Cboe Global Markets, Inc.
Form 10-K
February 22, 2019
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 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, 2018

or

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

For the transition period from to

Commission File No. 001-34774

Cboe Global Markets, Inc.

(Exact name of registrant as specified in its charter)

Delaware	20-5446972
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

400 South LaSalle Street	
Chicago, Illinois	60605
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code

(312) 786-5600

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

Title of Each Class	Name of Exchange on Which Registered
Common Stock, par value $0.01 per share	Cboe BZX

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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. (Check One):

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

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, 2018, the aggregate market value of the Registrant's outstanding voting common equity held by non-affiliates was approximately $11.7 billion based on the closing price of $104.07 per share of common stock.

The number of outstanding shares of the registrant's common stock as of February 15, 2019 was 111,596,097 shares of common stock.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of Cboe Global Market’s Definitive Proxy Statement for the 2019 Annual Meeting of Stockholders, which will be filed no later than 120 days after December 31, 2018, are incorporated by reference in Part III.

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CBOE GLOBAL MARKETS, INC.

2018 FORM 10-K

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CERTAIN DEFINED TERMS

Throughout this document, unless otherwise specified or the context so requires:

- "Cboe," "we," "us," "our" or "the Company" refers to Cboe Global Markets, Inc. and its subsidiaries.
- "ADV" means average daily volume.
- "ADNV" means average daily notional value.
- "Bats Global Markets" and "Bats" refer to our wholly-owned subsidiary Bats Global Markets, Inc., now known as Cboe Bats, LLC, and its subsidiaries.
- "BYX" refers to Cboe BYX Exchange, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "BZX" refers to Cboe BZX Exchange, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "C2" refers to Cboe C2 Exchange, Inc. a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "Cboe Chi-X Europe" refers to our broker-dealer entity, Cboe Chi-X Europe Limited, a wholly-owned subsidiary of Cboe Global Markets, Inc., operated in the United Kingdom.
- "Cboe Europe Equities" refers to Cboe Europe Limited, a wholly-owned subsidiary of Cboe Global Markets, Inc., the U.K. operator of our Multilateral Trading Facility ("MTF"), and our Regulated Market ("RM"), under its Recognized Investment Exchange ("RIE") status.
- "Cboe FX" refers to Cboe FX Holdings, LLC, a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "Cboe Options" refers to Cboe Exchange, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "Cboe SEF" refers to Cboe SEF, LLC, our swap execution facility that is a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "Cboe Trading" refers to our broker-dealer entity, Cboe Trading, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc., operated in the United States.
- "CFE" refers to Cboe Futures Exchange, LLC, a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "CFTC" refers to the U.S. Commodity Futures Trading Commission.
- "EDGA" refers to Cboe EDGA Exchange, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "EDGX" refers to Cboe EDGX Exchange, Inc., a wholly-owned subsidiary of Cboe Global Markets, Inc.
- "Exchanges" refers to Cboe Options, C2, BZX, BYX, EDGX, and EDGA.
- "FASB" refers to the Financial Accounting Standards Board.
- "FCA" refers to the U.K. Financial Conduct Authority.
- “FINRA” refers to the Financial Industry Regulatory Authority.
- "GAAP" refers to Generally Accepted Accounting Principles in the United States.
- "Merger" refers to our acquisition of Bats Global Markets, completed on February 28, 2017.
- "OCC" refers to The Options Clearing Corporation.
- "OPRA" refers to Options Price Reporting Authority, LLC.
- "SEC" refers to the U.S. Securities and Exchange Commission.
- "SPX" refers to our S&P 500 Index exchange-traded options products.
- “TPH” refers to either a Trading Permit Holder or a Trading Privilege Holder.
- "VIX" refers to the Cboe Volatility Index methodology.

TRADEMARK AND OTHER INFORMATION

Cboe®, Bats®, BYX®, BZX®, Cboe Options Institute®, Cboe Vest®, Cboe Volatility Index®, CFE®, EDGA®, EDGX®, LiveVol®, Silexx® and VIX® are registered trademarks, and Cboe Global MarketsSM, Cboe Futures ExchangeSM, C2SM, SilexxSM and SPXSM and are service marks of Cboe Global Markets, Inc. and its subsidiaries. Standard & Poor's®, S&P®, S&P 100® and S&P 500® are registered trademarks of Standard & Poor's Financial Services LLC and have been licensed for use by Cboe Exchange, Inc. Dow Jones®, Dow Jones Industrial Average®, DJIA® and Dow Jones Indexes are registered trademarks or service marks of Dow Jones Trademark Holdings, LLC, used under license. MSCI, and the MSCI index names are service marks of MSCI Inc., used under license. Russell®

and the Russell index names are registered trademarks of Frank Russell Company, used under license. FTSE® and the FTSE indexes are trademarks and service marks of FTSE International Limited, used under license. All other trademarks and service marks are the property of their respective owners.

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This Annual Report on Form 10-K includes market share and industry data that we obtained from industry publications and surveys, reports of governmental agencies and internal company surveys. Industry publications and surveys generally state that the information they contain has been obtained from sources believed to be reliable, but we cannot assure you that this information is accurate or complete. We have not independently verified any of the data from third-party sources nor have we ascertained the underlying economic assumptions relied upon therein. Statements as to our market position are based on the most currently available market data. While we are not aware of any misstatements regarding industry data presented herein, our estimates involve risks and uncertainties and are subject to change based on various factors. We refer you to the “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K and our other filings with the SEC.

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 that involve a number of risks and uncertainties. You can identify these statements by forward-looking words such as "may," "might," "should," "expect," "plan," "anticipate," "believe," "estimate," "predict," "potential" or "continue," and the negative of these terms and other comparable terminology. All statements that reflect our expectations, assumptions or projections about the future other than statements of historical fact are forward-looking statements, including statements in "Business" and "Management's Discussion and Analysis of Financial Condition and Results of Operations." These forward-looking statements, which are subject to known and unknown risks, uncertainties and assumptions about us, may include projections of our future financial performance based on our growth strategies and anticipated trends in our business. These statements are only predictions based on our current expectations and projections about future events. There are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from those expressed or implied by the forward-looking statements. In particular, you should consider the risks and uncertainties described under "Risk Factors" in this Annual Report.

While we believe we have identified material risks, these risks and uncertainties are not exhaustive. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time, and it is not possible to predict all risks and uncertainties, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

Some factors that could cause actual results to differ include:

- the loss of our right to exclusively list and trade certain index options and futures products;
- economic, political and market conditions;
- compliance with legal and regulatory obligations;
- price competition and consolidation in our industry;
- decreases in trading volumes, market data fees or a shift in the mix of products traded on our exchanges;
- legislative or regulatory changes;
- potential difficulties in our migration of trading platforms and our ability to retain employees as a result of the Merger;
- our ability to protect our systems and communication networks from security risks, cybersecurity risks, insider threats and unauthorized disclosure of confidential information;
- increasing competition by foreign and domestic entities;
- our dependence on and exposure to risk from third parties;
- fluctuations to currency exchange rates;
- our index providers' ability to maintain the quality and integrity of their indexes and to perform under our agreements;
- our ability to operate our business without violating the intellectual property rights of others and the costs associated with protecting our intellectual property rights;
- our ability to attract and retain skilled management and other personnel, including those experienced with post acquisition integration;
- our ability to accommodate trading volume and transaction traffic, including significant increases, without failure or degradation of performance of our systems;
- misconduct by those who use our markets or our products;
- challenges to our use of open source software code;
- our ability to meet our compliance obligations, including managing potential conflicts between our regulatory responsibilities and our for-profit status;

- damage to our reputation;
- the ability of our compliance and risk management methods to effectively monitor and manage our risks;
- our ability to manage our growth and strategic acquisitions or alliances effectively;
- restrictions imposed by our debt obligations;
- our ability to maintain an investment grade credit rating;

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- impairment of our goodwill, investments or intangible assets; and
- the accuracy of our estimates and expectations.

For a detailed discussion of these and other factors that might affect our performance, see Part I, Item 1A of this Report. We do not undertake, and expressly disclaim, any duty to update any forward-looking statement whether as a result of new information, future events or otherwise, except as required by law. We caution you not to place undue reliance on the forward-looking statements, which speak only as of the date of this filing.

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PART I

Item 1. Business

The following description of the business should be read in conjunction with the information included elsewhere in this Annual Report on Form 10-K for the year ended December 31, 2018. This description contains forward-looking statements that involve risks and uncertainties. Actual results could differ significantly from the results discussed in the forward-looking statements due to the factors set forth in “Risk Factors” and elsewhere in this Annual Report on Form 10-K.

Overview

Cboe Global Markets, Inc. is one of the world’s largest exchange holding companies, offering cutting-edge trading and investment solutions to investors around the world. The Company is committed to relentless innovation, connecting global markets with world-class technology, and providing seamless solutions that enhance the customer experience.

Cboe offers trading across a diverse range of products in multiple asset classes and geographies, including options, futures, U.S. and European equities, exchange-traded products (“ETPs”), global foreign exchange (“FX”) and multi-asset volatility products based on the VIX Index, the world’s barometer for equity market volatility. Cboe’s trading venues include the largest options exchange in the U.S. and the largest stock exchange by value traded in Europe. In addition, the Company is one of the largest stock exchange operators by volume in the U.S. and a leading market globally for ETP trading.

The Company reports the results of its operations in five business segments: Options, U.S. Equities, Futures, European Equities and Global FX. Our operating revenues consist primarily of transaction fees, regulatory fees, market data fees and connectivity fees. We also generate revenue from both the calculation and dissemination of index values and from the licensing of our proprietary products. Transaction fee revenues are generated on the contracts or shares traded on our exchanges. In 2018, approximately 68.6% of our net revenues were transaction fee revenues.

Our principal executive offices are located at 400 South LaSalle Street, Chicago, Illinois 60605, and our telephone number is (312) 786-5600. Our web site is www.cboe.com. Information contained on or linked through our web site is not incorporated by reference into this Annual Report on Form 10-K.

Our Business

Cboe Options was founded in 1973 as a non-stock corporation owned by its members. Cboe Options was the first organized marketplace for the trading of standardized, exchange-traded options on equity securities. In 2004, CFE began operations as a futures exchange. Cboe Global Markets was incorporated in the State of Delaware on August 15, 2006. In June 2010, Cboe Options demutualized, Cboe Options, CFE and C2 became wholly-owned subsidiaries of Cboe Global Markets and Cboe Global Markets completed its initial public offering. In October 2010, C2 initiated operations. As described in further detail below, on February 28, 2017, the Company completed the acquisition of Bats. Following the acquisition, on October 16, 2017, we changed our legal name from CBOE Holdings, Inc. to Cboe Global Markets, Inc. On September 17, 2018, we voluntarily delisted our common stock from Nasdaq Global Select Market and transferred the listing to Cboe BZX Exchange.

On February 28, 2017, pursuant to the Agreement and Plan of Merger, dated as of September 25, 2016 (the “Merger Agreement”), by and among Cboe Global Markets, Bats, CBOE Corporation, a Delaware corporation and a wholly-owned subsidiary of Cboe (“Merger Sub”), and Cboe Bats, LLC (formerly CBOE V, LLC), a Delaware limited liability company and a wholly-owned subsidiary of Cboe (“Merger LLC”), Cboe completed the Merger of Merger Sub with and into Bats and the subsequent merger (the "Subsequent Merger") of Bats with and into Merger LLC. As a result of the Merger, Bats became a wholly-owned subsidiary of Cboe. In connection with the Merger, the Company issued approximately 30 million shares of Cboe Global Markets common stock and paid approximately $956 million in cash. The Company entered into a term loan agreement and completed a notes offering, as described below, securing $1.65 billion to finance the cash portion of its acquisition of Bats as well as the repayment of Bats' existing indebtedness.

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The Merger significantly expanded the Company's product lines across multiple asset classes, broadened its geographic reach with pan-European equities, added global FX markets and diversified its business mix with significant non-transactional revenue streams.

As a result of the Merger, in 2017 the Company began reporting five business segments: Options, U.S. Equities, Futures, European Equities, and Global FX. Prior to this, the Company operated as a single reportable business segment as of December 31, 2016.

- Options. The Options segment includes our options exchange business, which lists for trading (i) options on market indexes ("index options"), including the VIX Index and SPX, mostly on an exclusive basis, (ii) non-exclusive "multiply-listed" options, such as options on the stocks of listed individual corporations ("equity options") and (iii) options on other ETPs, such as exchange-traded funds ("ETFs") and exchange-traded notes ("ETN"). These options trade on Cboe Options, C2, BZX and EDGX. Cboe Options is our primary options market and offers trading in listed options through a single system that integrates electronic trading and traditional open outcry trading on our trading floor in Chicago. This integration of electronic trading and traditional open outcry trading into a single exchange is known as our Hybrid trading model. C2, BZX and EDGX are our all-electronic exchanges that also offer trading in listed options, and typically operate with different market models and fee structures than Cboe Options. It also includes market data revenue generated from the U.S. tape plans and from the sale of associated proprietary market data.
- U.S. Equities. The U.S. Equities segment includes listed cash equities and ETP transaction services that occur on BZX, BYX, EDGX and EDGA. It also includes ETP listings, market data revenue generated from the U.S. tape plans, and from the sale of proprietary market data, routing services, connectivity fees and advertising activity from ETF.com.
- Futures. The Futures segment includes the business of our futures exchange, CFE, which lists futures on the VIX Index, corporate bond indexes and bitcoin and other futures products. It also includes market data revenue generated from the sale of associated proprietary market data.
- European Equities. The European Equities segment includes the pan European listed cash equities transaction services, ETPs, exchange traded commodities, and international depository receipts that occur on the RIE, operated by Cboe Europe Equities. It also includes the listed cash equities and ETPs routed transaction services that occurred through Cboe Chi-X Europe, as well as the listings business where ETPs can be listed on Cboe Europe Equities. Cboe Europe Equities operates two lit books, a periodic auctions book, a Large In Scale trading negotiation facility and two dark books on its MTF, and operates one lit book and one dark book on its RM. On its MTF books, Cboe Europe Equities offers trading in listed cash equity securities from 18 European markets. It also includes market data revenue generated from the sale of associated proprietary market data.
- Global FX. The Global FX segment includes institutional FX services on the Cboe FX platform, which offers an independent, transparent electronic marketplace structure where institutional buyers and sellers worldwide can trade spot FX directly, either anonymously or on a disclosed basis with each other. The Global FX segment also includes non-deliverable forward FX transactions executed on Cboe SEF.

See "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Note 17 - Segment Reporting to the notes to our Consolidated Financial Statements for discussion of revenues, and operating income (loss) by business segment. Certain areas within our segments operate globally. For information regarding risks related to our international operations see "Risk Factors."

The following chart illustrates volume and notional value for Options (Cboe Options, C2 Options, BZX Options and EDGX Options); Futures (CFE); U.S. Equities (BZX Equities, BYX Equities, EDGA Equities, EDGX Equities); European Equities; and Global FX (Cboe FX) for the periods indicated (which includes information prior to the acquisition of Bats):

	Annual Volumes		
	2018	2017	2016
Options ADV (in millions)	7.9	6.9	4.5
U.S. Equities ADV (in billions)	1.4	1.3	1.6
Futures ADV (in thousands)	300.0	294.8	238.8
European Equities touched ADNV (€ in billions)	10.4	9.4	10.6
Global FX ADNV ($ in billions)	37.4	29.5	26.9

ADV= average daily volume

ADNV= average daily notional value

Competitive Strengths

We have established ourselves as a global leader and innovator in our industry. We believe we are well positioned to further enhance our leadership position through several key competitive strengths:

- Innovative Products and Services. We are structured and committed to deliver a differentiated experience to our customers, through our offering of innovative proprietary products, order types, risk management tools and other products and services. We have also worked closely and collaboratively with market participants to introduce new products and services to meet the evolving needs of the industry, and we plan to continue these efforts. Products we have developed include index options, equity options, options and futures on the VIX Index and other volatility indexes, short duration options, including Weeklys, FLexible EXchange Options (“FLEX options”) and options strategy benchmark indexes. We have also developed products that enable our customers to monitor their order handling on our markets in real time, such as our user dashboard and latency reports. We were the first U.S. options exchange to trade options during non-U.S. trading hours, offering extended trading hours in our exclusive proprietary products. We also connect with a growing customer base through trading and educational resources, including resources available through our website, the world-renowned Cboe Options Institute, participating at industry trade shows and industry forums.
- Leading Proprietary Technology. Bats’ leading proprietary technology was designed in-house to optimize reliability, speed, scalability and versatility. The trading technology platforms have experienced very low operational downtime and have low latency. We believe that this reliability, capacity and speed gives our customers an additional incentive to use our platforms to mitigate trade execution risk, especially in times of extreme market volatility. We plan to further utilize Bats’ leading proprietary trading technology for trading in all of our equities, options and futures markets, which is expected to enhance reliability, speed, efficiency, versatility, resiliency and scalability and result in uniformity of customer experience across all of our markets. C2 and CFE were migrated to Bats’ trading platform on February 25, 2018 and May 14, 2018, respectively. We expect to migrate Cboe Options to Bats’ trading platform on October 7, 2019.
- Leading Market Position, Reputation and Brand. We are a leading global operator of securities exchanges and other electronic markets and have a strong market share in the markets we serve. Cboe Options, the largest U.S. options exchange, based on both contract volume and notional value, and one of the largest options exchanges in the world, is an options market leader. As the creator of listed options and other significant products in the listed options

industry, including the VIX Index and VIX futures and options, Cboe is a leading brand name in the options and volatility space. In U.S. listed cash equities, we are one of the largest three exchange operators, with a market share of 18.4% of the overall U.S. equity market for the year ended December 31, 2018. In European-listed equities, we execute the largest notional value of pan-European equities traded by a single market operator, with a market share of 22.3% of European trading in the securities available for trading on Cboe Europe Equities for the year ended December 31, 2018. In addition, we have a substantial presence in the

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spot FX markets, with a 15.1% market share of the publicly reported institutional spot FX markets for the year ended December 31, 2018. The combination of our attractive market positions, the quality of our markets and the expertise of our teams have enabled us to grow our market share across most of our markets.

- Strategic Relationships and Partnerships. We have entered into licensing agreements with index providers under which we have rights to create volatility indexes and offer options and futures products on their indexes. We have also formed partnerships with key providers to develop new products and services. See "Proprietary Products-Strategic Relationships."

Growth Strategy

Our mission is "to power your potential to stay ahead of an evolving market" and is brought to life through: (1) relentless innovation to expand our diverse offering for investors around the world, (2) cutting-edge technology to connect customers to global markets, and (3) seamless solutions to enhance the customer experience through insights, education, data, analytics and more. We expect to further grow our business and increase our revenues and profitability by following our mission and pursuing the following growth strategies:

- Expand Our Customer Base. The acquisition of Bats expanded our customer base through geographic expansion and broader product offerings and leveraged alliances that complement our core business. We intend to continue our efforts to grow the use of our products domestically and internationally, by intensifying our business development efforts to target new institutional investors and retail investors and to inform them about how to trade our products, especially our proprietary products. With our expanded sales team through the Bats acquisition, we are able to increase our cross selling efforts and reach a larger group of potential customers domestically and internationally. We also intend to continue to offer investor education and a wide breadth of educational resources for both institutional and retail customers through the Cboe Options Institute and through our comprehensive website, as well and through our presence at industry trade shows and participation in industry forums. We have expanded, and intend to continue growing, our educational offerings, including through the Cboe Risk Management Conferences ("RMC"), which are held annually in the United States, Europe and Asia. Cboe Europe also expanded access in 2018 to securities listed in Czech Republic, Hungary and Poland.
- Develop Innovative Products and Services. We are continuing to explore the development of index and other high margin derivative products to trade on our exchanges. We intend to license and create proprietary intellectual property to develop proprietary products that meet the needs of the derivatives industry, both through strategic relationships and internally developed products, while continuing to diversify our product line across asset classes. In addition, as market share and volumes on our exchanges and trading platforms continue to rise, we believe that additional proprietary market data, analytics and connectivity revenues can be generated while continuing to offer competitive pricing across all of our segments. In 2018, we continued to leverage relationships to extend our product offering by launching new products, such as futures on corporate bond indexes. The MiFID II (defined below) solutions that we implemented in 2018, Periodic Auctions and Cboe Large-In-Scale, have seen strong adoption from our clients searching for MiFID II compliant solutions.
- Grow U.S. Equities by Expanding Listings. We were the number one market by continuous trading volume for ETPs in 2018. We believe this trading market share leadership can be used to attract new ETP listings or transfers of existing ETPs listed on other exchanges in both the United States and Europe. In 2018, Cboe added to its U.S. market 61 new ETPs and 12 transfers. In addition to generating more revenues from increased trading volume in ETPs, we believe listing ETPs offers the opportunity to generate incremental fees from opening and closing auctions, as well as value added market data and analytics. In Europe, we are capitalizing on changes to regulatory transparency requirements that encourage ETP trading to migrate to regulated exchange markets like Cboe Europe Equities. We also expect continued global industry expansion in ETP launches, trading volumes and assets, which we hope will create additional opportunities for us to serve issuers, liquidity providers and investors.

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- Offer Compelling Economic Models. We have designed our fees and pricing models to provide benefits to market participants that concentrate their overall trading activity, which we believe encourages market participants to increase their business with us. In our proprietary products, we offer discounts and incentives to certain participants based on relative volume and the use of selected strategies. In multiply-listed products and cash equities trading, we offer incentive programs to attract order flow to help our market participants manage both the fixed and transaction-based costs of trading. We regularly review the fees and pricing models for all of our exchanges to provide an industry-leading economic offering.
- Continue to Enhance Our Leading Edge Technology. We recognize that the opportunity to participate in the growth of the equities and derivatives market will be driven in great part by the trading functionality and technology capabilities that an exchange offers to market participants. We intend to use our strong in-house development capabilities and continued investment to further enhance and develop the functionality and capacity of our trading systems. See "Technology."
- Evaluate Strategic Opportunities. We evaluate strategic opportunities that we believe will enhance stockholder value. We specifically look for strategic opportunities beyond our current businesses that will capitalize on our core competencies and diversify our sources of revenue. We continue to form new alliances with various partners that leverage our strengths and enable us to diversify our product and business lines across new regions and asset classes.

Proprietary Products

In addition to our exchanges providing a marketplace and listing venue for the trading of securities and derivatives that meet criteria established in the rules of their respective exchanges, we also offer trading in products and licenses based on our own proprietary indexes and index methodologies. These include volatility index products based on various broad-based market indexes (such as the S&P 500, the S&P 100 and the Russell 2000), volatility indexes based on ETFs and individual stocks (such as the Cboe S&P 500 Implied Correlation Index and the Cboe S&P 500 Smile Index) and options strategy benchmarks (such as BuyWrite, PutWrite and Collar indexes based on the S&P 500 and Russell 2000 and BuyWrite indexes based on other broad-based market indexes). Our most frequently traded products are SPX options and VIX options and futures. In addition to any transaction fee revenue generated on products created based on these indexes, we have licensed others to use some of these indexes to create products and have entered into agreements whereby we have granted to others the rights to sub-license certain indexes. We generate revenue from both the calculation and dissemination of index values and from the licensing of our proprietary indexes.

These proprietary products are built both through our in-house research and development staff and our strategic relationships and license agreements with index providers. The following is a discussion of our strategic relationships and additional detail on our most frequently traded products, including SPX options and VIX options and futures.

Strategic Relationships

The Company has long-term business relationships with several providers of market indexes. We license their indexes, including on an exclusive basis, as the foundation for indexes, index options and other products. The Company also acquires interests in and forms partnerships with key providers to develop new products and services that are expected to capitalize on our core competencies and diversify our sources of revenue. Of particular note are the following:

- S&P 500, S&P 100, S&P Select Sector Indexes. We have the exclusive right to offer options contracts on the S&P 500 Index, the S&P 100 Index and the S&P Select Sector Indexes as a result of a licensing arrangement with S&P Dow Jones Indices, LLC ("S&P"). Our license with S&P is through December 31, 2033, with an exclusive license to trade options on the S&P 500 Index through December 31, 2032. We are also authorized to use the S&P 500 Index and S&P 100 Index for the creation of Cboe volatility indexes, such as the VIX Index, and tradable products on those volatility indexes.

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- FTSE Russell Indexes. Under our license agreement with the London Stock Exchange Group’s leading global index franchises, Frank Russell Company and FTSE International Limited (together “FTSE Russell”), we have the exclusive right in the United States to offer options on more than two dozen FTSE Russell indexes, which represent a diverse group of domestic and global equities with international appeal. We offer options on the Russell 2000, Russell 1000, Russell 1000 Value, Russell 1000 Growth, FTSE Emerging Markets, FTSE 100 and FTSE China 50 Indexes.
- MSCI. We have the exclusive right in the United States to offer options on six of MSCI’s indexes, as a result of a licensing arrangement with MSCI Inc. We currently offer options on two of these indexes, the MSCI EAFE and the MSCI Emerging Markets Indexes.
- Dow Jones Industrial Average ("DJIA"). We have the exclusive right during standard U.S. trading hours to offer options contracts on the DJIA and certain other Dow Jones indexes through December 31, 2033 as a result of a licensing arrangement with DJI Opco, LLC. We are also authorized to use these indexes to create Cboe volatility indexes and trade options, futures and other products on these indexes.
- Cboe Vest. We have a majority equity investment in Cboe Vest Financial Group, Inc. (“Cboe Vest”), an investment manager focused on Target Outcome Investment strategies. Cboe Vest offers mutual funds, including Cboe Vest S&P 500 Buffer Protect Strategy Fund and Cboe Vest Defined Distribution Strategy Fund.

SPX Options

The S&P 500 Index is an index comprised of 500 large-cap U.S. listed companies. It is one of the most commonly followed indexes, and is considered a bellwether for the U.S. economy. The options we offer on the S&P 500 Index are exclusive to Cboe and contribute substantially to our volumes and transaction fees. Because of its status as a bellwether, SPX is traded in a number of different trading strategies by customers with different goals, including pension funds hedging their equity exposure by buying put options, asset managers seeking enhanced returns by selling covered call options and hedge funds using risk-managed strategies to capture so-called “risk premia” embedded in option prices. We also offer SPX Weeklys options, which we believe that traders are using to fine tune the timing of hedging strategies and maximize the risk premium in strategies that involve the sale of options, such as covered call writing.

Volatility Trading

Cboe pioneered the volatility trading space with its introduction of futures on the VIX Index in 2004 and options on the VIX Index in 2006. The VIX Index is based on real-time prices of options on the S&P 500 Index and is designed to reflect investors’ consensus view of future 30-day expected stock market volatility. Since we started offering these products, we have seen trading from a number of different customer segments utilizing a number of different trading strategies, including hedging extreme stock market declines, also known as “tail risk” hedging, and risk-managed strategies that seek to capture the relative price changes of expected volatility at different times in the future. We also offer VIX Weeklys options and futures to provide investors with opportunities and tools to trade volatility over a shorter term.

Trading volumes in options and futures on the VIX Index may be especially sensitive to market volatility, with increases in volume generally occurring along with spikes in volatility. While we believe that there will be continued intrinsic growth in our volatility products, significant changes in the levels of market volatility may significantly impact volumes in these products.

Listing

Cboe serves as a listing destination for ETPs in the U.S. and Europe. In 2018, Cboe’s market specifically structured and designed for ETP issuers and their investors added 61 listings and won 23 percent of all new U.S. ETP listings. There are now 290 ETPs globally listed on Cboe from 55 different issuers. We offer fully automated opening, closing and halt reopening auctions for our listed securities, which are designed to maximize the efficiency of the price discovery process.

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Cboe also offers issuers the choice of a more traditional market maker program referred to as the Cboe Lead Market Maker ("LMM") program on Cboe BZX and the Cboe Europe Equities Liquidity Provider Program ("LPP") on Cboe Europe Equities. An LMM has certain quoting obligations and for meeting those enhanced obligations, Cboe pays the LMM an enhanced rebate for executions against its displayed orders in the issuer's security and charges a reduced fee when the LMM executes against other orders in the issuer's security. Under the LPP, Cboe Europe Equities offers three programs designed for participants that wish to provide liquidity by posting and maintaining executable quotes within certain set parameters with the result of providing liquidity on a regular and ongoing basis. Cboe BZX also offers the Cboe Liquidity Management Provider ("LMP") Program ("LMP Program"). The LMP Program is a rewards-based program that incentivizes liquidity providers to make a better market in ETPs. Incentives are based on an LMP's quote quality in the Cboe LMP Program securities, which include all Cboe-listed ETPs and certain non-Cboe-listed ETPs.

Market Data

We derive a portion of our revenue from market data fees from U.S. tape plans, including Unlisted Trading Privileges ("UTPs"), the Consolidated Tape Association ("CTA") and OPRA. Fees, net of plan costs, from UTP, CTA, and OPRA are allocated and distributed to plan participants like us according to their share of tape fees based on a formula, required by Regulation NMS, which may take into account both trading and quoting activity.

We also provide a robust offering of market data products across multiple asset classes and geographic regions that are designed to suit our customers' diverse needs. Products include real-time depth of book quotation information, auction and complex option information, top of book quotes and trades, last sale information, consolidated equity feeds, real-time index values, and trade reporting facility information. We also provide analytics services and historical information for our markets through multiple data services.

Our Models

To meet various market demands we utilize a variety of market and pricing models. Cboe Options utilizes various models in different listed options classes, with different combinations of customer priority, participation rights and pro-rata, modified pro-rata or price-time priority depending on the product. We have adopted a pro-rata model on listed equity options trading on C2 and EDGX. Cboe Options and EDGX Options utilize a "classic" pricing model that charges a fee to market makers and a portion of that fee is then provided back to customers' brokers (known as payment for order flow). The classic pricing model also provides customers with rebates and volume incentive programs and charges fees to non-customers. In our proprietary products, we assess transaction fees on all participants, with the amount of the fee based on the market participant's role and the origin of the underlying order, and subject to discounts based on relative volume or trading strategies.

CFE utilizes a price-time priority model for VIX futures and clients are charged transaction fees that vary depending on the type of market participant on whose behalf a trade is made and on whether the trade is executed through CFE's central limit order book, or is a block trade. CFE also has rebate schedules for VIX futures that provide rebates for satisfying designated trading volume thresholds and has also adopted a maker–taker fee structure for weekly VIX futures.

We have adopted a price-time priority model and "maker-taker" and "taker-maker" pricing models in certain of our markets. Under our "maker-taker" pricing model, on BZX (for both listed cash equity securities and listed equity options), EDGX (for listed cash equity securities) and C2 (options), a customer posting an order on our book (the "liquidity maker") is paid a rebate for an execution occurring against that order, a customer executing against an order resting on our book (the "liquidity taker") is charged a fee. We generate a substantial portion of our operating income from the difference between the "maker" rebate and the "taker" fee. Although customers must pay a fee to access that liquidity, that fee is explicitly disclosed and charged to all customers on a non-discriminatory basis. Conversely, the BYX and EDGA listed cash equity securities “taker-maker” pricing model provides that a liquidity taker will be paid a rebate, and the liquidity maker will be charged a fee. In Europe, following the implementation of MiFID II, rebates are no longer generally available unless they are tied to a market making scheme or specific service. Cboe Europe Equities is therefore moving away from its traditional maker-taker pricing model to one where a participant must meet certain performance criteria to earn rebates.

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The Cboe FX platform uses a price firmness-time priority model and clients are charged either a flat or tiered commission rate based upon the notional amount traded on the platform.

Our exchanges also charge fees for the opportunity to trade or access our exchanges, including fees for trading-related functionality. To facilitate trading, we also charge fees for certain technology services, terminal and other equipment rights, maintenance services, trading floor space and telecommunications services.

Customers

Our customers include financial institutions, institutional and individual investors and professional traders. Our equities and options customers in the United States include trading permit holders and members of Cboe Options, C2, BZX, BYX, EDGX and EDGA, which are SEC registered broker dealers, and the clients of those broker dealers. Our futures customers include banks, futures commission merchants, hedge funds, asset managers, proprietary trading firms and Commodity Trading Advisors. Similarly, our equities' customers in Europe are European Union ("E.U.") regulated brokerage and proprietary trading firms, as well as sponsored access clients of these brokerage firms, and certain non-E.U. regulated and unregulated direct access participants. Our institutional spot FX customers include banks, broker dealers, hedge funds, asset managers, proprietary trading firms, Commodity Trading Advisors and corporates. Access to our markets, trading rights and privileges depend upon the nature of the customer, such as whether the individual is a trading permit holder, trading privilege holder, member or participant of one of our markets.

Competition

The industry in which we operate is intensely competitive. We believe we face competition on a number of factors, including:

· the price, quality and speed of our trade execution;
· functionality and ease of use of our trading platforms;
· range of our products and services;
· integrity of our marketplaces;
· technological innovation and adaption; and
· our reputation.

We believe that we compete favorably with respect to these factors through a variety of methods, including:

· offering access to a broad array of products and services, including proprietary products and market data;
· offering fee schedules, pricing models that both attract order flow and provide incentives to liquidity providers;
· providing advanced technology that offers broad functionality, low latency, fast execution, ease of use, scalability, reliability and security;
· offering efficient, transparent and liquid marketplaces;
· offering deep and liquid markets with opportunities for price improvement;
· maintaining close relationships with customers; and
· providing customers with a comprehensive source of information on options and ETPs as well as extensive options education.

In our proprietary products, we compete against other futures exchanges and swap execution facilities that offer similar products, as well as against financial market participants that offer similar over-the-counter derivatives. We also compete against certain multiply-listed options products, such as options on SPY, which offer some of the market exposure of our proprietary products such as options on SPX.

The multiply-listed options industry is extremely competitive. We expect this trend to continue. The number of U.S. options exchanges that we compete with is 11 exchanges, as of December 31, 2018, in large part due to existing exchange holding companies opening new exchanges that offer different markets and pricing models on existing technology. Most of the equity options and options on ETPs listed and traded on our exchanges are also listed and traded on the other options exchanges. In addition, the options exchanges that we compete with set fees and rebates to attract multiply-listed options business to their exchanges, which has historically reduced the net revenue per contract that we generate from multiply-listed options, and the options exchanges that we compete with structure their options businesses in partnership with established market participants, such as consolidators, and other order flow providers, to increase their volume traded.

Our U.S. listed cash equity securities and listing services compete against nine other exchanges and several alternative trading systems ("ATSs"). Market participants have multiple venues for the execution of orders, including national securities exchanges and numerous off exchange venues, including ATSs operating "dark pools" that do not publicly display quotations, "lit" ATSs that publicly display quotations operating as electronic communication networks, and broker dealers who internalize orders off exchange. Additionally, issuers have multiple venues for the listing of their products, including other national and regional exchanges.

The market for execution services in Europe has become significantly more competitive following the introduction of the Markets in Financial Instruments Directive (Directive 2004/39/EC) ("MiFID"). We expect that competition in pan-European trading will continue to increase in the near term, though the Directive on Markets in Financial Instruments (Directive 2014/65/EU) repealing Directive 2004/39/EC ("MiFID II") and the Regulation on Markets in Financial Instruments (Regulation (EU) No 600/2014) ("MiFIR") place more onerous conditions on trading venues and investment firms and restrict certain types of trading activity. New MTFs emerged that have captured significant market share from existing national exchanges. Our major competitors in Europe include national stock exchanges and other pan-European market operators as of December 31, 2018.

The spot FX market remains severely fragmented, with transparent automated marketplaces such as Cboe FX challenging a small number of similarly situated competitors. While the spot FX market recently has been experiencing a shift from competing interbank platforms to ECNs, the electronification of the spot FX market may encounter resistance from clients that still prefer to utilize the phone, instant chats, terminals and key banking relationships for price discovery and trading. Furthermore, electronification of the FX market appears to be experiencing more resistance outside the United States. The electronic spot FX market is also intensely competitive, with over 10 other venues competing for market share as of December 31, 2018.

In addition, demand for our market data faces competition from other securities exchanges, technology companies, third-party market data providers and information and software vendors, who have their own substantial market data distribution capabilities that serve as alternative means for receiving open market data feeds instead of connecting directly to our exchanges. The sale of our proprietary data products is also under competitive threat from ATSs and trading venues that offer similar products. Distributors and consumers of our market data may also use our market data as an input into a product that competes against one of our traded or cleared products.

Technology

Cboe Trading Technology

Cboe currently operates two distinct technology platforms for its equity, options and futures markets, Cboe Command and the Bats trading platform. Cboe Options is currently operating on Cboe Command. C2, CFE, BZX, BYX, EDGA, EDGX and Cboe Europe Equities all operate on the Bats platform. CFE's migration to Bats' trading platform was completed on February 25, 2018 and C2's migration was completed on May 14, 2018. We also plan to utilize Bats' leading proprietary technology by migrating trading on Cboe Options onto Bats' trading platform which is expected to be completed on October 7, 2019. Until the migration is completed, Cboe Options is expected to continue operating on Cboe Command. In addition, Cboe operates a separate FX trading platform for Global FX.

Our trading platforms are developed, owned and operated in-house and are designed to optimize reliability, speed, scalability and versatility. Each of our exchanges provide different market models, appealing to different user bases and the trading technologies support all of them. Further, the technologies are designed to support many specialized features for each of the markets, including: dark books, trade reporting facility, systematic internalizer, Large-in-Scale, smart order routing, FLEX options, 24x5 trading and hybrid trading (combining electronic and open outcry).

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Our trading platforms have experienced very low operational downtime and low latency. The trading platforms use readily available hardware, thereby minimizing capital outlays required for each new market entry. Also, in order to continue to implement new enhancements to the Bats trading platforms, new releases of software are deployed on a weekly basis in all of the applicable markets.

Disaster Recovery

We operate and maintain geographically diverse disaster recovery facilities for all of our markets. We expect that the disaster recovery facilities can be up and running in a short period of time and work with our market participants to ensure that the marketplace can be quickly reopened. We believe that our recovery time in the event of an outage is comparable to or better than that of our competitors. We regularly test our data center recovery plans and periodically carry out weekend tests using our back-up data centers, as well as an annual test with our U.S. trading participants. In Europe, we also regularly test our data center recovery plans and periodically carry out weekend tests which use our back-up data center, as well as an annual test with our European trading participants. We continue to work to improve both the availability of our technology and our disaster recovery facilities.

Routing and Clearing

OCC is the sole provider of clearing on all of our options and futures exchanges. National Securities Clearing Corporation (“NSCC”) is the sole provider of clearing on our U.S. listed cash equity exchanges. Cboe Europe Equities relies on LCH.Clearnet Group Limited (“LCH”), EuroCCP N.V., a Dutch domiciled clearing house (“EuroCCP”) and SIX x clear Ltd (“SIX x-clear”) to clear trades in European listed equity securities as part of an interoperable clearing model.

Cboe Trading is a routing broker-dealer used by our four U.S. equity exchanges and our BZX, C2 and EDGX exchanges for options.

Regulatory Environment and Compliance

Various aspects of our business are subject to regulation by the SEC, CFTC, FINRA, ESMA and FCA and market participants may be subject to regulation by the SEC, CFTC, FINRA, FCA, Board of Governors of the Federal Reserve, U.S. Department of the Treasury and/or foreign regulators. The following is a discussion of the more significant areas of regulation of us by the SEC, the CFTC, and certain European regulators.

Recent Developments

Laws and regulations regarding our business are frequently modified or changed to address perceived problems, new products, competition or at the request of market participants. The following is a summary of the general regulatory structure and brief discussion of recent regulatory developments that may significantly impact our business.

United States

Transaction Fee Pilot

In December 2018, the SEC approved a transaction fee pilot in national market system (“NMS”) stocks (the “transaction fee pilot”). The pilot will subject stock exchange transaction fee pricing, including maker-taker fee-and-rebate pricing models, to new temporary pricing restrictions across two test groups, and require the exchanges to prepare data to be submitted to the SEC. The pilot includes a test group that will prohibit rebates and linked pricing, as well as a test group that will impose a cap of $0.0010 for removing or providing displayed liquidity. Once commenced, the pilot will last for up to two years with an automatic sunset at one year unless extended by the SEC.

The transaction fee pilot may cause Cboe's equities exchanges, BZX, BYX, EDGX and EDGA, to require additional resources to comply with or challenge the pilot and it may have a material impact on our business, financial

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condition and operating results if, for example, order flow shifts away from exchanges were to occur. See Note 23 ("Commitments, Contingencies, and Guarantees—Legal Proceedings") for more information.

Europe

MiFID Review

The overarching objective of MiFID II and MiFIR is to further the stability, integrity, transparency and efficiency of E.U. financial markets, as well as to enhance investor protection. MiFID II and MiFIR began to apply in January 2018. This legislation has resulted in a significant change in the E.U. regulatory landscape for trading and clearing. Cboe Europe Equities and its customers have incurred significant costs related to the implementation of these requirements and may continue to incur additional costs as the regulation evolves through further guidance or legislation.

Capital Markets Union

The E.C. has highlighted one of its top priorities as being the establishment of a fully functioning, well regulated Capital Markets Union by 2019. In February 2015, the E.C. adopted a Green Paper outlining its possible scope and highlighting five short term priority areas, including securitization, updating the Prospectus Directive, Small and Medium Enterprise ("SME") credit information, private placements and finalization of the European Long Term Investment Funds. An Action Plan of concrete steps was set out in September 2015, and an update of the list of initiatives was published in September 2016. This remains an ongoing project for the E.C., which may result in additional regulation or legislation.

Orderly Markets

ESMA has implemented "Guidelines on systems and controls in an automated trading environment for trading platforms, investment firms and competent authorities." The purpose of the guidelines is to ensure common, uniform and consistent application of MiFID and the Market Abuse Directive as they apply to the systems and controls required of: (i) trading platforms and investment firms in an automated trading environment; and (ii) trading platforms and investment firms in relation to the provision of direct market access and sponsored access. These requirements will be further enhanced by MiFID II and MiFIR and the Market Abuse Regulation ("MAR") which came into effect on July 3, 2016. MAR extends the scope of the market abuse framework to new markets, new behaviors and new platforms.

OTC Derivatives, Central Counterparties and Trade Repositories

The European Market Infrastructure Regulation sets out new rules relating to OTC derivatives markets, central counterparties and trade repositories. The new rules introduce a reporting obligation for OTC derivatives markets, a clearing obligation for eligible OTC derivatives markets, measures to reduce counterparty credit and operational risk for bilateral OTC derivatives markets, CCPs, and trade repositories, and rules on the establishment of interoperability between CCPs. The regulation became effective in August 2012, with the first obligations effective beginning in March 2013. In addition, a new regulation governing the authorization and supervision of Central Securities Depositories was approved in September 2014, with the publication of most "Level 2" Regulatory Technical Standards in March 2017, for implementation in March 2019, and a recovery and resolution framework is currently being considered for CCPs.

Compliance

U.S. Securities Industry

Federal securities laws have established a two-tiered system for the regulation of securities exchanges and market participants. The first tier consists of the SEC, which has primary responsibility for enforcing federal securities laws. The second tier consists of self-regulatory organizations (“SROs”), which are non-governmental entities that must register with and are regulated by the SEC. Cboe Options, C2, BZX, BYX, EDGX, and EDGA (the “Exchanges”) are SROs, each registered under Section 6 of the Exchange Act of 1934, as amended (“Exchange Act”) as a “national securities exchange,” and are subject to oversight by the SEC.

SROs are an essential component of the regulatory scheme of the Exchange Act for providing fair and orderly markets and protecting investors. To be registered as a national securities exchange, an exchange must successfully undergo an application and review process with the SEC prior to beginning operations. Among other things, the SEC must determine that the SRO has the ability to comply with the Exchange Act and to enforce compliance by its members and persons associated with its members with the provisions of the Exchange Act, the rules and regulations thereunder and the rules of the exchange.

In general, an exchange SRO is responsible for operating its trading platforms consistent with its rules, and regulating its members through the adoption and enforcement of rules governing the business conduct of its members. The rules of the exchange must also assure fair representation of its members in the selection of its directors and administration of its affairs and, among other things, provide that one or more directors be representative of issuers or investors and not be associated with a member of the exchange or with a broker or dealer. Additionally, the rules of the exchange must be adequate to ensure fair dealing and to protect investors and may not impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Exchange Act.

As registered national securities exchanges, virtually all facets of our Exchange operations are subject to the SEC's oversight, as prescribed by the Exchange Act. The Exchange Act and the rules thereunder impose on us many regulatory and operational responsibilities, including record keeping and the day-to-day responsibilities for market operations and broker-dealer oversight. Furthermore, as SROs, the Exchanges are potentially subject to regulatory or legal action by the SEC or other interested parties. The SEC also has broad enforcement powers to censure, fine, issue cease-and-desist orders, prohibit us from engaging in some of our businesses, suspend or revoke our designation as a registered securities exchange or remove or censure any of our officers or directors who violate applicable laws or regulations. For example, on June 11, 2013, Cboe Options and C2 entered into a consent order with the SEC, under which Cboe Options and C2 were censured, ordered to cease and desist from violating certain sections of the Exchange Act, paid a fine of $6 million and agreed to complete certain undertakings. We have certified to the completion of these undertakings and are also required to certify until 2019. In addition, on January 12, 2015, EDGX and EDGA entered into a consent order with the SEC, under which EDGX and EDGA were censured, ordered to cease and desist from violating certain sections of the Exchange Act, paid a fine of $14 million and agreed to complete certain undertakings. We have certified to the completion of these undertakings and are no longer required to certify.

As part of its regulatory oversight, the SEC conducts periodic reviews and inspections of exchanges, and the Exchanges have been subject to such routine reviews and inspections. To the extent such reviews and inspections result in regulatory or other changes, we may be required to modify the manner in which we conduct our business, which may adversely affect our business. We collect certain fees to cover Section 31 fees charged to the Exchanges by the SEC and certain fees derived from our regulatory function and fines in connection with our disciplinary proceedings. The Exchanges are responsible for the ultimate payment of Section 31 fess to the SEC. Additionally, under the rules of each of our options exchanges, as required by the SEC, any revenue derived from the regulatory fees and fines cannot be used for non-regulatory purposes.

Section 19 of the Exchange Act also provides that we must submit to the SEC proposed changes to any of the Exchanges' rules, including revisions of their certificates of incorporation, bylaws, or other governing documents of the SROs or their parent companies. The SEC will typically publish the proposal for public comment, following which the SEC may approve or disapprove the proposal, as it deems appropriate. Certain categories of rule changes, like fee changes, can be effective on filing, but the SEC retains the ability to suspend or reject such filings within a prescribed period of time.

Futures and Swaps Industry-CFE and Cboe SEF

The operations of each of CFE and Cboe SEF are subject to regulation by the CFTC under the Commodity Exchange Act. The Commodity Exchange Act generally requires that futures trading in the United States be conducted on a designated contract market and, in some cases, requires swaps trading to be conducted on swap execution facility ("SEF") or designated contract market ("DCM"). The Commodity Exchange Act and CFTC regulations establish criteria for an exchange to be designated as a contract market on which futures and futures options contracts may be traded, and for a trading platform to be designated as a swap execution facility on which certain swaps may be traded. Designation

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as a contract market or swap execution facility for the trading of a specified futures or swaps contracts is non-exclusive. This means that the CFTC may permit additional exchanges or trading platforms to be contract markets or swap execution facilities for trading the same or similar contracts.

CFE is a designated contract market, and Cboe SEF is a swap execution facility, each of which is subject to the oversight of the CFTC and to a variety of ongoing regulatory and reporting responsibilities under the Commodity Exchange Act. As a designated contract market, CFE is required to comply with the applicable core principles and regulations under the Commodity Exchange Act, as is Cboe SEF as a swap execution facility. Each of CFE and Cboe SEF has surveillance and regulatory operations and procedures to monitor and enforce compliance by trading privilege holders with CFE rules, and by participants with SEF rules, as applicable. If CFE or Cboe SEF fails to comply with applicable laws, rules or regulations, it may be subject to censure, fines, cease-and-desist orders, suspension of its business, removal of personnel or other sanctions, including revocation of CFE's designation as a contract market or Cboe SEF's designation as a swap execution facility.

Europe

Our European stock exchange, Cboe Europe Equities, is located in London and subject to regulation in the United Kingdom and to certain European regulations. Cboe Europe Equities has applied to the Netherlands Authority for the Financial Markets to become a Regulated Market in the Netherlands. The application is expected to be decided by the end of the first quarter of 2019. The current United Kingdom regulatory system was established by the Financial Services Act 2012 ("FSA12"), which amended the Financial Services and Markets Act 2000 ("FSMA"). The legislation replaced the previous financial services regulator, the Financial Services Authority, with three new bodies: The Financial Policy Committee ("FPC"), The Prudential Regulation Authority ("PRA"), and the FCA. The FPC is a committee of the Bank of England and sets policy for financial regulation. It is made up of the Governor and other senior figures within the Bank, along with the chief executives of the PRA and FCA and senior industry figures. The PRA is responsible for the prudential regulation of banks, insurance companies and other systemically important institutions. Financial conduct of markets, including activity on, and the operation of, markets is regulated by the FCA, which is an independent non governmental body, given statutory powers by the FSA12. The FCA has three statutory objectives: to secure an appropriate degree of protection for consumers; to protect and enhance the integrity of the U.K. financial system; and to promote effective competition in the interests of consumers in the markets for financial services. The FCA is accountable to Her Majesty's Treasury Ministers and, through them, to Parliament.

FSMA, as amended by FSA12, governs the regulation of financial services and markets in the U.K. Under Section 19 of FSMA, any person who carries on a regulated activity in the U.K. must be authorized by the appropriate authority or exempt. Recognized bodies, which include exchanges and clearing houses, are exempt. Breach of Section 19 may be a criminal offense and punishable on indictment by a maximum term of two years imprisonment and/or a fine. The FSMA (Regulated Activities) Order 2001 which is secondary legislation under FSMA, details regulated activities and specified investments.

Once a firm is authorized or recognized by the FCA, it is required to meet the standards set out in its Handbook of Rules and Guidance and to supply the FCA with information so that the FCA can monitor the firm's business. The FCA supervises the firm according to the risks that it poses to the FCA's statutory objectives.

Much of the U.K. financial services regulation originates in the European Union. On November 1, 2007, MiFID, which replaced the Investment Services Directive, came into force, and was implemented by EEA member states. MiFID aims to harmonize European financial services businesses by setting out provisions governing organizational and conduct of business requirements that apply to firms and the requirements applicable to RMs (for example, stock exchanges) and MTFs. MiFID also aims to facilitate cross border business by extending the concept of "passporting," which allows firms authorized to carry on business in one EEA member state to carry on business in other EEA member states.

As an RIE that operates both an RM and an MTF, Cboe Europe Equities is required to comply with the relevant U.K. requirements as set out in the FCA Handbook, including, where applicable, relevant European Directives and Regulations, as implemented, or which apply directly in the U.K. These requirements include organizational requirements, capital resources requirements and the specific requirements for RMs and MTFs. MiFID sets out requirements for RMs and MTFs with respect to the establishment of transparent and non discretionary rules and procedures governing access and for fair and orderly trading and the efficient execution of orders, as well as to facilitate the efficient settlement of transactions conducted on RMs and MTFs and monitoring compliance with the rules. The regulatory functions required of Cboe Europe Equities by MiFID are performed by in house staff. Cboe Europe Equities utilizes the same state of the art, real time surveillance system that we use to monitor trading and market activities on BZX, BYX, EDGA and EDGX.

MiFID has been updated, and the new legislation, known as MiFID II and MiFIR, was implemented January 3, 2018 and generally tightens the requirements placed on both exchanges and investment firms. In particular, use of certain waivers from pre trade transparency are capped as a percentage of total market volume and a general trading obligation requires almost all equity trades to be conducted on a duly registered trading venue. Furthermore, MiFID II and MiFIR extend mandatory transparency requirements to non equity markets, such as fixed income.

Global FX

While the global institutional spot FX market remains largely unregulated, the enactment of the Dodd Frank Act and its related regulations in the United States and the ongoing implementation of MiFID II and MiFIR in Europe have impacted the regulatory landscape for currency derivative products. For example, certain standardized currency derivative products are required to trade on an organized trading venue such as an SEF or DCM in the United States or on an MTF or OTF in Europe. Moreover, even in the largely unregulated spot FX market, this movement towards additional trading standards and norms is highlighted by the publication of the FX Global Code in 2017 by the Global Foreign Exchange Committee, reflecting principles of good conduct for the wholesale FX market (the “Global Code”), and whose publication may lead to additional oversight in the global FX market.

Broker Dealer

Cboe Trading is a registered broker dealer regulated by the SEC, FINRA, other SROs of which it is a member and various state securities regulators. Cboe Trading currently operates as the routing broker dealer for sending orders from the BZX, BYX, C2, EDGX and EDGA exchanges to other venues for execution, including routing orders among BZX, BYX, C2, EDGX and EDGA. Cboe Trading does not currently serve as the routing broker-dealer for Cboe Options. Cboe Trading is considered a facility of BZX, BYX, C2, EDGX and EDGA and is subject to the rules of these exchanges. BZX, BYX, C2, EDGX and EDGA are responsible for enforcing Cboe Trading’s compliance with their rules, including to ensure Cboe Trading is not given preferential treatment.

Cboe Trading is subject to SEC and SRO rules and, as a registered broker-dealer, regulations concerning all aspects of its business, including trading practices, order handling, best execution, anti money laundering, handling of material non public information, safeguarding data, reporting, record retention, market access and the conduct of its officers, employees and other associated persons. The SEC, SROs and state securities commissions may conduct proceedings which can result in injunctions or other sanctions, censures, fines, the issuance of cease and desist orders or the suspension or expulsion of a broker dealer, its officers or employees. The SEC and FINRA impose certain minimum capital requirement rules that require notification when a broker dealer’s net capital falls below certain predefined criteria, dictate the ratio of debt to equity in the regulatory capital composition of a broker dealer, constrain the ability of a broker dealer to expand its business under certain circumstances and impose certain requirements that may have the effect of prohibiting a broker dealer from distributing or withdrawing capital.

Cboe Global Markets

Certain aspects of Cboe Global Markets are also subject to SEC and FCA oversight, including certain ownership and voting restrictions on its stockholders. The focus of the SEC's regulation of Cboe Global Markets is to assure fair representation of members in the selection of the directors of the Exchanges, public participation in the governance of the Exchanges and that the Exchanges can satisfy their regulatory responsibilities under the Exchange Act. Furthermore, the SEC requires that Cboe Global Markets give due regard to the preservation of the independence of the self-regulatory function of the Exchanges and to Cboe Global Markets' obligations to investors and the general public. The

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SEC also requires that Cboe Global Markets not take any actions that would interfere with the effectuation of any decisions by the board of directors of any of the Exchanges relating to its regulatory functions or the structure of the market that it regulates or that would interfere with the ability of such Exchange to carry out its responsibilities under the Exchange Act. To the extent that Cboe Global Markets' business activities involve or relate to the Exchanges, the officers and directors of Cboe Global Markets may be deemed to be officers and directors of the exchanges for purposes of and subject to oversight under the federal securities laws. Accordingly, the SEC may exercise direct supervision and disciplinary authority over certain Cboe Global Markets' activities and those activities may be subject to SEC approval and, in some cases, public notice and comment.

In addition, Cboe Global Markets indirectly holds all of the issued share capital and voting rights in Cboe Europe Equities and its wholly owned subsidiary, Cboe Chi-X Europe. As a result, we and any person who holds, or has voting power with respect to, 10% or more of the outstanding shares of Cboe Global Markets common stock is subject to certain regulatory requirements under U.K. law, such as filing a change in control notice with the FCA when acquiring indirect control in an FCA entity.

U.S. Regulatory Responsibilities

Our U.S.-based exchanges are responsible for assessing the compliance of their TPHs or members, including Cboe Trading, with the respective exchange's rules and the applicable rules of the SEC and/or CFTC. The main activities that the exchanges, as applicable, are required to monitor for the purpose of compliance with these rules include:

- surveillance designed to detect violations of exchange trading rules;
- surveillance designed to detect violations of other SEC and/or CFTC rules;
- the further investigation of matters deemed to be problematic;
- the investigation of complaints about possible rule violations brought by customers, TPHs, members or other SROs; and
- the examination of TPHs or members, including Cboe Trading, for compliance with rules such as those related to net capital, books and records, market access and other matters related to the TPHs' exchange business functions.

In order to ensure market integrity, we regulate and monitor our TPHs' and members' trading activities by using both our employees and third parties under RSAs. See "Regulatory Agreements" below. Providing effective regulation is important for attracting and retaining the confidence and participation of market-makers, broker-dealers and institutional and retail investors.

We expend considerable time, financial resources and effort to ensure that the exchanges' rules and regulations conform to regulatory best practices within the securities and futures exchange industries and within the regulatory regime overseen by the SEC and CFTC, our primary regulators. In order to support our efforts and those of our market participants to comply with applicable law and our exchange rules, we developed a regulatory program to monitor market activity on our exchanges.

All of our Exchanges and CFE are participants in the Intermarket Surveillance Group ("ISG"). ISG is an international information-sharing cooperative governed by a written agreement that provides for a comprehensive surveillance sharing arrangement. In addition to the agreement for confidential information sharing, the ISG provides a framework for the coordination of regulatory efforts among exchanges trading securities, commodity futures and related products to address potential intermarket manipulations and trading abuses.

As part of the regulatory program, each of our Exchanges and CFE have rules pertaining to their respective disciplinary processes.

U.S. Regulatory Agreements

The Exchanges and CFE have entered into agreements under which third parties have agreed to perform regulatory functions on behalf of our markets, (i.e., RSAs). As discussed below, in addition, in certain other instances for our

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Exchanges, a third party has assumed the regulatory responsibility under Rule 17d-1 or Rule 17d-2 under the Exchange Act, while in others, we retain the regulatory responsibility for the activities.

Regulatory Services Agreement with FINRA

The Exchanges have entered into agreements with FINRA under which FINRA has agreed to provide regulatory services to the Exchanges. Under these agreements, FINRA performs certain regulatory functions on behalf of the Exchanges. The Exchanges remain responsible for the regulation of their TPHs, members and marketplaces, and retain the authority for bringing disciplinary actions against their TPHs, members, although FINRA performs various disciplinary-related functions on behalf of the Exchanges.

Regulatory Services Agreements with NFA and OCC

The National Futures Association ("NFA") performs regulatory functions on behalf of CFE pursuant to an RSA with CFE. CFE retains overall responsibility for the regulation of its marketplace. In addition, OCC also performs certain regulatory functions on behalf of CFE pursuant to an RSA with CFE. CFE also performs certain regulatory functions in-house. Whether performed under an RSA or in-house, CFE also remains responsible for bringing disciplinary actions. CFE is also a party to cooperative and regulatory information sharing agreements with other SROs and is a member of the ISG, described above.

Rule 17d-1 Designations and Rule 17d-2 Agreements

Section 17(d) of the Exchange Act and the related Exchange Act rules permit SROs to allocate certain regulatory responsibilities to avoid duplicative oversight and regulation. Under Exchange Act Rule 17d-1, the SEC designates one SRO to be the designated examining authority ("DEA") for each broker-dealer that is a member of more than one SRO. The DEA is responsible for the regulatory oversight of the Exchange Act's financial responsibility rules pertaining to that broker-dealer. Cboe Options is the DEA for several of its TPHs. Cboe Trading's assigned DEA is FINRA.

Exchange Act Rule 17d-2 permits SROs to enter into agreements, commonly called Rule 17d-2 agreements, which are approved by the SEC and concern the enforcement of rules applicable to all of those SROs and relating to TPHs and members those SROs have in common. The Exchanges have entered into certain bi-lateral Rule 17d-2 agreements under which FINRA is allocated responsibility for enforcing certain federal securities laws and certain Exchange rules that are common with FINRA rules. The Exchanges have entered into certain other multi-party Rule 17d-2 agreements that allocate responsibility among the participating SROs, which may include the Exchanges, for ensuring that their allocated common members comply with certain rules governing, among other items, options sales practices, expiring exercise declarations, options position limits and large options position reporting and position adjustments.

National Market System Plans

We are member participants of several NMS plans. Cboe Options, C2, BZX, and EDGX are member exchanges in OPRA, which is the designated securities information processor for market information that is generated through the trading of exchange-listed securities options in the United States, and it disseminates certain core trading information, such as last sale reports and quotations. Cboe Options, BZX, BYX, EDGA and EDGX also participate in the CTA and the Nasdaq Unlisted Trading Privileges Plan, which perform analogous services for the U.S. equities market. NYSE Technologies acts as the "processor" for OPRA and CTA. Nasdaq acts as the processor for the Nasdaq Unlisted Trading Privileges Plan.

Cboe Options, C2, BZX and EDGX are also parties to the Options Order Protection and Locked/Crossed Market Plan (the “Distributive Linkage”), which is designed to prohibit trade-throughs and avoid locked/crossed markets. Cboe Options, C2, BZX and EDGX are also parties to the Options Listing Procedures Plan, which sets forth the procedures that the options exchanges must follow to list new options. Cboe Options, C2, BZX, BYX, EDGA and EDGX are also parties to the NMS plan for the selection and reservation of securities symbols.

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Under the Options Regulatory Surveillance Authority Plan ("ORSA Plan"), U.S. securities options exchanges are permitted to act jointly in the administration, operation and maintenance of a regulatory system for the surveillance, investigation and detection of the unlawful use of undisclosed, material information in trading in one or more of their markets. The ORSA Plan is intended to enhance the effectiveness and efficiency with which the exchanges regulate their respective markets and to avoid duplication of certain regulatory efforts. FINRA operates the ORSA Plan facility.

The consolidated audit trail NMS plan ("CAT") involves the creation of a comprehensive audit trail of orders that enhances the ability to efficiently and accurately track all activity in Regulation NMS securities in the U.S. markets. Upon final implementation of the provisions of the CAT, data will be required to be reported to a central repository the following day by each SRO and broker-dealer. On November 15, 2016, the SEC approved the CAT. In 2017, Thesys CAT LLC ("Thesys"), a subsidiary of Thesys Technologies, LCC, was selected as the plan processor with the responsibility to build and operate the CAT. There is a phased implementation through 2021. The first phase was required to go live on November 15, 2017, but failed to go live on that date. The CAT went live in November 2018, at which time we began initial reporting to the CAT. The current CAT plan processor, Thesys, is expected to be replaced by a new plan processor. The second phase is scheduled to go live November 15, 2019, however, such deadline might be impacted as a result of engaging a new plan processor. While the funding of the CAT is ultimately expected to be provided by both the execution venues (which includes us) and industry members, until the SEC approves a funding model, the funding to date has solely been provided by the execution venues. The funding by the execution venues has been done in exchange for promissory notes expected to be repaid once such industry member fees are collected. Until the SEC approves a funding model that shares the cost of the CAT between the execution venues and industry members, the execution venues may continue to incur additional significant costs, including as a result of engaging a new plan processor, or result in the uncollectibility of promissory notes related to the funding of the implementation and operation of the CAT.

Intellectual Property

We own or have rights to a number of intellectual property assets, including trademarks, service marks, domain names, trade names, copyrights, trade secrets and patents. While the majority of our intellectual property is protected under U.S. law, we have many intellectual property assets protected by laws in Europe, Asia and other parts of the world. We license some intellectual property assets to other entities. We attempt to protect our intellectual property rights, while respecting the legitimate intellectual property rights of others.

Employees

As of December 31, 2018, we employed 842 individuals, 730 of whom are based in the United States, 92 of whom are located in London, 15 of whom are located in Ecuador, 1 of whom is located in Switzerland, 1 of whom is located in Hong Kong, and 3 of whom are located in Singapore. Of these employees, 297 were involved in technology or operations and 115 were involved in direct support of trading operations. The remaining 430 employees provide business development, financial, regulation, human resources, compliance, legal, planning and research, administrative and managerial support.

We have 8 building engineers that are covered by a collective bargaining agreement, which expires on May 31, 2021, with the International Union of Operating Engineers Local 399, AFL-CIO. Management believes that we have strong relationships with our employees, and we have never experienced a work stoppage.

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Executive Officers of Cboe Global Markets

Set forth below is information regarding our executive officers:

Name	Age	Position
Edward T. Tilly	55	Chairman of the Board, President and Chief Executive Officer
Christopher A. Isaacson	40	Executive Vice President and Chief Operating Officer
Brian N. Schell	53	Executive Vice President, Chief Financial Officer and Treasurer
John Deters	48	Executive Vice President, Chief Strategy Officer and Head of Multi-Asset Solutions
Bryan Harkins	42	Executive Vice President, Co-Head of Markets Division
Mark S. Hemsley	56	Executive Vice President, President Europe
Andrew Lowenthal	57	Executive Vice President, Co-Head of Markets Division
Patrick Sexton	54	Executive Vice President, General Counsel and Corporate Secretary
Jill Griebenow	39	Senior Vice President, Chief Accounting Officer

Edward T. Tilly. Mr. Tilly is our Chairman, President and Chief Executive Officer. Mr. Tilly has served as our President since January 2019, Chairman since February 2017 and as CEO and director since May 2013. Prior to becoming CEO, Mr. Tilly served as President and Chief Operating Officer from November 2011, and Executive Vice Chairman from August 2006 until November 2011. He was a member of CBOE from 1989 until 2006, and served as Member Vice Chairman from 2004 through July 2006. He holds a B.A. degree in Economics from Northwestern University.

Christopher A. Isaacson. Mr. Isaacson is our Executive Vice President and Chief Operating Officer, a position he has held since January 2019. Previously he was our Executive Vice President and Chief Information Officer, a position he was appointed to upon the Company's acquisition of Bats. Prior to that, he served as Bats' Executive Vice President and Global Chief Information Officer since February 2014 and he has held other various senior leadership positions since 2005. Prior to being one of the founders of Bats, Mr. Isaacson was a software developer at Tradebot Systems, Inc. from 2003 to 2005. Mr. Isaacson serves on the board of directors of the OCC. Mr. Isaacson holds a B.S. degree in information systems with a minor in math from Nebraska Wesleyan University and an M.B.A. degree from the University of Nebraska-Lincoln.

Brian N. Schell. Mr. Schell is our Executive Vice President, Chief Financial Officer and Treasurer, a position he has held since January 2018. Previously, he was Deputy Chief Financial Officer of the Company's subsidiary Cboe Exchange, Inc., a position he was appointed to upon the Company's acquisition of Bats. Prior to that, he served as Chief Financial Officer of Bats since March 2011. Prior to joining Bats, he held various senior leadership positions at H&R Block Inc., as well as various positions at the FDIC, KPMG and JP Morgan. Mr. Schell holds a B.B.A. degree with an emphasis in finance from the University of Notre Dame and an M.B.A. degree from The George Washington University.

John Deters. Mr. Deters is our Executive Vice President, Chief Strategy Officer and Head of Multi-Asset Solutions. He has served as our Head of Multi-Asset Solutions since 2018 and as Chief Strategy Officer since December 2013. Prior to joining Cboe in 2013, Mr. Deters was most recently a Vice President and Investment Banker of Financial Institutions Group, Investment Banking at Barclays from 2008 to 2013. Mr. Deters holds a B.A. degree from Wheaton College, an M.B.A. degree from the University of Chicago, and a J.D./M.S. dual degree from Georgetown University Law Center.

Bryan Harkins. Mr. Harkins is our Executive Vice President, Co-Head of Markets Division, a position he has held since March 2018. Previously, he was Head of Equities and Global FX of the Company's subsidiaries, a position he was appointed to upon the Company's acquisition of Bats. Prior to that, he served as Executive Vice President, Head of U.S. Markets of Bats since January 2014. Prior to the Direct Edge acquisition by Bats in January 2014 when Mr. Harkins first joined Bats, Mr. Harkins served as Chief Operating Officer of Direct Edge, where he worked since 2007. Mr. Harkins holds a B.A. degree from the University of Notre Dame and an M.B.A. degree from New York University's Stern School of Business.

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Mark S. Hemsley. Mr. Hemsley is our Executive Vice President, President Europe, a position he was appointed to upon the Company's acquisition of Bats. Previously, he served as Bats Europe Limited's Executive Vice President, Chief Executive Officer since November 2011 and as Chief Executive Officer and Chairman from 2008 to 2011. Prior to joining Bats, Mr. Hemsley founded Belvedere Hill Limited, a corporate advisory firm, where he worked from 2005 to 2008, and is currently a non-shareholder director. Mr. Hemsley holds an M.B.A. degree from City University Business School.

Andrew Lowenthal. Mr. Lowenthal is our Executive Vice President, Co-Head of Markets Division, a position he has held since March 2018. Previously, he was Senior Vice President, Head of Global Derivatives of the Company's subsidiary Cboe Exchange, Inc. from March 2017 to March 2018 and Senior Vice President, Business Development of Cboe Exchange, Inc. from September 2016 to March 2017. He has also held various positions with increasing responsibility and oversight in the business development area since joining the Company in 1983. Mr. Lowenthal attended the University of Michigan and holds a B.S. degree from DePaul University and an M.B.A. degree from DePaul University.

Patrick Sexton. Mr. Sexton is our Executive Vice President, General Counsel and Corporate Secretary, a position he has held since March 2018. Previously, he was Deputy General Counsel of the Company's subsidiary Cboe Exchange, Inc. He has served in that capacity since July 2013 and has acted as legal, regulatory and compliance counsel with increasing responsibility and oversight since joining the Company in 1997. Mr. Sexton holds a B.A. degree from the University of Notre Dame and a J.D. degree with honors from Notre Dame Law School.

Jill Griebenow. Ms. Griebenow is our Senior Vice President, Chief Accounting Officer, a position she has held since August 2018. Previously, she served as Chief Financial Officer, Europe of the Company's subsidiary Cboe Europe Limited, a position she was appointed to upon the Company's acquisition of Bats. She also previously served as Chief Financial Officer, Europe of Bats' subsidiary Bats Europe Limited since February 2014 and was employed by Bats in the financial area since 2011. Prior to that, she has also held various positions at Ernst & Young LLP. Ms. Griebenow is a certified public accountant and holds a bachelor's degree in accounting from the University of Northern Iowa.

Available Information

Our website is www.cboe.com. The Company files annual, quarterly and current reports, proxy statements and other information with the SEC under the Exchange Act. The Company makes available, free of charge, on its website its annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, as soon as reasonably practicable after such reports are electronically filed with, or furnished to, the SEC. The Company's reports filed with, or furnished to, the SEC are also available on the SEC's website at www.sec.gov.

In addition, we have posted on our website the charters for our (i) Audit Committee, (ii) Compensation Committee, and (iii) Nominating and Governance Committee, as well as our Code of Business Conduct and Ethics and Corporate Governance Guidelines. We will provide a copy of these documents without charge to stockholders upon written request to Investor Relations, Cboe Global Markets, Inc., 400 South LaSalle Street, Chicago, Illinois 60605. Our website and information included in or linked to our website are not part of this Form 10-K.

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Item 1A. Risk Factors.

The risks and uncertainties described below are those that we believe are material at this time relating to our business. These risks and uncertainties, however, are not the only risks and uncertainties that we face. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also significantly impact us. Any of these risks and uncertainties may materially and adversely affect our business, financial condition or results of operations, liquidity, and cash flows.

Loss of our right to exclusively list and trade certain index options and futures could have a material adverse effect on our financial performance.

We hold exclusive licenses to list securities index options on the S&P 500 Index, the Russell 2000 Index, as well as others, granted to us by the owners of such indexes and based on which we have developed our proprietary VIX methodology. In 2018, approximately 64.7% of our net transaction fees (defined below) were generated by futures and index options, the overwhelming majority of which were generated by our exclusively-licensed products and products based on the VIX methodology. The bulk of this revenue is attributable to our S&P 500 Index options and VIX Index options and futures. As a result, our net revenues are dependent in large part on the exclusive licenses we hold for these products and our ability to maintain our exclusive VIX methodology.

There is a risk, with respect to each of our current exclusive licenses, that the owner of the index may not renew the license with us on an exclusive basis or at all. In the first event, we would be subject to multiple listing in the trading of what is now an exclusive index product, which could result in a loss of market share and negatively impact our profitability. In the second event, we could lose the right to list the index product entirely. The loss or limited use of any of our exclusive index licenses, especially for the S&P 500 Index, for any reason could have a material adverse effect on our business and profitability.

In addition to the risks related to our exclusive licenses, if we are unable to retain exclusive proprietary rights in the VIX methodology, our volatility products could be subject to multiple listing, which could have a material adverse effect on us.

The E.U. has adopted legislation commonly referred to as MiFIR that will require the person with proprietary rights to a benchmark to provide non-discriminatory access to that benchmark to trading venues and central counterparty clearing houses for the purposes of trading and clearing. Licenses to the benchmark must be provided on fair, reasonable and non-discriminatory terms. In addition, the E.U. implemented at the beginning of 2018 legislation known as the Benchmark Regulation that may impact the ability of European investors to trade our U.S. benchmark products if they are not recognized, authorized, endorsed or deemed equivalent in the E.U. While similar legislation to MiFIR has not been proposed in the U.S., if it were passed, it could cause us to lose exclusivity in our internally developed and licensed index products. The new European legislation may impact our expansion activities of our U.S. benchmark products in Europe, and may reduce the volume on our US options and futures exchanges from international customers.

Furthermore, our competitors may succeed in providing a market for the trading of index-based or volatility products that are economically similar to those that we offer. It is also possible that a third party may offer trading in index-based products that are the same as those that are the subject of one of our exclusive licenses, but in a jurisdiction in which the index owner cannot require a license or in a manner otherwise not covered by our exclusive license.

The value of our exclusive licenses to list securities index options and futures also depends on the continued ability of index owners to require licenses for the trading of options and futures based on their indexes. Although we and the index owners have prevailed in legal actions challenging our rights to exclusively license indexes, we may be subject to changes in the law or other actions taken in the future that might impede our ability to exclusively offer trading in certain index options and futures.

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General economic conditions and other factors beyond our control could significantly reduce demand for our products and services and harm our business.

The volume of exchange transactions and the demand for our products and services are directly affected by economic, political and market conditions in the U.S., Europe and elsewhere in the world that are beyond our control, including:

- economic, political and geopolitical market conditions;
- broad trends in business and finance;
- concerns over inflation and wavering institutional or retail confidence levels;
- government or central bank actions, such as changes in government fiscal and monetary policy and foreign currency exchange rates;
- other legislative and regulatory changes;
- the availability of short-term and long-term funding and capital;
- the perceived attractiveness of the U.S. or European capital markets;
- the availability of alternative investment opportunities;
- changes in the level of trading activity in underlying instruments;
- changes and volatility in the prices of securities;
- changes in the volume of foreign currency transactions;
- changes in supply and demand for currencies;
- movements in currency exchange rates;
- the level and volatility of interest rates;
- changes in the financial strength of market participants;
- consolidation among market participants and market data subscribers;
- unforeseen market closures or other disruptions in trading; and
- disruptions due to terrorism, war, extreme weather events or other catastrophes

Any of these factors, individually or collectively, could have a material adverse effect on our business, financial condition and operating results by causing a substantial decline in the financial services markets and reducing trading volumes and demand for market data.

We operate in a highly regulated industry and may be subject to censures, fines and other legal proceedings if we fail to comply with legal and regulatory obligations.

Cboe Options, C2, BZX, BYX, EDGX and EDGA are registered national securities exchanges and self-regulatory organizations (“SROs”), and, as such, are subject to comprehensive regulation by the SEC. CFE is a designated contract market (“DCM”), and Cboe SEF is a swap execution facility (“SEF”), each registered with the CFTC and subject to comprehensive regulation by the CFTC. In addition to its other SRO responsibilities, BZX, as a listing market, also is responsible for evaluating applications submitted by issuers interested in listing their securities on BZX and monitoring each issuer’s compliance with BZX’s continued listing standards. Failure to comply with these SRO responsibilities could result in potential sanctions or fines and a negative impact on Cboe’s reputation or branding.

Our European business is subject to regulatory oversight in the U.K. by the U.K. Financial Conduct Authority (“FCA”), which through the “passporting” regime provides authorization to carry on business in other Member States of the E.U. and the European Economic Area in accordance with the applicable E.U. legislation and regulation to which our European business is subject. If a regulatory authority makes a finding of non compliance, conditional fines could be imposed, and our licenses could be revoked. Any such fine or revocation of a license could have a material adverse effect on our business, financial condition and operating results.

In addition to the requirements related to operating our U.S. markets imposed by the SEC and the CFTC, we also have certain responsibilities for regulating the TPHs and members that trade on our exchanges. While we have entered into agreements under which FINRA with respect to our options and equities exchanges, and NFA with respect to our futures exchange, provide certain regulatory services, we retain ultimate responsibility for the regulation of our TPHs and members.

Our ability to comply with applicable laws and rules is largely dependent on the establishment and maintenance of appropriate systems and procedures, our ability to attract and retain qualified personnel, the ability of FINRA and NFA to perform under the regulatory services agreements and our oversight of the work done by FINRA and NFA. The SEC and CFTC have broad powers to audit, investigate and enforce compliance and to punish noncompliance by, as applicable, SROs, DCMs and SEFs pursuant to applicable laws, rules and regulations.

If a regulatory authority were to find one of our programs of enforcement or compliance to be deficient, our SROs, DCM, or SEF could be the subject of investigations and enforcement proceedings that may result in substantial sanctions, including revocation of registration as a national securities exchange, DCM, or SEF. Any such investigations or proceedings, whether successful or unsuccessful, could result in substantial costs, the diversion of resources, including management time, and potential harm to our reputation, which could have a material adverse effect on our business, financial condition and operating results. In addition, our SROs, DCM, or SEF may be required to modify or restructure their regulatory functions in response to any changes in the regulatory environment, or they may be required to rely on third parties to perform regulatory and oversight functions, each of which may require us to incur substantial expenses and may harm our reputation if our regulatory services are deemed inadequate. For example, if we are unable to fulfill our obligations under the consent orders with the SEC with respect to Cboe Options and C2, it may have a significant adverse impact on our business, financial condition and operating results.

In addition, SROs are required by federal law to perform a variety of regulatory functions. In light of those responsibilities, courts have held that SROs are immune from damages for some civil claims related to actions that are incident to their regulatory responsibilities. There is a risk that a court might not adopt the immunity doctrine, and whether a court that recognizes the doctrine would apply it to a claim depends on the nature of the claim. In addition, we could be exposed to liability to regulators or other governmental authorities even in situations where immunity would bar a civil claim.

Our business may be adversely affected by price competition.

The securities industry is characterized by intense price competition, especially with respect to transaction fees. We may be required to adjust pricing to respond to actions by new or existing competitors, which could adversely impact our business, financial condition and operating results. We also compete with respect to the pricing of market data and value-added market data, such as historical market data.

In our options segment, the pricing model for trade execution has changed in response to competitive market conditions, and our competitors have adjusted transaction fees and fee structures accordingly, including by opening new exchanges, which allow them to offer multiple pricing models that can appeal to different segments of market participants. These changes have resulted in significant pricing pressures on us, especially on transaction fees and incentives for multiply-listed products. As a result of these pricing pressures, our average rate per multiply-listed options contract may decrease. It is likely that this pressure will continue and even intensify as our competitors continue to seek to increase their share of trading by further reducing their transaction fees or by offering other financial incentives to order providers and liquidity providers to induce them to direct orders to their markets.

In addition, one or more competitors may engage in aggressive pricing strategies and significantly decrease or completely eliminate their profit margin for a period of time in order to capture a greater share of trading volume. Some order-providing firms on our exchanges have taken ownership positions in options exchanges that compete with us and such exchanges have given those firms added economic incentives to direct orders to them.

With respect to our proprietary products, we compete with futures exchanges and swap execution facilities that offer similar products and other financial market participants that offer over-the-counter derivatives. We also compete against certain multiply-listed options products, including SPY, which offer some of the features of our proprietary products.

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To attract market share, we may offer “inverted” pricing specials or no transaction fee trading from time to time. BZX also offers a “cross asset add volume tier” that gives a bigger rebate for additional volume on both the BZX equities and options platforms. These forms of promotions may adversely affect our profitability.

If we are unable to compete successfully with respect to the pricing of our services and products, our business, financial condition and operating results may be adversely affected. We could lose a substantial percentage of our share of trading if we are unable to price transactions in a competitive manner. Also, our profits could decline if competitive pressures or regulatory changes, such as the transaction fee pilot, force us to reduce fees.

A significant portion of our operating revenues is generated by our transaction-based business. If the amount of trading volume on our exchanges decreases, or the product mix shifts to lower revenue products, our revenues from transaction fees will most likely decrease.

In 2018, approximately 68.6% of our net revenues were generated by our transaction-based business. This business is dependent on our ability to attract and maintain order flow, both in absolute terms and relative to other market centers. If the amount of trading volume on our exchanges, CFE or notional value traded on Cboe FX and Cboe Europe Equities exchanges decreases, we are likely to see a decrease in transaction fees.

Our total trading volumes could decline if our market participants reduce their trading activity for any reason, such as:

- heightened capital requirements;
- transaction tax;
- regulatory or legislative actions;
- reduced need to trade due to changes in volatility and/or passive investment trends;
- reduced access to capital required to fund trading activities;
- consolidation among market participants; or
- significant market disruptions.

Over the past few years, a number of legislative actions have been taken, both domestically and internationally, that may cause market participants to be subject to increased capital requirements and additional compliance burdens. These actions, including the Collins Amendment to Dodd-Frank, MiFID II and MiFIR, may cause market participants to reduce trading activity on our exchanges.

In addition, the transaction fees generated are different based on type of product and other factors, including the type of customer and certain volume discounts. If the amount of our trading volume decreases, the mix traded shifts to our lower revenue per contract products or the transaction fee pilot is implemented, our revenues from transaction fees will most likely decrease. We can offer no assurance that we would be able to reduce our costs to match the amount of any such decrease.

Our market data fees, connectivity fees and revenues may be reduced due to declines in our market share, trading volumes or regulatory changes.

The occurrence of any event that reduces the amount of market data fees that we receive, whether as a result of fee reductions, fewer members subscribing to the U.S. tape plans, declines in market share or trading volumes (or notional volume in the case of Cboe Europe Equities) or regulatory changes, will have a direct negative impact on our business, financial condition and operating results. For example, if our market share of U.S. listed cash equities and options, or Cboe’s European cash equities trading, were to decline, our share of market data fees could also decline. Moreover, market data fees could decline as a result of a reduction in the numbers of market data users, for example because of consolidation among market data subscribers or due to a decline in professional subscriptions as a result of staff reductions in the financial services industry or otherwise.

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Regulatory and legal developments could also impact the fees we receive from market data and connectivity, or our cost in providing such services. In the U.S., we are generally required to file with the SEC any changes to the fees that we charge for our securities market data products and connectivity fees. In recent years, certain industry groups have objected to the ability of exchanges to charge for certain market data products. Specifically, the Securities Industry and Financial Markets Association ("SIFMA") has filed a number of denial of access applications with the SEC to set aside proposed rule changes to establish or modify fees for our market data products, connectivity fees and related services. Further, the SEC and some media have been scrutinizing market data and market access in late 2018. An adverse ruling in these matters or additional scrutiny could cause the SEC to more closely examine exchange market data and connectivity fees, which in turn could result in our having to reduce the fees we charge for market data and connectivity and there could be a negative impact on our revenues. See Note 23 ("Commitments, Contingencies, and Guarantees—Legal Proceedings") for more information.

We believe Cboe Europe Equities currently offers market data to customers on a non discriminatory basis at a reasonable cost. As regulators determine how market data should be disaggregated and what is a reasonable commercial basis for providing market data, it could affect our ability to offer market data products in the same manner that we do today thereby causing an adverse effect on our European market data revenues. While MiFID II and MiFIR aim to encourage a commercial solution to a consolidated tape in Europe, should this fail to materialize, policy makers might be encouraged to implement a mandatory solution that could impact our ability to develop our own commercial offering.

Legislative or regulatory changes affecting our markets could have a material adverse effect on our business, financial condition and operating results.

Changes in regulation by the SEC, CFTC, FCA, foreign regulators or other government action, including SEC approval of rule filings by other SROs or entities, including OCC, could materially affect our markets. In recent years, the securities and derivatives industries have been subject to regulatory changes as a result of increasing government and public scrutiny of the securities and derivatives industries. We have also experienced an increase in rulemaking and legislation that could affect our business.

Starting in 2015, large U.S. banks were required to use a calculation methodology known as the current exposure method ("CEM") to compute regulatory capital requirements associated with the clearing guarantee provided by bank-affiliated OCC clearing members. U.S. banks, as well as European banks that also apply CEM, are required to maintain regulatory capital that is disproportionate to the risk of clearing options contracts and has led to further increases in capital requirements for bank holding companies and bank subsidiaries involved in the trading and clearing of derivatives. In October 2018, the Board of Governors of the Federal Reserve, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency proposed to replace CEM with a more risk-sensitive calculation method known as the standardized approach to counterparty credit risk ("SA-CCR"), which is expected to reduce capital requirements associated with the clearing of listed options. If CEM is not replaced or the implementation of SA-CCR does not reduce capital requirements, we may experience a reduction in trading in options and futures due to bank-affiliated clearing members charging their customers more to trade, reducing the type or number of customers or withdrawing from the business of market-maker clearing.

Further, Congress, regulators and some media have been increasingly scrutinizing electronic trading, the structure of equity markets and high frequency trading in recent years. The SEC continues to consider various potential market structure changes, which could result in reduced trading volumes, or which could negatively affect our business. To the extent the SEC adopts regulatory changes, our business, financial condition and operating results could be negatively impacted. In addition, the continued growth of high frequency trading has been the subject of private litigation and regulatory enforcement actions alleging that high frequency trading firms have received unfair advantages at the expense of other traders. High frequency trading accounts for a meaningful percentage of the daily volume in the U.S. and European equity markets, and these actions and other efforts to slow trading could lead to a reduction in trading volumes, negatively impacting all trading markets, including our business. Additionally, in September 2018, the SEC held a roundtable on market data and market access to discuss a number of topics, including market data revenue received by exchanges. To the extent the SEC adopts regulatory changes related to market data and market access (connectivity), our business, financial condition and operating results could be negatively impacted.

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In addition, as discussed above, in December 2018, the SEC approved the transaction fee pilot. The transaction fee pilot may cause Cboe's equities exchanges, BZX, BYX, EDGX and EDGA, to require additional resources to comply with or challenge the pilot and it may have a material impact on our business, financial condition and operating results if, for example, shifts in order flow away from exchanges were to occur. See Note 23 ("Commitments, Contingencies, and Guarantees—Legal Proceedings") for more information.

Under E.U. regulations, European banks and other European financial institutions become subject to punitive capital charges if they transact options or futures through a non-qualifying clearinghouse. OCC, our clearinghouse for options and futures, is not currently recognized as a qualified clearinghouse by the E.U.; however, the OCC is working with the E.U. to qualify as a foreign clearinghouse equivalent. As a prerequisite to becoming qualified, OCC could be required by the E.U. to contribute significant capital to its default waterfall applicable in the event of clearing member default. This capital could be required to be drawn before the default fund contributions of non-defaulting clearing members in the event that a defaulting clearing member's margin and other contributions were to be exhausted. OCC's stockholders, including Cboe Options, could effectively be required to fund this capital. If the E.U. does not recognize OCC as a qualified clearinghouse by June 15, 2019 (or by a subsequent date in the event that the current deadline is extended), then European market participants that clear through OCC would become subject to punitive capital charges. As a result, we could experience the loss of a significant number of European market participants and a significant reduction in trading activity on our options and futures markets, which could have a material adverse effect on our business, financial condition and operating results.

MiFID came into effect in 2007 regulating the market for execution services within European listed cash equity securities. MiFID has been superseded and enhanced by MiFID II and MiFIR, which were implemented at the beginning of 2018. The implementation of MiFID II and MiFIR in Europe has resulted in an alteration of the existing MiFID structure that has encouraged competition among market centers in Europe. MiFID II and MiFIR introduce a number of new rules, including enhanced internal organizational and compliance monitoring requirements, which apply directly to European trading venues such as our MTF and RM. The impact of MiFID II and MiFIR is significant, and could reduce trading volumes and trading fees, while increasing our costs of operating in Europe.

The legislative and regulatory environment in which the spot FX market operates is evolving and has undergone significant changes in the recent past, and there may be future regulatory changes in the spot FX industry. Spot FX market participants have seen an increasing number of law enforcement actions and regulatory inquiries into their business practices, resulting in the publication of the Global Code as a means to reach global consensus on standards of good conduct in the wholesale FX market. The governmental bodies and regulatory organizations that regulate parts of the spot FX market may enact, propose and may consider legislative and regulatory initiatives and may adopt new or revised laws and regulations. Changes in the interpretation or enforcement of existing laws and regulations by these entities, or the adoption of new legal or regulatory requirements, may also adversely affect our spot FX business. Further, our FX non-deliverable forwards business may also be adversely affected by proposed regulatory changes to the rules governing swap execution facilities.

It is also possible that there will be additional legislative and regulatory changes or efforts in the environment in which we operate our businesses. Actions on any of the specific regulatory issues currently under review in the U.S. or Europe and other proposals could have a material impact on our business.

In addition, U.S. and foreign legislatures and regulators and other regulatory authorities could impose legislative or regulatory changes that could adversely impact the ability of our market participants to use our markets or participate in the securities industry at all. Any such changes could result in the loss of a significant number of market participants or a reduction in trading activity on our markets, either of which could have a material adverse effect on our business, financial condition and operating results. Changes or proposed changes in regulation may also result in additional costs of compliance and modification of market participants' trading activity on our exchanges and markets.

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A failure to migrate our information technology systems successfully following the Merger or a material disruption in our information technology systems could adversely affect our business, financial condition and operating results.

We rely extensively on our information technology systems. The failure of information technology systems to operate effectively, difficulty in migrating our information technology systems, inconsistencies in standards, controls, procedures and policies and problems with transitioning to upgraded or replacement systems could adversely impact our business, financial condition and operating results. In addition, a number of our TPHs are not connected to Bats' technology platforms and must complete the process of connecting to these platforms as part of the migration.

Although we have successfully migrated CFE and C2 to the Bats' technology platforms, the process of migrating Cboe Options may take longer, cost more and provide fewer synergies than initially anticipated. There may also be new regulations adopted during the transition period that require systems changes, which could divert attention away from migration process and cause delays. To the extent this occurs, the anticipated benefits of the Bats acquisition may be reduced or delayed or may never come to fruition. Although our combined management team has experience with migrating other businesses and CFE and C2 to Bats' technology platform, there are certain portions of our Cboe Options business, such as open outcry trading that have not yet been supported by Bats' technology platform.

We currently expect to complete the migration of Cboe Options by October 7, 2019. However, we may not be able to successfully achieve the transition on the timetable currently contemplated, and the transition may not be successful, have inadequate performance or could encounter various difficulties and unexpected issues. Any delays, trading disruptions or issues that we encounter in the transition could have a material adverse effect on our businesses and could negatively affect our reputation, which in turn could have a material adverse effect on our overall business, results of operations and financial condition, as well as impair customer confidence in our product offerings and overall services or be subject to heightened regulatory scrutiny.

The technology upon which we rely, including those of our service providers, may be vulnerable to security risks, cybersecurity risks, insider threats, unauthorized disclosure of confidential information, operational disruptions, and other risks and events that could harm our business.

The secure and reliable operation of our technology, including our computer systems and communications networks, and those of our service providers and market participants, is a critical element of our operations. These systems and networks may be subject to various cybersecurity incidents, improper or inadvertent access to or disclosure of confidential, commercially sensitive, or personally identifiable information, data theft, corruption or destruction, cyber-attack, malware and other security problems, as well as acts of terrorism, natural disasters, human error, criminal insider activity, power loss and other events that are beyond our control. For example, in 2018, we discovered and investigated, and are continuing to further investigate as of the date of this filing, an incident involving a suspected theft of computer servers and networking devices. Additionally, as of the date of this filing, we believe that a number of the suspected stolen servers may have contained a limited amount of firm-specific trading data from in or before 2017, but we did not find evidence that the servers or devices contained personally identifiable information. We continue to review and enhance our policies, procedures and controls around the protection of our computer systems and communications networks to minimize the risk of reoccurrence.

We currently maintain physical, technical, and administrative safeguards to protect the confidentiality, integrity, availability and reliability of our systems, networks and information more broadly, and to guard against cybersecurity incidents and unauthorized access. We also maintain and continue to enhance measures for tracking and appropriately disposing of technology equipment hardware during technology updates and migrations. Collectively, these safeguards and measures may prove inadequate to prevent the attendant risk posed by cybersecurity incidents, subjecting us to contractual restrictions, liability and damages, loss of business, penalties, unfavorable publicity, and increased scrutiny by our regulators, and materially impacting our financial condition and operating results. We may be required to expend significant resources in the event of any real or threatened breaches in security or system failures, including to protect against threatened breaches, to alleviate harm caused by an actual breach, and to address any reputational harm or litigation or regulatory liability. Such harms also could cause us to lose market participants, experience lower trading volume, and negatively impact our competitive advantage and business, financial condition and operating results.

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Additionally, as threats continue to evolve and increase, and as the regulatory environment related to information security, data collection and use, and privacy becomes increasingly rigorous, we may be required to devote significant additional resources to modify and enhance our security controls and to identify and remediate any security vulnerabilities, which could have an adverse effect on our business, financial condition and operating results.

Intense competition could materially adversely affect our market share and financial performance.

The market for trade execution services and products is intensely competitive in the asset classes and geographies in which we operate. Increased competition may result in a decline in our share of trading activity and a decline in our revenues from transaction fees and market data fees, thereby adversely affecting our operating results. We compete with a number of entities on several different fronts, including the cost, quality and speed of our trade execution, functionality and ease of use of our trading platform, range of our products and services, our technological innovation and adaptation and our reputation. See "Business – Competition."

Some of our competitors and potential competitors have greater financial, marketing, technological, personnel and other resources than we do. These factors may enable them to develop similar or more innovative products, to offer lower transaction fees or better execution to their customers or to execute their business strategies more quickly or efficiently than we can. In addition, our business, financial condition and operating results may be adversely affected if we cannot successfully develop, introduce and/or market new services and products or if we need to adopt costly and customized technology for our services and products.

Furthermore, new or existing competitors may:

- respond more quickly to competitive pressures;
- develop products that compete with our products or are preferred by our customers;
- offer products and services at prices below ours to gain market share and to promote other businesses;
- develop and expand their technology and service offerings more efficiently;
- provide better, more user-friendly and more reliable technology;
- take greater advantage of acquisitions, alliances and other opportunities;
- market, promote, bundle and sell their products and services more effectively;
- leverage existing relationships with customers and alliance partners more effectively or exploit brand names to market and sell their services; and
- exploit regulatory disparities between traditional, regulated exchanges and alternative markets, including over-the-counter markets, that benefit from a reduced regulatory burden and lower-cost business model.

If our products, markets, services and technology are not competitive or we fail to anticipate or respond adequately to changes in technology, customer preferences and regulatory requirements or any significant delays in product development efforts our business, financial condition and operating results could be materially harmed.

We depend on third-party service providers for certain services that are important to our business. An interruption, significant increase in fees or cessation or impairment of such service by any third party could have a material adverse effect on our business, financial condition and operating results.

We depend on a number of service providers, including clearing organizations such as OCC, NSCC, LCH, EuroCCP and SIX x clear; securities information processors such as the CTA, UTP Securities Information Processor and OPRA; regulatory and other service providers such as FINRA, NFA, OCC and Thesys; the hosts of our data and disaster recovery centers; and various vendors of communications and networking products and services. In addition, we also depend on third party routing and clearing firms who are involved in processing transactions on our behalf. More specifically:

- If OCC, NSCC, EuroCCP, LCH and SIX x-clear were unable to perform clearing services for existing or new products, or their clearing members were unable or unwilling to clear through them, transactions could likely not occur on our markets or there may be delays, including until clearing is moved to another clearing agency.

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In 2018, approximately 64.7% of our net transaction fees were generated by options and futures that were cleared through OCC.

- OPRA, UTP Securities Information Processor and the CTA consolidate options and equities market information such as last sale reports and quotations. If any of them were unable to provide this information for a sustained period of time, we may be unable to offer trading on our options and equities markets.
- We are heavily dependent on technology for our markets, including our data and disaster recovery centers, including those housed by third parties, and certain communications and networking products and services. If this technology is unavailable, and cannot be replaced in a short time period, we may be unable to operate our markets.
- FINRA, OCC, and NFA provide certain regulatory services and functions for our options, equities and futures exchanges, while we retain regulatory responsibilities for such services. If FINRA, OCC, or NFA stopped providing services, or provided inadequate services, we may be subject to action by the SEC or CFTC, or may have limitations placed upon our markets.
- We rely on Thesys to provide services for the implementation of the CAT. Thesys is expected to be replaced by a new plan processor. If Thesys or the new plan processor stop providing services, provide inadequate services or we experience difficulties in the transition to a new plan processor, we and the other execution venues may incur regulatory liability including enforcement action by the SEC or limitations placed upon our markets. In addition, until the SEC approves a funding model that shares the cost of the CAT between the execution venues and industry members, the execution venues may continue to incur additional significant costs, including as a result of engaging a new plan processor, or result in the uncollectibility of promissory notes related to the funding of the implementation and operation of the CAT.
- We rely on third party routing and clearing firms to clear trades in U.S. listed cash equity securities routed by us to other markets, and to execute trades in options that we route to other markets.

With respect to options, all contracts traded on our exchanges must be cleared through clearing members of OCC. At December 31, 2018, there were 95 TPHs that are clearing members of OCC. Two clearing members accounted for approximately 52.5% of transaction and other fees collected through OCC in 2018. The next largest clearing member accounted for approximately 15.8% of transaction and other fees collected through OCC. Additionally, the two largest clearing members clear the majority of the market-maker sides of transactions at Cboe Options, C2, BZX, EDGX and at all of the options exchanges. Should a clearing member or liquidity provider exit the business or withdraw from our options exchanges, enact additional market-maker financial requirements or if market-makers were unable to transfer to another clearing member or other liquidity providers were unable to provide additional liquidity, this could create a significant disruption to the options markets, including ours.

We cannot provide assurance that any of these providers will be able to continue to provide these services in an efficient manner or that they will be able to adequately expand their services to meet our needs. An interruption or malfunction in or the cessation or impairment of an important service by a third party or disruption of a third party's operations could cause us to halt trading in some or all of our products or our services, make us unable to conduct other aspects of our business, cause us to experience the loss of a significant number of market participants or cause us to experience a significant reduction in trading activity on our options and futures markets, each of which could have a material adverse effect on our business, financial condition and operating results. In addition, our inability to make alternative arrangements, such as moving clearing to another clearing agency, in a timely manner, or at all, could have a material adverse impact on our business, financial condition and operating results.

Our operations outside of the U.S. expose us to currency risk.

In addition to our operations in the U.S., we have operations in the U.K., continental Europe, Ecuador, Hong Kong and Singapore. We, therefore, have exposure to exchange rate movements between the British pound, the Euro, the Hong Kong dollar, and the Singapore dollar against the U.S. dollar. Significant inflation or changes in foreign exchange rates with respect to one or more of these currencies could occur as a result of general economic conditions, acts of war or terrorism, changes in governmental monetary or tax policy, Brexit or changes in local interest rates.

These exchange rate differences will affect the translation of our non U.S. results of operations and financial condition into U.S. dollars as part of our consolidated financial statements.

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If one or more of the index providers from which we have licenses or service providers with respect to proprietary products fails to maintain the quality and integrity of their indexes or fails to perform under our agreements with them or if customer preferences change, revenues we generate from trading in these proprietary products may suffer.

We are a party to a number of license agreements pursuant to which we may list for trading securities options on various indexes including license agreements that we have with S&P, for the S&P 500 Index and S&P 100 Index, S&P, for the DJIA, LSEG, for more than two dozen FTSE Russell indexes, including the Russell 2000 Index, and MSCI Inc., for six MSCI indexes, including the MSCI EAFE Index and MSCI Emerging Markets Index. These license agreements provide that we are authorized to list options on their indexes, and some of the resulting index options are among the most actively traded products on our exchanges. The quality and integrity of each of these indexes are dependent on the ability of the index providers to maintain the index, including by means of the calculation and rebalancing of the index, and we are dependent on the index providers for a number of things, including the provision of index data to us. We also rely on index providers to enforce intellectual property rights against unlicensed uses of the indexes and uses of the indexes that infringe on our licenses. Furthermore, some of our agreements concerning our proprietary products provide for the parties to those agreements to provide important services to us. If any of our index providers are unable to maintain the quality and integrity of their indexes, or if any of the index providers or service providers fail to perform their obligations under the agreements, trading in these products, and therefore transaction fees we receive, may be adversely affected or we may not receive the financial benefits of the agreements that we negotiated.

We and our licensors may not be able to protect our respective intellectual property rights.

We rely on patent, trade secret, copyright and trademark laws, the law of the doctrine of misappropriation and contractual protections to protect our proprietary technology, proprietary products, index methodologies and other proprietary rights. In addition, we rely on the intellectual property rights of our licensors in connection with our listing of exclusively-licensed index and futures products. We and our licensors may not be able to prevent third parties from copying, or otherwise obtaining and using, our intellectual property without authorization, listing our proprietary or exclusively-licensed index products without licenses or otherwise infringing on our rights. We and our licensors may have to rely on litigation to enforce our intellectual property rights, determine the validity and scope of the proprietary rights of others or defend against claims of infringement or invalidity. We and our licensors may not be successful in this regard. Such litigation, whether successful or unsuccessful, could result in substantial costs to us, diversion of our resources or a reduction in our revenues, any of which could materially adversely affect our business.

Any infringement by us on intellectual property rights of others could result in litigation and could have a material adverse effect on our operations.

Our competitors, as well as others, have obtained, or may obtain, patents or may otherwise hold intellectual property rights that are related to our technology or the types of products and services we offer or plan to offer. We may not be aware of all intellectual property that may pose a risk of infringement by our products, services or technologies. In addition, some patent applications in the U.S. are confidential until a patent is issued, and therefore we cannot evaluate the extent to which our products and services may be covered or asserted to be covered in pending patent applications. Thus, we cannot be sure that our products and services do not infringe on the rights of others or that others will not make claims of infringement against us. Claims of infringement are not uncommon in our industry, and even if we believe that such claims are without merit, they can be time-consuming and costly to defend and divert management resources and attention. If one or more of our products, services or technologies were determined to infringe a patent or other intellectual property right held by another party, we may be required to pay damages, stop using, developing or marketing those products, services or technologies, obtain a license from the holders of the patents or redesign those products, services or technologies to avoid infringing the patent. If we were required to stop using, developing or marketing certain products, our business, financial condition and operating results could be materially harmed. Moreover, if we were unable to obtain required licenses, we may not be able to redesign our products, services or technologies to avoid infringement, which could materially adversely affect our business, financial condition and operating results.

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If we fail to attract or retain highly skilled management and other employees, including those experienced with integration of our business, our business may be harmed.

Our success largely depends on the skills, experience and continued efforts of management and other key personnel. As a result, to be successful, we must retain and motivate executives and other key employees. We expect to benefit from the integration experience of certain employees who were formerly Bats personnel. However, we have no assurances that these employees will remain with us. The roles and responsibilities of departing executive officers and employees will need to be filled either by existing or new officers and employees, which may require us to devote time and resources to identifying, hiring and integrating replacements for the departed executives and employees that could otherwise be used to advance integration or otherwise pursue business opportunities, which could have a material adverse effect on our overall business, financial condition and operating results.

Additionally, certain of our information technology employees will be important to retain during the migration period to effectively manage our technology platforms and to assist in the process of migrating our systems to the Bats' technology platform. Many of these employees have extensive knowledge and experience in highly technical and complex aspects of Cboe Command. Because of the complexity and risks associated with our business and the specialized knowledge required to conduct this business effectively, and because the growth in our industry has increased demand for qualified personnel, many of our employees could find employment at other companies if they chose to do so, particularly if we fail to continue to provide competitive levels of compensation. Also, our employees may experience uncertainty about their future roles until integration strategies following the Merger are executed. These circumstances may adversely affect our ability to retain key personnel. We also must continue to motivate employees and maintain their focus on our strategies and goals. Doing so may be difficult due to the uncertainty and challenges associated with post-merger integration. In addition, if these personnel were to leave or we are unable to recruit highly qualified personnel, we may experience increased difficulty in the integration process, synergy realization, maintenance of the current technology platform and may not be able to adequately replace such personnel, which could have a material adverse effect on our overall business, results of operations and financial condition.

There is substantial competition for qualified and capable personnel in the technology space, which may make it difficult for us to retain and recruit qualified employees in sufficient numbers. If we fail to retain our current employees, it would be difficult and costly to identify, recruit and train replacements needed to continue to conduct and expand our business. In particular, failure to retain and attract qualified systems personnel could result in systems failures. Consequently, our reputation may be harmed, we may incur additional costs and our profitability could decline. There can be no assurance that we will be able to retain and motivate our employees in the same manner as we have historically done.

Additionally, effective succession planning is also important to our long-term success. Failure to ensure effective transfer of knowledge and smooth transitions involving our management team and key employees could hinder our strategic planning and execution.

Computer and communications systems failures and capacity constraints could harm our reputation and our business.

Our business depends on the integrity and performance of our computer and communications systems. If our systems cannot expand to cope with increased demand or otherwise fail to perform, including during migrations from the Cboe Command platform to the Bats technology platform, we could experience unanticipated disruptions in service, slower response times and delays in the introduction of new products and services. These consequences could result in trading outages, lower trading volumes, financial losses, decreased customer service and satisfaction and regulatory sanctions and could have a material adverse effect on our ability to conduct our business. Although we have a back-up plan of significant trading and key corporate systems, the back-up systems or disaster recovery plans may prove to be inadequate in the event of a systems failure or cyber-security breach. Despite having disaster recovery facilities, there can be no guarantees that we will be able to open an efficient, transparent and liquid marketplace, if we can open at all, following a systems failure. Moreover, with extended trading hours, we have to operate our systems longer and have fewer non-trading hours to address any potential concerns with the systems on which we rely.

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Our markets have experienced occasional systems failures and delays in the past and in the future our systems may fail, in whole or in part, or may operate slowly, causing one or more of the following:

- unanticipated disruption in service to our participants;
- failures or delays during peak trading times or times of unusual market volatility;
- slower response times and delays in trade execution and processing;
- incomplete or inaccurate accounting, recording or processing of trades; and
- distribution of inaccurate or untimely market data to participants who rely on this data in their trading activity.

Any of these events may cause:

- a loss in transaction or other fees due to the inability to provide services for a time;
- requests by market participants or others that we reimburse them for financial loss, either within the constraints of the limited liability provisions of our exchanges' rules or in excess of those amounts;
- trading volume to diminish on our exchanges due to dissatisfaction with the platform; and
- one or more of our regulators to investigate or take enforcement action against us.

As a consequence of any of these events, our business, financial condition and results of operations could suffer materially.

In addition to other measures, we test our systems to confirm whether they will be able to handle anticipated present and future peak trading activity or times of unusual market volatility. However, we cannot assure you that our estimates of future trading volume will be accurate or that our systems will always be able to accommodate actual trading volume without failure or degradation of performance.

We anticipate that we will need to continue to make significant investments in hardware, software and telecommunications infrastructure to accommodate the increases in traffic. If we cannot increase the capacity and capabilities of our systems to accommodate increasing trading activity and to execute our business strategy, our ability to maintain or expand our businesses would be adversely affected.

Misconduct by our TPHs, members, participants or others could harm us.

We run the risk that our TPHs, members, participants or other persons who use our markets or our products or our employees may engage in fraud, market or product manipulation or other misconduct, which could result in regulatory sanctions and serious harm to our reputation, especially because we are the parent company of SROs. It is not always possible to deter misconduct, or market or product manipulation, and the precautions we take to prevent and detect this activity may not be effective in all cases. In addition, misconduct, or market or product manipulation by, or failures of, participants on our or other exchanges may discourage trading on our exchanges or of our products, which could reduce revenues.

Our use of open source software code may subject our software to general release or require us to re engineer our software, which could harm our business.

The Bats technology platform uses open source software code. Companies that incorporate open source software into their products have, from time to time, faced claims challenging the ownership of open source software. As a result, we could be subject to suits by parties claiming ownership of what we believe to be open source software. In addition, some open source software licenses require users who distribute open source software as part of their software to publicly disclose all or part of the source code in their software and make any derivative works of the open source code available on unfavorable terms or at no cost. Open source license terms may be ambiguous, and many of the risks associated with usage of open source software cannot be eliminated. We believe that our use of open source software is in compliance with the relevant open source software licenses and does not require disclosure of any of our source code. However, if we were found to have inappropriately used open source software, we may be required to release our proprietary source code, re engineer or discontinue use of our software or take other remedial action.

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Potential conflicts of interest between our for-profit status and our regulatory responsibilities may adversely affect our business.

As a for-profit business with regulatory responsibilities, we are responsible for disciplining TPHs and members for violating our rules, including by imposing fines and sanctions. This may create a conflict of interest between our business interests and our regulatory responsibilities. Any failure by us to fulfill our regulatory obligations could significantly harm our reputation, increase regulatory scrutiny or cause the SEC or CFTC to take action against us, all of which could adversely affect our business, results of operations or financial condition.

Brexit could have a negative impact on the U.K. and E.U. economies and lead to considerable uncertainty while new treaties are negotiated.

On June 23, 2016, the U.K. voted to leave the E.U. in a referendum (the “Brexit Vote”). On March 29, 2017, the U.K. invoked Article 50 with its notice to leave the E.U. The terms and the exact timing of the U.K.’s exit from the E.U. (“Brexit”) remain unclear, although it is unlikely to be completed before March 29, 2019. In addition to the economic uncertainty the Brexit Vote brings, there are a number of potential risks that investors should consider:

- Political uncertainty. Following the Brexit Vote, the U.K. has entered into a period of acute political uncertainty both as to the nature and timing of the negotiations with the E.U. Such uncertainty could lead to a high degree of economic and market disruption and legal uncertainty. It is not possible to ascertain how long this period will last and the impact it will have on the U.K. in general and markets more broadly.
- Legal uncertainty. A significant proportion of English law currently derives from or is designed to operate in concert with E.U. law. This is especially true of English law relating to financial markets, financial services, prudential and conduct regulation of financial institutions, bank recovery and resolution, payment services and systems, settlement finality, and market infrastructure. Depending on the timing and terms of the U.K.’s exit from the E.U., significant changes to English law are likely, and we cannot predict what these changes will be and how they may affect our business.
- Regulatory uncertainty. There is significant uncertainty about how the remaining E.U. countries (“EU27”) financial institutions with assets (including branches) in the U.K. and U.K. financial institutions with assets in the EU27 will be regulated. At present, E.U. single market regulation allows regulated financial institutions (including credit institutions, investment firms, alternative investment fund managers, insurance and reinsurance undertakings) to benefit from a passporting system for regulatory authorizations required to conduct their businesses, as well as facilitating mutual rights of access to important elements of market infrastructure such as payment and settlement systems. E.U. law is also the framework for mutual recognition of bank recovery and resolution regimes.
- Once the U.K. ceases to be a member state of the E.U., the current passporting arrangements are expected to cease to be effective, as will the current mutual rights of access to market infrastructure and current arrangements for mutual recognition of bank recovery and resolution regimes. The ability of regulated financial institutions to continue to do business between the U.K. and the EU27 after the U.K. ceases to be a member state of the E.U. would therefore be subject to separate arrangements between the U.K. and the EU27. There can be no assurance that there will be any such arrangements concluded and, if they are concluded, on what terms.
- Market uncertainty. Since the Brexit Vote, there has been volatility and disruption of the capital, currency, exchange rates and credit markets. If this disruption continues, it may adversely impact our business, financial condition and operating results.

In 2018, we derived 7.8% of our total net revenues from our U.K. operations. Depending on the outcome of the Brexit negotiations, companies with operations in the U.K. may face unfavorable business conditions to access the single market. In preparation for Brexit, Cboe Europe Equities is planning to establish a new venue in Amsterdam and has applied to the Netherlands Authority for the Financial Markets to become a Regulated Market in the Netherlands. The

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application is expected to be decided by the end of the first quarter of 2019. Cboe Europe Equities may continue to choose to move some or all of its operations to the E.U. and the related costs and expenses could have a material adverse effect on our business, financial condition and operating results.

Damage to our reputation could have a material adverse effect on our business, financial condition and operating results.

We believe one of our competitive strengths is our strong industry reputation. Various issues may give rise to reputational risk, including issues relating to:

- the representation of our business in the media;
- the quality and benefits of using our proprietary products, including the reliability and functionality of our transaction based business, and the accuracy of our market data;
- the ability to execute our business plan, key initiatives or new business ventures and the ability to keep up with changing customer demands and regulatory initiatives;
- our regulatory compliance and our enforcement of compliance on our customers;
- the accuracy of our financial statements and other financial and statistical information;
- the quality of our corporate governance structure;
- the quality of our disclosure controls and internal controls over financial reporting, including any failures in supervision;
- the integrity and performance of our computer and communications systems;
- security breaches, including any unauthorized delivery of proprietary data to third parties;
- management of our outsourcing relationships, including our relationship with FINRA and NFA;
- any misconduct or fraudulent activity by our employees, especially senior management, or other persons formerly or currently associated with us;
- our listings business and our enforcement of our listing rules; and
- any negative publicity surrounding our listed companies.

Damage to our reputation could cause a reduction in the trading volume of our proprietary products or on our exchanges or cause us to lose customers. This, in turn, may have a material adverse effect on our business, financial condition and operating results.

If our risk management and compliance methods are not effective, our business, financial condition and operating results may be adversely affected.

Our ability to comply with all applicable laws and rules is largely dependent on our establishment and maintenance of compliance, audit, risk and reporting systems and procedures, as well as our ability to attract and retain qualified compliance, audit and risk management personnel. These systems and procedures may not be fully effective. We face the risk of intervention by regulatory authorities, including extensive examination and surveillance activity. In the case of actual or alleged non compliance with applicable laws or regulations, we could be subject to investigations and judicial or administrative proceedings that may result in substantial penalties, settlements or civil lawsuits, including by customers, for damages, which may be substantial. In the past, the SEC has brought actions against exchange operators, including us, for failing to fulfill their obligations to have an effective regulatory system. Any failure to comply with applicable laws and rules could adversely affect our business, reputation, financial condition and operating results and, in extreme cases, our ability to conduct our business or portions thereof. As the parent company for SROs, we are responsible for maintaining exchanges that comply with securities and futures laws, SEC and CFTC regulations and the rules of the respective exchanges.

We have methods to identify, monitor and manage our risks. Management of legal and regulatory risk requires policies and procedures to properly monitor, record and verify a large number of transactions and events. If our policies, procedures, and compliance systems are not effective or we are not successful in monitoring or evaluating the risks to which we are or may be exposed, our business, reputation, financial condition and operating results could be materially adversely affected. We cannot provide assurance that our policies and procedures will always be effective, or that our

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management, compliance department, enterprise risk management program and internal audit department would be able to identify any such ineffectiveness. If these functions, policies and procedures are not effective, we may be subject to monetary or other penalties by our regulators, and our insurance policies may not provide adequate coverage.

Financial or other problems experienced by third parties could have an adverse effect on our business.

We are exposed to credit risk from third parties, including customers, clearing agents and counterparties. For example, we are exposed to credit risk for transaction fees we bill to customers on a monthly basis in arrears. Our customers and other third parties may default on their obligations to us due to a lack of liquidity, operational failure, bankruptcy or other reasons.

In addition, with respect to orders Cboe Trading routes to other markets for execution on behalf of our customers, Cboe Trading is exposed to counterparty credit risk in the case of failure to perform on the part of our routing and clearing firms who are involved in processing equities and options transactions on our behalf, as well as failure on the part of such brokers to pass back any transactional rebates. Wedbush Securities Inc. (“Wedbush”), and Morgan Stanley & Co. LLC (“Morgan Stanley”) guarantee equity trades until one day after the trade date, after which time NSCC provides a guarantee. Thus, Cboe Trading is potentially exposed to credit risk to the counterparty to an equity trade routed to another market center between the trade date and one day after the trade date in the event that Wedbush or Morgan Stanley fails to perform. With respect to U.S. listed equity options and futures, we deliver matched trades of our customers to the OCC, which acts as a central counterparty on all transactions occurring on Cboe Options, C2, BZX, EDGX and CFE and, as such, guarantees clearance and settlement of all of our matched options and futures trades.

With respect to U.S. equities, Cboe Trading has counterparty credit risk exposure to Wedbush and Morgan Stanley related to clearing until the day following the trade date. Cboe Trading uses Wedbush to clear trades routed through affiliates of Credit Suisse Securities (USA) LLC as well as for trades routed directly to other exchanges and optionally dark pools. Morgan Stanley clears trades routed through the Morgan Stanley routing brokers and also clears executions routed to most dark pools. Cboe Trading maintains counterparty credit risk exposure from routing brokers with respect to rebates earned until completion of the routing brokers next invoice cycle following the execution.

With respect to U.S. listed equity and exchange traded product options, Cboe Trading is subject to counterparty credit risk exposure with respect to rebates earned from routing brokers until completion of the routing brokers’ next invoice cycle has completed for an execution.

Our exposure to credit risk may be further impacted by volatile securities markets that may affect the ability of our customers and other third parties to satisfy their contractual obligations to us. Moreover, we may not be successful in managing our credit risk through reporting and control procedures or by maintaining credit standards. Any losses arising from such defaults or other credit losses could adversely affect our financial condition and operating results.

While neither Cboe FX nor Cboe SEF has direct counterparty risk, Cboe FX or Cboe SEF may suffer a decrease in transaction volume if a bank or prime broker experiences an event that causes other prime brokers to decrease or revoke the credit available to the prime broker experiencing the event. Therefore, Cboe FX and Cboe SEF may have risk that is related to the credit of the banks and prime brokers that trade spot FX on the Cboe FX platform, or non-deliverable forward FX transactions on Cboe SEF.

We may be required to assume ownership of a position in securities in connection with our order routing service, which could subject us to trading losses when our broker-dealer disposes of that position.

We offer a smart order routing service through our broker dealer subsidiary, Cboe Trading, which provides its customers with access to other market centers when we route their orders to those market centers for execution. In connection with this service, we may assume ownership of a position in securities. This may occur, for example, when a market center to which we have routed a customer's order experiences systems problems and is unable to determine the status of that order. When this happens, we may make a business decision to provide a cancellation notice to our customer, relieving our customer of any liability with respect to the order. We may be informed later, however, that the order was executed at the market center to which we routed it, in which case Cboe Trading would be required to take ownership of that securities position. Our third party clearing brokers maintain error accounts on behalf of Cboe Trading into which such positions settle, and we require the respective clearing broker to trade out of those positions as expeditiously as possible, which could result in our incurring trading losses.

We may not effectively manage our growth, which could materially harm our business, financial condition and operating results.

We have experienced increased volume on our futures exchange, extended trading hours on our futures exchange and in SPX and VIX options and developed several proprietary products. We also experienced a substantial expansion of our business following our acquisition of Bats, which significantly expanded our product line across asset classes, broadened our geographic reach with strong pan-European equities and global FX positions and diversified our business mix with significant non-transactional revenue streams. Bats has also experienced significant growth in its business since its inception in 2005, with material expansions into diverse businesses including European listed cash equity securities, U.S. listed equity options and global institutional spot FX trading.

We expect that our business will continue to grow, which may place a significant strain on our management, personnel, systems and resources. We must continually improve our operational, financial and regulatory systems and managerial controls and procedures, and may need to continue to expand, train and manage our workforce. We must also maintain close coordination among our technology, legal, accounting, finance, marketing, sales, regulatory and compliance functions. We cannot assure you that we will manage our growth effectively. If we fail to do so, our business, financial condition and operating results could be materially harmed. Furthermore, failure to successfully expand into new asset classes or new geographies may adversely affect our growth strategy and our future profitability.

Our continued growth will require increased investment by us in technology, facilities, personnel, and financial and management systems and controls. It also will require expansion of our procedures for monitoring and assuring our compliance with applicable regulations, and we will need to integrate, train and manage a growing employee base. The expansion of our existing businesses, any expansion into new businesses and the resulting growth of our employee base will increase our need for internal audit and monitoring processes, which may be more extensive and broader in scope than those we have historically required. We may not be successful in identifying or implementing all of the processes that are necessary. Further, unless our growth results in an increase in our revenues that is proportionally greater than or equal to the increase in our costs associated with this growth, our business, financial condition and operating results will be adversely affected.

Our ability to implement or amend rules could be limited or delayed because of regulation, which could negatively affect our ability to implement needed changes.

Our exchanges registered with the SEC must submit proposed rule changes to the SEC for its review and, in many cases, its approval. Even where a proposed rule change may be effective upon filing with the SEC, the SEC retains the right to suspend and disapprove such a rule change. Also, the CFTC may stay or disapprove rules that we file with it for CFE or Cboe SEF. The rule review process can be lengthy and can significantly delay the implementation of proposed rule changes that we believe are necessary to the operation of our markets. If the SEC or CFTC delays, including because of a government shutdown, or does not allow one of our exchanges to implement a rule change, this could negatively affect our ability to make needed changes or implement business activities.

Similarly, the SEC must approve amendments to our exchange subsidiaries’ certificates of incorporation and bylaws as well as certain amendments to the certificate of incorporation and bylaws of Cboe Global Markets. The SEC may decide not to approve a proposed amendment or may delay such approval in a manner that could negatively affect our ability to make a desired change, which could prevent or delay us from improving the operations of our markets or recognize income from new products.

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Changes in the tax laws and regulations affecting us, our products and our market participants could have a material adverse effect on our business.

Legislation may be proposed, both domestically and internationally, that could add a transaction tax on our products or change the way that our market participants are taxed on the products they trade on our markets. If such proposals were to become law, they could have a negative impact on the securities industry and on us by making transactions more costly to market participants, which may reduce trading and could make our markets less competitive.

In addition to proposed tax changes that could affect our market participants, like other corporations, we are subject to taxes at federal, state and local levels, as well as in non-U.S. jurisdictions. Changes in tax laws, regulations or policies or successful claims by tax authorities could result in our having to pay higher taxes, which would in turn reduce our net income. If this occurs, we may experience a higher effective tax rate.

We selectively explore acquisition opportunities and strategic alliances relating to other businesses, products or technologies. We may not be successful in integrating other businesses, products or technologies with our business. Any such transaction also may not produce the results we anticipate, which could adversely affect our business, financial condition and operating results.

We selectively explore and pursue acquisition and other opportunities to strengthen our business and grow our company. We may enter into business combination transactions, make acquisitions or enter into strategic partnerships, joint ventures or alliances, any of which may be material. The market for acquisition targets and strategic alliances is highly competitive, which could make it more difficult to find appropriate merger or acquisition opportunities. If we are required to raise capital by incurring debt or issuing additional equity for any reason in connection with a strategic acquisition or investment, financing may not be available or the terms of such financing may not be favorable to us and our stockholders, whose interests may be diluted by the issuance of additional stock.

The process of integration, such as integrating our business with Bats' business, may produce unforeseen regulatory issues and operating difficulties and expenditures and may divert the attention of management from the ongoing operation of our business and harm our reputation. We may not successfully achieve the integration objectives, and we may not realize the anticipated cost savings, revenue growth and synergies in full or at all, or it may take longer to realize them than expected, any of which could negatively impact our business, financial condition and operating results.

We may be required to inject further capital into OCC or EuroCCP or return dividends received back to OCC.

OCC is the sole provider of clearing on all of our options and futures exchanges. In addition, Cboe Europe owns 20% of EuroCCP, which is one of three interoperable central counterparties used to clear trades conducted on Cboe Europe. Under OCC's capital plan, each of OCC's existing exchange stockholders, which include Cboe Options, agreed to provide its pro rata share in replenishment capital, up to a maximum of $40 million per exchange stockholder, if certain capital thresholds are breached. However, as discussed in additional detail in Note 7 ("Investments"), the OCC capital plan has been disapproved by the SEC and due to the recency there is uncertainty regarding next steps and potential consequences. If the OCC capital plan is unwound as a result of this disapproval, we may be required to return dividend payments received from OCC, which could have a material adverse effect on our financial condition and operating results. Although the SEC's disapproval of the OCC capital plan may affect Cboe Options' $40 million replenishment capital commitment described above, given OCC's importance to Cboe Options' business, if OCC were to experience financial difficulties, Cboe Options might nevertheless be required to inject further capital into it in order to maintain its working or regulatory capital. Likewise, if EuroCCP were to experience financial difficulties, Cboe Europe might be required to inject further capital into it in order to maintain its working or regulatory capital. In a worst case scenario, OCC or EuroCCP, as applicable, might have their regulatory license suspended or withdrawn, or might have to wind down. This may result in a loss to Cboe Options and Cboe Europe of their respective investments in OCC and EuroCCP and withdrawals of OCC or EuroCCP as clearing houses, which could have a material adverse effect on our business, financial condition and operating results.

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We have outstanding indebtedness, which may decrease our business flexibility and adversely affect our business, financial condition and operating results.

As of December 31, 2018, we had $275 million outstanding under our term loan facility, $950 million of senior unsecured notes and no funds outstanding under our revolving credit facility. The financial and other covenants to which we have agreed and our increased indebtedness may have the effect of reducing our flexibility to respond to changing business and economic conditions, thereby placing us at a competitive disadvantage compared to competitors that have less indebtedness and making us more vulnerable to general adverse economic and industry conditions. Our increased indebtedness will also increase future borrowing costs, and the covenants pertaining thereto may also limit our ability to repurchase shares of our common stock, increase dividends or obtain additional financing to fund working capital, capital expenditures, acquisitions or general corporate requirements. We are also required to dedicate a larger portion of our cash flow from operations to payments on our indebtedness, thereby reducing the availability of our cash flow for other purposes, including working capital, capital expenditures and general corporate purposes. Further, a portion of our borrowings are at variable rates of interest, which exposes us to the risk of increased interest rates unless we enter into offsetting hedging transactions.

Our ability to make payments on and to refinance our debt obligations and to fund planned capital expenditures depend on our ability to generate cash from our operations. This, to a certain extent, is subject to general economic, financial, competitive, legislative, regulatory and other factors that are beyond our control.

We may not be able to refinance any of our indebtedness on commercially reasonable terms, or at all. If we cannot service our indebtedness, we may have to take actions such as selling assets, seeking additional equity or reducing or delaying capital expenditures, strategic acquisitions, investments and alliances, any of which could impede the implementation of our business strategy or prevent us from entering into transactions that would otherwise benefit our business. Additionally, we may not be able to effect such actions, if necessary, on commercially reasonable terms, or at all. Any of the foregoing consequences could adversely affect our business, financial condition and operating results.

Deterioration in our credit profile may increase our costs of borrowing money.

As of December 31, 2018, we have investment grade credit ratings from S&P Global Ratings (A-) and Moody's Investor Service (A3). Ratings from credit agencies are not recommendations to buy, sell or hold our securities, and each rating should be evaluated independently of any other rating. There is no assurance that we will maintain such credit ratings, since credit ratings may be lowered or withdrawn entirely by a rating agency if, in its judgment, the circumstances warrant. If a rating agency were to downgrade our rating below investment grade, our borrowing costs could increase.

If our goodwill, investments in non-consolidated subsidiaries and intangible assets become impaired, the resulting charge to earnings may be significant.

We are required to assess investments in non-consolidated subsidiaries and intangible assets for impairment at least annually. Goodwill impairment testing is performed annually in the fiscal fourth quarter or more frequently if conditions exist that indicate that the asset may be impaired. In the future, we may take charges against earnings resulting from impairment. Any determination requiring the write-off of a significant portion of our goodwill, intangible assets or investments in non-consolidated subsidiaries could adversely affect our results of operations and financial condition.

Any decision to pay dividends on our common stock is at the discretion of our board of directors and depends upon the earnings and cash flow of our operating subsidiaries. Accordingly, there can be no guarantee that we will pay dividends to our stockholders.

Any decision to pay dividends on our common stock in the future will be at the discretion of our board of directors, which may determine not to declare dividends at all or at a reduced amount. The board’s determination to declare dividends will depend upon our profitability and financial condition, contractual restrictions, restrictions imposed by applicable law and the SEC and other factors that the board deems relevant. As a holding company with no significant business operations of its own, Cboe Global Markets depends entirely on distributions, if any, it may receive from its subsidiaries to meet its obligations and pay dividends to its stockholders. If these subsidiaries are not profitable, or even if they are and they determine to retain their profits for use in their businesses, we will be unable to pay dividends to our stockholders.

Fluctuations in our quarterly operating results may negatively affect the valuation of our common stock.

Our business could experience seasonal fluctuations, reflecting reduced trading activity generally during the third quarter of each year and during the last month of each year. As a result, it is possible that our operating results or other operating metrics may fail to meet the expectations of stock market analysts and investors. If this happens, the market price of our common stock may be adversely affected.

Certain provisions in our organizational documents could prevent or delay a change of control.

Our organizational documents contain provisions that could block actions that stockholders might find favorable, including discouraging, delaying or preventing a change of control or any unsolicited acquisition proposals for us. These include provisions:

- prohibiting stockholders from acting by written consent;
- requiring advance notice of director nominations and of business to be brought before a meeting of stockholders; and
- limiting the persons who may call special stockholders' meetings.
- In addition, our organizational documents include provisions that:
- restrict any person from voting or causing the voting of shares of stock representing more than 20% of our outstanding voting capital stock; and
- restrict any person from beneficially owning shares of stock representing more than 20% of the outstanding shares of our capital stock.

Furthermore, our board of directors has the authority to issue shares of preferred stock in one or more series and to fix the rights and preferences of these shares without stockholder approval. Any series of our preferred stock is likely to be senior to our common stock with respect to dividends, liquidation rights and, possibly, voting rights. The ability of the board of directors to issue preferred stock also could have the effect of discouraging unsolicited acquisition proposals, thus adversely affecting the market price of our common stock.

Delaware law makes it difficult for stockholders that have recently acquired a large interest in a corporation to cause the merger or acquisition of the corporation against the board's wishes. Under Section 203 of the Delaware General Corporation Law, a Delaware corporation may not engage in any merger or other business combination with an interested stockholder for a period of three years following the date that the stockholder became an interested stockholder except in limited circumstances, including by approval of the corporation's board of directors.

We indirectly hold 100% of the issued share capital and voting rights in Cboe Europe and its wholly owned subsidiary, Cboe Chi-X Europe. As a result, any person who holds, or has voting power with respect to, 10% or more of the outstanding shares of our common stock is subject to certain regulatory requirements under U.K. law.

A person that indirectly acquires control in a FCA entity is required to file a change in control notice with the FCA. Though both are FCA regulated entities, the statutorily prescribed change in control notification threshold for Cboe Europe is acquisition of voting power with respect to 20% or more of the issued share capital thereof. The change in control notification threshold for Cboe Chi-X Europe is acquisition of voting power with respect to 10% or more of the issued share capital thereof. Therefore, any person who holds, or has voting power with respect to, 10% or more of the outstanding shares of our common stock will be required to file a change in control notice in respect of Cboe Chi-X Europe and, if this holding is in excess of 20%, also for Cboe Europe. This obligation may discourage, delay or prevent accumulations of 10% or more of our common stock.

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Item 1B.Unresolved Staff Comments

Not applicable.

Item 2.Properties

Our principal offices are located at 400 South LaSalle Street, Chicago, Illinois 60605. Through our wholly-owned subsidiary, Cboe Building Corporation, we own the building in which our principal offices are located and occupy approximately 300,000 square feet of this building.

In addition to our principal offices, we have space located at 8050 Marshall Drive, Lenexa, Kansas, where we lease approximately 61,900 square feet of space. The lease on this space expires in February 2027 and contains two five-year renewal options, as well as a one-time option to terminate in November 2019 if certain contingencies under the lease are met. We have an office located at 17 State Street, New York, New York, where we lease approximately 21,000 square feet of space, which expires in April 2024, and contains one five-year renewal option. The disaster recovery sites in the United States are located in Kansas City, Missouri and Secaucus, New Jersey. In addition, we have agreements with a primary data center in Secaucus, New Jersey and a secondary data center in Chicago, Illinois. Our principal offices in the United Kingdom are at 11 Monument Street, London, where we lease approximately 10,300 square feet of office space, which expires in March 2027. Our work area recovery space is available on invocation with a specialist provider. In Europe, our primary data center is in Slough, England. The secondary data center for Cboe Europe is in Park Royal, London. We operate a back-up location for our London operations in the United Kingdom. We also maintain leased locations in California, Florida, Singapore, Amsterdam, and Hong Kong.

We believe that our properties are in good operating condition and adequately serve our current business operations. Generally, our properties are not earmarked for use by a particular segment. Instead, most of our properties are used by two or more segments. We also anticipate that suitable additional or alternative space will be available at commercially reasonable terms for future expansion to the extent necessary.

Item 3.Legal Proceedings

Cboe incorporates herein by reference the discussion set forth in Note 21 (“Income Taxes”) and Note 23 (“Commitments, Contingencies, and Guarantees– Legal Proceedings”) of the consolidated financial statements included herein.

Item 4.Mine Safety Disclosures

Not applicable.

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PART II

Item 5.Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Common Stock

The Company's common stock is listed on Cboe BZX under the trading symbol CBOE. On September 17, 2018, we voluntarily delisted our common stock from Nasdaq Global Select Market and transferred the listing to Cboe BZX Exchange. As of January 31, 2019, there were approximately 163 holders of record of our common stock.

Dividends

Each share of common stock, including restricted stock awards and restricted stock units, is entitled to receive dividend and dividend equivalents, respectively, if, as and when declared by the board of directors of the Company.

The Company’s expectation is to continue to pay dividends. The decision to pay a dividend, however, remains within the discretion of the Company's board of directors and may be affected by various factors, including our earnings, financial condition, capital requirements, level of indebtedness and other considerations our board of directors deems relevant. Future debt obligations and statutory provisions, among other things, may limit, or in some cases prohibit, our ability to pay dividends.

As a holding company, the Company's ability to declare and continue to pay dividends in the future with respect to its common stock will also be dependent upon the ability of its subsidiaries to pay dividends to it under applicable corporate law.

Recent Sales of Unregistered Securities

Not applicable.

Use of Proceeds

Not applicable.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

Share Repurchase Program

In 2011, the board of directors approved an initial authorization for the Company to repurchase shares of its outstanding common stock of $100 million and approved additional authorizations of $100 million in each of 2012, 2013, 2014, 2015 and 2016, $150 million in February 2018, and $100 million in August 2018, for a total authorization of $850 million. The program permits the Company to purchase shares through a variety of methods, including in the open market or through privately negotiated transactions, in accordance with applicable securities laws. It does not obligate the Company to make any repurchases at any specific time or situation.

Under the program, for the year ended December 31, 2018, the Company repurchased 1,347,954 shares of common stock at an average cost per share of $104.52, totaling $140.9 million. Since inception of the program through December 31, 2018, the Company has repurchased 12,295,355 shares of common stock at an average cost per share of $52.37, totaling $643.9 million.

As of December 31, 2018, the Company had $206.1 million of availability remaining under its existing share repurchase authorizations.

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Purchase of common stock from employees

During the fiscal quarter ended December 31, 2018, we purchased shares from employees in connection with the settlement of employee tax withholding obligations arising from the vesting of restricted stock units, restricted stock awards, and stock options. The table below represents repurchases made by or on behalf of us or any “affiliated purchaser” of our common stock during the fiscal quarter ended December 31, 2018:

Period	Total number of shares purchased		Average price paid per share
October 1 to October 31, 2018	120	$	104.91
November 1 to November 30, 2018	6,207		112.49
December 1 to December 31, 2018	45,870		106.18
Total	52,197		106.93

Stockholder Return Performance Graph

The following graph compares the cumulative total return provided to stockholders on our common stock since our initial public offering against the return of the S&P 500 Index and a customized peer group that includes CME Group Inc., Intercontinental Exchange Inc., and Nasdaq, Inc.

An investment of $100, with reinvestment of all dividends, is assumed to have been made in our common stock, the index and the peer groups on December 31, 2013, and its performance is tracked on an annual basis through December 31, 2018.

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Comparison of Cumulative Total Return of the

Company, Peer Groups, Industry Indexes and/or Broad Markets

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

Among Cboe Global Markets, Inc., the S&P 500 Index

and a Peer Group

	12/13	12/14	12/15	12/16	12/17	12/18
Cboe Global Markets, Inc.	100.00	123.82	128.48	148.42	253.01	200.89
S&P 500	100.00	113.69	115.26	129.05	157.22	150.33
Peer Group	100.00	113.10	131.68	159.36	199.20	233.49

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Item 6.Selected Financial Data

The following selected financial and operating data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and the accompanying notes included in Items 7 and 8, respectively of this Form 10-K. The information set forth below is not necessarily indicative of our future results for any period. We completed the acquisition of Bats during 2017 and included the financial results of Bats in our consolidated financial results from March 1, 2017.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in millions, except per share data)				
Consolidated Statements of Operations Data:					
Revenues:					
Transaction fees	$ 1,986.9	$ 1,564.9	$ 509.3	$ 485.3	$ 466.9
Access fees	127.9	106.8	52.4	53.3	59.3
Exchange services and other fees	83.1	74.8	46.3	42.2	38.0
Market data fees	204.0	164.5	33.2	30.0	30.5
Regulatory fees	333.9	291.5	48.3	33.5	37.1
Other revenue	33.0	26.6	13.6	19.5	14.6
Total revenues	2,768.8	2,229.1	703.1	663.8	646.4
Cost of revenues:					
Liquidity payments	1,113.0	849.7	35.8	29.2	29.1
Routing and clearing	39.1	37.6	11.1	2.3	4.1
Section 31 fees (1)	302.4	260.0	11.8	—	—
Royalty fees	97.4	86.2	78.0	70.6	66.1
Total cost of revenues	1,551.9	1,233.5	136.7	102.1	99.3
Revenues less cost of revenues	1,216.9	995.6	566.4	561.7	547.1
Operating expenses:					
Compensation and benefits	228.8	201.4	113.2	105.9	121.7
Depreciation and amortization	204.0	192.2	44.4	46.3	40.0
Technology support services	47.9	42.1	22.5	20.7	19.2
Professional fees and outside services	68.3	66.0	53.1	50.1	32.0
Travel and promotional expenses	13.0	17.2	11.0	9.0	9.0
Facilities costs	11.5	10.3	5.7	5.0	5.7
Acquisition-related costs	30.0	84.4	13.6	—	—
Other expenses	14.0	10.1	4.7	4.8	5.7
Total operating expenses	617.5	623.7	268.2	241.8	233.3
Operating income	599.4	371.9	298.2	319.9	313.8
Interest (expense) income, net	(38.2)	(41.3)	(5.7)	—	—
Other income (expense)	10.0	3.8	14.1	4.1	(4.1)
Income before income tax provision	571.2	334.4	306.6	324.0	309.7
Income tax provision	146.0	(66.2)	120.9	119.0	120.0
Net income	$ 425.2	$ 400.6	$ 185.7	$ 205.0	$ 189.7
Net loss attributable to noncontrolling interests	1.3	1.1	1.1	—	—
Net income excluding noncontrolling interests	426.5	401.7	186.8	205.0	189.7
Change in redemption value of noncontrolling interests	(1.3)	(1.1)	(1.1)	—	—
Net income allocated to participating securities	(3.1)	(3.9)	(0.8)	(0.9)	(1.3)

Net income allocated to common stockholders	$ 422.1	$ 396.7	$ 184.9	$ 204.1	$ 188.4
Basic earnings per share	$ 3.78	$ 3.70	$ 2.27	$ 2.46	$ 2.21
Diluted earnings per share	$ 3.76	$ 3.69	$ 2.27	$ 2.46	$ 2.21
Basic weighted average shares outstanding	111.8	107.2	81.4	83.1	85.4
Diluted weighted average shares outstanding	112.2	107.5	81.4	83.1	85.4
Distributions per share	$ 1.16	$ 1.04	$ 0.96	$ 0.88	$ 0.78

(1) As national securities exchanges, Cboe Options, C2, BZX, BYX, EDGX, and EDGA are assessed fees pursuant to Section 31 of the Exchange Act. Section 31 fees are assessed on the notional value traded and are designed to recover the costs to the government of supervision and regulation of securities markets and securities professionals. Section 31 fees are paid directly to the SEC, and our national securities exchanges then pass these costs along to our members as regulatory transaction fees, recognizing these amounts as incurred in cost of revenues and revenues, respectively.

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	As of December 31,				
	2018	2017	2016	2015	2014
	(in millions)				
Balance Sheet Data:					
Assets:					
Cash and cash equivalents	$ 275.1	$ 143.5	$ 97.3	$ 102.3	$ 147.9
Financial investments	35.7	47.3	—	—	—
Goodwill and intangible assets, net	4,411.6	4,610.0	35.2	10.1	—
Total assets	$ 5,321.0	$ 5,265.7	$ 476.7	$ 384.8	$ 383.9
Liabilities and stockholders' equity:					
Short-term and long-term debt	$ 1,215.4	$ 1,237.9	$ —	$ —	$ —
Total liabilities	2,070.6	2,145.7	146.2	125.2	133.8
Total redeemable noncontrolling interest	9.4	9.4	12.6	—	—
Total stockholders' equity	3,241.0	3,110.6	317.9	259.6	250.1
Total liabilities, redeemable noncontrolling interest, and stockholders' equity	$ 5,321.0	$ 5,265.7	$ 476.7	$ 384.8	$ 383.9

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Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations

Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") should be read in conjunction with the consolidated financial statements of the Company and the notes thereto included in Item 8 of this Annual Report on Form 10-K. The following discussion contains forward-looking statements. Actual results could differ materially from the results discussed in the forward-looking statements. See "Risk Factors" and "Forward-Looking Statements" above.

Overview

Cboe Global Markets, Inc. is one of the world’s largest exchange holding companies, offering cutting-edge trading and investment solutions to investors around the world. The Company is committed to relentless innovation, connecting global markets with world-class technology, and providing seamless solutions that enhance the customer experience.

Cboe offers trading across a diverse range of products in multiple asset classes and geographies, including options, futures, U.S. and European equities, exchange-traded products, global foreign exchange and multi-asset volatility products based on the VIX, the world’s barometer for equity market volatility.

Cboe’s trading venues include the largest options exchange in the U.S. by volume and the largest stock exchange by value traded in Europe. In addition, the Company is one of the largest stock exchange operators in the U.S. by volume and a leading market globally for ETP trading.

The Company is headquartered in Chicago with offices in Kansas City, New York, London, San Francisco, Singapore, Hong Kong, and Ecuador.

On February 28, 2017, pursuant to the Agreement and Plan of Merger, dated as of September 25, 2016, Cboe acquired Bats Global Markets, Inc. The year ended December 31, 2017 includes financial results for Bats for the period from March 1, 2017 through December 31, 2017.

Business Segments

We previously operated as a single reportable business segment as of December 31, 2016. As a result of the Merger, in 2017, we began reporting five segments: Options, U.S. Equities, Futures, European Equities, and Global FX. Segment performance is primarily based on operating income (loss). We have aggregated all of our corporate costs and eliminations, as well as other business ventures, within Corporate Items and Eliminations; however, operating expenses that relate to activities of a specific segment have been allocated to that segment. Our management allocates resources, assesses performance and manages our business according to these segments:

Options. Our Options segment includes trading of listed market indexes (index options), mostly on an exclusive basis, as well as on non-exclusive "multiply-listed" options, such as options on the stocks of individual corporations (equity options) and options on other exchange-traded products (ETP options), such as exchange-traded funds (ETF options) and exchange-traded notes (ETN options) that occur on Cboe Options, C2, BZX and EDGX. It also includes the listed equity and ETP options routed transaction services that occur on Cboe Trading.

U.S. Equities. Our U.S. Equities segment includes trading of listed cash equities and ETP transaction services that occur on BZX, BYX, EDGX and EDGA. It also includes the listings business where ETPs and the Company are listed on BZX.

Futures. Our Futures segment includes trading of futures on the VIX Index and bitcoin, and other products that occur on CFE, our all-electronic futures exchange.

European Equities. Our European Equities segment includes trading of pan European listed equities transaction services, ETPs, exchange traded commodities, and international depository receipts that occur on the RIE, operated by

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Cboe Europe Equities. It also includes the listed cash equities and ETPs routed transaction services that occurred through Cboe Chi-X Europe, as well as the listings business where ETPs can be listed on Cboe Europe Equities.

Global FX. Our Global FX segment includes institutional FX services on the Cboe FX platform, as well as non-deliverable forward FX transactions executed on Cboe SEF.

Factors Affecting Results of Operations

In broad terms, our business performance is impacted by a number of drivers, including macroeconomic events affecting the risk and return of financial assets, investor sentiment, the regulatory environment for capital markets, geopolitical events, central bank policies and changing technology, particularly in the financial services industry. Our future revenues and net income will continue to be influenced by a number of domestic and international economic trends, including:

- trading volumes on our proprietary products such as VIX options and futures and SPX options;
- trading volumes in listed cash equity securities and ETPs in both the U.S. and Europe, volumes in listed equity options, and volumes in institutional FX trading, all of which are driven primarily by overall macroeconomic conditions;
- the demand for the U.S. tape plan market data distributed by the Securities Information Processors (SIPs), which determines the pool size of the industry market data revenue we receive based on our market share;
- the demand for information about, or access to, our markets, which is dependent on the products we trade, our importance as a liquidity center and the quality and pricing of our data and access services;
- consolidation of our customers and competitors in the industry,
- continuing pressure in transaction fee pricing due to intense competition in the United States and Europe; and
- regulatory changes relating to market structure and increased capital requirements, and those which affect certain types of instruments, transactions, pricing structures, capital market participants or reporting or compliance requirements, including any changes resulting from Brexit.

A number of significant structural, political and monetary issues continue to confront the global economy, and instability could return at any time, resulting in an increased level of market volatility, increased trading volumes and a return of uncertainty. In contrast, many of the largest customers of our transactional businesses continue to adapt their business models as they address the implementation of regulatory changes initiated following the global financial crisis.

Components of Revenues

Transaction Fees

Transaction fees represent fees charged by the Company for the performance obligation of executing a trade on its markets. These fees can be variable based on trade volume tiered discounts, however as all tiered discounts are calculated monthly, the actual discount is recorded on a monthly basis. Transaction fees, as well as any tiered volume discounts, are calculated and billed monthly in accordance with the Company’s published fee schedules. Transaction fees are recognized across all segments. The Company also pays liquidity payments to customers based on its published fee schedules. The Company uses these payments to improve the liquidity on its markets and therefore recognizes those payments as a cost of revenue.

Access Fees

Access fees represent fees assessed for the opportunity to trade, including fees for trading-related functionality and connectivity across all segments. They are billed monthly in accordance with the Company’s published fee schedules and recognized on a monthly basis when the performance obligation is met. There is no remaining performance obligation after revenue is recognized.

Exchange Services and Other Fees

To facilitate trading, the Company offers technology services, terminal and other equipment rights, maintenance services, trading floor space, trading floor connectivity and telecommunications services. Trading floor and equipment rights are generally on a month-to-month basis. Facilities, systems services and other fees are generally monthly fee-based, although certain services are influenced by trading volume or other defined metrics, others are based solely on demand. All fees associated with the trading floor are recognized in the Options segment.

Market Data Fees

Market data fees represent the fees from the U.S. tape plans and fees from customers for proprietary market data. Fees from the U.S. tape plans are collected monthly based on published fee schedules and distributed quarterly to the U.S. exchanges based on a known formula using trading and/or quoting activity. A contract for proprietary market data is entered into and charged on a monthly basis in accordance with the Company's published fee schedules as the service is provided. Both types of market data are satisfied over time, and revenue is recognized on a monthly basis as the customer receives and consumes the benefit as the Company provides the data. U.S. tape plan market data is recognized in the U.S. Equities and Options segments. Proprietary market data fees are recognized across all segments.

Regulatory Fees

Regulatory fees primarily represent fees collected by the Company to cover the Section 31 fees charged to the Exchanges under the authority of the SEC (Cboe Options, C2, BZX, BYX, EDGX and EDGA) and are charged by the SEC. Consistent with industry practice, the fees charged to customers are based on the fee set by the SEC per notional value of the transaction executed on the Company's markets and calculated and billed monthly. These fees are recognized in the U.S. Equities and Options segments and as the exchanges are responsible for the ultimate payment to the SEC, the exchanges are considered the principals in these transactions. Regulatory fees also include the options regulatory fee (ORF) charged to customers which supports the Company's regulatory oversight function in the Options segment.

Other Revenue

Other revenue primarily includes among other items, revenue from various licensing agreements, all fees related to the trade reporting facility operated in the European Equities segment, and revenue associated with advertisements through the Company's website.

Components of Cost of Revenues

Liquidity Payments

Liquidity payments are directly correlated to the volume of securities traded on our markets. As stated above, we record the liquidity rebates paid to market participants providing liquidity, in the case of C2, BZX, EDGX and Cboe Europe Equities, as cost of revenue. BYX and EDGA offer a pricing model pursuant to which we rebate liquidity takers for executing against an order resting on our book, which is also recorded as a cost of revenue.

Routing and clearing

Various rules require that U.S. options and cash equities trade executions occur at the National Best Bid/Offer (NBBO) displayed by any exchange. Linkage order routing consists of the cost incurred to provide a service whereby

Cboe equity and options exchanges deliver orders to other execution venues when there is a potential for obtaining a better execution price or when instructed to directly route an order to another venue by the order provider. The service affords exchange order flow providers an opportunity to obtain the best available execution price and may also result in cost benefits to those clients. Such an offering improves our competitive position and provides an opportunity to attract orders which would otherwise bypass our exchanges. We utilize third-party brokers or our broker-dealer, Cboe Trading, to facilitate such delivery.

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Section 31 Fees

Exchanges under the authority of the SEC (Cboe Options, C2, BZX, BYX, EDGX and EDGA) are assessed fees pursuant to the Exchange Act designed to recover the costs to the U.S. government of supervision and regulation of securities markets and securities professionals. We treat these fees as a pass-through charge to customers executing eligible listed cash equities and listed equity options trades. Accordingly, we recognize the amount that we are charged under Section 31 as a cost of revenues and the corresponding amount that we charge our customers as regulatory transaction fees revenue. Since the regulatory transaction fees recorded in revenues are equal to the Section 31 fees recorded in cost of revenues, there is no impact on our operating income. CFE, Cboe Europe Equities and Cboe FX are not U.S. national securities exchanges, and accordingly are not charged Section 31 fees.

Royalty Fees

Royalty fees primarily consist of license fees paid by us for the use of underlying indexes in our proprietary products usually based on contracts traded. The Company has licenses with the owners of the S&P 500 Index, S&P 100 Index and certain other S&P indexes, FTSE Russell indexes, the DJIA, MSCI, and certain other index products. This category also includes fees related to the dissemination of market data related to S&P indexes.

Components of Operating Expenses

Compensation and Benefits

Compensation and benefits represent our largest expense category and tend to be driven by our staffing requirements, financial performance, and the general dynamics of the employment market. Stock-based compensation is a non-cash expense related to equity awards. Stock-based compensation can vary depending on the quantity and fair value of the award on the date of grant and the related service period.

Depreciation and Amortization

Depreciation and amortization expense results from the depreciation of long-lived assets purchased and the amortization of purchased and internally developed software, and the amortization of intangible assets.

Technology Support Services

Technology support services consists primarily of costs related to the maintenance of computer equipment supporting our system architecture, circuits supporting our wide area network, support for production software, fees paid to information vendors for displaying data and off-site system hosting fees.

Professional Fees and Outside Services

Professional fees and outside services consist primarily of consulting services, which include supplemental staff activities primarily related to systems development and maintenance, legal, regulatory and audit, and tax advisory services.

Travel and Promotional Expenses

Travel and promotional expenses primarily consist of advertising, costs for special events, sponsorship of industry conferences, options education seminars and travel-related expenses.

Facilities Costs

Facilities costs primarily consist of expenses related to owned and leased properties including rent, maintenance, utilities, real estate taxes and telecommunications costs.

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Acquisition-Related Costs

Acquisition-related costs relate to acquisitions and other strategic opportunities, including the Merger. The acquisition-related costs include fees for investment banking advisors, lawyers, accountants, tax advisors, public relations firms, severance and retention costs, impairment of capitalized software and other external costs directly related to the mergers and acquisitions, as well as compensation-related expenses.

Other Expenses

Other expenses represent costs necessary to support our operations that are not already included in the above categories.

Non-Operating Income (Expense)

Income and expenses incurred through activities outside of our core operations are considered non-operating and are classified as other income/(expense). These activities primarily include interest earned on the investing of excess cash, interest expense related to outstanding debt facilities, dividend income and equity earnings or losses from our investments in other business ventures.

Results of Operations

The comparability of our results of operations between reported periods is impacted by the acquisition of Bats on February 28, 2017. Operating results and other financial metrics for U.S. Equities, European Equities and Global FX represent activity for the ten months ended December 31, 2017. The following are summaries of changes in financial performance and include certain non-GAAP financial measures. These non-GAAP financials measures assist management in comparing our performance on a consistent basis for purposes of business decision making by removing the impact of certain items management believes do not reflect our underlying operations. Please see the footnotes below for additional information and reconciliations from our consolidated financial statements.

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Comparison of Years Ended December 31, 2018 and 2017

Overview

The following summarizes changes in financial performance for the year ended December 31, 2018, compared to the year ended December 31, 2017:

	Year Ended December 31, 2018	2017	Increase/ (Decrease)	Percent Change	
	(in millions, except percentages, earnings per share, and as noted below)				
Total revenues	$ 2,768.8	$ 2,229.1	$ 539.7	24.2	%
Total cost of revenues	1,551.9	1,233.5	318.4	25.8	%
Revenues less cost of revenues	1,216.9	995.6	221.3	22.2	%
Total operating expenses	617.5	623.7	(6.2)	(1.0)	%
Operating income	599.4	371.9	227.5	61.2	%
Income before income tax provision	571.2	334.4	236.8	70.8	%
Income tax provision	146.0	(66.2)	212.2		