit Award Agreement - 3 Year Award		10-Q	001-13221	10.4	7/28/2022
10.14[2]	Form of Performance Stock Unit Award Agreement - 2019		10-Q	001-13221	10.5	7/28/2022
10.15[2]	Form of Performance Stock Unit Award Agreement - 2020		10-Q	001-13221	10.6	7/28/2022
10.16[2]	Form of Performance Stock Unit Award Agreement - 2021		10-Q	001-13221	10.7	7/28/2022
10.17[2]	Form of Performance Stock Unit Award Agreement - 2022	X				
10.18[2]	Form of Deferred Stock Unit Award Agreement with Outside Directors		10-Q	001-13221	10.8	7/28/2022
10.19[2]	Executive Change-in-Control Severance Plan		10-Q	001-13221	10.1	10/28/2021
21.1	Subsidiaries of Cullen/Frost Bankers, Inc.	X				
23.1	Consent of Independent Registered Public Accounting Firm	X				

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
24.1	Power of Attorney	X				
31.1	Rule 13a-14(a) Certification of the Chief Executive Officer	X				
31.2	Rule 13a-14(a) Certification of the Chief Financial Officer	X				
32.1[3]	Section 1350 Certification of the Chief Executive Officer	X				
32.2[3]	Section 1350 Certification of the Chief Financial Officer	X				
101.INS[4]	Inline XBRL Instance Document	X				
101.SCH	Inline XBRL Taxonomy Extension Schema Document	X				
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	X				
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	X				
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	X				
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	X				
104[5]	Cover Page Interactive Data File					

(1) We agree to furnish to the SEC, upon request, copies of any such instruments.

(2) Management contract or compensatory plan or arrangement.

(3) This exhibit shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that section, and shall not be deemed to be incorporated by reference into any filing under the Securities Act of 1933 or the Securities Exchange Act of 1934.

(4) The instance document does not appear in the interactive data file because its XBRL tags are embedded within the Inline XBRL document.

(5) Formatted as Inline XBRL and contained within the Inline XBRL Instance Document in Exhibit 101.

(b) Exhibits - See exhibit index included in Item 15(a)3 of this Annual Report on Form 10-K.

(c) Financial Statement Schedules - See Item 15(a)2 of this Annual Report on Form 10-K.

ITEM 16. FORM 10-K SUMMARY

None

SIGNATURES

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

Date: February 3, 2023

CULLEN/FROST BANKERS, INC.
(Registrant)

By: /s/ JERRY SALINAS
Jerry Salinas
Group Executive Vice President and Chief Financial Officer

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

Signature	Title	Date
/s/ PHILLIP D. GREEN* **Phillip D. Green**	Chairman of the Board, Director and Chief Executive Officer (Principal Executive Officer)	February 3, 2023
/s/ JERRY SALINAS **Jerry Salinas**	Group Executive Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 3, 2023
/s/ CARLOS ALVAREZ* **Carlos Alvarez**	Director	February 3, 2023
/s/ CHRIS M. AVERY* **Chris M. Avery**	Director	February 3, 2023
/s/ ANTHONY R. CHASE* **Anthony R. Chase**	Director	February 3, 2023
/s/ CYNTHIA J. COMPARIN* **Cynthia J. Comparin**	Director	February 3, 2023
/s/ SAMUEL G. DAWSON* **Samuel G. Dawson**	Director	February 3, 2023
/s/ CRAWFORD H. EDWARDS* **Crawford H. Edwards**	Director	February 3, 2023
/s/ PATRICK B. FROST* **Patrick B. Frost**	Director and President of Frost Bank	February 3, 2023
/s/ DAVID J. HAEMISEGGER* **David J. Haemisegger**	Director	February 3, 2023
/s/ CHARLES W. MATTHEWS* **Charles W. Matthews**	Director	February 3, 2023
/s/ JOSEPH A. PIERCE* **Joseph A. Pierce**	Director	February 3, 2023
/s/ LINDA B. RUTHERFORD* **Linda B. Rutherford**	Director	February 3, 2023
/s/ JACK WILLOME* **Jack Willome**	Director	February 3, 2023
*By: /s/ JERRY SALINAS **Jerry Salinas** As attorney-in-fact for the persons indicated	Group Executive Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 3, 2023

NOTES

NOTES

CULLEN/FROST BANKERS, INC.

(NYSE: CFR)

is a financial holding company, headquartered in San Antonio, with $52.9 billion in assets at December 31, 2022. One of the 50 largest U.S. banks, Frost provides a wide range of banking, investments and insurance services to businesses and individuals across Texas in the Austin, Corpus Christi, Dallas, Fort Worth, Houston, Permian Basin, Rio Grande Valley and San Antonio regions. Founded in 1868, Frost has helped clients with their financial needs during three centuries. Additional information is available at frostbank.com.

CORPORATE HEADQUARTERS

111 West Houston Street
San Antonio, Texas 78205

(210) 220-4011
frostbank@frostbank.com

FROSTBANK.COM

CERTIFICATIONS

The certifications of the Chief Executive Officer and the Chief Financial Officer of Cullen/Frost Bankers, Inc., required under Section 302 of the Sarbanes-Oxley Act of 2002, have been filed as exhibits to Cullen/Frost's 2022 Annual Report on Form 10-K.

In addition, the certification of the Chief Executive Officer of Cullen/Frost, required under the rules of the New York Stock Exchange, Inc., has been filed with the Exchange.

INVESTOR INQUIRIES

Analysts, investors and others desiring additional information about Cullen/Frost Bankers, Inc., may contact AB Mendez, Senior Vice President, Director of Investor Relations, at (210) 220-5234. SEC filings and other helpful information for investors can be found at investor.frostbank.com

TRANSFER AGENT AND REGISTRAR

Computershare
P.O. Box 505000 / Louisville, KY 40233
(866) 252-0444

Cullen/Frost Bankers, Inc.