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

# FORM 10-Q

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

**For the quarterly period ended September 30, 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 number: 000-32651**

# Nasdaq, Inc.
**(Exact name of registrant as specified in its charter)**

| | |
|---|---|
| **Delaware**<br>**(State or Other Jurisdiction of Incorporation or Organization)** | **52-1165937**<br>**(I.R.S. Employer Identification No.)** |
| **One Liberty Plaza, New York, New York**<br>**(Address of Principal Executive Offices)** | **10006**<br>**(Zip Code)** |

**Registrant’s telephone number, including area code:**
**+1 212 401 8700**

**No changes**
**(Former name, former address and former fiscal year, if changed since last report)**

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

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

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

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

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

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

Indicate the number of shares outstanding of each of the issuer’s classes of common stock, as of the latest practicable date.

| Class | Outstanding at October 30, 2018 |
|---|---|
| Common Stock, $.01 par value per share | 163,957,026 shares |

**Nasdaq, Inc.**
**Form 10-Q**
**For the Quarterly Period Ended September 30, 2018**

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## About This Form 10-Q

Throughout this Form 10-Q, unless otherwise specified:

- "Nasdaq," "we," "us" and "our" refer to Nasdaq, Inc.
- "Nasdaq Baltic" refers to collectively, Nasdaq Tallinn AS, Nasdaq Riga, AS, and AB Nasdaq Vilnius.
- "Nasdaq BX" refers to the cash equity exchange operated by Nasdaq BX, Inc.
- "Nasdaq BX Options" refers to the options exchange operated by Nasdaq BX, Inc.
- "Nasdaq Clearing" refers to the clearing operations conducted by Nasdaq Clearing AB.
- "Nasdaq GEMX" refers to the options exchange operated by Nasdaq GEMX, LLC.
- "Nasdaq ISE" refers to the options exchange operated by Nasdaq ISE, LLC.
- "Nasdaq MRX" refers to the options exchange operated by Nasdaq MRX, LLC.
- "Nasdaq Nordic" refers to collectively, Nasdaq Clearing AB, Nasdaq Stockholm AB, Nasdaq Copenhagen A/S, Nasdaq Helsinki Ltd, and Nasdaq Iceland hf.
- "Nasdaq PHLX" refers to the options exchange operated by Nasdaq PHLX LLC.
- "Nasdaq PSX" refers to the cash equity exchange operated by Nasdaq PHLX LLC.
- "The Nasdaq Options Market" refers to the options exchange operated by The Nasdaq Stock Market LLC.
- "The Nasdaq Stock Market" refers to the cash equity exchange operated by The Nasdaq Stock Market LLC.

* * * * * *

Nasdaq also provides as a tool for the reader the following list of abbreviations and acronyms that are used throughout this Quarterly Report on Form 10-Q.

401(k) Plan: Voluntary Defined Contribution Savings Plan

2016 Credit Facility: $400 million senior unsecured term loan facility which matures on November 25, 2019

2017 Credit Facility: $1 billion senior unsecured revolving credit facility which matures on April 25, 2022

2019 Notes: $500 million aggregate principal amount of senior unsecured floating rate notes due March 22, 2019 with an interest rate equal to the three-month U.S. dollar LIBOR plus 0.39%

2020 Notes: $600 million aggregate principal amount of 5.55% senior unsecured notes due January 15, 2020

2021 Notes: €600 million aggregate principal amount of 3.875% senior unsecured notes due June 7, 2021

2023 Notes: €600 million aggregate principal amount of 1.75% senior unsecured notes due May 19, 2023

2024 Notes: $500 million aggregate principal amount of 4.25% senior unsecured notes due June 1, 2024

2026 Notes: $500 million aggregate principal amount of 3.85% senior unsecured notes due June 30, 2026

ASU: Accounting Standards Update

BWise: BWise Beheer B.V. and its subsidiaries

CCP: Central Counterparty

EMIR: European Market Infrastructure Regulation

Equity Plan: Nasdaq Equity Incentive Plan

ESPP: Nasdaq Employee Stock Purchase Plan

ETP: Exchange Traded Product

eVestment: eVestment, Inc. and its subsidiaries

Exchange Act: Securities Exchange Act of 1934, as amended

FASB: Financial Accounting Standards Board

FICC: Fixed Income and Commodities Trading and Clearing

FINRA: Financial Industry Regulatory Authority

IPO: Initial Public Offering

ISE: U.S. Exchange Holdings, Inc. and its subsidiaries

LCH: LCH Group Holdings Limited

LIBOR: London Interbank Offered Rate

MTF: Multilateral Trading Facility

NFX: Nasdaq Futures, Inc.

NPM: The NASDAQ Private Market, LLC

NSCC: National Securities Clearing Corporation

OCC: The Options Clearing Corporation

OTC: Over-the-Counter

PSU: Performance Share Unit

Regulation NMS: Regulation National Market System

SEC: U.S. Securities and Exchange Commission

SERP: Supplemental Executive Retirement Plan

SFSA: Swedish Financial Supervisory Authority

S&P: Standard & Poor's

S&P 500: S&P 500 Stock Index

TSR: Total Shareholder Return

U.S. GAAP: U.S. Generally Accepted Accounting Principles

UTP: Unlisted Trading Privileges

UTP Plan: Joint SRO Plan Governing the Collection, Consolidation, and Dissemination of Quotation and Transaction Information for Nasdaq-Listed Securities Traded on Exchanges on a UTP Basis

* * * * *

NASDAQ, the NASDAQ logos, and other brand, service or product names or marks referred to in this report are trademarks or services marks, registered or otherwise, of Nasdaq, Inc. and/or its subsidiaries. FINRA and TRADE REPORTING FACILITY are registered trademarks of FINRA.

* * * * * *

This Quarterly Report on Form 10-Q 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. For market comparison purposes, The Nasdaq Stock Market data in this Quarterly Report on Form 10-Q for IPOs is based on data generated internally by us, which includes best efforts underwritings; therefore, the data may not be comparable to other publicly-available IPO data. Data in this Quarterly Report on Form 10-Q for new listings of equity securities on The Nasdaq Stock Market is based on data generated internally by us, which includes best efforts underwritings, issuers that switched from other listing venues, closed-end funds and ETPs. Data in this Quarterly Report on Form 10-Q for IPOs and new listings of equity securities on the Nasdaq Nordic and Nasdaq Baltic exchanges also is based on data generated internally by us. IPOs and new listings data is presented as of period end. 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" section in this Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, the "Risk Factors" section in the Quarterly Report on Form 10-Q for the quarter ended June 30, 2018 that was filed with the SEC on August 1, 2018, the "Risk Factors" section in the Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 that was filed with the SEC on May 2, 2018, and the "Risk Factors" section in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 that was filed with the SEC on February 28, 2018.

* * * * * *

Nasdaq intends to use its website, ir.nasdaq.com, as a means for disclosing material non-public information and for complying with SEC Regulation FD and other disclosure obligations. These disclosures will be included on Nasdaq's website under "Investor Relations."

## Forward-Looking Statements

*The SEC encourages companies to disclose forward-looking information so that investors can better understand a company's future prospects and make informed investment decisions. This Quarterly Report on Form 10-Q contains these types of statements. Words such as "may," "will," "could," "should," "anticipates," "envisions," "estimates," "expects," "projects," "intends," "plans," "believes" and words or terms of similar substance used in connection with any discussion of future expectations as to industry and regulatory developments or business initiatives and strategies, future operating results or financial performance, and other future developments identify forward-looking statements. These include, among others, statements relating to:*

- *our strategy, growth forecasts and 2018 outlook;*
- *the integration of acquired businesses, including accounting decisions relating thereto;*
- *the scope, nature or impact of acquisitions, divestitures, investments, joint ventures or other transactional activities;*
- *the effective dates for, and expected benefits of, ongoing initiatives, including transactional activities and other strategic, restructuring, technology, de-leveraging and capital return initiatives;*
- *our products, order backlog and services;*
- *the impact of pricing changes;*
- *tax matters;*
- *the cost and availability of liquidity and capital; and*
- *any litigation, or any regulatory or government investigation or action, to which we are or could become a party or which may affect us.*

*Forward-looking statements involve risks and uncertainties. Factors that could cause actual results to differ materially from those contemplated by the forward-looking statements include, among others, the following:*

- *our operating results may be lower than expected;*
- *our ability to successfully integrate acquired businesses or divest sold businesses or assets, including the fact that any integration may be more difficult, time consuming or costly than expected, and we may be unable to realize synergies from business combinations, acquisitions, divestitures or other transactional activities;*
- *loss of significant trading and clearing volumes or values, fees, market share, listed companies, market data products customers or other customers;*
- *our ability to keep up with rapid technological advances and adequately address cybersecurity risks;*
- *economic, political and market conditions and fluctuations, including interest rate and foreign currency risk, inherent in U.S. and international operations;*
- *the performance and reliability of our technology and technology of third parties on which we rely;*
- *any significant error in our operational processes;*
- *our ability to continue to generate cash and manage our indebtedness; and*
- *adverse changes that may occur in the litigation or regulatory areas, or in the securities markets generally.*

*Most of these factors are difficult to predict accurately and are generally beyond our control. You should consider the uncertainty and any risk related to forward-looking statements that we make. These risk factors are discussed under the caption "Part II. Item 1A. Risk Factors," in this Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, our Quarterly Report on Form 10-Q for the quarter ended June 30, 2018 that was filed with the SEC on August 1, 2018, our Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 that was filed with the SEC on May 2, 2018, and more fully described in the "Risk Factors," section in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 that was filed with the SEC on February 28, 2018. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this report. You should carefully read this entire Quarterly Report on Form 10-Q, including "Part I. Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations," and the condensed consolidated financial statements and the related notes. Except as required by the federal securities laws, we undertake no obligation to update any forward-looking statement, release publicly any revisions to any forward-looking statements or report the occurrence of unanticipated events. For any forward-looking statements contained in any document, we claim the protection of the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995.*

## PART I - FINANCIAL INFORMATION
## Item 1. Financial Statements.
## Nasdaq, Inc.
## Condensed Consolidated Balance Sheets
## (in millions, except share and par value amounts)

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| | (unaudited) | |
| **Assets** | | |
| Current assets: | | |
| Cash and cash equivalents | $ 324 | $ 377 |
| Restricted cash | 52 | 22 |
| Financial investments, at fair value | 202 | 235 |
| Receivables, net | 356 | 356 |
| Default funds and margin deposits | 4,219 | 3,988 |
| Other current assets | 304 | 235 |
| Assets held for sale | — | 297 |
| Total current assets | 5,457 | 5,510 |
| Property and equipment, net | 371 | 400 |
| Goodwill | 6,369 | 6,586 |
| Intangible assets, net | 2,328 | 2,468 |
| Other non-current assets | 330 | 390 |
| Total assets | $ 14,855 | $ 15,354 |
| **Liabilities** | | |
| Current liabilities: | | |
| Accounts payable and accrued expenses | $ 176 | $ 177 |
| Section 31 fees payable to SEC | 21 | 128 |
| Accrued personnel costs | 145 | 170 |
| Deferred revenue | 257 | 161 |
| Other current liabilities | 173 | 85 |
| Default funds and margin deposits | 4,219 | 3,988 |
| Short-term debt | 808 | 480 |
| Liabilities held for sale | — | 45 |
| Total current liabilities | 5,799 | 5,234 |
| Long-term debt | 3,072 | 3,727 |
| Deferred tax liabilities, net | 137 | 225 |
| Non-current deferred revenue | 91 | 126 |
| Other non-current liabilities | 154 | 162 |
| Total liabilities | 9,253 | 9,474 |
| **Commitments and contingencies** | | |
| **Equity** | | |
| Nasdaq stockholders' equity: | | |
| Common stock, $0.01 par value, 300,000,000 shares authorized, shares issued: 169,423,805 at September 30, 2018 and 172,373,432 at December 31, 2017; shares outstanding: 163,949,047 at September 30, 2018 and 167,441,030 at December 31, 2017 | 2 | 2 |
| Additional paid-in capital | 2,676 | 3,024 |
| Common stock in treasury, at cost: 5,474,758 shares at September 30, 2018 and 4,932,402 shares at December 31, 2017 | (291) | (247) |
| Accumulated other comprehensive loss | (1,184) | (862) |
| Retained earnings | 4,399 | 3,963 |
| Total Nasdaq stockholders' equity | 5,602 | 5,880 |
| Total liabilities and equity | $ 14,855 | $ 15,354 |

See accompanying notes to condensed consolidated financial statements.

**Nasdaq, Inc.**
**Condensed Consolidated Statements of Income**
**(Unaudited)**
**(in millions, except per share amounts)**

| | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|---|---|---|---|---|
| | 2018 | 2017 | 2018 | 2017 |
| **Revenues:** | | | | |
| Market Services | $ 586 | $ 581 | $ 1,968 | $ 1,808 |
| Corporate Services | 131 | 126 | 395 | 370 |
| Information Services | 179 | 150 | 528 | 432 |
| Market Technology | 68 | 62 | 194 | 176 |
| Other revenues | — | 46 | 56 | 143 |
| **Total revenues** | 964 | 965 | 3,141 | 2,929 |
| **Transaction-based expenses:** | | | | |
| Transaction rebates | (293) | (266) | (947) | (874) |
| Brokerage, clearance and exchange fees | (71) | (96) | (312) | (275) |
| **Revenues less transaction-based expenses** | 600 | 603 | 1,882 | 1,780 |
| **Operating expenses:** | | | | |
| Compensation and benefits | 164 | 167 | 534 | 489 |
| Professional and contract services | 33 | 38 | 105 | 110 |
| Computer operations and data communications | 32 | 32 | 94 | 91 |
| Occupancy | 23 | 23 | 72 | 69 |
| General, administrative and other | 28 | 15 | 73 | 64 |
| Marketing and advertising | 7 | 7 | 27 | 22 |
| Depreciation and amortization | 53 | 47 | 159 | 140 |
| Regulatory | 8 | 9 | 24 | 25 |
| Merger and strategic initiatives | 6 | 3 | 7 | 20 |
| **Total operating expenses** | 354 | 341 | 1,095 | 1,030 |
| **Operating income** | 246 | 262 | 787 | 750 |
| Interest income | 3 | 2 | 8 | 6 |
| Interest expense | (38) | (34) | (112) | (107) |
| Net gain on divestiture of businesses | (8) | — | 33 | — |
| Other investment income | — | — | 7 | 2 |
| Net income from unconsolidated investees | 6 | 4 | 13 | 10 |
| **Income before income taxes** | 209 | 234 | 736 | 661 |
| Income tax provision | 46 | 64 | 234 | 178 |
| **Net income attributable to Nasdaq** | $ 163 | $ 170 | $ 502 | $ 483 |
| **Per share information:** | | | | |
| Basic earnings per share | $ 0.99 | $ 1.02 | $ 3.03 | $ 2.91 |
| Diluted earnings per share | $ 0.97 | $ 1.00 | $ 2.99 | $ 2.85 |
| Cash dividends declared per common share | $ 0.44 | $ 0.38 | $ 1.26 | $ 1.08 |

See accompanying notes to condensed consolidated financial statements.

**Nasdaq, Inc.**
**Condensed Consolidated Statements of Comprehensive Income**
**(Unaudited)**
**(in millions)**

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 |
|---|---|---|---|---|
| **Net income** | $ 163 | $ 170 | $ 502 | $ 483 |
| Other comprehensive income (loss): | | | | |
| Foreign currency translation gains (losses): | | | | |
| Net foreign currency translation gains (losses) | 22 | 92 | (239) | 258 |
| Income tax (expense)[1] | (15) | (25) | (76) | (104) |
| Total | 7 | 67 | (315) | 154 |
| Employee benefit plan income tax (expense)[1] | — | — | (7) | — |
| Total other comprehensive income (loss), net of tax | 7 | 67 | (322) | 154 |
| **Comprehensive income attributable to Nasdaq** | $ 170 | $ 237 | $ 180 | $ 637 |

[1] For the nine months ended September 30, 2018, includes the reclassification of the stranded tax effects related to the Tax Cuts and Jobs Act. See Note 17, “Income Taxes,” for further discussion.

See accompanying notes to condensed consolidated financial statements.

**Nasdaq, Inc.**
**Condensed Consolidated Statements of Cash Flows**
**(Unaudited)**
**(in millions)**

| | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 |
|---|---|---|
| **Cash flows from operating activities:** | | |
| Net income | $ 502 | $ 483 |
| Adjustments to reconcile net income to net cash provided by operating activities: | | |
| Depreciation and amortization | 159 | 140 |
| Share-based compensation | 51 | 52 |
| Deferred income taxes | (12) | (4) |
| Reversal of certain Swedish tax benefits | 41 | — |
| Net gain on divestiture of businesses | (33) | — |
| Net income from unconsolidated investees | (13) | (10) |
| Other reconciling items included in net income | 10 | 18 |
| Net change in operating assets and liabilities, net of effects of divestiture and acquisitions: | | |
| Receivables, net | (11) | 30 |
| Other assets | (23) | 376 |
| Accounts payable and accrued expenses | 6 | (18) |
| Section 31 fees payable to SEC | (107) | (77) |
| Accrued personnel costs | (22) | (82) |
| Deferred revenue | 74 | 18 |
| Other liabilities | 46 | (66) |
| Net assets held for sale | — | (251) |
| **Net cash provided by operating activities** | 668 | 609 |
| **Cash flows from investing activities:** | | |
| Purchases of trading securities | (294) | (291) |
| Proceeds from sales and redemptions of trading securities | 299 | 334 |
| Purchases of available-for-sale investment securities | (18) | (12) |
| Proceeds from maturities of available-for-sale investment securities | 32 | 30 |
| Proceeds from divestiture of businesses, net | 286 | — |
| Purchases of property and equipment | (72) | (102) |
| Other investment activities | (6) | (32) |
| **Net cash provided by (used in) investing activities** | 227 | (73) |
| **Cash flows from financing activities:** | | |
| Proceeds from (repayments of) commercial paper, net | (170) | 154 |
| Repayments of long-term debt | (115) | (683) |
| Payment of debt extinguishment cost | — | (9) |
| Proceeds from utilization of credit commitment, net of debt issuance costs | — | 10 |
| Proceeds from issuances of senior unsecured notes, net of debt issuance costs | — | 498 |
| Cash paid for repurchase of common stock | (394) | (175) |
| Cash dividends paid | (208) | (180) |
| Proceeds received from employee stock activity | 10 | 32 |
| Payments related to employee shares withheld for taxes | (44) | (65) |
| Proceeds of customer funds | 15 | — |
| **Net cash used in financing activities** | (906) | (418) |
| Effect of exchange rate changes on cash and cash equivalents and restricted cash | (12) | 15 |
| Net increase (decrease) in cash and cash equivalents and restricted cash | (23) | 133 |
| Cash and cash equivalents and restricted cash at beginning of period | 399 | 418 |
| Cash and cash equivalents and restricted cash at end of period | $ 376 | $ 551 |
| **Supplemental Disclosure Cash Flow Information** | | |
| Cash paid for: | | |
| Interest | $ 121 | $ 114 |
| Income taxes, net of refund | $ 195 | $ 126 |

See accompanying notes to condensed consolidated financial statements.

### 1. Organization and Nature of Operations

Nasdaq, Inc. is a leading provider of trading, clearing, marketplace technology, regulatory, securities listing, information and public and private company services. Our global offerings are diverse and include trading and clearing across multiple asset classes, trade management services, market data products, financial indexes, investment data and analytics, capital formation solutions, corporate solutions, and market technology products and services. Our technology powers markets across the globe, supporting equity derivative trading, clearing and settlement, cash equity trading, fixed income trading, trading surveillance and many other functions.

We manage, operate and provide our products and services in four business segments: Market Services, Corporate Services, Information Services and Market Technology.

#### Market Services

Our Market Services segment includes our Equity Derivative Trading and Clearing, Cash Equity Trading, FICC and Trade Management Services businesses. We operate multiple exchanges and other marketplace facilities across several asset classes, including derivatives, commodities, cash equity, debt, structured products and ETPs. In addition, in some countries where we operate exchanges, we also provide broker services, clearing, settlement and central depository services. Our transaction-based platforms provide market participants with the ability to access, process, display and integrate orders and quotes. The platforms allow the routing and execution of buy and sell orders as well as the reporting of transactions, providing fee-based revenues.

In the U.S., we operate six electronic options exchanges and three cash equity exchanges. The Nasdaq Stock Market, the largest of our cash equities exchanges, is the largest single venue of liquidity for trading U.S.-listed cash equities. We also operate an electronic platform for trading of U.S. Treasuries and NFX, a U.S. based designated contract market which lists cash-settled energy derivatives based on key energy benchmarks including oil, natural gas and U.S. power. In addition, we also operate a Canadian exchange for the trading of Canadian-listed securities.

In Europe, we operate exchanges in Stockholm (Sweden), Copenhagen (Denmark), Helsinki (Finland), and Reykjavik (Iceland), as well as the clearing operations of Nasdaq Clearing, as Nasdaq Nordic. We also operate exchanges in Tallinn (Estonia), Riga (Latvia) and Vilnius (Lithuania) as Nasdaq Baltic. Collectively, Nasdaq Nordic and Nasdaq Baltic offer trading in cash equities, depository receipts, warrants, convertibles, rights, fund units and ETFs, as well as trading and clearing of derivatives and clearing of resale and repurchase agreements.

Nasdaq Commodities is the brand name for Nasdaq’s worldwide suite of commodity-related products and services. Nasdaq Commodities’ offerings include oil, power, natural gas and carbon emission markets, tanker and dry cargo freight, seafood derivatives, iron ore, electricity certificates and clearing services. These products are listed on two of Nasdaq’s derivatives exchanges, Nasdaq Oslo ASA and NFX.

Through our Trade Management Services business, we provide market participants with a wide variety of alternatives for connecting to and accessing our markets via a number of different protocols used for quoting, order entry, trade reporting, DROP functionality and connectivity to various data feeds. We also provide data center services, including co-location to market participants, whereby firms may lease cabinet space and power to house their own equipment and servers within our data centers. Our broker services operations offer technology and customized securities administration solutions to financial participants in the Nordic market.

#### Corporate Services

Our Corporate Services segment includes our Corporate Solutions and Listing Services businesses.

Our Corporate Solutions business serves corporate clients, including companies listed on our exchanges and private companies. We help organizations manage the two-way flow of information with their key constituents, including their board members and investors, and with clients and the public through our suite of advanced technology, analytics, and consultative services. In April 2018, we sold our Public Relations Solutions and Digital Media Services businesses. See “2018 Divestiture,” of Note 4, “Acquisitions and Divestiture,” for further discussion. As of September 30, 2018, our Corporate Solutions business includes our investor relations, board & leadership, and governance, risk and compliance products and services.

For segment reporting purposes, we have included in corporate items the revenues and expenses of the Public Relations Solutions and Digital Media Services businesses, which were part of the Corporate Solutions business, within our Corporate Services segment, prior to the date of sale. See Note 18, “Business Segments,” for further discussion.

Earlier this year, we realigned our businesses to better serve the needs of our corporate clients. As a result, beginning in the second quarter of 2018, our BWise corporate enterprise risk management solutions are now offered as part of governance, risk and compliance products and services within our Corporate Solutions business. BWise was previously part of our Market Technology segment.

Our Listing Services business includes our U.S. and European Listing Services businesses. We operate a variety of listing platforms around the world to provide multiple global capital raising solutions for private and public companies. Our main listing markets are The Nasdaq Stock Market and the Nasdaq Nordic and Nasdaq Baltic exchanges. Through Nasdaq First North, our Nordic and Baltic operations also offer alternative marketplaces for smaller companies and growth companies. Our Listing Services business also includes NPM, which provides liquidity solutions for private companies.

As of September 30, 2018, there were 3,049 total listings on The Nasdaq Stock Market, including 390 ETPs. The combined market capitalization was approximately $13.4 trillion. In Europe, the Nasdaq Nordic and Nasdaq Baltic exchanges, together with Nasdaq First North, were home to 1,010 listed companies with a combined market capitalization of approximately $1.5 trillion.

**Information Services**

Beginning in the second quarter of 2018, our Information Services segment was recategorized into the following businesses:

- Market Data;
- Index; and
- Investment Data & Analytics.

Prior to the second quarter, our Information Services segment was comprised of our Data Products and our Index Licensing and Services businesses.

Our Market Data business sells and distributes historical and real-time quote and trade information to the sell-side, the buy-side, retail online brokers, proprietary trading shops, other venues, internet portals and data distributors. Our market data products enhance transparency of market activity within our exchanges and provide critical information to professional and non-professional investors globally.

Our Index business develops and licenses Nasdaq-branded indexes, associated derivatives, and financial products and also provides custom calculation services for third-party clients. As of September 30, 2018, we had 358 ETPs licensed to Nasdaq's indexes which had $206 billion in assets under management.

Our Investment Data & Analytics business is a leading content and analytics cloud-based solutions provider used by asset managers, investment consultants and asset owners to help facilitate better investment decisions.

**Market Technology**

Our Market Technology segment is a leading global technology solutions provider and partner to exchanges, clearing organizations, central securities depositories, regulators, banks, brokers and corporate businesses. Our Market Technology business is the sales channel for our complete global offering to other marketplaces.

Market Technology provides technology solutions for trading, clearing, settlement, surveillance and information dissemination to markets with wide-ranging requirements, from the leading markets in the U.S., Europe and Asia to emerging markets in the Middle East, Latin America, and Africa. Our marketplace solutions can handle a wide array of assets, including cash equities, equity derivatives, currencies, various interest-bearing securities, commodities and energy products, and are currently powering more than 100 marketplaces in 50 countries. Market Technology also provides market surveillance services to broker-dealer firms worldwide, as well as risk management solutions.

As discussed above under "Corporate Services," as of the second quarter of 2018, our BWise business, which was previously part of our Market Technology segment, is now offered as part of our Corporate Solutions business.

**2. Basis of Presentation and Principles of Consolidation**

The condensed consolidated financial statements are prepared in accordance with U.S. GAAP and include the accounts of Nasdaq, its wholly-owned subsidiaries and other entities in which Nasdaq has a controlling financial interest. When we do not have a controlling interest in an entity but exercise significant influence over the entity's operating and financial policies, such investment is accounted for under the equity method of accounting. We recognize our share of earnings or losses of an equity method investee based on our ownership percentage. See "Equity Method Investments," of Note 7, "Investments," for further discussion of our equity method investments.

The accompanying condensed consolidated financial statements reflect all adjustments which are, in the opinion of management, necessary for a fair statement of the results for the interim periods presented. These adjustments are of a normal recurring nature. All significant intercompany accounts and transactions have been eliminated in consolidation.

As permitted under U.S. GAAP, certain footnotes or other financial information can be condensed or omitted in the interim condensed consolidated financial statements. The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the consolidated financial statements and accompanying notes included in Nasdaq's Annual Report on Form 10-K for the fiscal year ended December 31, 2017 that was filed with the SEC on February 28, 2018.

Certain prior year amounts have been reclassified to conform to the current year presentation primarily due to the adoption of ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)," on January 1, 2018. See Note 3, "Significant Accounting Policies Update," for further discussion.

The preparation of condensed consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts and the disclosure of contingent amounts in the condensed consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

*Subsequent Events*

We have evaluated subsequent events through the issuance date of this Quarterly Report on Form 10-Q. See Note 19, "Subsequent Events," for further discussion.

**Recent Accounting Pronouncements**

| Accounting Standard | Description | Effective Date | Effect on the Financial Statements or Other Significant Matters |
|---|---|---|---|
| ***Intangibles - Goodwill and Other - Internal-Use Software***<br><br>In August 2018, the FASB issued ASU 2018-15, "Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract." | This ASU clarifies the accounting for implementation costs of a hosting arrangement and aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). Capitalized implementation costs should be expensed over the term of the hosting arrangement and recognized in the same line item in the statement of income as the hosted service costs. Payments for capitalized implementation costs should be classified in the statement of cash flows in the same manner as payments made for fees associated with the hosting element. Capitalized implementation costs should be presented in the balance sheet in the same line item as a prepayment for the fees of the associated hosting arrangement. | January 1, 2020, with early adoption permitted. We early adopted this standard as of July 1, 2018. | There was no impact to the financial statements as a result of the adoption of this standard, as we are currently accounting for costs incurred in a cloud computing arrangement in accordance with the guidance provided in this standard. |
| ***Fair Value Measurements***<br><br>In August 2018, the FASB issued ASU 2018-13 "Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement." | This ASU modifies the disclosure requirements on fair value measurements by removing certain disclosure requirements related to the fair value hierarchy, modifying existing disclosure requirements related to measurement uncertainty, and adding new requirements, mainly for Level 3 fair value measurements. | January 1, 2020, with early adoption permitted. We early adopted this standard as of July 1, 2018 on a prospective basis. | There was no impact to the financial statements or our disclosures as a result of the adoption of this standard. |

| Accounting Standard | Description | Effective Date | Effect on the Financial Statements or Other Significant Matters |
|---|---|---|---|
| ***Income Statement - Reporting Comprehensive Income*** In February 2018, the FASB issued ASU 2018-02, "Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income (Topic 220)." | This ASU provides an election to reclassify tax effects that are stranded in accumulated other comprehensive income as a result of tax reform to retained earnings. An election is also available to reclassify other stranded tax effects that relate to the Tax Cuts and Jobs Act but do not directly relate to the change in the federal rate. Tax effects that are stranded in accumulated other comprehensive income for other reasons (e.g., prior changes in tax law, a change in valuation allowance) may not be reclassified. Previously, the effects of changes in tax rates and laws on deferred tax balances were required to be recorded as a component of tax expense related to continuing operations for the period in which the law was enacted, even if the assets and liabilities related to items of accumulated other comprehensive income. In other words, backward tracing of the income tax effects of items originally recognized through accumulated other comprehensive income was prohibited. | January 1, 2019, with early adoption permitted. We early adopted this standard as of January 1, 2018. | As a result of the adoption of this standard, in the first quarter of 2018, we recorded a reclassification of $142 million for stranded tax effects related to the Tax Cuts and Jobs Act from accumulated other comprehensive loss to retained earnings within stockholders' equity in the Condensed Consolidated Balance Sheets. See Note 17, "Income Taxes," for further discussion. |
| ***Goodwill*** In January 2017, the FASB issued ASU 2017-04, "Simplifying the Test for Goodwill Impairment." | This ASU simplifies how an entity is required to test goodwill for impairment and removes the second step of the goodwill impairment test, which required a hypothetical purchase price allocation if the fair value of a reporting unit is less than its carrying amount. Goodwill impairment will now be measured using the difference between the carrying amount and the fair value of the reporting unit and the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. The amendments in this ASU should be applied on a prospective basis. | January 1, 2020, with early adoption permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. | We do not anticipate a material impact on our consolidated financial statements at the time of adoption of this new standard as the carrying amounts of our reporting units have been less than their corresponding fair values in recent years. Therefore, the second step of the goodwill impairment test was not required. However, changes in future projections, market conditions and other factors may cause a change in the excess of fair value of our reporting units over their corresponding carrying amounts. We do not anticipate early adoption of this standard. |
| ***Financial Instruments - Credit Losses*** In June 2016, the FASB issued ASU 2016-13, "Measurement of Credit Losses on Financial Instruments." | This ASU changes the impairment model for certain financial instruments. The new model is a forward looking expected loss model and will apply to financial assets subject to credit losses and measured at amortized cost and certain off-balance sheet credit exposures. This includes loans, held-to-maturity debt securities, loan commitments, financial guarantees and net investments in leases, as well as trade receivables. For available-for-sale debt securities with unrealized losses, credit losses will be measured in a manner similar to today, except that the losses will be recognized as allowances rather than reductions in the amortized cost of the securities. | January 1, 2020, with early adoption permitted as of January 1, 2019. | We expect to adopt this standard on January 1, 2020. We are currently assessing the impact that this standard will have on our consolidated financial statements. We do not anticipate early adoption of this standard. |

| Accounting Standard | Description | Effective Date | Effect on the Financial Statements or Other Significant Matters |
|---|---|---|---|
| ***Leases***<br>In February 2016, the FASB issued ASU 2016-02, “Leases.” | Under this ASU, at the commencement date, lessees will be required to recognize a lease liability, which is a lessee’s obligation to make lease payments arising from a lease, measured on a discounted basis; and a right-of-use asset, which is an asset that represents the lessee’s right to use, or control the use of, a specified asset for the lease term. This guidance is not applicable for leases with a term of 12 months or less. Recognition, measurement and presentation of expenses will depend on classification as a finance or operating lease. The guidance also requires certain quantitative and qualitative disclosures about leasing arrangements. Lessor accounting is largely unchanged. In transition, lessees and lessors are required to recognize and measure leases at the beginning of the earliest period presented using a modified retrospective approach. | January 1, 2019. | See discussion below. |

**Leases**

We will adopt ASU 2016-02 on January 1, 2019. When adopted, this new standard will result in an increase in the assets and liabilities reflected on our consolidated balance sheets. In addition, we will be required to disclose key information about our leases. Nasdaq’s current operating lease portfolio is primarily comprised of real estate and data center leases. As of September 30, 2018, we had future contractual lease payment obligations of $636 million. We expect that we will elect the alternative transition approach allowed under the guidance and expect to implement new accounting policies as well as to elect certain practical expedients available under the guidance, including those related to leases with a term of 12 months or less and our application of discount rates. We do not expect the adoption of this new standard to have a material impact on our consolidated balance sheets or statements of income and it will not impact our cash flows.

**3. Significant Accounting Policies Update**

Our significant accounting policies are detailed in Note 2, “Summary of Significant Accounting Policies,” in our Annual Report on Form 10-K for the year ended December 31, 2017 that was filed with the SEC on February 28, 2018. Significant changes to our accounting policies as a result of adopting Topic 606 and ASU 2016-01, “Recognition and Measurement of Financial Assets and Financial Liabilities,” or ASU 2016-01, are discussed below.

**Revenue From Contracts With Customers**

On January 1, 2018, we adopted Topic 606 using the full retrospective method. The adoption of Topic 606 impacted the revenue and expense recognition for our Market Technology business and revenue recognition for our Listing Services business. However, the adoption of Topic 606 did not have a material impact on our consolidated financial statements at the time of adoption or in any prior reporting periods. There was no impact to revenue and expense recognition for our other businesses. Additional disclosures required by Topic 606 are provided below.

<u>Contract Balances</u>

Substantially all of our revenues are considered to be revenues from contracts with customers. The related accounts receivable balances are recorded in our Condensed Consolidated Balance Sheets as receivables which is net of allowance for doubtful accounts of $13 million as of September 30, 2018 and $9 million as of December 31, 2017. The changes in the balance between periods were immaterial. We do not have obligations for warranties, returns or refunds to customers.

For the majority of our contracts with customers, except for our market technology and listings services contracts, our performance obligations are short-term in nature and there is no significant variable consideration.

We do not have revenues recognized from performance obligations that were satisfied in prior periods. We have elected not to provide disclosures about transaction price allocated to unsatisfied performance obligations if contract durations are less than one year. For contract durations that are one-year or greater, we do not have a material portion of transaction price allocated to unsatisfied performance obligations that are not included in deferred revenue other than for our market technology contracts which are discussed below under “Market Technology.” Deferred revenue primarily represents our contract liabilities related to our fees for annual and initial listings, market technology, corporate solutions and information services contracts. Deferred revenue is the only significant contract asset or liability impacted by our adoption of Topic 606. See Note 8, “Deferred Revenue,” for our discussion on deferred revenue balances, activity, and expected timing of recognition. See “Revenue Recognition” below for further descriptions of our revenue contracts.

Sales commissions earned by our sales force are considered incremental and recoverable costs of obtaining a contract with a customer. These costs are deferred and amortized on a straight-line basis over the period of benefit that we have determined to be the contract term or estimated service periods. Sales commissions for renewal contracts are deferred and amortized on a straight-line basis over the related contractual renewal period. Amortization expense is included in compensation and benefits expense in the Condensed Consolidated Statements of Income. The balance of deferred costs and related amortization expense are not material to our consolidated financial statements. We elected the practical expedient of recognizing sales commissions as an expense when incurred if contract durations are one year or less. We also have elected the practical expedient of excluding sales taxes from transaction prices.

Certain judgments and estimates were used in the identification and timing of satisfaction of performance obligations and the related allocation of transaction price and are discussed below. We believe that these represent a faithful depiction of the transfer of services to our customers.

Revenue Recognition

Our primary revenue contract classifications are described below. Though we discuss additional revenue details in our “Management's Discussion and Analysis of Financial Condition and Results of Operations,” the categories below best represent those that depict similar economic characteristics of the nature, amount, timing and uncertainty of our revenues and cash flows.

***Market Services***

*Transaction-Based Trading and Clearing*

Transaction-based trading and clearing includes equity derivative trading and clearing revenues, cash equity trading revenues and FICC revenues. Nasdaq charges transaction fees for trades executed on our exchanges, as well as on orders that are routed to and executed on other market venues. Nasdaq charges clearing fees for contracts cleared with Nasdaq Clearing.

In the U.S., transaction fees are based on trading volumes for trades executed on our U.S. exchanges and in Europe, transaction fees are based on the volume and value of traded and cleared contracts. In Canada, transaction fees are based on trading volumes for trades executed on our Canadian exchange.

Nasdaq satisfies its performance obligation for trading services upon the execution of a customer trade and clearing services when a contract is cleared, as trading and clearing transactions are substantially complete when they are executed and we have no further obligation to the customer at that time. Transaction-based trading and clearing fees can be variable and are based on trade volume tiered discounts. Transaction revenues, as well as any tiered volume discounts, are calculated and billed monthly in accordance with our published fee schedules. In the U.S., we also pay liquidity payments to customers based on our published fee schedules. We use these payments to improve the liquidity on our markets and therefore recognize those payments as a cost of revenue.

The majority of our FICC trading and clearing customers are charged transaction fees, as discussed above, which are based on the volume and value of traded and cleared contracts. We also enter into annual fixed contracts with customers trading U.S. Treasury securities. The customers are charged an annual fixed fee which is billed per the agreement, on a monthly or quarterly basis. Revenues earned on fixed contracts are recognized over time on a ratable basis over the contract period beginning on the date that our service is made available to the customer since the customer receives and consumes the benefit as Nasdaq provides the service.

For U.S. equity derivative trading, we credit a portion of the per share execution charge to the market participant that provides the liquidity. For U.S. cash equity trading, for Nasdaq and Nasdaq PSX, we credit a portion of the per share execution charge to the market participant that provides the liquidity and for Nasdaq BX, we credit a portion of the per share execution charge to the market participant that takes the liquidity. We record these credits as transaction rebates that are included in transaction-based expense in the Condensed Consolidated Statements of Income. These transaction rebates are paid on a monthly basis and the amounts due are included in accounts payable and accrued expenses in the Condensed Consolidated Balance Sheets.

In the U.S., we pay Section 31 fees to the SEC for supervision and regulation of securities markets. We pass these costs along to our customers through our equity derivative trading and clearing fees and our cash equity trading fees. We collect the fees as a pass-through charge from organizations executing eligible trades on our options exchanges and our cash equity platforms and we recognize these amounts in transaction-based expenses when incurred. Section 31 fees received are included in cash and cash equivalents in the Condensed Consolidated Balance Sheets at the time of receipt and, as required by law, the amount due to the SEC is remitted semiannually and recorded as Section 31 fees payable to the SEC in the Condensed Consolidated Balance Sheets until paid. Since the amount recorded as revenues is equal to the amount recorded as transaction-based expenses, there is no impact on our revenues less transaction-based expenses. As we hold the cash received until payment to the SEC, we earn interest income on the related cash balances.

Under our Limitation of Liability Rule and procedures, we may, subject to certain caps, provide compensation for losses directly resulting from the systems’ actual failure to correctly process an order, quote, message or other data into our platform. We do not record a liability for any potential claims that may be submitted under the Limitation of Liability Rule unless they meet the provisions required in accordance with U.S. GAAP. As such, losses arising as a result of the rule are accrued and charged to expense only if the loss is probable and estimable.

*Trade Management Services*

We provide market participants with a wide variety of alternatives for connecting to and accessing our markets for a fee. We also offer market participants co-location services, whereby firms may lease cabinet space and power to house their own equipment and servers within our data centers. These participants are charged monthly fees for cabinet space, connectivity and support in accordance with our published fee schedules. These fees are recognized on a monthly basis when the performance obligation is met. We also earn revenues from annual and monthly exchange membership and registration fees. Revenues for providing access to our markets, co-location services and monthly exchange membership and registration fees are recognized on a monthly basis as the service is provided. Revenues from annual fees for exchange membership and registration fees are recognized ratably over the following 12-month period since the customer receives and consumes the benefit as Nasdaq provides the service. We also offer broker services to financial participants in the Nordic market primarily providing flexible back-office systems, which allow customers to entirely or partly outsource their company's back-office functions. Revenues from broker services are based on a fixed basic fee for administration or licensing, maintenance and operations, and an incremental fee depending on the number of transactions completed. Broker services revenues are generally billed and recognized monthly.

***Corporate Solutions***

As of September 30, 2018, corporate solutions revenues primarily include subscription and transaction-based income from our investor relations, board & leadership, and governance, risk and compliance products and services. In April 2018, we completed the sale of our Public Relations Solutions and Digital Media Services businesses. See "2018 Divestiture," of Note 4, "Acquisitions and Divestiture," for further discussion. Subscription-based revenues earned are recognized over time on a ratable basis over the contract period beginning on the date that our service is made available to the customer since the customer receives and consumes the benefit as Nasdaq provides the service. Generally, fees are billed quarterly in advance and the contract provides for automatic renewal. As part of the subscription agreements, customers can also be charged usage fees based upon actual usage of the services provided. Revenues from usage fees are recognized at a point in time upon completion of the service.

***Listing Services***

Listing services revenues primarily include initial listing fees and annual renewal fees. Under Topic 606, the initial listing fee is allocated to multiple performance obligations including initial and subsequent listing services and corporate solutions services (when a company qualifies to receive these services under the applicable Nasdaq rule), as well as a customer's material right to renew the option to list on our exchanges. In performing this allocation, the standalone selling price of the performance obligations is based on the initial and annual listing fees and the standalone selling price of the corporate solutions services is based on its market value. All listing fees are billed upfront and the identified performance obligations are satisfied over time since the customer receives and consumes the benefit as Nasdaq provides the listing service. Upon adoption of Topic 606, the amount of revenue related to the corporate solutions services performance obligation is recognized ratably over a two-year period, which is based on contract terms, with the remaining revenue recognized ratably over time as customers continue to list on our exchanges, which is estimated to be over a period of six years based on our historical listing experience and projected future listing duration.

In the U.S., annual renewal fees are charged based on the number of outstanding shares of companies listed in the U.S. at the end of the prior year and are recognized ratably over the following 12-month period since the customer receives and consumes the benefit as Nasdaq provides the service. European annual renewal fees, which are received from companies listed on our Nasdaq Nordic and Nasdaq Baltic exchanges and Nasdaq First North, are directly related to the listed companies' market capitalization on a trailing 12-month basis and are recognized ratably over the following 12-month period since the customer receives and consumes the benefit as Nasdaq provides the service.

***Market Data Products***

Market data products revenues are earned from U.S. and European proprietary market data products. In the U.S., we also earn revenues from U.S. shared tape plans.

We earn revenues primarily based on the number of data subscribers and distributors of our data. Market data products revenues are subscription-based and are recognized on a monthly basis net of amounts due under revenue sharing arrangements with market participants.

For U.S. tape plans, revenues are collected monthly based on published fee schedules and distributed quarterly to the U.S. exchanges based on a formula required by Regulation NMS that takes into account both trading and quoting activity. Revenues are presented on a net basis as we are acting as an agent in this arrangement.

*Market Data Products Revenue Sharing*

The most significant component of market data products revenues recorded on a net basis is the UTP Plan revenue sharing in the U.S. All indicators of principal versus agent reporting under U.S. GAAP have been considered in analyzing the appropriate presentation of UTP Plan revenue sharing. However, the following are the primary indicators of net reporting:

- We are the administrator for the UTP Plan, in addition to being a participant in the UTP Plan. In our unique role as administrator, we facilitate the collection and dissemination of revenues on behalf of the UTP Plan participants. As a participant, we share in the net distribution of revenues according to the plan on the same terms as all other plan participants.

- The operating committee of the UTP Plan, which is comprised of representatives from each of the participants, including us solely in our capacity as a UTP Plan participant, is responsible for setting the level of fees to be paid by distributors and subscribers and taking action in accordance with the provisions of the UTP Plan, subject to SEC approval.
- Risk of loss on the revenue is shared equally among plan participants according to the UTP Plan.

The exchanges that comprise Nasdaq Nordic and Nasdaq Baltic do not have any market data products revenue sharing agreements.

***Index***

We develop and license Nasdaq branded indexes, associated derivatives and financial products as part of our Global Index Family. We also provide index data products and custom calculation services for third-party clients. Revenues primarily include license fees from these branded indexes, associated derivatives and financial products in the U.S. and abroad. We primarily have two types of license agreements: transaction-based licenses and asset-based licenses. Transaction-based licenses are generally renewable agreements. Customers are charged based on transaction volume or a minimum contract amount, or both. If a customer is charged based on transaction volume, we recognize revenue when the transaction occurs. If a customer is charged based on a minimum contract amount, we recognize revenue on a pro-rata basis over the licensing term since the customer receives and consumes the benefit as Nasdaq provides the service. Asset-based licenses are also generally renewable agreements. Customers are charged based on a percentage of assets under management for licensed products, per the agreement, on a monthly or quarterly basis. These revenues are recognized over the term of the license agreement since the customer receives and consumes the benefit as Nasdaq provides the service. Revenue from index data subscriptions are recognized on a monthly basis.

***Investment Data & Analytics***

Investment data & analytics revenues are earned from investment content and analytics products. We earn revenues primarily based on the number of content and analytics subscribers and distributors.

Subscription agreements are generally annual in term, payable in advance, and provide for automatic renewal. Subscription-based revenues are recognized over time on a ratable basis over the contract period beginning on the date that our service is made available to the customer since the customer receives and consumes the benefit as Nasdaq provides the service.

***Market Technology***

Market Technology provides technology solutions for trading, clearing, settlement, surveillance and information dissemination, as well as risk management solutions. Revenues primarily consist of software, license and support revenues, change request and advisory revenues, and software as a service revenues.

In our Market Technology business, we enter into long-term contracts with customers to develop customized technology solutions, license the right to use software, and provide post-contract support and other services to our customers. We also enter into agreements to modify the system solutions sold by Nasdaq after delivery has occurred. In addition, we enter into subscription agreements which allow customers to connect to our servers to access our software.

Our long-term contracts with customers to develop customized technology solutions, license the right to use software and provide post-contract support and other services to our customers have multiple performance obligations. The performance obligations are generally: 1) software license and installation service and 2) software support. We have determined that the software license and installation service are not distinct as the license and the customized installation service are inputs to produce the combined output, a functional and integrated software system.

For contracts with multiple performance obligations, we allocate the contract transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract. In instances where standalone selling price is not directly observable, such as when we do not sell the product or service separately, we determine the standalone selling price predominately through an expected cost plus a margin approach.

Contract modifications are routine in the performance of our contracts. Contracts are often modified to account for changes in contract specifications or requirements. In most instances, contract modifications are for goods and services that are not distinct, and, therefore, are accounted for as part of the existing contract.

For our long-term contracts, payments are generally made throughout the contract life and can be dependent on either reaching certain milestones or paid upfront in advance of the service period depending on the stage of the contract. For subscription agreements, contract payment terms can be quarterly, annually or monthly, in advance. For all other contracts, payment terms vary.

We generally recognize revenue over time as our customers simultaneously receive and consume the benefits provided by our performance because our customer controls the asset for which we are creating, our performance does not create an asset with alternative use, and we have a right to payment for performance completed to date. For these services, we recognize revenue over time using costs incurred to date relative to total estimated costs at completion to measure progress toward satisfying our performance obligation. Incurred costs represent work performed, which corresponds with, and thereby depicts, the transfer of control to the customer. Contract costs generally include labor and overhead. For software support and update services, and for subscription agreements which allow customers to connect to our servers to access our software, we generally recognize revenue ratably over the service period beginning on the date our service is made available to the customer since the customer receives and consumes the benefit consistently over the period as Nasdaq provides the services.

Accounting for our long-term contracts requires judgment relative to assessing risks and their impact on the estimate of revenues and costs. Our estimates are impacted by factors such as the potential for schedule and technical issues, productivity, and the complexity of work performed. When adjustments in estimated total contract costs are required, any changes in the estimated revenues from prior estimates are recognized in the current period for the effect of such change. If estimates of total costs to be incurred on a contract exceed estimates of total revenues, a provision for the entire estimated loss on the contract is recorded in the period in which the loss is determined.

***Other Revenues***

Other revenues include the revenues from the Public Relations Solutions and Digital Media Services businesses which were sold in April 2018. Prior to the sale date, these revenues were included in our Corporate Solutions business and were primarily transaction-based revenues.

* * * * * *

The following table summarizes the amount of the transaction price allocated to performance obligations that are unsatisfied as of September 30, 2018 and relates to our Market Technology segment:

| | (in millions) |
|---|---|
| 2018[1] | $ 63 |
| 2019 | 238 |
| 2020 | 157 |
| 2021 | 90 |
| 2022 | 55 |
| 2023 and thereafter | 100 |
| Total | $ 703 |

[1] Represents performance obligations to be recognized over the remaining three months of 2018.

Market technology deferred revenue, as discussed in Note 8, “Deferred Revenue,” to the condensed consolidated financial statements, represents consideration received that is yet to be recognized as revenue for unsatisfied performance obligations.

The following tables summarize the disaggregation of revenue by major product and service and by segment for the three months ended September 30, 2018 and 2017:

| | Three Months Ended September 30, 2018 | | | | | |
|---|---|---|---|---|---|---|
| | Market Services | Corporate Services | Information Services | Market Technology | Other Revenues | Consolidated |
| | (in millions) | | | | | |
| Transaction-based trading and clearing, net | $ 150 | $ — | $ — | $ — | $ — | $ 150 |
| Trade management services | 72 | — | — | — | — | 72 |
| Corporate solutions | — | 59 | — | — | — | 59 |
| Listing services | — | 72 | — | — | — | 72 |
| Market data products | — | — | 95 | — | — | 95 |
| Index | — | — | 52 | — | — | 52 |
| Investment data & analytics | — | — | 32 | — | — | 32 |
| Market technology | — | — | — | 68 | — | 68 |
| Other revenues | — | — | — | — | — | — |
| **Revenues less transaction-based expenses** | $ 222 | $ 131 | $ 179 | $ 68 | $ — | $ 600 |

| | Three Months Ended September 30, 2017 | | | | | |
|---|---|---|---|---|---|---|
| | Market Services | Corporate Services | Information Services | Market Technology | Other Revenues | Consolidated |
| | (in millions) | | | | | |
| Transaction-based trading and clearing, net | $ 144 | $ — | $ — | $ — | $ — | $ 144 |
| Trade management services | 75 | — | — | — | — | 75 |
| Corporate solutions | — | 59 | — | — | — | 59 |
| Listing services | — | 67 | — | — | — | 67 |
| Market data products | — | — | 97 | — | — | 97 |
| Index | — | — | 43 | — | — | 43 |
| Investment data & analytics | — | — | 10 | — | — | 10 |
| Market technology | — | — | — | 62 | — | 62 |
| Other revenues | — | — | — | — | 46 | 46 |
| **Revenues less transaction-based expenses** | $ 219 | $ 126 | $ 150 | $ 62 | $ 46 | $ 603 |

For the three months ended September 30, 2018, approximately 63.0% of Market Services revenues were recognized at a point in time and 37.0% were recognized over time. For the three months ended September 30, 2017, approximately 62.0% of Market Services revenues were recognized at a point in time and 38.0% were recognized over time. Substantially all revenues from the Corporate Services, Information Services and Market Technology segments were recognized over time for both the three months ended September 30, 2018 and 2017.

The following tables summarize the disaggregation of revenue by major product and service and by segment for the nine months ended September 30, 2018 and 2017:

| | Nine Months Ended September 30, 2018 | | | | | |
|---|---|---|---|---|---|---|
| | Market Services | Corporate Services | Information Services | Market Technology | Other Revenues | Consolidated |
| | (in millions) | | | | | |
| Transaction-based trading and clearing, net | $ 489 | $ — | $ — | $ — | $ — | $ 489 |
| Trade management services | 220 | — | — | — | — | 220 |
| Corporate solutions | — | 178 | — | — | — | 178 |
| Listing services | — | 217 | — | — | — | 217 |
| Market data products | — | — | 293 | — | — | 293 |
| Index | — | — | 152 | — | — | 152 |
| Investment data & analytics | — | — | 83 | — | — | 83 |
| Market technology | — | — | — | 194 | — | 194 |
| Other revenues | — | — | — | — | 56 | 56 |
| **Revenues less transaction-based expenses** | $ 709 | $ 395 | $ 528 | $ 194 | $ 56 | $ 1,882 |

| | Nine Months Ended September 30, 2017 | | | | | |
|---|---|---|---|---|---|---|
| | Market Services | Corporate Services | Information Services | Market Technology | Other Revenues | Consolidated |
| | (in millions) | | | | | |
| Transaction-based trading and clearing, net | $ 441 | $ — | $ — | $ — | $ — | $ 441 |
| Trade management services | 218 | — | — | — | — | 218 |
| Corporate solutions | — | 173 | — | — | — | 173 |
| Listing services | — | 197 | — | — | — | 197 |
| Market data products | — | — | 276 | — | — | 276 |
| Index | — | — | 125 | — | — | 125 |
| Investment data & analytics | — | — | 31 | — | — | 31 |
| Market technology | — | — | — | 176 | — | 176 |
| Other revenues | — | — | — | — | 143 | 143 |
| **Revenues less transaction-based expenses** | $ 659 | $ 370 | $ 432 | $ 176 | $ 143 | $ 1,780 |

For the nine months ended September 30, 2018, approximately 64.0% of Market Services revenues were recognized at a point in time and 36.0% were recognized over time. For the nine months ended September 30, 2017, approximately 63.0% of Market Services revenues were recognized at a point in time and 37.0% were recognized over time. Substantially all revenues from the Corporate Services, Information Services and Market Technology segments were recognized over time for both the nine months ended September 30, 2018 and 2017.

* * * * * *

**Equity Securities**

On January 1, 2018, we adopted ASU 2016-01 which requires that investments in equity securities (excluding equity method investments) be measured at fair value with changes in fair value recognized in net income. Equity securities are no longer classified as trading or available for sale.

We elected the measurement alternative for equity securities which were historically accounted for under the cost method of accounting. Since these equity securities do not have readily determinable fair values, they are measured at cost, less any impairment, plus or minus changes resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. We evaluate these securities for impairment by considering a variety of factors such as the earnings capacity of the investment. If a qualitative assessment indicates that the security is impaired, Nasdaq will estimate the fair value of the security, and if the fair value is less than the carrying amount of the security, recognize an impairment loss in net income equal to the difference between the carrying amount and fair value. There was no impact on our condensed consolidated financial statements as a result of this change.

The guidance for classifying and measuring investments in debt securities is unchanged. Therefore, changes in debt securities classified as trading securities are included in dividend and investment income in the Condensed Consolidated Statements of Income and debt securities classified as available-for-sale investment securities are carried at fair value with unrealized gains and losses, net of tax, reported in accumulated other comprehensive loss within stockholders' equity in the Condensed Consolidated Balance Sheets. Realized gains and losses on these securities are included in earnings upon disposition of the securities using the specific identification method. In addition, realized losses are recognized when management determines that a decline in value is other than temporary, which requires judgment regarding the amount and timing of recovery. For financial investments that are classified as available-for-sale securities, we also consider the extent to which cost exceeds fair value, the duration of that difference, management's judgment about the issuer's current and prospective financial condition, as well as our intent and ability to hold the security until recovery of the unrealized losses.

**4. Acquisitions and Divestiture**

**2018 Pending Acquisition**

In September 2018, we announced that we made a SEK 75 per share and SEK 85 per warrant, or approximately $190 million (based on an exchange rate of USD 1.00 = SEK 8.96 as of September 13, 2018), all cash recommended public offer to the shareholders and warrant holders of Cinnober, a major Swedish financial technology provider to brokers, exchanges and clearinghouses worldwide. Our acquisition of Cinnober would be included in our Market Technology segment. Nasdaq expects to fund the acquisition with either cash on hand or liquidity available under existing credit facilities. The public tender offer is expected to be completed during the fourth quarter of 2018, subject to certain customary conditions.

**2018 Divestiture and 2017 Acquisitions**

We completed the following divestiture in 2018 and acquisitions in 2017. Financial results of each transaction are included in our Condensed Consolidated Statements of Income from the date of each divestiture or acquisition.

**2018 Divestiture**

In April 2018, we sold our Public Relations Solutions and Digital Media Services businesses which were part of our Corporate Solutions business to West Corporation and recognized a pre-tax net gain on the sale of $33 million, net of disposal costs ($14 million after tax), which includes a post-closing working capital adjustment of $8 million ($5 million after tax) recorded during the three months ended September 30, 2018. The total net pre-tax gain is included in net gain on divestiture of businesses in the Condensed Consolidated Statements of Income for the nine months ended September 30, 2018.

As of December 31, 2017, the assets and liabilities of the above businesses were held for sale. See Note 5, "Assets and Liabilities Held For Sale," for further discussion.

Through a multi-year partnership with West, Nasdaq will continue to provide eligible Nasdaq-listed clients with access to public relations, webcasting and webhosting products and services as part of the terms of the transaction.

As part of the terms of the transaction, we are providing transition services to West, such as technology, finance and facilities related services for a period of time, and the compensation received for such transition services is being reflected as a reduction to the underlying expenses incurred by Nasdaq to provide such transition services.

* * * * * *

**2017 Acquisitions**

| | Purchase Consideration | Total Net Liabilities Acquired | Total Net Deferred Tax Liability | Acquired Intangible Assets | Goodwill |
|---|---|---|---|---|---|
| | (in millions) | | | | |
| eVestment | $ 744 | $ (10) | $ (104) | $ 405 | $ 453 |

The amounts in the table above represent the preliminary allocation of purchase price as of September 30, 2018 and are subject to revision during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date. Adjustments to the provisional values, which may include tax and other estimates, during the measurement period will be recorded in the reporting period in which the adjustment amounts are determined. Changes to amounts recorded as assets and liabilities may result in a corresponding adjustment to goodwill.

See "Intangible Assets" below for further discussion of intangible assets acquired in the eVestment acquisition.

***Acquisition of eVestment***

In October 2017, we acquired eVestment for $705 million. The aggregate cash consideration of $744 million, which is net of cash acquired of $22 million, included $39 million of estimated tax benefits associated with the transaction. We acquired net liabilities, at fair value, totaling $10 million and we recorded a net deferred tax liability of $104 million, which is net of the $39 million in estimated tax benefits associated with the transaction. The deferred tax liability recorded of $143 million relates to differences in the U.S. GAAP and tax basis of our investment in eVestment. eVestment is part of our Information Services segment.

Nasdaq used cash on hand and issuances of commercial paper to fund this acquisition.

***Acquisition of Sybenetix***

In September 2017, we acquired Sybenetix for an immaterial amount. Sybenetix is part of our Market Technology segment.

***Intangible Assets***

**Intangible Assets**

The following table presents the details of acquired intangible assets for eVestment at the date of the acquisition. All acquired intangible assets with finite lives are amortized using the straight-line method.

**Intangible Assets**

| ($ in millions) | |
|---|---|
| **Customer relationships** | $ 378 |
| Discount rate used | 9.3% |
| Estimated average useful life | 14 years |
| **Trade name** | $ 13 |
| Discount rate used | 9.2% |
| Estimated average useful life | 8 years |
| **Technology** | $ 14 |
| Discount rate used | 9.2% |
| Estimated average useful life | 8 years |
| **Total intangible assets** | $ 405 |

Customer Relationships

Customer relationships represent the non-contractual and contractual relationships with customers.

*Methodology*

For our acquisition of eVestment, customer relationships were valued using the income approach, specifically an excess earnings method. The excess earnings method examines the economic returns contributed by the identified tangible and intangible assets of a company, and then isolates the excess return that is attributable to the intangible asset being valued.

*Discount Rates*

The discount rates used reflect the amount of risk associated with the hypothetical cash flows for the customer relationships relative to the overall business. In developing a discount rate for the customer relationships, we estimated a weighted-average cost of capital for the overall business and we employed this rate when discounting the cash flows. The resulting discounted cash flows were then tax-effected at the applicable statutory rate.

For our acquisition of eVestment, a discounted tax amortization benefit was added to the fair value of the assets under the assumption that the customer relationships would be amortized for tax purposes over a period of 15 years.

*Estimated Useful Life*

We estimate the useful life based on the historical behavior of the customers and a parallel analysis of the customers using the excess earnings method.

Trade Name

As part of our acquisition of eVestment, we acquired a trade name. This trade name is recognized in the industry and carries a reputation for quality. As such, the reputation and positive recognition embodied in this trade name is a valuable asset to Nasdaq.

*Methodology*

The eVestment trade name was valued using the income approach, specifically the relief-from-royalty method, or RFRM. The RFRM is used to estimate the cost savings that accrue to the owner of an intangible asset who would otherwise have to pay royalties or license fees on revenues earned through the use of the asset. The royalty rate is applied to the projected revenue over the expected remaining life of the intangible asset to estimate royalty savings. The net after-tax royalty savings are calculated for each year in the remaining economic life of the trade name and discounted to present value.

*Discount Rates*

The discount rate used reflects the amount of risk associated with the hypothetical cash flows for the trade name relative to the overall business as discussed above in "Customer Relationships."

*Estimated Useful Life*

We have estimated the useful life of the eVestment trade name to be 8 years.

Technology

As part of our acquisition of eVestment, we acquired developed technology.

*Methodology*

The developed technology was valued using the income approach, specifically the RFRM as discussed above in "Trade Names."

*Discount rate*

The discount rate used reflects the amount of risk associated with the hypothetical cash flows for the developed technology relative to the overall business as discussed above in "Customer Relationships."

*Estimated Useful Life*

We have estimated the useful life of the eVestment technology to be 8 years.

**Pro Forma Results and Acquisition-related Costs**

In January 2018, we entered into a definitive agreement to sell the above businesses. See "2018 Divestiture," of Note 4, "Acquisitions and Divestiture," for further discussion.

Based on the sales price in the agreement, no impairment charge was recorded at the time of the sale as the carrying amount of the net assets was less than the sales price in the agreement less costs to sell.

The carrying amounts of the major classes of assets and liabilities that were classified as held for sale at December 31, 2017 in the Condensed Consolidated Balance Sheets were as follows:

| | December 31, 2017 (in millions) |
|---|---|
| Receivables, net | $ 27 |
| Property and equipment, net | 21 |
| Goodwill [1] | 202 |
| Intangible assets, net[2] | 38 |
| Other assets | 9 |
| Total assets held for sale | $ 297 |
| | |
| Deferred tax liabilities | $ 16 |
| Other current liabilities | 29 |
| Total liabilities held for sale | $ 45 |

(1) The assignment of goodwill was based on the relative fair value of the disposal group and the portion of the remaining reporting unit.

(2) Primarily represents customer relationships.

**Pro Forma Results and Acquisition-related Costs**

The condensed consolidated financial statements for the three and nine months ended September 30, 2018 and 2017 include the financial results of the above 2017 acquisitions from the date of each acquisition. Pro forma financial results have not been presented since these acquisitions both individually and in the aggregate were not material to our financial results.

Acquisition-related costs for the transactions described above were expensed as incurred and are included in merger and strategic initiatives expense in the Condensed Consolidated Statements of Income.

**5. Assets and Liabilities Held For Sale**

In September 2017, we commenced a process to evaluate strategic alternatives for our Public Relations Solutions and Digital Media Services businesses within our Corporate Solutions business as part of our strategic refinement and subsequently committed to a plan to divest these businesses. The Corporate Solutions business is part of our Corporate Services segment. The Public Relations Solutions and Digital Media Services businesses included the following products and services:

- Nasdaq GlobeNewswire;
- Nasdaq Influencers;
- Nasdaq Media Intelligence;
- Nasdaq IR Websites and Newsrooms; and
- Nasdaq Webcasts.

We determined that we met all of the criteria to classify the assets and liabilities of these businesses as held for sale. The disposal of these businesses did not represent a strategic shift that would have a major effect on our operations and financial results and were, therefore, not classified as discontinued operations. As a result of this classification, the assets and liabilities of these businesses were separately presented within the Condensed Consolidated Balance Sheets as held for sale and were recorded at the lower of their carrying amount or fair value less costs to sell.

* * * * * *

**6. Goodwill and Acquired Intangible Assets**

**Goodwill**

The following table presents the changes in goodwill by business segment during the nine months ended September 30, 2018:

| | Market Services | Corporate Services | Information Services | Market Technology | Total |
|---|---|---|---|---|---|
| | | | (in millions) | | |
| Balance at December 31, 2017 | $ 3,546 | $ 490 | $ 2,362 | $ 188 | $ 6,586 |
| Reclassification of goodwill[1] | — | 29 | — | (29) | — |
| Foreign currency translation adjustment | (111) | (16) | (79) | (11) | (217) |
| Balance at September 30, 2018 | $ 3,435 | $ 503 | $ 2,283 | $ 148 | $ 6,369 |

[1] Concurrent with the realignment of our BWise corporate enterprise risk management solutions from our Market Technology segment to our Corporate Services segment, goodwill was reassigned to the Corporate Services segment using a relative fair value approach.

As of September 30, 2018, the amount of goodwill that is expected to be deductible for tax purposes in future periods is $749 million.

Goodwill represents the excess of purchase price over the value assigned to the net assets, including identifiable intangible assets, of a business acquired. Goodwill is allocated to our reporting units based on the assignment of the fair values of each reporting unit of the acquired company. We test goodwill for impairment at the reporting unit level annually, or in interim periods if certain events occur indicating that the carrying amount may be impaired, such as changes in the business climate, poor indicators of operating performance or the sale or disposition of a significant portion of a reporting unit. There was no impairment of goodwill for the nine months ended September 30, 2018 and 2017; however, events such as extended economic weakness or unexpected significant declines in operating results of a reporting unit may result in goodwill impairment charges in the future.

* * * * * *

**Acquired Intangible Assets**

The following table presents details of our total acquired intangible assets, both finite- and indefinite-lived:

| | September 30, 2018 | | | | December 31, 2017 | | | |
|---|---|---|---|---|---|---|---|---|
| | Gross Amount | Accumulated Amortization | Net Amount | Weighted-Average Useful Life (in Years) | Gross Amount | Accumulated Amortization | Net Amount | Weighted-Average Useful Life (in Years) |
| | | (in millions) | | | | (in millions) | | |
| **Finite-Lived Intangible Assets** | | | | | | | | |
| Technology | $ 50 | $ (13) | $ 37 | 9 | $ 65 | $ (22) | $ 43 | 8 |
| Customer relationships | 1,708 | (606) | 1,102 | 18 | 1,708 | (526) | 1,182 | 18 |
| Other | 17 | (5) | 12 | 8 | 17 | (4) | 13 | 8 |
| Foreign currency translation adjustment | (143) | 62 | (81) | | (111) | 46 | (65) | |
| Total finite-lived intangible assets | $ 1,632 | $ (562) | $ 1,070 | | $ 1,679 | $ (506) | $ 1,173 | |
| **Indefinite-Lived Intangible Assets** | | | | | | | | |
| Exchange and clearing registrations | $ 1,257 | $ — | $ 1,257 | | $ 1,257 | $ — | $ 1,257 | |
| Trade names | 127 | — | 127 | | 129 | — | 129 | |
| Licenses | 52 | — | 52 | | 52 | — | 52 | |
| Foreign currency translation adjustment | (178) | — | (178) | | (143) | — | (143) | |
| Total indefinite-lived intangible assets | $ 1,258 | $ — | $ 1,258 | | $ 1,295 | $ — | $ 1,295 | |
| Total intangible assets | $ 2,890 | $ (562) | $ 2,328 | | $ 2,974 | $ (506) | $ 2,468 | |

Amortization expense for acquired finite-lived intangible assets was $27 million for the three months ended September 30, 2018, $22 million for the three months ended September 30, 2017, $83 million for the nine months ended September 30, 2018, and $67 million for the nine months ended September 30, 2017. Amortization expense increased in 2018 primarily due to additional amortization expense associated with acquired intangible assets in 2017. These amounts are included in depreciation and amortization expense in the Condensed Consolidated Statements of Income.

The estimated future amortization expense (excluding the impact of foreign currency translation adjustments of $81 million as of September 30, 2018) of acquired finite-lived intangible assets as of September 30, 2018 is as follows:

| | (in millions) |
|---|---|
| 2018[1] | $ 27 |
| 2019 | 99 |
| 2020 | 98 |
| 2021 | 97 |
| 2022 | 94 |
| 2023 and thereafter | 736 |
| Total | $ 1,151 |

[1] Represents the estimated amortization to be recognized for the remaining three months of 2018.

In April 2018, in connection with the sale of the Public Relations Solutions and Digital Media Services businesses, we recorded a $2 million pre-tax, non-cash write-off related to an indefinite-lived intangible asset trade name.

## 7. Investments

The following table presents the details of our investments:

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| | (in millions) | |
| Trading securities | $ 202 | $ 221 |
| Available-for-sale investment securities | — | 14 |
| Financial investments, at fair value | $ 202 | $ 235 |
| | | |
| Equity method investments | $ 131 | $ 131 |
| Equity securities | $ 76 | $ 152 |

### Financial Investments, at Fair Value

*Trading Securities*

Trading securities, which are included in financial investments, at fair value in the Condensed Consolidated Balance Sheets, are primarily comprised of highly rated European government debt securities, of which $174 million as of September 30, 2018 and $160 million as of December 31, 2017, are assets utilized to meet regulatory capital requirements, primarily for our clearing operations at Nasdaq Clearing.

*Available-for-Sale Investment Securities*

As of December 31, 2017, available-for-sale investment securities, which are included in financial investments, at fair value in the Condensed Consolidated Balance Sheets, were primarily comprised of commercial paper debt securities. As of December 31, 2017, the cumulative unrealized gains and losses on these securities were immaterial.

### Equity Method Investments

As of September 30, 2018 and December 31, 2017, our equity method investments primarily included equity interests in OCC and EuroCCP N.V.

The carrying amounts of our equity method investments are included in other non-current assets in the Condensed Consolidated Balance Sheets.

Net income recognized from our equity interest in the earnings and losses of these equity method investments was $6 million for the three months ended September 30, 2018, $4 million for the three months ended September 30, 2017, $13 million for the nine months ended September 30, 2018, and $10 million for the nine months ended September 30, 2017.

***Capital Contribution to OCC***

In March 2015, OCC implemented a capital plan under which the options exchanges that are OCC's stockholders contributed $150 million of new equity capital to OCC, committed to make future replenishment capital contributions under certain circumstances, and received commitments regarding future dividend payments and related matters. See "Other Commitments," of Note 16, "Commitments, Contingencies and Guarantees," for further discussion of our commitment to make future replenishment capital contributions. Nasdaq and ISE each contributed $30 million of new equity capital under the OCC capital plan. OCC adopted specific policies with respect to fees, customer refunds and stockholder dividends, which envision an annual dividend equal to the portion of OCC's after-tax income that exceeds OCC's capital requirements after payment of refunds to OCC's clearing members (such refunds are generally 50% of the portion of OCC's pre-tax income that exceeds OCC's capital requirements). In February 2016, the SEC approved the OCC capital plan and certain industry participants appealed that approval in the Federal Court of Appeals. The Court of Appeals denied a requested stay, permitting OCC to pay a dividend which Nasdaq received in February 2016. In August 2017, the Court of Appeals remanded the case to the SEC for further examination of the record and an independent assessment by the SEC of the evidence OCC submitted. The Court directed that the SEC approval of the OCC capital plan remain in place during the SEC's examination unless the SEC determined not to preserve it. The SEC has allowed OCC to preserve the capital plan, and in September 2018 and 2017, OCC disbursed annual dividends. Nasdaq, as the owner of two shares, received $13 million in 2018 and $10 million in 2017. There has been no final ruling by the SEC at this time, and there is no deadline for the SEC to issue its ruling.

### Equity Securities

The carrying amounts of our equity securities are included in other non-current assets in the Condensed Consolidated Balance Sheets. As of September 30, 2018, our equity securities primarily represent our 5% ownership interest in LCH. As of December 31, 2017, our equity securities primarily represented our 5% ownership in Borsa Istanbul and our 5% ownership interest in LCH. For the nine months ended September 30, 2018, no impairment charges were recorded on our equity securities and there were no upward or downward adjustments recorded.

The Borsa Istanbul shares, which were issued to us in the first quarter of 2014, were part of the consideration received under a market technology agreement. This investment had a carrying amount of $75 million which was guaranteed to us via a put option negotiated as part of the market technology agreement. During the second quarter of 2018, we exercised the put option and we expect to receive cash consideration in installments through 2022.

In October 2018, we entered into an agreement to sell our ownership interest in LCH. See "Sale of Equity Security," of Note 19, "Subsequent Events," for further discussion.

**8. Deferred Revenue**

Deferred revenue represents consideration received that is yet to be recognized as revenue. The changes in our deferred revenue during the nine months ended September 30, 2018 are reflected in the following table:

| | Initial Listing Revenues | Annual Listings Revenues | Market Technology Revenues | Corporate Solutions and Other Revenues[2] | Information Services Revenues | Other[3] | Total |
|---|---|---|---|---|---|---|---|
| | | | | (in millions) | | | |
| Balance at December 31, 2017 | $ 64 | $ 3 | $ 109 | $ 37 | $ 40 | $ 34 | $ 287 |
| Additions | 30 | 231 | 118 | 189 | 128 | 18 | 714 |
| Revenue recognized | (27) | (173) | (131) | (191) | (91) | (29) | (642) |
| Reclassification of deferred revenue[1] | — | — | (11) | 11 | — | — | — |
| Translation adjustment | (2) | (1) | (8) | — | 1 | (1) | (11) |
| Balance at September 30, 2018 | $ 65 | $ 60 | $ 77 | $ 46 | $ 78 | $ 22 | $ 348 |

(1) Concurrent with the realignment of our BWise corporate enterprise risk management solutions from our Market Technology segment to our Corporate Services segment, deferred revenue was reassigned to the Corporate Services segment.

(2) Other revenues include the revenues from the Public Relations Solutions and Digital Media Services businesses through the date of sale (April 2018). See "2018 Divestiture," of Note 4, "Acquisitions and Divestiture," to the condensed consolidated financial statements for further discussion.

(3) The balance as of September 30, 2018 and December 31, 2017 primarily includes deferred revenue from listing of additional shares fees which are included in our Listing Services segment. The activity during the period primarily pertains to our Trade Management Services and FICC businesses, which are included in our Market Services segment, for contracts paid monthly or quarterly in advance of the service.

On January 1, 2018, we adopted Topic 606. As a result, a portion of revenues that were previously deferred were recognized either in prior period revenues, through restatement, or as an adjustment to retained earnings upon adoption of the new standard. See "Revenue From Contracts With Customers," of Note 3, "Significant Accounting Policies Update," for a description of our initial listing, annual listing, market technology, corporate solutions, and information services revenues and the revenue recognition policy for each of these revenue streams.

As of September 30, 2018, we estimate that our deferred revenue will be recognized in the following years:

| | Initial Listing Revenues | Annual Listings Revenues | Market Technology Revenues | Corporate Solutions Revenues | Information Services Revenues | Other[2] | Total |
|---|---|---|---|---|---|---|---|
| | | | | (in millions) | | | |
| Fiscal year ended: | | | | | | | |
| 2018[1] | $ 6 | $ 60 | $ 18 | $ 24 | $ 35 | $ 3 | $ 146 |
| 2019 | 23 | — | 34 | 21 | 43 | 10 | 131 |
| 2020 | 15 | — | 18 | 1 | — | 6 | 40 |
| 2021 | 10 | — | 7 | — | — | 3 | 20 |
| 2022 | 7 | — | — | — | — | — | 7 |
| 2023 and thereafter | 4 | — | — | — | — | — | 4 |
| Total | $ 65 | $ 60 | $ 77 | $ 46 | $ 78 | $ 22 | $ 348 |

(1) Represents deferred revenue that is anticipated to be recognized over the remaining three months of 2018.

(2) Other primarily includes revenues from listing of additional shares fees which are included in our Listing Services business.

The timing of recognition of our deferred market technology revenues is primarily dependent upon the completion of customization and any significant modifications made pursuant to existing market technology contracts. As such, as it relates to market technology revenues, the timing represents our best estimate.

## 9. Debt Obligations

The following table presents the changes in the carrying amount of our debt obligations during the nine months ended September 30, 2018:

| | December 31, 2017 | Additions | Payments, Accretion and Other | September 30, 2018 |
|---|---|---|---|---|
| | | (in millions) | | |
| Short-term debt: | | | | |
| Commercial paper | $ 480 | $ 3,192 | $ (3,363) | $ 309 |
| Senior unsecured floating rate notes due March 22, 2019[1] | 498 | — | 1 | 499 |
| Total short-term debt | 978 | 3,192 | (3,362) | 808 |
| Long-term debt: | | | | |
| 5.55% senior unsecured notes due January 15, 2020 | 599 | — | — | 599 |
| 3.875% senior unsecured notes due June 7, 2021 | 716 | — | (22) | 694 |
| 4.25% senior unsecured notes due June 1, 2024 | 496 | — | 1 | 497 |
| 1.75% senior unsecured notes due May 19, 2023 | 712 | — | (22) | 690 |
| 3.85% senior unsecured notes due June 30, 2026 | 496 | — | — | 496 |
| $400 million senior unsecured term loan facility due November 25, 2019 (average interest rate of 3.37% for the period January 1, 2018 through September 30, 2018) | 100 | — | — | 100 |
| $1 billion revolving credit commitment due April 25, 2022 (average interest rate of 2.74% for the period January 1, 2018 through September 30, 2018) | 110 | — | (114) | (4) |
| Total long-term debt | 3,229 | — | (157) | 3,072 |
| Total debt obligations | $ 4,207 | $ 3,192 | $ (3,519) | $ 3,880 |

(1) Balance was reclassified to short-term debt as of March 31, 2018.

### Commercial Paper Program

Our U.S. dollar commercial paper program is supported by our 2017 Credit Facility which provides liquidity support for the repayment of commercial paper issued through the commercial paper program. See “2017 Credit Facility” below for further discussion of our 2017 Credit Facility. The effective interest rate of commercial paper issuances fluctuate as short term interest rates and demand fluctuate. The fluctuation of these rates due to market conditions may impact our interest expense.

As of September 30, 2018, commercial paper notes in the table above reflect the aggregate principal amount, less the unamortized discount which is being accreted through interest expense over the life of the applicable notes. The original maturities of these notes range from 7 days to 63 days and the weighted-average maturity is 29 days. The weighted-average effective interest rate is 2.45% per annum.

### Senior Unsecured Notes

Our senior unsecured notes were all issued at a discount. As a result of the discount, the proceeds received from each issuance were less than the aggregate principal amount. As of September 30, 2018, the amounts in the table above reflect the aggregate principal amount, less the unamortized debt discount and the unamortized debt issuance costs which are being accreted through interest expense over the life of the applicable notes. Our senior unsecured notes are general unsecured obligations of ours and rank equally with all of our existing and future unsubordinated obligations and they are not guaranteed by any of our subsidiaries. The senior unsecured notes were issued under indentures that, among other things, limit our ability to consolidate, merge or sell all or substantially all of our assets, create liens, and enter into sale and leaseback transactions.

With the exception of the 2020 Notes, upon a change of control triggering event (as defined in the various note indentures), the terms require us to repurchase all or part of each holder’s notes for cash equal to 101% of the aggregate principal amount purchased plus accrued and unpaid interest, if any.

#### *Senior Unsecured Floating Rate Notes*

In September 2017, Nasdaq issued the 2019 Notes. The 2019 Notes pay interest quarterly in arrears at a rate equal to the three-month U.S. dollar LIBOR as determined at the beginning of each quarterly period plus 0.39% per annum until March 22, 2019.

#### *5.55% Senior Unsecured Notes*

In January 2010, Nasdaq issued the 2020 Notes. The 2020 Notes pay interest semiannually at a rate of 5.55% per annum until January 15, 2020.

#### *3.875% Senior Unsecured Notes*

In June 2013, Nasdaq issued the 2021 Notes. The 2021 Notes pay interest annually at a rate of 3.875% per annum until June 7, 2021 and such rate may vary with Nasdaq’s debt rating up to a rate not to exceed 5.875%.

The 2021 Notes have been designated as a hedge of our net investment in certain foreign subsidiaries to mitigate the foreign exchange risk associated with certain investments in these subsidiaries. The decrease in the carrying amount of $22 million noted in the “Payments, Accretion and Other” column in the table above primarily reflects the translation of the 2021 Notes into U.S. dollars and is recorded in accumulated other comprehensive loss within stockholders’ equity in the Condensed Consolidated Balance Sheets as of September 30, 2018.

***4.25% Senior Unsecured Notes***

In May 2014, Nasdaq issued the 2024 Notes. The 2024 Notes pay interest semiannually at a rate of 4.25% per annum until June 1, 2024 and such rate may vary with Nasdaq’s debt rating up to a rate not to exceed 6.25%.

***1.75% Senior Unsecured Notes***

In May 2016, Nasdaq issued the 2023 Notes. The 2023 Notes pay interest annually at a rate of 1.75% per annum until May 19, 2023 and such rate may vary with Nasdaq’s debt rating up to a rate not to exceed 3.75%.

The 2023 Notes have been designated as a hedge of our net investment in certain foreign subsidiaries to mitigate the foreign exchange rate risk associated with certain investments in these subsidiaries. The decrease in the carrying amount of $22 million noted in the “Payments, Accretion and Other” column in the table above reflects the translation of the 2023 Notes into U.S. dollars and is recorded in accumulated other comprehensive loss within stockholders’ equity in the Condensed Consolidated Balance Sheets as of September 30, 2018.

***3.85% Senior Unsecured Notes***

In June 2016, Nasdaq issued the 2026 Notes. The 2026 Notes pay interest semiannually at a rate of 3.85% per annum until June 30, 2026 and such rate may vary with Nasdaq’s debt rating up to a rate not to exceed 5.85%.

**Credit Facilities**

As of September 30, 2018, the amounts in the table above reflect the aggregate principal amount, less the unamortized debt issuance costs which are being accreted through interest expense over the life of the applicable credit facility. Nasdaq is permitted to repay borrowings under our credit facilities at any time in whole or in part, without penalty.

Our credit facilities contain financial and operating covenants. Financial covenants include a minimum interest expense coverage ratio and a maximum leverage ratio. Operating covenants include, among other things, limitations on Nasdaq’s ability to incur additional indebtedness, grant liens on assets, dispose of assets and pay dividends. Our credit facilities allow us to pay cash dividends on our common stock. The facilities also contain customary affirmative covenants, including access to financial statements, notice of defaults and certain other material events, maintenance of properties and insurance, and events of default, including cross-defaults to our material indebtedness.

***2017 Credit Facility***

In April 2017, Nasdaq entered into the 2017 Credit Facility. The 2017 Credit Facility consists of a $1 billion five-year revolving credit facility (with sublimits for non-dollar borrowings, swingline borrowings and letters of credit), which replaced a former credit facility. Nasdaq intends to use funds available under the 2017 Credit Facility for general corporate purposes and to provide liquidity support for the repayment of commercial paper issued through the commercial paper program.

As of September 30, 2018, no amounts were outstanding on the 2017 Credit Facility. The $4 million credit balance represents unamortized debt issuance costs. Of the $1 billion that is available for borrowing, $311 million provides liquidity support for the commercial paper program and for a letter of credit. As such, as of September 30, 2018, the total remaining amount available under the 2017 Credit Facility was $689 million. See “Commercial Paper Program” above for further discussion of our commercial paper program.

Under our 2017 Credit Facility, borrowings under the revolving credit facility and swingline borrowings bear interest on the principal amount outstanding at a variable interest rate based on either the LIBOR or the base rate (as defined in the credit agreement) (or other applicable rate with respect to non-dollar borrowings), plus an applicable margin that varies with Nasdaq’s debt rating.

The 2017 Credit Facility includes an option for Nasdaq to increase the available aggregate amount by up to $500 million, subject to the consent of the lenders funding the increase and certain other conditions.

***2016 Credit Facility***

In March 2016, Nasdaq entered into the 2016 Credit Facility. Under our 2016 Credit Facility, borrowings bear interest on the principal amount outstanding at a variable interest rate based on either the LIBOR or the base rate (or other applicable rate with respect to non-dollar borrowings), plus an applicable margin that varies with Nasdaq’s debt rating.

As of September 30, 2018, the amount outstanding of $100 million is due upon maturity at November 25, 2019.

**Other Credit Facilities**

We also have credit facilities related to our Nasdaq Clearing operations in order to provide further liquidity. Credit facilities, which are available in multiple currencies, totaled $219 million as of September 30, 2018 and $187 million as of December 31, 2017 in available liquidity, none of which was utilized.

**Debt Covenants**

As of September 30, 2018, we were in compliance with the covenants of all of our debt obligations.

## 10. Retirement Plans

### Defined Contribution Savings Plan

We sponsor a 401(k) Plan for U.S. employees. Employees are immediately eligible to make contributions to the plan and are also eligible for an employer contribution match at an amount equal to 100.0% of the first 6.0% of eligible employee contributions. Savings plan expense included in compensation and benefits expense in the Condensed Consolidated Statements of Income was $3 million for both the three months ended September 30, 2018 and 2017 and $10 million for both the nine months ended September 30, 2018 and 2017.

### Pension and Supplemental Executive Retirement Plans

We maintain non-contributory, defined-benefit pension plans, non-qualified SERPs for certain senior executives and other post-retirement benefit plans for eligible employees in the U.S., collectively referred to as the Nasdaq Benefit Plans. Our pension plans and SERPs are frozen. Future service and salary for all participants do not count toward an accrual of benefits under the pension plans and SERPs. Most employees outside the U.S. are covered by local retirement plans or by applicable social laws. Benefits under social laws are generally expensed in the periods in which the costs are incurred. The total expense for these plans is included in compensation and benefits expense in the Condensed Consolidated Statements of Income and was $4 million for the three months September 30, 2018, $5 million for the three months ended September 30, 2017, $15 million for the nine months September 30, 2018, and $13 million for the nine months ended September 30, 2017. During the third quarter of 2018, we contributed $22 million to our U.S. defined-benefit pension plans. This contribution increased our funded status to approximately 100.0%. We will continue to monitor the plan's funded status.

## 11. Share-Based Compensation

We have a share-based compensation program for employees and non-employee directors. Share-based awards granted under this program include stock options, restricted stock (consisting of restricted stock units), and PSUs. For accounting purposes, we consider PSUs to be a form of restricted stock.

### Summary of Share-Based Compensation Expense

The following table shows the total share-based compensation expense resulting from equity awards and the 15.0% discount for the ESPP for the three and nine months ended September 30, 2018 and 2017 in the Condensed Consolidated Statements of Income:

| | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|---|---|---|---|---|
| | 2018 | 2017 | 2018 | 2017 |
| | (in millions) | | | |
| Share-based compensation expense before income taxes | $ 18 | $ 18 | $ 51 | $ 52 |
| Income tax benefit | (5) | (7) | (14) | (21) |
| Share-based compensation expense after income taxes | $ 13 | $ 11 | $ 37 | $ 31 |

### Common Shares Available Under Our Equity Plan

As of September 30, 2018, we had approximately 11.0 million shares of common stock authorized for future issuance under our Equity Plan.

### Restricted Stock

We grant restricted stock to most active employees. The grant date fair value of restricted stock awards is based on the closing stock price at the date of grant less the present value of future cash dividends. Restricted stock awards granted generally vest 25.0% on the second anniversary of the grant date, 25.0% on the third anniversary of the grant date, and 50.0% on the fourth anniversary of the grant date. We generally recognize compensation expense for restricted stock awards on a straight-line basis over the requisite service period of the award, taking into account an estimated forfeiture rate. Granted but unvested shares are generally forfeited upon termination of employment.

### Summary of Restricted Stock Activity

The following table summarizes our restricted stock activity for the nine months ended September 30, 2018:

| | Restricted Stock | |
|---|---|---|
| | Number of Awards | Weighted-Average Grant Date Fair Value |
| Unvested balances at January 1, 2018 | 1,988,500 | $ 57.34 |
| Granted | 489,203 | $ 81.77 |
| Vested | (669,577) | $ 47.54 |
| Forfeited | (229,214) | $ 63.29 |
| Unvested balances at September 30, 2018 | 1,578,912 | $ 68.20 |

As of September 30, 2018, $58 million of total unrecognized compensation cost related to restricted stock is expected to be recognized over a weighted-average period of 1.9 years.

### PSUs

PSUs are based on performance measures that impact the amount of shares that each recipient will receive upon vesting. We have two performance-based long-term PSU programs for certain officers, a one-year performance-based program and a three-year cumulative performance-based program that focuses on TSR.

*One-Year PSU Program*

The grant date fair value of PSUs under the one-year performance-based program is based on the closing stock price at the date of grant less the present value of future cash dividends. Under this program, an eligible employee receives a target grant of PSUs, but may receive from 0.0% to 150.0% of the target amount granted, depending on the achievement of performance measures. These awards vest ratably on an annual basis over a three-year period commencing with the end of the one-year performance period. Compensation cost is recognized over the performance period and the three-year vesting period based on the probability that such performance measures will be achieved, taking into account an estimated forfeiture rate. Granted but unvested shares are generally forfeited upon termination of employment.

During 2017, certain grants of PSUs with a one-year performance period exceeded the applicable performance parameters. As a result, an additional 14,497 units above target were considered granted in the first quarter of 2018 and are included in the below table.

*Three-Year PSU Program*

Under the three-year performance-based program, each eligible individual receives PSUs, subject to market conditions, with a three-year cumulative performance period that vest at the end of the performance period. Compensation cost is recognized over the three-year vesting period, taking into account an estimated forfeiture rate, regardless of whether the market condition is satisfied, provided that the requisite service period has been completed. Granted but unvested shares are generally forfeited upon termination of employment. Performance will be determined by comparing Nasdaq's TSR to two peer groups, each weighted 50.0%. The first peer group consists of exchange companies, and the second peer group consists of all companies in the S&P 500. Nasdaq's relative performance ranking against each of these groups will determine the final number of shares delivered to each individual under the program. The payout under this program will be between 0.0% and 200.0% of the number of PSUs granted and will be determined by Nasdaq's overall performance against both peer groups. However, if Nasdaq's TSR is negative for the three-year performance period, regardless of TSR ranking, the payout will not exceed 100.0% of the number of PSUs granted. We estimate the fair value of PSUs granted under the three-year PSU program using the Monte Carlo simulation model, as these awards contain a market condition.

Certain grants of PSUs that were issued in 2015 with a three-year performance period exceeded the applicable performance parameters. As a result, an additional 237,876 units above target were considered granted in the first quarter of 2018 and are included in the below table.

The following weighted-average assumptions were used to determine the weighted-average fair values of the PSU awards granted under the three-year PSU program:

| | Nine Months Ended September 30, | |
|---|---|---|
| | 2018 | 2017 |
| Weighted-average risk free interest rate[1] | 2.36% | 1.44% |
| Expected volatility[2] | 18.7% | 19.2% |
| Weighted-average grant date share price | $86.24 | $69.45 |
| Weighted-average fair value at grant date | $116.86 | $81.57 |

(1) The risk-free interest rate for periods within the expected life of the award is based on the U.S. Treasury yield curve in effect at the time of grant.

(2) We use historic volatility for PSU awards issued under the three-year PSU program, as implied volatility data could not be obtained for all the companies in the peer groups used for relative performance measurement within the program.

In addition, the annual dividend assumption utilized in the Monte Carlo simulation model is based on Nasdaq's dividend yield at the date of grant.

**Summary of PSU Activity**

The following table summarizes our PSU activity for the nine months ended September 30, 2018:

| | PSUs | | | |
|---|---|---|---|---|
| | One-Year Program | | Three-Year Program | |
| | Number of Awards | Weighted-Average Grant Date Fair Value | Number of Awards | Weighted-Average Grant Date Fair Value |
| Unvested balances at January 1, 2018 | 333,004 | $ 61.39 | 1,009,958 | $ 78.18 |
| Granted[1] | 132,019 | $ 80.36 | 484,075 | $ 90.92 |
| Vested | (6,702) | $ 49.40 | (655,204) | $ 64.08 |
| Forfeited | (22,650) | $ 60.84 | — | $ — |
| Unvested balances at September 30, 2018 | 435,671 | $ 67.35 | 838,829 | $ 96.55 |

(1) Includes target awards granted and certain additional awards granted based on overachievement of performance parameters.

As of September 30, 2018, $12 million of total unrecognized compensation cost related to the one-year PSU program is expected to be recognized over a weighted-average period of 1.5 years. For the three-year PSU program, $34 million of total unrecognized compensation cost is expected to be recognized over a weighted-average period of 1.5 years.

**Stock Options**

No stock option awards were granted during the nine months ended September 30, 2018.

In January 2017, our CEO received 268,817 performance-based non-qualified stock options which will vest annually over a three-year period, with each vesting contingent upon the achievement of annual performance parameters. On January 30, 2018, Nasdaq's management compensation committee and board of directors determined that the performance goal for 2017 was met, resulting in the settlement of the first one-third of the grant.

The weighted-average grant date fair value was $66.68. We estimated the fair value of this stock option award using the Black-Scholes valuation model using the following assumptions:

| | |
|---|---|
| Expected life (in years) | 6 |
| Weighted-average risk free interest rate | 2.1% |
| Expected volatility | 25.6% |
| Dividend yield | 1.92% |

Our computation of expected life was based on an estimate of the average length of time between option grant and exercise. The interest rate for periods within the expected life of the award was based on the U.S. Treasury yield curve in effect at the time of grant. Our computation of expected volatility was an estimate of the future upward/downward fluctuations in the underlying share price. We used Nasdaq's historical volatility for the trailing 6-year period as of the grant date. Our computation of dividend yield was based on annualized dividends expressed as a percentage of share price.

**Summary of Stock Option Activity**

A summary of stock option activity for the nine months ended September 30, 2018 is as follows:

| | Number of Stock Options | Weighted-Average Exercise Price | Weighted-Average Remaining Contractual Term (in years) | Aggregate Intrinsic Value (in millions) |
|---|---|---|---|---|
| Outstanding at January 1, 2018 | 571,380 | $ 43.84 | 5.40 | $ 19 |
| Exercised | (99,953) | 24.52 | | |
| Forfeited | (3,182) | 26.86 | | |
| Outstanding at September 30, 2018 | 468,245 | $ 48.08 | 5.48 | $ 18 |
| Exercisable at September 30, 2018 | 289,033 | $ 36.55 | 3.83 | $ 14 |

The net cash proceeds from the exercise of 11,953 stock options for the three months ended September 30, 2018 was immaterial. We received net cash proceeds of $2 million from the exercise of 99,953 stock options for the nine months ended September 30, 2018. We received net cash proceeds of $1 million from the exercise of 40,160 stock options for the three months ended September 30, 2017 and received net cash proceeds of $24 million from the exercise of 1,074,321 stock options for the nine months ended September 30, 2017.

The aggregate intrinsic value in the above table represents the total pre-tax intrinsic value (i.e., the difference between our closing stock price on September 28, 2018 of $85.80 and the exercise price, times the number of shares) based on stock options with an exercise price less than Nasdaq’s closing price of $85.80 as of September 28, 2018, which would have been received by the option holders had the option holders exercised their stock options on that date. This amount can change based on the fair market value of our common stock. The total number of in-the-money stock options exercisable as of September 30, 2018 was 0.3 million and the weighted-average exercise price was $36.55. As of September 30, 2017, 0.3 million outstanding stock options were exercisable and the weighted-average exercise price was $23.77.

The total pre-tax intrinsic value of stock options exercised was $1 million for the three months ended September 30, 2018, $2 million for the three months ended September 30, 2017, $6 million for the nine months ended September 30, 2018, and $53 million for the nine months ended September 30, 2017.

**ESPP**

We have an ESPP under which approximately 2.0 million shares of our common stock have been reserved for future issuance as of September 30, 2018. Under our ESPP, employees may purchase shares having a value not exceeding 10.0% of their annual compensation, subject to applicable annual Internal Revenue Service limitations. We record compensation expense related to the 15.0% discount that is given to our employees which totaled $1 million for both the three months ended September 30, 2018 and 2017 and $3 million for both the nine months ended September 30, 2018 and 2017.

## 12. Nasdaq Stockholders’ Equity

**Common Stock**

As of September 30, 2018, 300,000,000 shares of our common stock were authorized, 169,423,805 shares were issued and 163,949,047 shares were outstanding. The holders of common stock are entitled to one vote per share, except that our certificate of incorporation limits the ability of any person to vote in excess of 5.0% of the then-outstanding shares of Nasdaq common stock.

**Common Stock in Treasury, at Cost**

We account for the purchase of treasury stock under the cost method with the shares of stock repurchased reflected as a reduction to Nasdaq stockholders’ equity and included in common stock in treasury, at cost in the Condensed Consolidated Balance Sheets. Shares repurchased under our share repurchase program are currently retired and canceled. When treasury shares are reissued, they are recorded at the average cost of the treasury shares acquired. We held

5,474,758 shares of common stock in treasury as of September 30, 2018 and 4,932,402 shares as of December 31, 2017, most of which are related to shares of our common stock repurchased for the settlement of employee tax withholding obligations arising from the vesting of restricted stock.

**Share Repurchase Program**

In January 2018, our board of directors authorized an additional $500 million for the share repurchase program bringing the total capacity to $726 million.

These purchases may be made from time to time at prevailing market prices in open market purchases, privately-negotiated transactions, block purchase techniques or otherwise, as determined by our management. The purchases are primarily funded from existing cash balances. The share repurchase program may be suspended, modified or discontinued at any time. The share repurchase program has no defined expiration date.

The following table summarizes our share repurchase activity:

| | Nine Months Ended September 30, | |
|---|---|---|
| | 2018 | 2017 |
| Number of shares of common stock repurchased | 4,508,426 | 2,455,171 |
| Average price paid per share | $ 87.43 | $ 71.15 |
| Total purchase price (in millions) | $ 394 | $ 175 |

As discussed above in “Common Stock in Treasury, at Cost,” shares repurchased under our share repurchase program are currently retired and cancelled. As of September 30, 2018, the remaining amount authorized for share repurchases under the program was $332 million.

**Other Repurchases of Common Stock**

During the first nine months of 2018, we repurchased 542,356 shares of our common stock in settlement of employee tax withholding obligations arising from the vesting of restricted stock.

**Preferred Stock**

Our certificate of incorporation authorizes the issuance of 30,000,000 shares of preferred stock, par value $0.01 per share, issuable from time to time in one or more series. As of September 30, 2018 and December 31, 2017, no shares of preferred stock were issued or outstanding.

* * * * * *

**Cash Dividends on Common Stock**

During the nine months ended September 30, 2018, our board of directors declared the following cash dividends:

| Declaration Date | Dividend Per Common Share | Record Date | Total Amount Paid | Payment Date |
|---|---|---|---|---|
| | | | (in millions) | |
| January 30, 2018 | $ 0.38 | March 16, 2018 | $ 63 | March 30, 2018 |
| March 26, 2018 | 0.44 | June 15, 2018 | 73 | June 29, 2018 |
| July 24, 2018 | 0.44 | September 14, 2018 | 72 | September 28, 2018 |
| | | | $ 208 | |

The total amount paid of $208 million was recorded in retained earnings in the Condensed Consolidated Balance Sheets at September 30, 2018.

In October 2018, the board of directors declared a regular quarterly cash dividend of $0.44 per share on our outstanding common stock. The dividend is payable on December 28, 2018 to shareholders of record at the close of business on December 14, 2018. The estimated amount of this dividend is $72 million. In March 2018, the board of directors approved a regular quarterly cash dividend of $0.44 per share on our outstanding common stock which reflects a 16.0% increase from our prior quarterly cash dividend of $0.38. Future declarations of quarterly dividends and the establishment of future record and payment dates are subject to approval by the board of directors.

Our board of directors maintains a dividend policy with the intention to provide stockholders with regular and growing dividends over the long term as earnings and cash flow grow.

## 13. Earnings Per Share

The following table sets forth the computation of basic and diluted earnings per share:

| | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|---|---|---|---|---|
| | 2018 | 2017 | 2018 | 2017 |
| **Numerator:** | (in millions, except share and per share amounts) | | | |
| Net income attributable to common shareholders | $ 163 | $ 170 | $ 502 | $ 483 |
| **Denominator:** | | | | |
| Weighted-average common shares outstanding for basic earnings per share | 164,227,243 | 166,694,755 | 165,622,428 | 166,195,433 |
| Weighted-average effect of dilutive securities: | | | | |
| Employee equity awards[1] | 2,071,426 | 2,315,145 | 1,931,307 | 3,036,349 |
| Contingent issuance of common stock | 992,247 | 992,247 | 330,749 | 334,384 |
| Weighted-average common shares outstanding for diluted earnings per share | 167,290,916 | 170,002,147 | 167,884,484 | 169,566,166 |
| **Basic and diluted earnings per share:** | | | | |
| Basic earnings per share | $ 0.99 | $ 1.02 | $ 3.03 | $ 2.91 |
| Diluted earnings per share | $ 0.97 | $ 1.00 | $ 2.99 | $ 2.85 |

(1) PSUs, which are considered contingently issuable, are included in the computation of dilutive earnings per share on a weighted average basis when management determines the related performance criteria are met.

There were no securities that were antidilutive for both the three and nine months ended September 30, 2018. Securities that were not included in the computation of diluted earnings per share because their effect was antidilutive totaled 179,712 for the three months ended September 30, 2017 and 325,187 for the nine months ended September 30, 2017.

## 14. Fair Value of Financial Instruments

The following tables present our financial assets and financial liabilities that are measured at fair value on a recurring basis as of September 30, 2018 and December 31, 2017. We did not have any financial liabilities measured at fair value on a recurring basis as of December 31, 2017.

| | September 30, 2018 | | | |
|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 |
| | (in millions) | | | |
| **Assets at Fair Value** | | | | |
| Financial investments, at fair value | $ 202 | $ 148 | $ 54 | $ — |
| Default fund and margin deposit investments | 1,617 | 215 | 1,402 | — |
| Total Assets at Fair Value | $ 1,819 | $ 363 | $ 1,456 | $ — |
| **Liabilities at Fair Value** | | | | |
| Other financial instruments | $ 56 | $ — | $ 56 | $ — |
| Total Liabilities at Fair Value | $ 56 | $ — | $ 56 | $ — |

| | December 31, 2017 | | | |
|---|---|---|---|---|
| | Total | Level 1 | Level 2 | Level 3 |
| | (in millions) | | | |
| **Assets at Fair Value** | | | | |
| Financial investments, at fair value | $ 235 | $ 135 | $ 100 | $ — |
| Default fund and margin deposit investments | 2,129 | 371 | 1,758 | — |
| Total Assets at Fair Value | $ 2,364 | $ 506 | $ 1,858 | $ — |

As of September 30, 2018 and December 31, 2017, Level 1 financial investments, at fair value were primarily comprised of trading securities, mainly highly rated European government debt securities. As of September 30, 2018 and December 31, 2017, Level 2 financial investments, at fair value were primarily comprised of trading securities, mainly corporate bonds and European mortgage bonds. Of the Level 1 and Level 2 financial investments, at fair value, $174 million as of September 30, 2018 and $160 million as of December 31, 2017 are assets utilized to meet regulatory capital requirements, primarily for our clearing operations at Nasdaq Clearing.

Our Level 1 default fund and margin deposit investments were primarily comprised of highly rated European and U.S. government debt securities. Level 2 default fund and margin deposit investments were primarily comprised of central bank certificates and reverse repurchase agreements, as of September 30, 2018 and December 31, 2017.

Our Level 2 other financial instruments include a liability associated with Nasdaq Clearing's requirement to fulfill the settlement of certain contracts of a defaulted member. As of September 30, 2018, the fair value of this guarantee was $56 million and is included in other current liabilities in the Condensed Consolidated Balance Sheets. See Note 15, “Clearing Operations,” for further discussion of default fund contributions and margin deposits.

**Financial Instruments Not Measured at Fair Value on a Recurring Basis**

Some of our financial instruments are not measured at fair value on a recurring basis but are recorded at amounts that approximate fair value due to their liquid or short-term nature. Such financial assets and financial liabilities include: cash and cash equivalents, restricted cash, receivables, net, certain other current assets, accounts payable and accrued expenses, Section 31 fees payable to SEC, accrued personnel costs, commercial paper and certain other current liabilities.

Our investments in OCC and EuroCCP N.V. are accounted for under the equity method of accounting. Our investment in LCH is accounted for using the measurement alternative as this investment does not have a readily determinable fair value. See “Equity Securities,” of Note 3, “Significant Accounting Policies Update,” and “Equity Method Investments,” and “Equity Securities,” of Note 7, “Investments,” for further discussion.

We also consider our debt obligations to be financial instruments. The fair value of our debt obligations, utilizing discounted cash flow analyses for our floating rate debt and prevailing market rates for our fixed rate debt, was $4.0 billion as of September 30, 2018 and $4.4 billion as of December 31, 2017. The discounted cash flow analyses are based on borrowing rates currently available to us for debt with similar terms and maturities. The fair value of our commercial paper approximates the carrying value since the rates of interest on this short-term debt approximate market rates as of September 30, 2018. Our commercial paper and our fixed rate and floating rate debt are categorized as Level 2 in the fair value hierarchy.

For further discussion of our debt obligations, see Note 9, “Debt Obligations.”

**Non-Financial Assets Measured at Fair Value on a Non-Recurring Basis**

Our non-financial assets, which include goodwill, intangible assets, and other long-lived assets, are not required to be carried at fair value on a recurring basis. Fair value measures of non-financial assets are primarily used in the impairment analysis of these assets. Any resulting asset impairment would require that the non-financial asset be recorded at its fair value. Nasdaq uses Level 3 inputs to measure the fair value of the above assets on a non-recurring basis. As of September 30, 2018 and December 31, 2017, there were no non-financial assets measured at fair value on a non-recurring basis.

## 15. Clearing Operations

**Nasdaq Clearing**

Nasdaq Clearing is authorized and supervised under EMIR as a multi-asset clearinghouse by the SFSA. Such authorization is effective for all member states of the European Union and certain other non-member states that are part of the European Economic Area, including Norway. The clearinghouse acts as the CCP for exchange and OTC trades in equity derivatives, fixed income derivatives, resale and repurchase contracts, power derivatives, emission allowance derivatives, fuel oil derivatives, and seafood derivatives.

Through our clearing operations in the financial markets, which include the resale and repurchase market, the commodities markets, and the seafood market, Nasdaq Clearing is the legal counterparty for, and guarantees the fulfillment of, each contract cleared. These contracts are not used by Nasdaq Clearing for the purpose of trading on its own behalf. As the legal counterparty of each transaction, Nasdaq Clearing bears the counterparty risk between the purchaser and seller in the contract. In its guarantor role, Nasdaq Clearing has precisely equal and offsetting claims to and from clearing members on opposite sides of each contract, standing as the CCP on every contract cleared. In accordance with the rules and regulations of Nasdaq Clearing, default fund and margin collateral requirements are calculated for each clearing member’s positions in accounts with the CCP. See “Default Fund Contributions and Margin Deposits” below for further discussion of Nasdaq Clearing’s default fund and margin requirements.

Nasdaq Clearing maintains four member sponsored default funds: one related to financial markets, one related to commodities markets, one related to the seafood market, and a mutualized fund. Under this structure, Nasdaq Clearing and its clearing members must contribute to the total regulatory capital related to the clearing operations of Nasdaq Clearing. This structure applies an initial separation of default fund contributions for the financial, commodities and seafood markets in order to create a buffer for each market’s counterparty risks. Simultaneously, a mutualized default fund provides capital efficiencies to Nasdaq Clearing’s members with regard to total regulatory capital required. See “Default Fund Contributions” below for further discussion of Nasdaq Clearing’s default fund. Power of assessment and a liability waterfall also have been implemented. See “Power of Assessment” and “Liability Waterfall” below for further discussion. These requirements ensure the alignment of risk between Nasdaq Clearing and its clearing members.

**Nasdaq Commodities Clearing Default**

In September 2018, a member of the Nasdaq Clearing commodities market defaulted due to inability to post sufficient collateral to cover increased margin requirements for the positions of the relevant member, which had experienced losses due to sharp adverse movements in the Nordic - German power market spread. Nasdaq Clearing followed default procedures and offset the future market risk on the defaulting member’s p ositions. The default resulted in a loss of $133 million which was allocated to Nasdaq Clearing and the members of the commodities default fund in accordance with the liability waterfall as follows:

- the first $8 million of the loss was allocated to Nasdaq Clearing’s junior capital; and
- the remainder was allocated on a pro-rata basis to the commodities clearing members’ default funds.

Nasdaq Clearing is exploring rights and available options to pursue recovery of the members’ default fund losses. Any funds recovered will be apportioned to the commodities default fund participants and thereafter to Nasdaq Clearing in accordance with the default fund rules.

During September 2018, Nasdaq Clearing replenished the utilized junior capital of $8 million for the commodities market and the commodities clearing members replenished their pro rata portions of the default fund. In addition, Nasdaq Clearing contributed approximately $22 million of temporary capital (which will remain in place for 90 days from September 11, 2018). In the event of a default during this time period, the temporary junior capital contribution would be utilized first, followed by the liability waterfall as of September 30, 2018 as described below.

In order to reduce the risk profile of commodities clearing operations, Nasdaq Clearing has increased margin levels by increasing the confidence level on commodity products and thereby shifted the risk from waterfall resources more to each portfolio holder's collateral.

As a result of the default, a $56 million liability was recorded in other current liabilities and $56 million of collateral was recorded in other current assets in the Condensed Consolidated Balance Sheets as of September 30, 2018 in order to allow Nasdaq Clearing to fulfill the settlement of certain contracts of the defaulted member arising from the default management process. We have established mitigating positions. The collateral and liability were previously included in Default Funds and Margin Deposits.

**Default Fund Contributions and Margin Deposits**

As of September 30, 2018, clearing member default fund contributions and margin deposits were as follows:

| | September 30, 2018 | | |
|---|---|---|---|
| | Cash Contributions | Non-Cash Contributions | Total Contributions |
| | (in millions) | | |
| Default fund contributions | $ 407 | $ 108 | $ 515 |
| Margin deposits | 3,812 | 3,922 | 7,734 |
| Total | $ 4,219 | $ 4,030 | $ 8,249 |

In accordance with its investment policy, of the total cash contributions of $4,219 million, Nasdaq Clearing has invested $1,187 million in highly rated European and U.S. government debt securities or central bank certificates with maturity dates primarily 90 days or less and $430 million in reverse repurchase agreements secured with highly rated government securities with maturity dates that range from 1 days to 19 days. The carrying value of these securities approximates their fair value due to the short-term nature of the instruments and reverse repurchase agreements. The remainder of this balance was held in cash in demand deposit accounts at central banks and large, highly rated financial institutions. Of the total default fund contributions of $515 million, Nasdaq Clearing can utilize $463 million as capital resources in the event of a counterparty default. The remaining balance of $52 million pertains to member posted surplus balances.

In the investment activity related to default fund and margin contributions, we are exposed to counterparty risk related to reverse repurchase agreement transactions, which reflect the risk that the counterparty might become insolvent and, thus, fail to meet its obligations to Nasdaq Clearing. We mitigate this risk by only engaging in transactions with high credit quality reverse repurchase agreement counterparties and by limiting the acceptable collateral under the reverse repurchase agreement to high quality issuers, primarily government securities and other securities explicitly guaranteed by a government. The value of the underlying security is monitored during the lifetime of the contract and in the event the market value of the underlying security falls below the reverse repurchase amount our clearinghouse may require additional collateral or a reset of the contract.

***Default Fund Contributions***

Required contributions to the default funds are proportional to the exposures of each clearing member. When a clearing member is active in more than one market, contributions must be made to all markets’ default funds in which the member is active. Clearing members’ eligible contributions may include cash and non-cash contributions. Cash contributions received are held in cash or invested by Nasdaq Clearing, in accordance with its investment policy, either in highly rated government debt securities, time deposits, central bank certificates or reverse repurchase agreements with highly rated government debt securities as collateral. Nasdaq Clearing maintains and manages all cash deposits related to margin collateral. All risks and rewards of collateral ownership, including interest, belong to Nasdaq Clearing. Clearing members’ cash contributions are included in default funds and margin deposits in the Condensed Consolidated Balance Sheets as both a current asset and a current liability. Non-cash contributions include highly rated government debt securities that must meet specific criteria approved by Nasdaq Clearing. Non-cash contributions are pledged assets that are not recorded in the Condensed Consolidated Balance Sheets as Nasdaq Clearing does not take legal ownership of these assets and the risks and rewards remain with the clearing members. These balances may fluctuate over time due to changes in the amount of deposits required and whether members choose to provide cash or non-cash contributions. Assets pledged are held at a nominee account in Nasdaq Clearing’s name for the benefit of the clearing members and are immediately accessible by Nasdaq Clearing in the event of a default. In addition to clearing members’ required contributions to the liability waterfall, Nasdaq Clearing is also required to contribute capital to the liability waterfall and overall regulatory capital as specified under its clearinghouse rules. As of September 30, 2018, Nasdaq Clearing committed capital totaling $128 million to the liability waterfall and overall regulatory capital, in the form of government debt securities, which are recorded as financial investments, at fair value in the Condensed Consolidated Balance Sheets. This includes temporary capital of $22 million (related to the Nasdaq commodities clearing default), which will remain in place for 90 days from September 11, 2018. The combined regulatory capital of the clearing members and Nasdaq Clearing will serve to secure the obligations of a clearing member exceeding such member’s own margin and default fund deposits and may be used to cover losses sustained by a clearing member in the event of a default.

***Margin Deposits***

Nasdaq Clearing requires all clearing members to provide collateral, which may consist of cash and non-cash contributions, to guarantee performance on the clearing members’ open positions, or initial margin. In addition, clearing members must also provide collateral to cover the daily margin call if needed. See “Default Fund Contributions” above for further discussion of cash and non-cash contributions.

Similar to default fund contributions, Nasdaq Clearing maintains and manages all cash deposits related to margin collateral. All risks and rewards of collateral ownership, including interest, belong to Nasdaq Clearing and are recorded in revenues. These cash deposits are recorded in default funds and margin deposits in the Condensed Consolidated Balance Sheets as both a current asset and current liability. Pledged margin collateral is not recorded in our Condensed Consolidated Balance Sheets as all risks and rewards of collateral ownership, including interest, belong to the counterparty. Assets pledged are held at a nominee account in Nasdaq Clearing’s name for the benefit of the clearing members and are immediately accessible by Nasdaq Clearing in the event of a default.

Nasdaq Clearing marks to market all outstanding contracts and requires payment from clearing members whose positions have lost value. The mark-to-market process helps identify any clearing members that may not be able to satisfy their financial obligations in a timely manner allowing Nasdaq Clearing the ability to mitigate the risk of a clearing member defaulting due to exceptionally large losses. In the event of a default, Nasdaq Clearing can access the defaulting member’s margin and default fund deposits to cover the defaulting member’s losses.

**Regulatory Capital and Risk Management Calculations**

Nasdaq Clearing manages risk through a comprehensive counterparty risk management framework, which is comprised of policies, procedures, standards and financial resources. The level of regulatory capital is determined in accordance with Nasdaq Clearing’s regulatory capital policy, as approved by the SFSA. Regulatory capital calculations are continuously updated through a proprietary capital-at-risk calculation model that establishes the appropriate level of capital.

As mentioned above, Nasdaq Clearing is the legal counterparty for each contract cleared and thereby guarantees the fulfillment of each contract. Nasdaq Clearing accounts for this guarantee as a performance guarantee. We determine the fair value of the performance guarantee by considering daily settlement of contracts and other margining and default fund requirements, the risk management program, historical evidence of default payments, and the estimated probability of potential default payouts. The calculation is determined using proprietary risk management software that simulates gains and losses based on historical market prices, extreme but plausible market scenarios, volatility and other factors present at that point in time for those particular unsettled contracts. Based on this analysis, excluding any liability related to the Nasdaq commodities clearing default (see discussion above), the estimated liability was nominal and no liability was recorded as of September 30, 2018.

**Power of Assessment**

To further strengthen the contingent financial resources of the clearinghouse, Nasdaq Clearing has power of assessment that provides the ability to collect additional funds from its clearing members to cover a defaulting member’s remaining obligations up to the limits established under the terms of the clearinghouse rules. The power of assessment corresponds to 100.0% of the clearing member’s aggregate contribution to the financial, commodities and seafood markets’ default funds.

**Liability Waterfall**

The liability waterfall is the priority order in which the capital resources would be utilized in the event of a default where the defaulting clearing member’s collateral would not be sufficient to cover the cost to settle its portfolio. If a default occurs and the defaulting clearing member’s collateral, including cash deposits and pledged assets, is depleted, then capital is utilized in the following amount and order:

- junior capital contributed by Nasdaq Clearing, which totaled $31 million as of September 30, 2018 ($22 million which is temporary capital related to the Nasdaq commodities clearing default and will remain in place for 90 days from September 11, 2018);
- a loss sharing pool related only to the financial market that is contributed to by clearing members and only applies if the defaulting member’s portfolio includes interest rate swap products;
- specific market default fund where the loss occurred (i.e., the financial, commodities, or seafood market), which includes capital contributions of the clearing members on a pro-rata basis;
- senior capital contributed to each specific market by Nasdaq Clearing, calculated in accordance with clearinghouse rules, which totaled $22 million as of September 30, 2018;

- mutualized default fund, which includes capital contributions of the clearing members on a pro-rata basis;
- replenished junior capital for the commodities market contributed by Nasdaq Clearing, which totaled $8 million as of September 30, 2018 (see below); and
- replenished default fund for the commodities market, which includes capital contributions of the clearing members on a pro-rata basis (see below).

If additional funds are needed after utilization of the liability waterfall, then Nasdaq Clearing will utilize its power of assessment and additional capital contributions will be required by non-defaulting members up to the limits established under the terms of the clearinghouse rules.

In addition to the capital held to withstand counterparty defaults described above, Nasdaq Clearing also has committed capital of $67 million to ensure that it can handle an orderly wind-down of its operation, and that it is adequately protected against investment, operational, legal, and business risks.

**Market Value of Derivative Contracts Outstanding**

The following table includes the market value of derivative contracts outstanding prior to netting:

| | September 30, 2018 (in millions) |
|---|---|
| Commodity and seafood options, futures and forwards(1)(2)(3) | $ 1,106 |
| Fixed-income options and futures(1)(2) | 520 |
| Stock options and futures(1)(2) | 187 |
| Index options and futures(1)(2) | 91 |
| Total | $ 1,904 |

(1) We determined the fair value of our option contracts using standard valuation models that were based on market-based observable inputs including implied volatility, interest rates and the spot price of the underlying instrument.

(2) We determined the fair value of our futures contracts based upon quoted market prices and average quoted market yields.

(3) We determined the fair value of our forward contracts using standard valuation models that were based on market-based observable inputs including LIBOR rates and the spot price of the underlying instrument.

**Derivative Contracts Cleared**

The following table includes the total number of derivative contracts cleared through Nasdaq Clearing for the nine months ended September 30, 2018 and 2017:

| | September 30, 2018 | September 30, 2017 |
|---|---|---|
| Commodity and seafood options, futures and forwards(1) | 1,506,560 | 2,040,033 |
| Fixed-income options and futures | 16,833,278 | 14,788,850 |
| Stock options and futures | 17,735,228 | 20,070,584 |
| Index options and futures | 35,569,046 | 32,748,357 |
| Total | 71,644,112 | 69,647,824 |

(1) The total volume in cleared power related to commodity contracts was 853 Terawatt hours (TWh) for the nine months ended September 30, 2018 and 911 TWh for the nine months ended September 30, 2017.

The outstanding contract value of resale and repurchase agreements was $4.1 billion as of September 30, 2018 and $5.0 billion as of September 30, 2017. The total number of contracts cleared was 6,835,634 for the nine months ended September 30, 2018 and was 5,891,900 for the nine months ended September 30, 2017.

## 16. Commitments, Contingencies and Guarantees

**Guarantees Issued and Credit Facilities Available**

In addition to the default fund contributions and margin collateral pledged by clearing members discussed in Note 15, "Clearing Operations," we have obtained financial guarantees and credit facilities which are guaranteed by us through counter indemnities, to provide further liquidity related to our clearing businesses. Financial guarantees issued to us totaled $12 million as of September 30, 2018 and $14 million as of December 31, 2017. As discussed in "Other Credit Facilities," of Note 9, "Debt Obligations," clearing-related credit facilities, which are available in multiple currencies, totaled $219 million as of September 30, 2018 and $187 million as of December 31, 2017, in available liquidity, none of which was utilized.

Execution Access is an introducing broker which operates the trading platform for our Fixed Income business to trade in U.S. Treasury securities. Execution Access has a clearing arrangement with Industrial and Commercial Bank of China Financial Services LLC, or ICBC. As of September 30, 2018, we have contributed $15 million of clearing deposits to ICBC in connection with this clearing arrangement. These deposits are recorded in other current assets in our Condensed Consolidated Balance Sheets. Some of the trading activity in Execution Access is cleared by ICBC through the Fixed Income Clearing Corporation, with ICBC acting as agent. Execution Access assumes the counterparty risk of clients that do not clear through the Fixed Income Clearing Corporation. Counterparty risk of clients exists for Execution Access between the trade date and the settlement date of the individual transactions, which is at least one business day (or more, if specified by the U.S. Treasury issuance calendar). Counterparties that do not clear through the Fixed Income Clearing Corporation are subject to a credit due diligence process and may be required to post collateral, provide principal letters, or provide other forms of credit enhancement to Execution Access for the purpose of mitigating counterparty risk. Daily position trading limits are also enforced for such counterparties.

We believe that the potential for us to be required to make payments under these arrangements is mitigated through the pledged collateral and our risk management policies. Accordingly, no contingent liability is recorded in the Condensed Consolidated Balance Sheets for these arrangements. However, no guarantee can be provided that these arrangements will at all times be sufficient.

**Lease Commitments**

We lease some of our office space under non-cancelable operating leases with third parties and sublease office space to third parties. Some of our lease agreements contain renewal options and escalation clauses based on increases in property taxes and building operating costs.

**Other Guarantees**

We have provided other guarantees of $4 million as of September 30, 2018 and $3 million as of December 31, 2017. These guarantees are primarily related to obligations for our rental and leasing contracts as well as performance guarantees on certain market technology contracts related to the delivery of software technology and support services. We have received financial guarantees from various financial institutions to support the above guarantees.

Through our clearing operations in the financial markets, Nasdaq Clearing is the legal counterparty for, and guarantees the performance of, its clearing members. See Note 15, “Clearing Operations,” for further discussion of Nasdaq Clearing performance guarantees.

We have provided a guarantee related to lease obligations for The Nasdaq Entrepreneurial Center, Inc., which is a not-for-profit organization designed to convene, connect and engage aspiring and current entrepreneurs. This entity is not included in the consolidated financial statements of Nasdaq.

We believe that the potential for us to be required to make payments under these arrangements is unlikely. Accordingly, no contingent liability is recorded in the Condensed Consolidated Balance Sheets for the above guarantees.

**Non-Cash Contingent Consideration**

As part of the purchase price consideration of a prior acquisition, we have agreed to future annual issuances of 992,247 shares of Nasdaq common stock which approximated certain tax benefits associated with the transaction. Such contingent future issuances of Nasdaq common stock will be paid ratably through 2027 if Nasdaq’s total gross revenues equal or exceed $25 million in each such year. The contingent future issuances of Nasdaq common stock are subject to anti-dilution protections and acceleration upon certain events.

**Escrow Agreements**

In connection with prior acquisitions, we entered into escrow agreements to secure the payment of post-closing adjustments and to ensure other closing conditions. As of September 30, 2018, these escrow agreements provide for future payment of $11 million, of which $9 million is included in other current liabilities and $2 million is included in other non-current liabilities in the Condensed Consolidated Balance Sheets.

**Routing Brokerage Activities**

One of our broker-dealer subsidiaries, Nasdaq Execution Services, provides a guarantee to securities clearinghouses and exchanges under its standard membership agreements, which require members to guarantee the performance of other members. If a member becomes unable to satisfy its obligations to a clearinghouse or exchange, other members would be required to meet its shortfalls. To mitigate these performance risks, the exchanges and clearinghouses often require members to post collateral, as well as meet certain minimum financial standards. Nasdaq Execution Services’ maximum potential liability under these arrangements cannot be quantified. However, we believe that the potential for Nasdaq Execution Services to be required to make payments under these arrangements is unlikely. Accordingly, no contingent liability is recorded in the Condensed Consolidated Balance Sheets for these arrangements.

**Pending Acquisition of Cinnober**

In September 2018, we announced that we made a SEK 75 per share and SEK 85 per warrant, or approximately $190 million (based on an exchange rate of USD 1.00 = SEK 8.96 as of September 13, 2018), all cash recommended public offer to the shareholders and warrant holders of Cinnober, a major Swedish financial technology provider to brokers, exchanges and clearinghouses worldwide. See “2018 Pending Acquisition,” of Note 4, “Acquisitions and Divestiture,” for further discussion.

**Other Commitments**

We have a 40.0% ownership in OCC. Under the OCC's capital plan, the OCC shareholders have committed to contribute up to $200 million in equity capital if certain capital thresholds are breached, including up to $80 million to be contributed by Nasdaq. See “Equity Method Investments,” of Note 7, “Investments,” for further discussion of our equity method investment in OCC.

**Legal and Regulatory Matters**

As previously disclosed, we are named as one of many defendants in City of Providence v. BATS Global Markets, Inc., et al., 14 Civ. 2811 (S.D.N.Y.), which was filed on April 18, 2014 in the United States District Court for the Southern District of New York. The district court appointed lead counsel, who filed an amended complaint on September 2, 2014. The amended complaint names as defendants seven national exchanges, as well as Barclays PLC, which operated a private alternative trading system. On behalf of a putative class of securities traders, the plaintiffs allege that the defendants engaged in a scheme to manipulate the markets through high-frequency trading; the amended complaint asserts claims against us under Section 10(b) of the Exchange Act and Rule 10b-5, as well as under Section 6(b) of the Exchange Act. The plaintiffs seek injunctive and monetary relief of an unspecified amount. We filed a motion to dismiss the amended complaint on November 3, 2014. In response, the plaintiffs filed a second amended complaint on November 24, 2014, which names the same defendants and alleges essentially the same violations. We then filed a motion to dismiss the second amended complaint on January 23, 2015. On August 26, 2015, the district court entered an order dismissing the second amended complaint in its entirety with prejudice, concluding that most of the plaintiffs' theories were foreclosed by absolute immunity and in any event that the plaintiffs failed to state any claim. The plaintiffs appealed the judgment of dismissal to the United States Court of Appeals for the Second Circuit. On December 19, 2017, the Second Circuit issued an opinion vacating the district court's judgment of dismissal and remanding to the district court for further proceedings. The exchanges filed a petition before the Second Circuit seeking panel or en banc rehearing on January 31, 2018, which the Second Circuit denied on March 13, 2018. On May 18, 2018, the exchanges filed a motion to dismiss the amended complaint, raising issues not addressed in the proceedings to date. Given the preliminary nature of the proceedings, we are unable to estimate what, if any, liability may result from this litigation. However, we believe that the claims are without merit and will continue to litigate vigorously.

During September 2018, a clearing member of Nasdaq Clearing's commodities market was declared in default. Consistent with our regulatory obligations, we notified all relevant regulators and are cooperating fully with information requests. We are engaging in discussions with the other members regarding the default and recovery process towards the defaulting member. We are unable to predict the outcome or exact timing of this matter. See "Nasdaq Commodities Clearing Default," of Note 15, "Clearing Operations," for further information on this event.

In addition, see "SEC Decisions," of Note 19, "Subsequent Events," for a discussion of recent SEC decisions.

Except as disclosed above and in prior reports filed under the Exchange Act, we are not currently a party to any litigation or proceeding that we believe could have a material adverse effect on our business, consolidated financial condition, or operating results. However, from time to time, we have been threatened with, or named as a defendant in, lawsuits or involved in regulatory proceedings.

In the normal course of business, Nasdaq discusses matters with its regulators raised during regulatory examinations or otherwise subject to their inquiries. Management believes that censures, fines, penalties or other sanctions that could result from any ongoing examinations or inquiries will not have a material impact on its consolidated financial position or results of operations. However, we are unable to predict the outcome or the timing of the ultimate resolution of these matters, or the potential fines, penalties or injunctive or other equitable relief, if any, that may result from these matters.

### Tax Audits

We are engaged in ongoing discussions and audits with taxing authorities on various tax matters, the resolutions of which are uncertain. Currently, there are matters that may lead to assessments, some of which may not be resolved for several years. Based on currently available information, we believe we have adequately provided for any assessments that could result from those proceedings where it is more likely than not that we will be assessed. We review our positions on these matters as they progress.

## 17. Income Taxes

We use the asset and liability method to determine income taxes on all transactions recorded in the consolidated financial statements. Deferred tax assets (net of valuation allowances) and deferred tax liabilities are presented net by jurisdiction as either a non-current asset or liability in our Condensed Consolidated Balance Sheets, as appropriate. Deferred tax assets and liabilities are determined based on differences between the financial statement carrying amounts and the tax basis of existing assets and liabilities (i.e., temporary differences) and are measured at the enacted rates that will be in effect when these differences are realized. If necessary, a valuation allowance is established to reduce deferred tax assets to the amount that is more likely than not to be realized. As of September 30, 2018 and December 31, 2017, net deferred tax assets are included in other non-current assets in the Condensed Consolidated Balance Sheets.

In order to recognize and measure our unrecognized tax benefits, management determines whether a tax position is more likely than not to be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position. Once it is determined that a position meets the recognition thresholds, the position is measured to determine the amount of benefit to be recognized in the consolidated financial statements. Interest and/or penalties related to income tax matters are recognized in income tax expense.

The following table shows our income tax provision and effective tax rate:

| | Three Months Ended September 30, | | Percentage Change | Nine Months Ended September 30, | | Percentage Change |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | | 2018 | 2017 | |
| | ($ in millions) | | | ($ in millions) | | |
| Income tax provision | $ 46 | $ 64 | (28.1)% | $ 234 | $ 178 | 31.5% |
| Effective tax rate | 22.0% | 27.4% | | 31.8% | 26.9% | |

The lower effective tax rate in the third quarter of 2018 when compared with the same period in 2017 is primarily due to the reduction of the U.S. corporate tax rate from 35% to 21%, effective January 1, 2018, and a decrease in tax expense related to a provisional adjustment due to the remeasurement of our deferred tax assets and liabilities under SEC Staff Accounting Bulletin No. 118, "Income Tax Accounting Implications of the Tax Cuts and Jobs Act," or SAB 118. These decreases are partially offset by a lower recognition of excess tax benefits associated with the vesting of employee share-based compensation arrangements and previously unrecognized tax benefits associated with positions taken in prior years in the first nine months of 2018 compared to the same period in 2017. The higher effective tax rate in the first nine months of 2018 when compared to the same period in 2017 is primarily due to the reversal of certain Swedish tax benefits recorded in prior periods and the tax expense associated with the sale of the Public Relations Solutions and Digital Media Services businesses. Also, we recorded a lower recognition of excess tax benefits associated with the vesting of employee share-based compensation arrangements and previously unrecognized tax benefits associated with positions taken in prior years in the first nine months of 2018 compared to the same period in 2017. These increases are partially offset by a decrease in tax expense due to the reduction of the U.S. corporate tax rate from 35% to 21%, effective January 1, 2018, and a decrease in tax expense related to a provisional adjustment due to the remeasurement of our deferred tax assets and liabilities under SAB 118.

The effective tax rate may also vary from period to period depending on, among other factors, the geographic and business mix of earnings and losses. These same and other factors, including history of pre-tax earnings and losses, are taken into account in assessing the ability to realize deferred tax assets.

Nasdaq and its eligible subsidiaries file a consolidated U.S. federal income tax return and applicable state and local income tax returns and non-U.S. income tax returns. Federal income tax returns for the years 2008 through 2015 are currently under examination by the Internal Revenue Services and we are subject to examination by the Internal Revenue Service for 2016 and 2017. Several state tax returns are currently under examination by the respective tax authorities for the years 2007 through 2016. Non-U.S. tax returns are subject to examination by the respective tax authorities for the years 2009 through 2017. Although the results of such examinations may have an impact on our unrecognized tax benefits, we do not anticipate that such impact will be material to our consolidated financial position or results of operations. In addition, we anticipate that the amount of unrecognized tax benefits as of September 30, 2018 will decrease in the next twelve months as we expect to settle certain tax audits.

The Swedish Tax Agency has disallowed certain interest expense deductions for the years 2013 - 2016. We appealed to the Lower Administrative Court for the years 2013 - 2015. In the first quarter of 2018, the Lower Administrative Court denied our appeal. We have appealed to the Administrative Court of Appeal. Through March 31, 2018, we had recorded tax benefits of $57 million associated with this matter. We continue to pay all assessments from the Swedish Tax Agency while this matter is pending and have paid $40 million through September 30, 2018. In the second quarter of 2018, the Administrative Court of Appeal decided similar cases against other taxpayers. Although we continue to assert the validity of these interest expense deductions, the decisions of the court lead us to conclude that we can no longer assert that we are more than likely to be successful in our appeal. As such, in the second quarter of 2018, we recorded tax expense of $41 million, or $0.24 per diluted share, which is net of any related U.S. tax benefits and reflects the impact of foreign currency translation. We expect to record future quarterly net tax expense of $1 million related to this matter.

The Tax Cuts and Jobs Act was enacted on December 22, 2017 and was effective January 1, 2018. The new legislation contains several key provisions, including a reduction of the U.S. corporate income tax rate from 35% to 21%. We were required to remeasure all of our U.S. deferred tax assets and liabilities as of December 22, 2017 and record the impact of such remeasurement in our 2017 financial statements. For the year ended December 31, 2017, we recorded a decrease to tax expense of $89 million, substantially all of which reflects the estimated impact associated with the remeasurement of our net U.S. deferred tax liability at the lower U.S. federal corporate income tax rate. The Tax Cuts and Jobs Act also imposes a transition tax on unremitted aggregate accumulated earnings of non-U.S. subsidiaries, which did not impact us.

SAB 118 has provided guidance which allows us to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. As of December 31, 2017, we recorded a provisional estimate of the effects of the new legislation. In the first quarter of 2018, we recorded an increase to tax expense of $5 million, which reflects the reduced federal tax benefit associated with state unrecognized tax benefits. In the third quarter of 2018, we recorded a decrease to tax expense of $4 million related to the remeasurement of our deferred tax assets and liabilities as of the enactment date. We will continue to analyze the Tax Cuts and Jobs Act and related accounting guidance and interpretations in order to finalize any impacts within the measurement period.

On January 1, 2018, we adopted Topic 220. See “Recent Accounting Pronouncements,” of Note 2, “Basis of Presentation and Principles of Consolidation,” for further discussion of this standard. As a result of the adoption of this standard, in the first quarter of 2018, we recorded a reclassification of $142 million for stranded tax effects related to the Tax Cuts and Jobs Act from accumulated other comprehensive loss to retained earnings within stockholders’ equity in the Condensed Consolidated Balance Sheets. Of the $142 million of stranded tax effects, $135 million relates to the effect on net foreign currency translation gains and losses and $7 million relates to the effect on employee benefit plan adjustment gains and losses.

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## 18. Business Segments

We manage, operate and provide our products and services in four business segments: Market Services, Corporate Services, Information Services and Market Technology. See Note 1, “Organization and Nature of Operations,” for further discussion of our reportable segments.

Our management allocates resources, assesses performance and manages these businesses as four separate segments. We evaluate the performance of our segments based on several factors, of which the primary financial measure is operating income. Results of individual businesses are presented based on our management accounting practices and structure.

The following table presents certain information regarding our operating segments for the three and nine months ended September 30, 2018 and 2017:

| | Market Services | Corporate Services | Information Services | Market Technology | Corporate Items | Consolidated |
|---|---|---|---|---|---|---|
| | | | (in millions) | | | |
| **Three Months Ended September 30, 2018** | | | | | | |
| Total revenues | $ 586 | $ 131 | $ 179 | $ 68 | $ — | $ 964 |
| Transaction-based expenses | (364) | — | — | — | — | (364) |
| Revenues less transaction-based expenses | 222 | 131 | 179 | 68 | — | 600 |
| Operating income (loss) | $ 121 | $ 42 | $ 117 | $ 9 | $ (43) | $ 246 |
| **Three Months Ended September 30, 2017** | | | | | | |
| Total revenues | $ 581 | $ 126 | $ 150 | $ 62 | $ 46 | $ 965 |
| Transaction-based expenses | (362) | — | — | — | — | (362) |
| Revenues less transaction-based expenses | 219 | 126 | 150 | 62 | 46 | 603 |
| Operating income (loss) | $ 118 | $ 41 | $ 111 | $ 14 | $ (22) | $ 262 |
| **Nine Months Ended September 30, 2018** | | | | | | |
| Total revenues | $ 1,968 | $ 395 | $ 528 | $ 194 | $ 56 | $ 3,141 |
| Transaction-based expenses | (1,259) | — | — | — | — | (1,259) |
| Revenues less transaction-based expenses | 709 | 395 | 528 | 194 | 56 | 1,882 |
| Operating income (loss) | $ 402 | $ 122 | $ 342 | $ 20 | $ (99) | $ 787 |
| **Nine Months Ended September 30, 2017** | | | | | | |
| Total revenues | $ 1,808 | $ 370 | $ 432 | $ 176 | $ 143 | $ 2,929 |
| Transaction-based expenses | (1,149) | — | — | — | — | (1,149) |
| Revenues less transaction-based expenses | 659 | 370 | 432 | 176 | 143 | 1,780 |
| Operating income (loss) | $ 359 | $ 115 | $ 318 | $ 39 | $ (81) | $ 750 |

Certain amounts are allocated to corporate items in our management reports as we believe they do not contribute to a meaningful evaluation of a particular segment's ongoing operating performance. These items include the following:

*2018 Divestiture:* We have included in corporate items the revenues and expenses of the Public Relations Solutions and Digital Media Services businesses which were part of the Corporate Solutions business within our Corporate Services segment as these businesses were sold in April 2018. See “2018 Divestiture,” of Note 4, “Acquisitions and Divestiture,” for further discussion.

*Amortization expense of acquired intangible assets:* We amortize intangible assets acquired in connection with various acquisitions. Intangible asset amortization expense can vary from period to period due to episodic acquisitions completed, rather than from our ongoing business operations. As such, if intangible asset amortization is included in performance measures, it is more difficult to assess the day-to-day operating performance of the segments, and the relative operating performance of the segments between periods. Management does not consider intangible asset amortization expense for the purpose of evaluating the performance of our segments or their managers or when making decisions to allocate resources. Therefore, we believe performance measures excluding intangible asset amortization expense provide management with a more useful representation of our segments' ongoing activity in each period.

*Merger and strategic initiatives expense:* We have pursued various strategic initiatives and completed a divestiture and a number of acquisitions in recent years which have resulted in expenses which would not have otherwise been incurred. These expenses generally include integration costs, as well as legal, due diligence and other third party transaction costs. The frequency and the amount of such expenses vary significantly based on the size, timing and complexity of the transaction.

*Clearing Default Loss:* In September 2018, we recorded an $8 million loss related to a default of a Nasdaq Clearing commodities member. See “Nasdaq Commodities Clearing Default,” of Note 15, “Clearing Operations,” for further discussion of the default. We have included the loss related to the default in corporate items as we believe it is non-recurring, as there has never been a loss due to member default in our clearinghouse, and should be excluded when evaluating the ongoing operating performance of the Market Services segment. Any expenses associated with the evaluation and enhancement of processes and procedures will be reflected within the Market Services segment.

*Other significant items:* We have included certain other charges or gains in corporate items, to the extent we believe they should be excluded when evaluating the ongoing operating performance of each individual segment. For the three and nine months ended September 30, 2018, other significant items included litigation costs and for the nine months ended September 30, 2018, out of period tax charges. For the nine months ended September 30, 2017, other significant items included loss on extinguishment of debt. We believe the exclusion of such amounts allows management and investors to better understand the ongoing financial results of each segment.

Accordingly, we do not allocate these costs for purposes of disclosing segment results because they do not contribute to a meaningful evaluation of a particular segment’s ongoing operating performance.

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A summary of our corporate items is as follows:

| | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|---|---|---|---|---|
| | 2018 | 2017 | 2018 | 2017 |
| | (in millions) | | | |
| Revenues - divested businesses | $ — | $ 46 | $ 56 | $ 143 |
| Expenses: | | | | |
| Amortization expense of acquired intangible assets | 27 | 22 | 83 | 67 |
| Merger and strategic initiatives expense | 6 | 3 | 7 | 20 |
| Clearing default loss | 8 | — | 8 | — |
| Extinguishment of debt | — | — | — | 10 |
| Expenses - divested businesses | — | 42 | 51 | 125 |
| Other | 2 | 1 | 6 | 2 |
| Total expenses | 43 | 68 | 155 | 224 |
| Operating loss | $ (43) | $ (22) | $ (99) | $ (81) |

* * * * * *

## 19. Subsequent Events

*SEC Decisions*

In recent years, certain industry groups have challenged the level of fees that U.S. exchanges charge for market data and connectivity. We have defeated two challenges in federal appeals court pertaining to market data and an additional challenge at the administrative level within the SEC. However, in October 2018, the SEC reversed that administrative decision and found that Nasdaq had not met a burden of demonstrating that certain challenged fees were fair and reasonable; we estimate that this decision will reduce our revenues by approximately $1 million. Nasdaq has appealed this decision to the U.S. Court of Appeals for the District of Columbia Circuit. In addition, the SEC remanded a series of additional challenges to market data and connectivity fees back to Nasdaq for further consideration. Nasdaq has petitioned the SEC to reconsider this decision. We are unable to predict the outcome or the timing of the ultimate resolution of these matters.

*Sale of Equity Security*

In October 2018, we entered into an agreement to sell our 5% ownership interest in LCH for aggregate pre-tax cash proceeds of approximately €148 million, or approximately $171 million (based on an exchange rate of 1 USD = 0.87 Euro as of October 18, 2018). Subject to regulatory non-objection, the transaction is expected to close in the fourth quarter of 2018.

**Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations.**

The following discussion and analysis of the financial condition and results of operations of Nasdaq should be read in conjunction with our condensed consolidated financial statements and related notes included in this Form 10-Q.

**Business Overview**

We are a leading provider of trading, clearing, marketplace technology, regulatory, securities listing, information and public and private company services. Our global offerings are diverse and include trading and clearing across multiple asset classes, trade management services, market data products, financial indexes, investment data and analytics, capital formation solutions, corporate solutions, and market technology products and services. Our technology powers markets across the globe, supporting equity derivative trading, clearing and settlement, cash equity trading, fixed income trading, trading surveillance and many other functions.

**Business Environment**

Our non-transactional businesses provide technology to exchanges, clearing organizations and central securities depositories around the world. We also offer companies and other organizations access to innovative products, software solutions and services that increase transparency, mitigate risk, improve board efficiency and facilitate better corporate governance. In our transactional businesses, we serve listed companies, market participants and investors by providing derivative, commodities, cash equity, and fixed income markets, as well as clearing services, thereby facilitating economic growth and corporate entrepreneurship. 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, government and private sector demands for capital, the regulatory environment for capital markets, changing technology, particularly in the financial services industry, and changes in investment patterns and priorities. Our future revenues and net income will continue to be influenced by a number of domestic and international economic trends including, among others:

- the demand by companies and other organizations for the products sold by our Corporate Solutions business, which is largely driven by the overall state of the economy and the attractiveness of our offerings;
- the challenges created by the automation of market data consumption, including competition and the quickly evolving nature of the market data business;
- the outlook of our technology customers for capital market activity;
- technological advances and members’ and customers’ demand for speed, efficiency, and reliability;
- the acceptance of cloud-based services and advanced analytics by our customers and global regulators;
- trading volumes and values in equity derivatives, cash equities and FICC, which are driven primarily by overall macroeconomic conditions;
- the number of companies seeking equity financing, which is affected by factors such as investor demand, the global economy, and availability of diverse sources of financing, as well as tax and regulatory policies;
- 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 market data and trade management services;
- the demand for licensed ETPs, enhanced analytics and other financial products based on our indexes as well as changes to the underlying assets associated with existing licensed financial products;
- continuing pressure in transaction fee pricing due to intense competition in the U.S. and Europe;
- competition related to pricing, product features and service offerings; and
- regulatory changes relating to market structure, including market data, or affecting certain types of instruments, transactions, pricing structures or capital market participants.

The current consensus forecast for gross domestic product growth for the U.S. is 2.9% in 2018 and 2.6% in 2019 and the Eurozone is 2.1% in 2018 and 1.8% in 2019. U.S. growth forecasts for 2019 have remained stable since the end of the first quarter of 2018. Growth forecasts for the Eurozone in 2019 have declined by 0.1 percentage points over the past two quarters. There are a number of significant structural and political issues continuing to impact the global economy. In the U.S. the Federal Reserve continues to tighten monetary policy, while Europe is close to exiting their own quantitative easing program. Since quarter end, strong U.S. employment data confirmed market confidence for additional rate rises. That in turn led to some additional volatility and trading volumes above 2018 averages, which are in turn slightly above 2017 levels.

In the U.S., the third quarter of 2018 was a strong quarter for IPOs, with 52 IPOs on The Nasdaq Stock Market compared with 34 in the third quarter of 2017. In addition, there were three IPOs in the third quarter of 2018 on the exchanges that comprise Nasdaq Nordic and Nasdaq Baltic compared with 10 in the third quarter of 2017. Additional impacts on our business drivers include the international enactment and implementation of legislative and regulatory initiatives, notably MiFID II in Europe, the evolution of market participants’ trading and investment strategies, and the continued rapid progression and deployment of new technology in the financial services industry. The business environment that influences our financial performance in 2018 may be characterized as follows:

- rapidly evolving technology for our businesses and their clients;

- increased demand for applications using emerging technologies and sophisticated analytics by both new entrants and industry incumbents;
- the expansion of the number of industries, and emergence of new industries, seeking to use advanced market technology;
- intense competition among U.S. exchanges and dealer-owned systems for cash equity trading and strong competition between MTFs and exchanges in Europe for cash equity trading; and
- globalization of exchanges, customers and competitors extending the competitive horizon beyond national markets.

**Business Segments**

We manage, operate and provide our products and services in four business segments: Market Services, Corporate Services, Information Services and Market Technology. See Note 1, “Organization and Nature of Operations,” and Note 18, “Business Segments,” to the condensed consolidated financial statements for further discussion of our reportable segments, as well as how management allocates resources, assesses performance and manages these businesses as four separate segments.

## Nasdaq's Operating Results

### Key Drivers

The following table includes key drivers for our Market Services, Corporate Services, Information Services and Market Technology segments. In evaluating the performance of our business, our senior management closely evaluates these key drivers.

| | Three Months Ended September 30, | | Nine Months Ended September 30, | |
|---|---|---|---|---|
| | 2018 | 2017 | 2018 | 2017 |
| **Market Services** | | | | |
| **Equity Derivative Trading and Clearing** | | | | |
| *U.S. equity options* | | | | |
| Total industry average daily volume (in millions) | 16.5 | 14.1 | 17.7 | 14.5 |
| Nasdaq PHLX matched market share | 16.4% | 16.9% | 16.0% | 16.9% |
| The Nasdaq Options Market matched market share | 8.5% | 9.1% | 9.3% | 9.5% |
| Nasdaq BX Options matched market share | 0.3% | 0.7% | 0.4% | 0.7% |
| Nasdaq ISE Options matched market share | 9.0% | 8.8% | 8.7% | 9.1% |
| Nasdaq GEMX Options matched market share | 4.8% | 5.3% | 4.6% | 5.3% |
| Nasdaq MRX Options matched market share | 0.1% | 0.2% | 0.1% | 0.1% |
| Total matched market share executed on Nasdaq's exchanges | 39.1% | 41.0% | 39.1% | 41.6% |
| *Nasdaq Nordic and Nasdaq Baltic options and futures* | | | | |
| Total average daily volume of options and futures contracts(1) | 279,329 | 296,086 | 332,743 | 335,679 |
| **Cash Equity Trading** | | | | |
| *Total U.S.-listed securities* | | | | |
| Total industry average daily share volume (in billions) | 6.35 | 6.06 | 6.94 | 6.58 |
| Matched share volume (in billions) | 77.8 | 69.1 | 250.3 | 223.2 |
| The Nasdaq Stock Market matched market share | 15.9% | 14.1% | 15.3% | 14.2% |
| Nasdaq BX matched market share | 2.9% | 3.3% | 3.1% | 3.0% |
| Nasdaq PSX matched market share | 0.7% | 0.7% | 0.8% | 0.8% |
| Total matched market share executed on Nasdaq's exchanges | 19.5% | 18.1% | 19.2% | 18.0% |
| Market share reported to the FINRA/Nasdaq Trade Reporting Facility | 30.4% | 34.1% | 32.5% | 34.3% |
| Total market share(2) | 49.9% | 52.2% | 51.7% | 52.3% |
| *Nasdaq Nordic and Nasdaq Baltic securities* | | | | |
| Average daily number of equity trades executed on Nasdaq's exchanges | 553,709 | 545,115 | 608,739 | 547,985 |
| Total average daily value of shares traded (in billions) | $ 4.8 | $ 5.1 | $ 5.5 | $ 5.3 |
| Total market share executed on Nasdaq's exchanges | 65.7% | 67.9% | 67.4% | 66.2% |
| **FICC** | | | | |
| *Fixed Income* | | | | |
| U.S. fixed income notional trading volume (in billions) | $ 3,194 | $ 3,975 | $ 12,484 | $ 13,770 |
| Total average daily volume of Nasdaq Nordic and Nasdaq Baltic fixed income contracts | 121,747 | 103,790 | 126,149 | 111,337 |
| *Commodities* | | | | |
| Power contracts cleared (TWh)(3) | 276 | 264 | 853 | 911 |
| **Corporate Services** | | | | |
| *Initial public offerings* | | | | |
| The Nasdaq Stock Market | 52 | 34 | 145 | 87 |
| Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic | 3 | 10 | 38 | 60 |
| *Total new listings* | | | | |
| The Nasdaq Stock Market(4) | 85 | 78 | 236 | 184 |
| Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic(5) | 6 | 11 | 50 | 72 |
| *Number of listed companies* | | | | |
| The Nasdaq Stock Market(6) | 3,049 | 2,935 | 3,049 | 2,935 |
| Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic(7) | 1,010 | 952 | 1,010 | 952 |
| **Information Services** | | | | |
| Number of licensed ETPs | 358 | 314 | 358 | 314 |
| ETP assets under management tracking Nasdaq indexes (in billions) | $ 206 | $ 154 | $ 206 | $ 154 |
| **Market Technology** | | | | |
| Order intake (in millions)(8) | $ 40 | $ 57 | $ 149 | $ 149 |
| Total order value (in millions)(9) | $ 703 | $ 670 | $ 703 | $ 670 |

(1) Includes Finnish option contracts traded on Eurex.
(2) Includes transactions executed on The Nasdaq Stock Market's, Nasdaq BX's and Nasdaq PSX's systems plus trades reported through the FINRA/Nasdaq Trade Reporting Facility.
(3) Transactions executed on Nasdaq Commodities or OTC and reported for clearing to Nasdaq Commodities measured by Terawatt hours (TWh).
(4) New listings include IPOs, including those completed on a best efforts basis, issuers that switched from other listing venues, closed-end funds and separately listed ETPs.
(5) New listings include IPOs and represent companies listed on the Nasdaq Nordic and Nasdaq Baltic exchanges and companies on the alternative markets of Nasdaq First North.
(6) Number of total listings on The Nasdaq Stock Market at period end, including 390 ETPs as of September 30, 2018 and 362 as of September 30, 2017.
(7) Represents companies listed on the Nasdaq Nordic and Nasdaq Baltic exchanges and companies on the alternative markets of Nasdaq First North at period end.
(8) Total contract value of orders signed during the period.
(9) Represents total contract value of signed orders that are yet to be recognized as revenue. Market technology deferred revenue, as discussed in Note 8, "Deferred Revenue," to the condensed consolidated financial statements, represents consideration received that is yet to be recognized as revenue for these signed orders. Total order value for the three and nine months ended September 30, 2017 was restated as a result of the adoption of Topic 606.

* * * * * *

**Financial Summary**

The following table summarizes our financial performance for the three and nine months ended September 30, 2018 when compared with the same periods in 2017. The comparability of our results of operations between reported periods is impacted by the divestiture of the Public Relations Solutions and Digital Media Services businesses in April 2018 and the acquisition of eVestment in October 2017. See Note 4, "Acquisitions and Divestiture," to the condensed consolidated financial statements for further discussion of these transactions. For a detailed discussion of our results of operations, see "Segment Operating Results" below.

| | Three Months Ended September 30, | | | Nine Months Ended September 30, | | |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | Percentage Change | 2018 | 2017 | Percentage Change |
| | (in millions, except per share amounts) | | | (in millions, except per share amounts) | | |
| Revenues less transaction-based expenses | $ 600 | $ 603 | (0.5)% | $ 1,882 | $ 1,780 | 5.7% |
| Operating expenses | 354 | 341 | 3.8 % | 1,095 | 1,030 | 6.3% |
| Operating income | 246 | 262 | (6.1)% | 787 | 750 | 4.9% |
| Interest expense | (38) | (34) | 11.8 % | (112) | (107) | 4.7% |
| Net gain on divestiture of businesses | (8) | — | N/M | 33 | — | N/M |
| Income before income taxes | 209 | 234 | (10.7)% | 736 | 661 | 11.3% |
| Income tax provision | 46 | 64 | (28.1)% | 234 | 178 | 31.5% |
| Net income attributable to Nasdaq | $ 163 | $ 170 | (4.1)% | $ 502 | $ 483 | 3.9% |
| Diluted earnings per share | $ 0.97 | $ 1.00 | (3.0)% | $ 2.99 | $ 2.85 | 4.9% |
| Cash dividends declared per common share | $ 0.44 | $ 0.38 | 15.8 % | $ 1.26 | $ 1.08 | 16.7% |

N/M - Not meaningful.

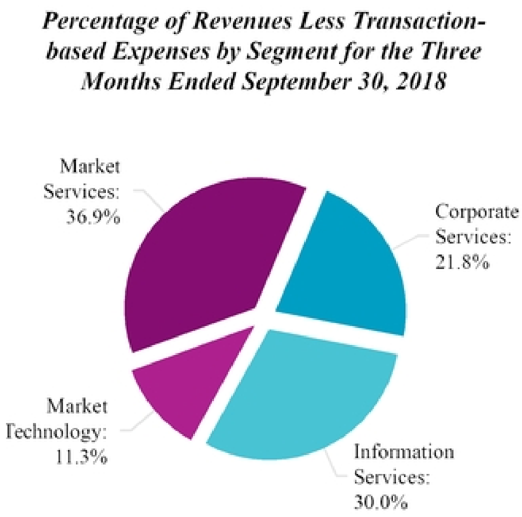
In countries with currencies other than the U.S. dollar, revenues and expenses are translated using monthly average exchange rates. Impacts on our revenues less transaction-based expenses and operating income associated with fluctuations in foreign currency are discussed in more detail under "Item 3. Quantitative and Qualitative Disclosures about Market Risk."

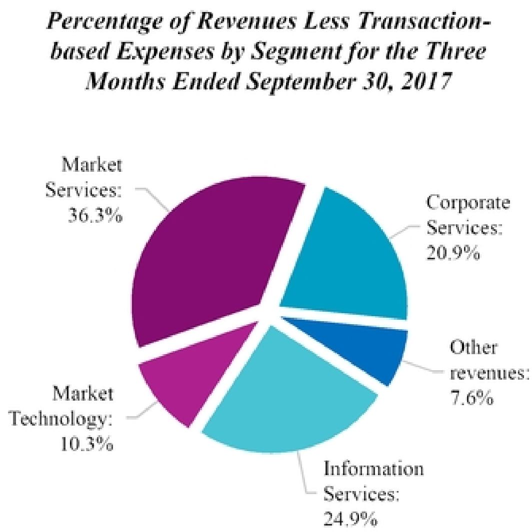
**Segment Operating Results**

The following table shows our revenues by segment, transaction-based expenses for our Market Services segment and total revenues less transaction-based expenses:

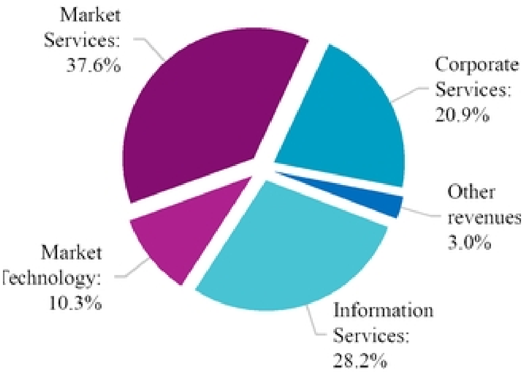
| | Three Months Ended September 30, | | | Nine Months Ended September 30, | | |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | Percentage Change | 2018 | 2017 | Percentage Change |
| | (in millions) | | | (in millions) | | |
| Market Services | $ 586 | $ 581 | 0.9 % | $ 1,968 | $ 1,808 | 8.8 % |
| Transaction-based expenses | (364) | (362) | 0.6 % | (1,259) | (1,149) | 9.6 % |
| Market Services revenues less transaction-based expenses | 222 | 219 | 1.4 % | 709 | 659 | 7.6 % |
| Corporate Services | 131 | 126 | 4.0 % | 395 | 370 | 6.8 % |
| Information Services | 179 | 150 | 19.3 % | 528 | 432 | 22.2 % |
| Market Technology | 68 | 62 | 9.7 % | 194 | 176 | 10.2 % |
| Other revenues | — | 46 | (100.0)% | 56 | 143 | (60.8)% |
| Total revenues less transaction-based expenses | $ 600 | $ 603 | (0.5)% | $ 1,882 | $ 1,780 | 5.7 % |

The following charts show our Market Services, Corporate Services, Information Services and Market Technology segments as a percentage of our total revenues less transaction-based expenses of $600 million for the three months ended September 30, 2018, $603 million for the three months ended September 30, 2017, $1,882 million for the nine months ended September 30, 2018, and $1,780 million for the nine months ended September 30, 2017:

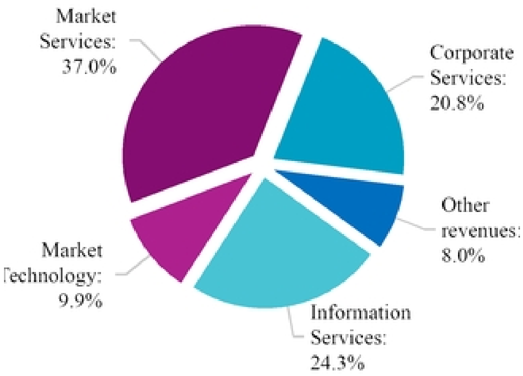


***Percentage of Revenues Less Transaction-based Expenses by Segment for the Nine Months Ended September 30, 2018***




***Percentage of Revenues Less Transaction-based Expenses by Segment for the Nine Months Ended September 30, 2017***



## MARKET SERVICES

The following table shows total revenues, transaction-based expenses, and total revenues less transaction-based expenses from our Market Services segment:

| | Three Months Ended September 30, | | | Nine Months Ended September 30, | | |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | Percentage Change | 2018 | 2017 | Percentage Change |
| | (in millions) | | | (in millions) | | |
| **Market Services Revenues:** | | | | | | |
| Equity Derivative Trading and Clearing Revenues[1] | $ 190 | $ 178 | 6.7 % | $ 621 | $ 560 | 10.9 % |
| Transaction-based expenses: | | | | | | |
| Transaction rebates | (115) | (106) | 8.5 % | (370) | (335) | 10.4 % |
| Brokerage, clearance and exchange fees[1] | (7) | (10) | (30.0)% | (34) | (29) | 17.2 % |
| **Equity derivative trading and clearing revenues less transaction-based expenses** | **68** | **62** | **9.7 %** | **217** | **196** | **10.7 %** |
| Cash Equity Trading Revenues[2] | 303 | 304 | (0.3)% | 1,056 | 958 | 10.2 % |
| Transaction-based expenses: | | | | | | |
| Transaction rebates | (176) | (157) | 12.1 % | (571) | (526) | 8.6 % |
| Brokerage, clearance and exchange fees[2] | (64) | (85) | (24.7)% | (276) | (245) | 12.7 % |
| **Cash equity trading revenues less transaction-based expenses** | **63** | **62** | **1.6 %** | **209** | **187** | **11.8 %** |
| FICC Revenues | 21 | 24 | (12.5)% | 71 | 72 | (1.4)% |
| Transaction-based expenses: | | | | | | |
| Transaction rebates | (2) | (3) | (33.3)% | (6) | (13) | (53.8)% |
| Brokerage, clearance and exchange fees | — | (1) | (100.0)% | (2) | (1) | 100.0 % |
| **FICC revenues less transaction-based expenses** | **19** | **20** | **(5.0)%** | **63** | **58** | **8.6 %** |
| **Trade Management Services Revenues** | **72** | **75** | **(4.0)%** | **220** | **218** | **0.9 %** |
| **Total Market Services revenues less transaction-based expenses** | **$ 222** | **$ 219** | **1.4 %** | **$ 709** | **$ 659** | **7.6 %** |

(1) Includes Section 31 fees of $7 million in the third quarter of 2018, $30 million in the first nine months of 2018, $9 million in the third quarter of 2017, and $27 million in the first nine months of 2017. Section 31 fees are recorded as equity derivative trading and clearing revenues with a corresponding amount recorded in transaction-based expenses.

(2) Includes Section 31 fees of $60 million in the third quarter of 2018, $264 million in the first nine months of 2018, $82 million in the third quarter of 2017, and $234 million in the first nine months of 2017. Section 31 fees are recorded as cash equity trading revenues with a corresponding amount recorded in transaction-based expenses.

***Equity Derivative Trading and Clearing Revenues***

Equity derivative trading and clearing revenues and equity derivative trading and clearing revenues less transaction-based expenses increased in the third quarter of 2018 compared with the same period in 2017. The increase in equity derivative trading and clearing revenues was primarily due to higher U.S. industry trading volumes, partially offset by a decrease in our overall U.S. matched market share executed on Nasdaq's exchanges and a decrease in the U.S. gross capture rate. The increase in equity derivative trading and clearing revenues less transaction-based expenses was primarily due to higher U.S. industry trading volumes and an increase in the U.S. net capture rate, partially offset by a decrease in our overall U.S. matched market share.

Equity derivative trading and clearing revenues and equity derivative trading and clearing revenues less transaction-based expenses increased in the first nine months of 2018 compared with the same period in 2017. The increases were primarily due to higher U.S. industry trading volumes, partially offset by a decrease in our overall U.S. matched market and a decrease in the U.S. average capture rate.

Section 31 fees are recorded as equity derivative trading and clearing revenues with a corresponding amount recorded as transaction-based expenses. In the U.S., we are assessed these fees from the SEC and pass them through to our customers in the form of incremental fees. Pass-through fees can increase or decrease due to rate changes by the SEC, our percentage of the overall industry volumes processed on our systems, and differences in actual dollar value of shares traded. Since the amount recorded in revenues is equal to the amount recorded as transaction-based expenses, there is no impact on our revenues less transaction-based expenses. The decrease in Section 31 fees in the third quarter of 2018 compared with the same period in 2017 was primarily due to lower average SEC fee rates, partially offset by higher dollar value traded on Nasdaq's exchanges. The increase in Section 31 fees in the first nine months of 2018 compared with the same period in 2017 was primarily due to higher dollar value traded on Nasdaq's exchanges, partially offset by a lower average SEC fee rates.

Transaction rebates, in which we credit a portion of the per share execution charge to the market participant, increased in the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily due to higher U.S. industry trading volumes, partially offset by a decrease in our overall U.S. matched market share.

Brokerage, clearance and exchange fees decreased in the third quarter and increased in the first nine months of 2018 compared with the same periods in 2017. The decrease in the third quarter of 2018 was primarily due to lower Section 31 pass-through fees and increase in the first nine months of 2018 was primarily due to higher Section 31 pass-through fees, as discussed above.

***Cash Equity Trading Revenues***

Cash equity trading revenues remained relatively flat in the third quarter of 2018 compared with the same period in 2017 while cash equity trading revenues less transaction-based expenses increased in the third quarter of 2018 compared with the same period in 2017. The increase in cash equity trading revenues less transaction-based expenses was primarily due to an increase in our overall U.S. matched market share executed on Nasdaq's exchanges and higher U.S. trading volumes, partially offset by a lower U.S. net capture rate.

Cash equity trading revenues and cash equity trading revenues less transaction-based expenses increased in the first nine months of 2018 compared with the same period in 2017 primarily due to higher U.S. trading volumes and an increase in our overall U.S. matched market share executed on Nasdaq's exchanges.

Further impacting the increase in cash equity trading revenues for the first nine months of 2018 was an increase in Section 31 pass-through fee revenue, partially offset by a lower U.S. average gross capture rate.

The increases in the first nine months of 2018 for both cash equity trading revenues and cash equity trading revenues less transaction-based expenses were also due to a favorable impact from foreign exchange of $3 million.

Similar to equity derivative trading and clearing, in the U.S. we record Section 31 fees as cash equity trading revenues with a corresponding amount recorded as transaction-based expenses. We are assessed these fees from the SEC and pass them through to our customers in the form of incremental fees. Since the amount recorded as revenues is equal to the amount recorded as transaction-based expenses, there is no impact on our revenues less transaction-based expenses. The decrease in Section 31 fees in the third quarter of 2018 compared with the same period in 2017 was primarily due to lower SEC fee rates, partially offset by higher dollar value traded on Nasdaq's exchanges. The increase in Section 31 fees in the first nine months of 2018 compared with the same period in 2017 was primarily due to higher dollar value traded on Nasdaq's exchanges, partially offset by lower SEC fee rates.

Transaction rebates increased in the third quarter and first nine months of 2018 compared with the same periods in 2017. For The Nasdaq Stock Market, Nasdaq PSX and Nasdaq Canada, we credit a portion of the per share execution charge to the market participant that provides the liquidity, and for Nasdaq BX, we credit a portion of the per share execution charge to the market participant that takes the liquidity. The increases were primarily due to an increase in our overall U.S. matched market share executed on Nasdaq's exchanges and higher U.S. trading volumes.

Brokerage, clearance and exchange fees decreased in the third quarter and increased in the first nine months of 2018 compared with the same periods in 2017. The decrease in the third quarter of 2018 was primarily due to lower Section 31 pass-through fees and increase in the first nine months of 2018 was primarily due to higher Section 31 pass-through fees, as discussed above.

***FICC Revenues***

FICC revenues decreased in the third quarter of 2018 compared with the same period in 2017 primarily due to a decline in revenues related to U.S. fixed income products. FICC revenues less transaction-based expenses decreased in the third quarter of 2018 compared with the same period in 2017 primarily due to a decline in revenues related to U.S. fixed income products offset by higher net revenues at NFX. Further impacting the decreases in FICC revenues and FICC revenues less transaction-based expenses for the third quarter of 2018 was an unfavorable impact from foreign exchange of $1 million.

FICC revenues decreased slightly and FICC revenues less transaction-based expenses increased in the first nine months of 2018 compared with the same period in 2017. The decrease in FICC revenues was primarily due to a decline in revenues related to U.S. fixed income products. The increase in FICC revenues less transaction-based expenses was primarily due to higher net revenues at NFX, partially offset by a decline in revenues related to U.S. fixed income products. The decrease in FICC revenues and the increase in FICC revenues less transaction-based expenses for the first nine months of 2018 was favorably impacted by foreign exchange of $2 million.

***Trade Management Services Revenues***

Trade management services revenues decreased in the third quarter of 2018 and increased in the first nine months of 2018 compared with the same periods in 2017. The decrease in the third quarter was primarily due to a decrease in revenues from a decline in port connectivity and an unfavorable impact from foreign exchange of $1 million. The increase in the first nine months was primarily due to an increase in revenues from customer demand for port connectivity.

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## CORPORATE SERVICES

The following table shows revenues from our Corporate Services segment:

| | Three Months Ended September 30, | | | Nine Months Ended September 30, | | |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | Percentage Change | 2018 | 2017 | Percentage Change |
| | (in millions) | | | (in millions) | | |
| **Corporate Services:** | | | | | | |
| **Corporate Solutions** | $ 59 | $ 59 | —% | $ 178 | $ 173 | 2.9% |
| **Listing Services** | 72 | 67 | 7.5% | 217 | 197 | 10.2% |
| **Total Corporate Services** | $ 131 | $ 126 | 4.0% | $ 395 | $ 370 | 6.8% |

***Corporate Solutions Revenues***

Corporate solutions revenues were flat in the third quarter and increased in the first nine months of 2018 compared with the same periods in 2017. The increase in the first nine months of 2018 was primarily due to an increase in board & leadership revenues and a favorable impact from foreign exchange of $2 million.

***Listing Services Revenues***

Listing services revenues increased in the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily resulting from client adoption of our all-inclusive annual listing fee program and an increase in the number and size of IPOs, partially offset by the run-off of fees earned from U.S. listing of additional shares. The increase in the first nine months was also due to a favorable impact from foreign exchange of $2 million.

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**INFORMATION SERVICES**

The following table shows revenues from our Information Services segment:

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Percentage Change | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 | Percentage Change |
|---|---|---|---|---|---|---|
| | (in millions) | | | (in millions) | | |
| **Information Services:** | | | | | | |
| **Market Data** | $ 95 | $ 97 | (2.1)% | $ 293 | $ 276 | 6.2% |
| **Index** | 52 | 43 | 20.9 % | 152 | 125 | 21.6% |
| **Investment Data & Analytics** | 32 | 10 | 220.0 % | 83 | 31 | 167.7% |
| **Total Information Services** | $ 179 | $ 150 | 19.3 % | $ 528 | $ 432 | 22.2% |

***Market Data Revenues***

Market data revenues decreased in the third quarter and increased in the first nine months of 2018 compared with the same periods in 2017. The decrease in the third quarter was primarily due to lower collections related to under reported usage. The increase in the first nine months of 2018 was primarily due to sales of new subscriptions and licenses, notably growth in the Asia Pacific region, and a favorable impact from foreign exchange of $5 million.

***Index Revenues***

Index revenues increased in both the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily due to higher assets under management in ETPs linked to Nasdaq indexes and higher licensing revenues from futures trading volume related to the Nasdaq 100 Index.

***Investment Data & Analytics Revenues***

Investment data & analytics revenues increased in both the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily due to the inclusion of revenues associated with the acquisition of eVestment.

**MARKET TECHNOLOGY**

The following table shows revenues from our Market Technology segment:

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Percentage Change | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 | Percentage Change |
|---|---|---|---|---|---|---|
| | (in millions) | | | (in millions) | | |
| **Market Technology** | $ 68 | $ 62 | 9.7% | $ 194 | $ 176 | 10.2% |

***Market Technology Revenues***

Market technology revenues increased in both the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily due to an increase in delivery and support revenues and higher software as a service revenues, partially offset by a decrease in change request and advisory revenues. The increase in the third quarter also included an unfavorable impact from foreign exchange of $2 million.

**OTHER REVENUES**

Other revenues include the revenues from the Public Relations Solutions and Digital Media Services businesses which were sold in April 2018. Prior to the sale date, these revenues were included in our Corporate Solutions business. See "2018 Divestiture," of Note 4, "Acquisitions and Divestiture," to the condensed consolidated financial statements for further discussion.

**Expenses**

***Operating Expenses***

The following table shows our operating expenses:

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Percentage Change | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 | Percentage Change |
|---|---|---|---|---|---|---|
| | (in millions) | | | (in millions) | | |
| Compensation and benefits | $ 164 | $ 167 | (1.8)% | $ 534 | $ 489 | 9.2 % |
| Professional and contract services | 33 | 38 | (13.2)% | 105 | 110 | (4.5)% |
| Computer operations and data communications | 32 | 32 | — % | 94 | 91 | 3.3 % |
| Occupancy | 23 | 23 | — % | 72 | 69 | 4.3 % |
| General, administrative and other | 28 | 15 | 86.7 % | 73 | 64 | 14.1 % |
| Marketing and advertising | 7 | 7 | — % | 27 | 22 | 22.7 % |
| Depreciation and amortization | 53 | 47 | 12.8 % | 159 | 140 | 13.6 % |
| Regulatory | 8 | 9 | (11.1)% | 24 | 25 | (4.0)% |
| Merger and strategic initiatives | 6 | 3 | 100.0 % | 7 | 20 | (65.0)% |
| **Total operating expenses** | $ 354 | $ 341 | 3.8 % | $ 1,095 | $ 1,030 | 6.3 % |

The decrease in compensation and benefits expense in the third quarter of 2018 was primarily due to the sale of the Public Relations Solutions and Digital Media Services businesses, partially offset by costs resulting from our 2017 acquisitions and higher compensation expense reflecting higher performance incentives. The increase in the first nine months of 2018 was primarily due to overall higher compensation costs resulting from our 2017 acquisitions and higher compensation expense reflecting higher performance incentives, partially offset by lower compensation costs due to the sale of the Public Relations Solutions and Digital Media Services businesses. The decrease in the third quarter also included a favorable impact from foreign exchange of $3 million and the increase in the first nine months included an unfavorable impact from foreign exchange of $4 million.

Headcount decreased to 4,024 employees as of September 30, 2018 from 4,416 as of September 30, 2017 primarily due to the sale of the Public Relations Solutions and Digital Media Services businesses, partially offset by our acquisition of eVestment.

Professional and contract services expense decreased in the third quarter and first nine months of 2018 primarily due to the sale of the Public Relations Solutions and Digital Media Services businesses, partially offset by additional expense associated with our 2017 acquisitions and litigation costs related to certain legal matters.

Computer operations and data communications expense was flat in the third quarter of 2018 as higher market data feed costs due to higher volumes and higher software maintenance costs were offset by lower costs resulting from the sale of the Public Relations Solutions and Digital Media Services businesses. Computer operations and data communications expense increased in the first nine months of 2018 primarily due to higher market data feed costs due to higher volumes and higher software maintenance costs, partially offset by lower costs resulting from the sale of the Public Relations Solutions and Digital Media Services businesses.

Occupancy expense was flat in the third quarter of 2018 as additional facility and rent costs associated with our 2017 acquisitions were offset by lower costs resulting from the sale of the Public Relations Solutions and Digital Media Services businesses. Occupancy expense increased in the first nine months of 2018 primarily due to additional facility and rent costs associated with our 2017 acquisitions, partially offset by lower costs from the sale of the Public Relations Solutions and Digital Media Services businesses.

The increase in general, administrative and other expense in the third quarter of 2018 was primarily due to the clearing default loss. See “Nasdaq Commodities Clearing Default,” of Note 15, “Clearing Operations,” for further discussion of the default. The increase in the first nine months of 2018 was due to the clearing default loss and also included higher costs associated with our 2017 acquisitions, lower regulatory fine income and a sales and use tax charge. General, administrative and other expense for the nine months ended 2017 included a pre-tax charge of $10 million in the second quarter of 2017 which primarily included a make-whole redemption price premium paid on the early extinguishment of previously outstanding debt.

Marketing and advertising expense was flat in the third quarter and increased in the first nine months of 2018. The increase in the first nine months of 2018 was primarily due to an increase in advertising spend.

The increase in depreciation and amortization expense in both the third quarter and first nine months of 2018 was primarily due to additional amortization expense associated with software assets placed in service and acquired intangible assets related to our 2017 acquisitions.

Merger and strategic initiatives expense in the third quarter and first nine months of 2018 was primarily related to costs associated with the sale of our Public Relations Solutions and Digital Media Services businesses. Merger and strategic initiative expense for the first nine months of 2018 includes a credit of $10 million which relates to the reclass of costs incurred during the first quarter of 2018 to sell the Public Relations Solutions and Digital Media Services businesses. Since these businesses were sold during the second quarter of 2018, these costs have been included as a deduction to the gain on the sale of these businesses. Merger and strategic initiatives expense in the third quarter and first nine months of 2017 was primarily related to our acquisition of ISE.

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***Non-operating Income and Expenses***

The following table shows our non-operating income and expenses:

| | Three Months Ended September 30, | | | Nine Months Ended September 30, | | |
|---|---|---|---|---|---|---|
| | 2018 | 2017 | Percentage Change | 2018 | 2017 | Percentage Change |
| | (in millions) | | | (in millions) | | |
| Interest income | $ 3 | $ 2 | 50.0% | $ 8 | $ 6 | 33.3 % |
| Interest expense | (38) | (34) | 11.8% | (112) | (107) | 4.7 % |
| Net interest expense | (35) | (32) | 9.4% | (104) | (101) | 3.0 % |
| Net gain on divestiture of businesses | (8) | — | N/M | 33 | — | N/M |
| Other investment income | — | — | —% | 7 | 2 | 250.0 % |
| Net income from unconsolidated investees | 6 | 4 | 50.0% | 13 | 10 | 30.0 % |
| Total non-operating income (expenses) | $ (37) | $ (28) | 32.1% | $ (51) | $ (89) | (42.7)% |

N/M - Not meaningful.

Interest Income

Interest income increased in both the third quarter and first nine months of 2018 compared with the same periods in 2017 primarily due to an increase in prevailing market rates.

Interest Expense

The following table shows our interest expense:

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Percentage Change | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 | Percentage Change |
|---|---|---|---|---|---|---|
| | (in millions) | | | (in millions) | | |
| Interest expense on debt | $ 35 | $ 32 | 9.4% | $ 105 | $ 101 | 4.0% |
| Accretion of debt issuance costs and debt discount | 2 | 1 | 100.0% | 5 | 4 | 25.0% |
| Other bank and investment-related fees | 1 | 1 | —% | 2 | 2 | —% |
| Interest expense | $ 38 | $ 34 | 11.8% | $ 112 | $ 107 | 4.7% |

See Note 9, “Debt Obligations,” to the condensed consolidated financial statements for further discussion.

Net Gain on Divestiture of Businesses

In April 2018, we sold our Public Relations Solutions and Digital Media Services businesses. See “2018 Divestiture,” of Note 4, “Acquisitions and Divestiture,” to the condensed consolidated financial statements for further discussion.

Other Investment Income

Other investment income in the first nine months of 2018 primarily related to dividend income received on an equity security.

Net Income from Unconsolidated Investees

Net income from unconsolidated investees in the third quarter and first nine months of 2018 and 2017 primarily relates to income recognized from our equity method investment in OCC. See “Equity Method Investments,” of Note 7, “Investments,” to the condensed consolidated financial statements for further discussion of our equity method investments.

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***Tax Matters***

The following table shows our income tax provision and effective tax rate:

| | Three Months Ended September 30, 2018 | Three Months Ended September 30, 2017 | Percentage Change | Nine Months Ended September 30, 2018 | Nine Months Ended September 30, 2017 | Percentage Change |
|---|---|---|---|---|---|---|
| | ($ in millions) | | | ($ in millions) | | |
| Income tax provision | $ 46 | $ 64 | (28.1)% | $ 234 | $ 178 | 31.5% |
| Effective tax rate | 22.0% | 27.4% | | 31.8% | 26.9% | |

For further discussion of our tax matters, see Note 17, “Income Taxes,” to the condensed consolidated financial statements.

The effective tax rate may vary from period to period depending on, among other factors, the geographic and business mix of earnings and losses. These same and other factors, including history of pre-tax earnings and losses, are taken into account in assessing the ability to realize deferred tax assets.

In order to recognize and measure our unrecognized tax benefits, management determines whether a tax position is more likely than not to be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position. Once it is determined that a position meets the recognition thresholds, the position is measured to determine the amount of benefit to be recognized in the condensed consolidated financial statements. Interest and/or penalties related to income tax matters are recognized in income tax expense.

***Non-GAAP Financial Measures***

In addition to disclosing results determined in accordance with U.S. GAAP, we also have provided non-GAAP net income attributable to Nasdaq and non-GAAP diluted earnings per share. Management uses this non-GAAP information internally, along with U.S. GAAP information, in evaluating our performance and in making financial and operational decisions. We believe our presentation of these measures provides investors with greater transparency and supplemental data relating to our financial condition and results of operations. In addition, we believe the presentation of these measures is useful to investors for period-to-period comparisons of our ongoing operating performance.

These measures are not in accordance with, or an alternative to, U.S. GAAP, and may be different from non-GAAP measures used by other companies. Investors should not rely on any single financial measure when evaluating our business. We recommend investors review the U.S. GAAP financial measures included in this Quarterly Report on Form 10-Q, including our condensed consolidated financial statements and the notes thereto. When viewed in conjunction with our U.S. GAAP results and the accompanying reconciliation, we believe these non-GAAP measures provide greater transparency and a more complete understanding of factors affecting our business than U.S. GAAP measures alone.

We understand that analysts and investors regularly rely on non-GAAP financial measures, such as non-GAAP net income attributable to Nasdaq and non-GAAP diluted earnings per share, to assess operating performance. We use non-GAAP net income attributable to Nasdaq and non-GAAP diluted earnings per share because they highlight trends more clearly in our business that may not otherwise be apparent when relying solely on U.S. GAAP financial measures, since these measures eliminate from our results specific financial items that have less bearing on our ongoing operating performance. Non-GAAP net income attributable to Nasdaq for the periods presented below is calculated by adjusting for the following items:

*Amortization expense of acquired intangible assets:* We amortize intangible assets acquired in connection with various acquisitions. Intangible asset amortization expense can vary from period to period due to episodic acquisitions completed, rather than from our ongoing business operations. As such, if intangible asset amortization is included in performance measures, it is more difficult to assess the day-to-day operating performance of the businesses, the relative operating performance of the businesses between periods, and the earnings power of Nasdaq. Performance measures excluding intangible asset amortization therefore provide investors with a more useful representation of our businesses' ongoing activity in each period.

*Merger and strategic initiatives expense:* We have pursued various strategic initiatives and completed a divestiture and a number of acquisitions in recent years which have resulted in expenses which would not have otherwise been incurred. These expenses generally include integration costs, as well as legal, due diligence and other third party transaction costs. The frequency and the amount of such expenses vary significantly based on the size, timing and complexity of the transaction. Accordingly, we exclude these costs for purposes of calculating non-GAAP measures which provide a more meaningful analysis of Nasdaq's ongoing operating performance or comparisons in Nasdaq's performance between periods.

*Clearing Default Loss:* In September 2018, we recorded an $8 million loss related to a default of a Nasdaq Clearing commodities member. See "Nasdaq Commodities Clearing Default," of Note 15, "Clearing Operations," for further discussion of the default. We have excluded the loss related to the default as we believe it is non-recurring, as there has never been a loss due to member default in our clearinghouse, and should be excluded when evaluating the ongoing operating performance of Nasdaq. Any expenses associated with the evaluation and enhancement of processes and procedures will not be excluded from our GAAP results.

*Other significant items:* We have excluded certain other charges or gains, including certain tax items, that are the result of other non-comparable events to measure operating performance. We believe the exclusion of such amounts allows management and investors to better understand the ongoing financial results of Nasdaq. For the three and nine months ended September 30, 2018, other significant items includes a net gain on divestiture of businesses associated with the sale of our Public Relations Solutions and Digital Media Services businesses. We recognized a pre-tax net gain on the sale of $33 million for the nine months ended September 30, 2018 which includes a post-closing working capital adjustment of $8 million recorded during the three months ended September 30, 2018. For the three and nine months ended September 30, 2018, other significant items included litigation costs and for the nine months ended September 30, 2018, out of period tax charges. For the nine months ended September 30, 2017, other significant items included loss on extinguishment of debt and wind down costs associated with an equity method investment that was previously written off. We believe the exclusion of such amounts allows management and investors to better understand the financial results of Nasdaq.

*Significant tax items:* The adjustment to the income tax provision includes the tax impact of each non-GAAP adjustment. In addition, for the nine months ended September 30, 2018, the adjustment to the income tax provision includes a $3 million increase to tax expense due to a remeasurement of our unrecognized tax benefits. For the three months ended September 30, 2017, the adjustment to the income tax provision includes an $8 million decrease to tax expense due to a remeasurement of our unrecognized tax benefits and the nine months ended September 30, 2017 includes a $12 million decrease to tax expense due to a remeasurement of our unrecognized tax benefits. Additional adjustments include the following items:

- For the nine months ended September 30, 2018, we recorded a reversal of previously recognized certain Swedish tax benefits. See Note 17, "Income Taxes," to the condensed consolidated financial statements for further discussion.
- The impact of the newly enacted U.S. tax legislation is related to the Tax Cuts and Jobs Act which was enacted on December 22, 2017. For the three months ended September 30, 2018, we recorded a decrease to tax expense of $4 million related to the remeasurement of our deferred tax assets and liabilities as of the enactment date. For the nine months ended September 30, 2018, we recorded an increase to tax expense of $1 million, consisting of a $5 million increase to tax expense which reflects the reduced federal tax benefit associated with state unrecognized tax benefits, partially offset by the $4 million decrease described above. These amounts may be refined in the future as new information becomes available.
- For the nine months ended September 30, 2018, we recorded excess tax benefits of $5 million related to employee share-based compensation which reflects the recognition of income tax effects of share-based awards when awards vest or are settled. For the three months ended September 30, 2017, we recorded excess tax benefits of $7 million, and for the nine months ended September 30, 2017, we recorded excess tax benefits of $30 million. This item is subject to volatility and will vary based on the timing of the vesting of employee share-based compensation arrangements and fluctuation in our stock price.

The following table represents reconciliations between U.S. GAAP net income attributable to Nasdaq and diluted earnings per share and non-GAAP net income attributable to Nasdaq and diluted earnings per share:

| | Three Months Ended September 30, 2018 | | Three Months Ended September 30, 2017 | |
|---|---|---|---|---|
| | Net Income | Diluted Earnings Per Share | Net Income | Diluted Earnings Per Share |
| | (in millions, except share and per share amounts) | | (in millions, except share and per share amounts) | |
| **U.S. GAAP net income attributable to Nasdaq and diluted earnings per share** | $ 163 | $ 0.97 | $ 170 | $ 1.00 |
| Non-GAAP adjustments: | | | | |
| Amortization expense of acquired intangible assets | 27 | 0.16 | 22 | 0.13 |
| Merger and strategic initiatives | 6 | 0.04 | 3 | 0.02 |
| Net gain on divestiture of businesses | 8 | 0.05 | — | — |
| Clearing default loss | 8 | 0.05 | — | — |
| Other | 2 | 0.01 | 1 | 0.01 |
| Adjustment to the income tax provision to reflect non-GAAP adjustments and other tax items | (17) | (0.11) | (17) | (0.10) |
| Impact of newly enacted U.S. tax legislation | (4) | (0.02) | — | — |
| Excess tax benefits related to employee share-based compensation | — | — | (7) | (0.05) |
| Total non-GAAP adjustments, net of tax | 30 | 0.18 | 2 | 0.01 |
| **Non-GAAP net income attributable to Nasdaq and diluted earnings per share** | $ 193 | $ 1.15 | $ 172 | $ 1.01 |
| Weighted-average common shares outstanding for diluted earnings per share | | 167,290,916 | | 170,002,147 |

| | Nine Months Ended September 30, 2018 | | Nine Months Ended September 30, 2017 | |
|---|---|---|---|---|
| | Net Income | Diluted Earnings Per Share | Net Income | Diluted Earnings Per Share |
| | (in millions, except share and per share amounts) | | (in millions, except share and per share amounts) | |
| **U.S. GAAP net income attributable to Nasdaq and diluted earnings per share** | $ 502 | $ 2.99 | $ 483 | $ 2.85 |
| Non-GAAP adjustments: | | | | |
| Amortization expense of acquired intangible assets | 83 | 0.49 | 67 | 0.40 |
| Merger and strategic initiatives | 7 | 0.04 | 20 | 0.12 |
| Net gain on divestiture of businesses | (33) | (0.20) | — | — |
| Clearing default loss | 8 | 0.05 | — | — |
| Extinguishment of debt | — | — | 10 | 0.06 |
| Other | 6 | 0.04 | 3 | 0.01 |
| Adjustment to the income tax provision to reflect non-GAAP adjustments and other tax items | (10) | (0.06) | (49) | (0.29) |
| Reversal of certain Swedish tax benefits | 41 | 0.24 | — | — |
| Impact of newly enacted U.S. tax legislation | 1 | 0.01 | — | — |
| Excess tax benefits related to employee share-based compensation | (5) | (0.03) | (30) | (0.18) |
| Total non-GAAP adjustments, net of tax | 98 | 0.58 | 21 | 0.12 |
| **Non-GAAP net income attributable to Nasdaq and diluted earnings per share** | $ 600 | $ 3.57 | $ 504 | $ 2.97 |
| Weighted-average common shares outstanding for diluted earnings per share | | 167,884,484 | | 169,566,166 |

**Liquidity and Capital Resources**

Historically, we have funded our operating activities and met our commitments through cash generated by operations, augmented by the periodic issuance of our common stock and debt. See Note 9, “Debt Obligations,” to the condensed consolidated financial statements for further discussion. Currently, our cost and availability of funding remain healthy.

As part of the purchase price consideration of a prior acquisition, Nasdaq has contingent future obligations to issue 992,247 shares of Nasdaq common stock annually which approximated certain tax benefits associated with the transaction of $484 million. Such contingent future issuances of Nasdaq common stock will be paid ratably through 2027 if Nasdaq’s total gross revenues equal or exceed $25 million in each such year. The contingent future issuances of Nasdaq common stock are subject to anti-dilution protections and acceleration upon certain events.

In April 2017, we entered into the 2017 Credit Facility which replaced a former credit facility. We also entered into a commercial paper program which enables us to borrow efficiently at reasonable short-term interest rates and is supported by our 2017 Credit Facility. See “Commercial Paper Program,” and “2017 Credit Facility,” of Note 9, “Debt Obligations,” to the condensed consolidated financial statements for further discussion.

As of September 30, 2018, no amounts were outstanding on the 2017 Credit Facility. The $4 million credit balance represents unamortized debt issuance costs. Of the $1 billion that is available for borrowing, $311 million provides liquidity support for the commercial paper program and for a letter of credit. As such, as of September 30, 2018, the total remaining amount available under the 2017 Credit Facility was $689 million.

In the near term, we expect that our operations and the availability under our revolving credit commitment and commercial paper program will provide sufficient cash to fund our operating expenses, capital expenditures, debt repayments, any share repurchases, and any dividends.

The value of various assets and liabilities, including cash and cash equivalents, receivables, accounts payable and accrued expenses, and commercial paper can fluctuate from month to month. Working capital (calculated as current assets less current liabilities) was $(342) million as of September 30, 2018, compared with $276 million as of December 31, 2017, a decrease of $618 million. Current asset balance changes decreased working capital by $53 million, with increases in default funds and margin deposits, other current assets and restricted cash, partially offset by decreases in assets held for sale, cash and cash equivalents, and financial investments, at fair value. Current liability balance changes decreased working capital by $565 million, due to increases in short-term debt as our 2019 Notes became due within one year in March 2018, default funds and margin deposits, deferred revenue, and other current liabilities, partially offset by decreases in Section 31 fees payable to the SEC, liabilities held for sale, accrued personnel costs, and accounts payable and accrued expenses.

Principal factors that could affect the availability of our internally-generated funds include:

- deterioration of our revenues in any of our business segments;
- changes in regulatory and working capital requirements; and
- an increase in our expenses.

Principal factors that could affect our ability to obtain cash from external sources include:

- operating covenants contained in our credit facilities that limit our total borrowing capacity;
- increases in interest rates under our credit facilities;
- credit rating downgrades, which could limit our access to additional debt;
- a decrease in the market price of our common stock; and
- volatility or disruption in the public debt and equity markets.

The following sections discuss the effects of changes in our financial assets, debt obligations, clearing and broker-dealer net capital requirements, and cash flows on our liquidity and capital resources.

***Financial Assets***

The following table summarizes our financial assets:

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| | (in millions) | |
| Cash and cash equivalents | $ 324 | $ 377 |
| Restricted cash | 52 | 22 |
| Financial investments, at fair value | 202 | 235 |
| Total financial assets | $ 578 | $ 634 |

<u>Cash and Cash Equivalents and Restricted Cash</u>

Cash and cash equivalents includes all non-restricted cash in banks and highly liquid investments with original maturities of 90 days or less at the time of purchase. The balance retained in cash and cash equivalents is a function of anticipated or possible short-term cash needs, prevailing interest rates, our investment policy, and alternative investment choices. As of September 30, 2018, our cash and cash equivalents of $324 million were primarily invested in bank deposits, money market funds and commercial paper. In the long-term, we may use both internally generated funds and external sources to satisfy our debt obligations and other long-term liabilities. Cash and cash sources to satisfy our debt obligations and other long-term liabilities. Cash and cash equivalents as of September 30, 2018 decreased $53 million from December 31, 2017, primarily due to:

- repurchases of our common stock;
- cash dividends paid on our common stock;
- repayments made on commercial paper, net;
- repayments of long-term debt;
- purchases of property and equipment; and
- payments related to employee shares withheld for taxes, partially offset by;
- net cash provided by operating activities; and
- proceeds from divestiture of businesses, net.

See “Cash Flow Analysis” below for further discussion.

As of September 30, 2018 and December 31, 2017, restricted cash is restricted from withdrawal due to a contractual or regulatory requirement or is not available for general use. Restricted cash was $52 million as of September 30, 2018 and $22 million as of December 31, 2017, an increase of $30 million. The increase relates to an increase in customer funds held in connection with privately negotiated securities transactions and an increase in regulatory capital requirements. Restricted cash is classified as restricted cash in the Condensed Consolidated Balance Sheets.

*Repatriation of Cash*

Our cash and cash equivalents held outside of the U.S. in various foreign subsidiaries totaled $138 million as of September 30, 2018 and December 31, 2017. The remaining balance held in the U.S. totaled $186 million as of September 30, 2018 and $239 million as of December 31, 2017.

Unremitted earnings of subsidiaries outside of the U.S. are used to finance our international operations and are generally considered to be indefinitely reinvested. It is not our current intent to change this position. However, the majority of cash held outside the U.S. is available for repatriation, but under current law in certain jurisdictions, could subject us to additional income taxes, less applicable foreign tax credits.

*Share Repurchase Program*

See “Share Repurchase Program,” of Note 12, “Nasdaq Stockholders’ Equity,” to the condensed consolidated financial statements for further discussion of our share repurchase program.

*Cash Dividends on Common Stock*

The following table shows quarterly cash dividends paid per common share on our outstanding common stock:

| | 2018 | 2017 |
|---|---|---|
| First quarter | $ 0.82 | $ 0.32 |
| Second quarter | — | 0.38 |
| Third quarter | 0.44 | 0.38 |
| Total | $ 1.26 | $ 1.08 |

See “Cash Dividends on Common Stock,” of Note 12, “Nasdaq Stockholders’ Equity,” to the condensed consolidated financial statements for further discussion of the dividends.

Financial Investments, at Fair Value

Our financial investments, at fair value totaled $202 million as of September 30, 2018 and $235 million as of December 31, 2017 and are primarily comprised of trading securities, mainly highly rated European government debt securities. Of these securities, $174 million as of September 30, 2018 and $160 million as of December 31, 2017 are assets utilized to meet regulatory capital requirements, primarily for our clearing operations at Nasdaq Clearing. See Note 7, “Investments,” to the condensed consolidated financial statements for further discussion of our trading investment securities.

***Debt Obligations***

The following table summarizes our debt obligations by contractual maturity:

| | Maturity Date | September 30, 2018 | December 31, 2017 |
|---|---|---|---|
| | | (in millions) | |
| Short-term debt: | | | |
| Commercial paper | Weighted-average maturity of 29 days | $ 309 | $ 480 |
| Senior unsecured floating rate notes[1] | March 2019 | 499 | 498 |
| Total short-term debt | | 808 | 978 |
| Long-term debt: | | | |
| $400 million senior unsecured term loan facility | November 2019 | 100 | 100 |
| 5.55% senior unsecured notes | January 2020 | 599 | 599 |
| 3.875% senior unsecured notes | June 2021 | 694 | 716 |
| $1 billion revolving credit commitment | April 2022 | (4) | 110 |
| 1.75% senior unsecured notes | May 2023 | 690 | 712 |
| 4.25% senior unsecured notes | June 2024 | 497 | 496 |
| 3.85% senior unsecured notes | June 2026 | 496 | 496 |
| Total long-term debt | | 3,072 | 3,229 |
| Total debt obligations | | $ 3,880 | $ 4,207 |

(1) Balance was reclassified to short-term debt as of March 31, 2018.

In addition to the $1 billion revolving credit commitment and $400 million term loan facility, we also have other credit facilities related to our Nasdaq Clearing operations in order to provide further liquidity. Other credit facilities, which are available in multiple currencies, totaled $219 million as of September 30, 2018 and $187 million as of December 31, 2017, in available liquidity, none of which was utilized.

As of September 30, 2018, we were in compliance with the covenants of all of our debt obligations.

See Note 9, “Debt Obligations,” to the condensed consolidated financial statements for further discussion of our debt obligations.

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***Clearing and Broker-Dealer Net Capital Requirements***

Clearing Operations Regulatory Capital Requirements

We are required to maintain minimum levels of regulatory capital for the clearing operations of Nasdaq Clearing. The level of regulatory capital required to be maintained is dependent upon many factors, including market conditions and creditworthiness of the counterparty. As of September 30, 2018, our required regulatory capital of $174 million is primarily comprised of highly rated European government debt securities that are included in financial investments, at fair value in the Condensed Consolidated Balance Sheets.

Broker-Dealer Net Capital Requirements

Our broker-dealer subsidiaries, Nasdaq Execution Services, Execution Access, NPM Securities, SMTX, and Nasdaq Capital Markets Advisory, are subject to regulatory requirements intended to ensure their general financial soundness and liquidity. These requirements obligate these subsidiaries to comply with minimum net capital requirements. The following table summarizes the net capital requirements for our broker-dealer subsidiaries as of September 30, 2018:

| Broker-Dealer Subsidiaries | Total Net Capital | Required Minimum Net Capital | Excess Capital |
|---|---|---|---|
| | | (in millions) | |
| Nasdaq Execution Services | $ 16.0 | $ 0.3 | $ 15.7 |
| Execution Access | 63.2 | 0.3 | 62.9 |
| NPM Securities | 0.6 | 0.3 | 0.3 |
| SMTX | 3.0 | 0.3 | 2.7 |
| Nasdaq Capital Markets Advisory | 0.4 | 0.3 | 0.1 |

Other Capital Requirements

*Nasdaq Execution Services*

Nasdaq Execution Services also is required to maintain a $2 million minimum level of net capital under our clearing arrangement with OCC.

*Cash Flow Analysis*

The following table summarizes the changes in cash flows:

| | Nine Months Ended September 30, | | Percentage Change |
|---|---|---|---|
| | 2018 | 2017 | 2018 vs. 2017 |
| | (in millions) | | |
| Net cash provided by (used in): | | | |
| Operating activities | $ 668 | $ 609 | 9.7 % |
| Investing activities | 227 | (73) | (411.0)% |
| Financing activities | (906) | (418) | 116.7 % |
| Effect of exchange rate changes on cash and cash equivalents and restricted cash | (12) | 15 | (180.0)% |
| Net increase in cash and cash equivalents and restricted cash | (23) | 133 | (117.3)% |
| Cash and cash equivalents and restricted cash at beginning of period | 399 | 418 | (4.5)% |
| Cash and cash equivalents and restricted cash at end of period | $ 376 | $ 551 | (31.8)% |

Net Cash Provided by Operating Activities

Net cash provided by operating activities increased $59 million for the nine months ended September 30, 2018 compared with the same period in 2017. The increase was primarily due to an increase in cash flows related to our equity derivative trading and clearing, cash equity trading, market data, index and listing services businesses and cash flows related to our acquisition of eVestment in the fourth quarter of 2017. In addition, cash provided by operating activities increased compared with the same period in 2017 primarily due to a decrease in severance payments made, partially offset by an increase in estimated tax payments, a payment made in the third quarter of 2018 to increase the funded status of our pension retirement obligation and higher Section 31 fee payments.

Net Cash Provided by (Used in) Investing Activities

Net cash provided by investing activities for the nine months ended September 30, 2018 primarily consisted of proceeds from divestiture of businesses, net and proceeds from sales and redemptions of trading securities, partially offset by purchases of trading securities and purchases of property and equipment.

Net cash used in investing activities for the nine months ended September 30, 2017 primarily consisted of purchases of trading securities and purchases of property and equipment, partially offset by proceeds from sales and redemptions of trading securities.

Net Cash Used in Financing Activities

Net cash used in financing activities for the nine months ended September 30, 2018 primarily consisted of $394 million related to the repurchase of our common stock, $208 million related to cash dividends paid on our common stock, $170 million of repayments of commercial paper, net, $115 million of repayment of our revolving credit commitment, and $44 million of payments related to employee shares withheld for taxes.

Net cash used in financing activities for the nine months ended September 30, 2017 primarily consisted of repayment of long-term debt of $683 million, $180 million related to cash dividends paid on our common stock, and $175 million related to the repurchase of our common stock, partially offset by net proceeds from the issuance of the 2019 Note of $498 million and commercial paper, net of $154 million.

See Note 4, “Acquisitions and Divestiture,” to the condensed consolidated financial statements for further discussion of our divestiture and acquisitions.

See Note 9, “Debt Obligations,” to the condensed consolidated financial statements for further discussion of our debt obligations.

See “Share Repurchase Program,” and “Cash Dividends on Common Stock,” of Note 12, “Nasdaq Stockholders’ Equity,” to the condensed consolidated financial statements for further discussion of our share repurchase program and cash dividends paid on our common stock.

**Contractual Obligations and Contingent Commitments**

Nasdaq has contractual obligations to make future payments under debt obligations by contract maturity, minimum rental commitments under non-cancelable operating leases, net and other obligations. The following table shows these contractual obligations as of September 30, 2018:

| Contractual Obligations | Payments Due by Period | | | | |
|---|---|---|---|---|---|
| | Total | Less than 1 year | 1-3 years | 3-5 years | More than 5 years |
| | (in millions) | | | | |
| Debt obligations by contract maturity[1] | $ 4,395 | $ 936 | $ 1,575 | $ 805 | $ 1,079 |
| Minimum rental commitments under non-cancelable operating leases, net[2] | 636 | 73 | 126 | 89 | 348 |
| Purchase obligations[3] | 19 | 10 | 9 | | |
| Other obligations[4] | 11 | 9 | 2 | — | — |
| Total | $ 5,061 | $ 1,028 | $ 1,712 | $ 894 | $ 1,427 |

(1) Our debt obligations include both principal and interest obligations. As of September 30, 2018, an interest rate of 4.16% was used to compute the amount of the contractual obligations for interest on the 2016 Credit Facility and 2.90% was used to compute the amount of the contractual obligations for interest on the 2019 Notes. All other debt obligations were primarily calculated on a 360-day basis at the contractual fixed rate multiplied by the aggregate principal amount as of September 30, 2018. See Note 9, "Debt Obligations," to the condensed consolidated financial statements for further discussion.

(2) We lease some of our office space under non-cancelable operating leases with third parties and sublease office space to third parties. Some of our leases contain renewal options and escalation clauses based on increases in property taxes and building operating costs.

(3) Purchase obligations primarily represent minimum outstanding obligations due under software license agreements.

(4) Other obligations primarily consist of potential future escrow agreement payments related to prior acquisitions.

### *Pending Acquisition of Cinnober*

In September 2018, we announced that we made a SEK 75 per share and SEK 85 per warrant, or approximately $190 million (based on an exchange rate of USD 1.00 = SEK 8.96 as of September 13, 2018), all cash recommended public offer to the shareholders and warrant holders of Cinnober, a major Swedish financial technology provider to brokers, exchanges and clearinghouses worldwide. See “2018 Pending Acquisition,” of Note 4, “Acquisitions and Divestiture,” to the condensed consolidated financial statements for further discussion.

### *Other*

In addition, we have a 40.0% ownership in OCC. Under the OCC's capital plan, the OCC shareholders have committed to contribute up to $200 million in equity capital if certain capital thresholds are breached, including up to $80 million to be contributed by Nasdaq. See “Equity Method Investments,” of Note 7, “Investments,” to the condensed consolidated financial statements for further discussion of our equity method investment in OCC.

## Non-Cash Contingent Consideration

As part of the purchase price consideration of a prior acquisition, we have agreed to future annual issuances of 992,247 shares of Nasdaq common stock which approximated certain tax benefits associated with the transaction. Such contingent future issuances of Nasdaq common stock will be paid ratably through 2027 if Nasdaq’s total gross revenues equal or exceed $25 million in each such year. The contingent future issuances of Nasdaq common stock are subject to anti-dilution protections and acceleration upon certain events.

## Off-Balance Sheet Arrangements

For discussion of off-balance sheet arrangements see:

- Note 15, “Clearing Operations,” to the condensed consolidated financial statements for further discussion of our non-cash default fund contributions and margin deposits received for clearing operations; and
- Note 16, “Commitments, Contingencies and Guarantees,” to the condensed consolidated financial statements for further discussion of:
  - Guarantees issued and credit facilities available;
  - Lease commitments;
  - Other guarantees;
  - Non-cash contingent consideration;
  - Escrow agreements;
  - Routing brokerage activities;
  - Legal and regulatory matters; and
  - Tax audits.

## Item 3. Quantitative and Qualitative Disclosures About Market Risk

Market risk represents the potential for losses that may result from changes in the market value of a financial instrument due

to changes in market conditions. As a result of our operating, investing and financing activities, we are exposed to market risks such as interest rate risk and foreign currency exchange rate risk. We are also exposed to credit risk as a result of our normal business activities.

We have implemented policies and procedures to measure, manage, monitor and report risk exposures, which are reviewed regularly by management and the board of directors. We identify risk exposures and monitor and manage such risks on a daily basis.

We perform sensitivity analyses to determine the effects of market risk exposures. We may use derivative instruments solely to hedge financial risks related to our financial positions or risks that are incurred during the normal course of business. We do not use derivative instruments for speculative purposes.

### *Interest Rate Risk*

We are subject to the risk of fluctuating interest rates in the normal course of business. Our exposure to market risk for changes in interest rates relates primarily to our financial investments and debt obligations which are discussed below.

Financial Investments

As of September 30, 2018, our investment portfolio was primarily comprised of trading securities, mainly highly rated European government debt securities, which pay a fixed rate of interest. These securities are subject to interest rate risk and will decrease in value if market interest rates increase. If market interest rates were to increase immediately and uniformly by 100 basis points from levels as of September 30, 2018, the fair value of this portfolio would have declined by $4 million.

Debt Obligations

As of September 30, 2018, substantially all of our debt obligations are fixed-rate obligations. While changes in interest rates will have no impact on the interest we pay on fixed-rate obligations, we are exposed to changes in interest rates as a result of the issuance of our 2019 Notes, borrowings under our 2017 Credit Facility and 2016 Credit Facility, and amounts outstanding from the sale of commercial paper under our commercial paper program, all of which have variable interest rates. As of September 30, 2018, we had principal amounts outstanding of $500 million on the 2019 Notes, $100 million under the 2016 Credit Facility, and $310 million of commercial paper. A hypothetical 100 basis points increase in interest rates on our outstanding 2019 Notes, the 2016 Credit Facility and our outstanding commercial paper would increase interest expense by approximately $9 million based on borrowings as of September 30, 2018.

### *Foreign Currency Exchange Rate Risk*

As a leading global exchange group, we are subject to foreign currency transaction risk. Our primary exposure to foreign currency denominated revenues less transaction-based expenses and operating income for the three and nine months ended September 30, 2018 is presented in the following table:

| | Euro | Swedish Krona | Other Foreign Currencies | U.S. Dollar | Total |
|---|---|---|---|---|---|
| | (in millions, except currency rate) | | | | |
| **Three Months Ended September 30, 2018** | | | | | |
| Average foreign currency rate to the U.S. dollar | 1.1631 | 0.1118 | # | N/A | N/A |
| Percentage of revenues less transaction-based expenses | 8.7% | 6.8 % | 5.0 % | 79.5% | 100.0% |
| Percentage of operating income | 11.1% | (1.5)% | (5.7)% | 96.1% | 100.0% |
| Impact of a 10% adverse currency fluctuation on revenues less transaction-based expenses | $ (5) | $ (4) | $ (3) | $ — | $ (12) |
| Impact of a 10% adverse currency fluctuation on operating income | $ (3) | $ — | $ (1) | $ — | $ (4) |

| | Euro | Swedish Krona | Other Foreign Currencies | U.S. Dollar | Total |
|---|---|---|---|---|---|
| | (in millions, except currency rate) | | | | |
| **Nine Months Ended September 30, 2018** | | | | | |
| Average foreign currency rate to the U.S. dollar | 1.1938 | 0.1166 | # | N/A | N/A |
| Percentage of revenues less transaction-based expenses | 9.2% | 7.3 % | 5.3 % | 78.2% | 100.0% |
| Percentage of operating income | 13.7% | (0.3)% | (5.8)% | 92.4% | 100.0% |
| Impact of a 10% adverse currency fluctuation on revenues less transaction-based expenses | $ (17) | $ (14) | $ (10) | $ — | $ (41) |
| Impact of a 10% adverse currency fluctuation on operating income | $ (11) | $ — | $ (5) | $ — | $ (16) |

\# Represents multiple foreign currency rates.
N/A Not applicable.

Our investments in foreign subsidiaries are exposed to volatility in currency exchange rates through translation of the foreign subsidiaries' net assets or equity to U.S. dollars. Substantially all of our foreign subsidiaries operate in functional currencies other than the U.S. dollar. Fluctuations in currency exchange rates may create volatility in our results of operations as we are required to translate the balance sheets and operational results of these foreign currency denominated subsidiaries into U.S. dollars for consolidated reporting. The translation of foreign subsidiaries' non-U.S. dollar balance sheets into U.S. dollars for consolidated reporting results in a cumulative translation adjustment which is recorded in accumulated other comprehensive loss within stockholders' equity in the Condensed Consolidated Balance Sheets.

Our primary exposure to net assets in foreign currencies as of September 30, 2018 is presented in the following table:

| | Net Assets | Impact of a 10% Adverse Currency Fluctuation |
|---|---|---|
| | (in millions) | |
| Swedish Krona[(1)] | $ 3,323 | $ (332) |
| Norwegian Krone | 187 | (19) |
| Canadian Dollar | 126 | (13) |
| British Pound | 157 | (16) |
| Euro | 106 | (11) |
| Australian Dollar | 104 | (10) |

(1) Includes goodwill of $2,457 million and intangible assets, net of $580 million.

***Credit Risk***

Credit risk is the potential loss due to the default or deterioration in credit quality of customers or counterparties. We are exposed to credit risk from third parties, including customers, counterparties and clearing agents. These parties may default on their obligations to us due to bankruptcy, lack of liquidity, operational failure or other reasons. We limit our exposure to credit risk by rigorously evaluating the counterparties with which we make investments and execute agreements. The financial investment portfolio objective is to invest in securities to preserve principal while maximizing yields, without significantly increasing risk. Credit risk associated with investments is minimized substantially by ensuring that these financial assets are placed with governments which have investment grade ratings, well-capitalized financial institutions and other creditworthy counterparties.

Our subsidiary, Nasdaq Execution Services, may be exposed to credit risk, due to the default of trading counterparties, in connection with the routing services it provides for our trading customers. System trades in cash equities routed to other market centers for members of our cash equity exchanges are routed by Nasdaq Execution Services for clearing to the NSCC. In this function, Nasdaq Execution Services is to be neutral by the end of the trading day, but may be exposed to intraday risk if a trade extends beyond the trading day and into the next day, thereby leaving Nasdaq Execution Services susceptible to counterparty risk in the period between accepting the trade and routing it to the clearinghouse. In this interim period, Nasdaq Execution Services is not novating like a clearing broker but instead is subject to the short-term risk of counterparty failure before the clearinghouse enters the transaction. Once the clearinghouse officially accepts the trade for novation, Nasdaq Execution Services is legally removed from trade execution risk. However, Nasdaq has membership obligations to NSCC independent of Nasdaq Execution Services' arrangements.

Pursuant to the rules of the NSCC and Nasdaq Execution Services' clearing agreement, Nasdaq Execution Services is liable for any losses incurred due to a counterparty or a clearing agent's failure to satisfy its contractual obligations, either by making payment or delivering securities. Adverse movements in the prices of securities that are subject to these transactions can increase our credit risk. However, we believe that the risk of material loss is limited, as Nasdaq Execution Services' customers are not permitted to trade on margin and NSCC rules limit counterparty risk on self-cleared transactions by establishing credit limits and capital deposit requirements for all brokers that clear with NSCC. Historically, Nasdaq Execution Services has never incurred a liability due to a customer's failure to satisfy its contractual obligations as counterparty to a system trade. Credit difficulties or insolvency, or the perceived possibility of credit difficulties or insolvency, of one or more larger or visible market participants could also result in market-wide credit difficulties or other market disruptions.

Execution Access is an introducing broker which operates the trading platform for our Fixed Income business to trade in U.S. Treasury securities. Execution Access has a clearing arrangement with Industrial and Commercial Bank of China Financial Services LLC, or ICBC. As of September 30, 2018, we have contributed $15 million of clearing deposits to ICBC in connection with this clearing arrangement. These deposits are recorded in other current assets in our Condensed Consolidated Balance Sheets. Some of the trading activity in Execution Access is cleared by ICBC through the Fixed Income Clearing Corporation, with ICBC acting as agent. Execution Access assumes the counterparty risk of clients that do not clear through the Fixed Income Clearing Corporation. Counterparty risk of clients exists for Execution Access between the trade date and settlement date of the individual transactions, which is at least one business day (or more, if specified by the U.S. Treasury issuance calendar). Counterparties that do not clear through the Fixed Income Clearing Corporation are subject to a credit due diligence process and may be required to post collateral, provide principal letters, or provide other forms of credit enhancement to Execution Access for the purpose of mitigating counterparty risk. Daily position trading limits are also enforced for such counterparties.

We have credit risk related to transaction and subscription-based revenues that are billed to customers on a monthly or quarterly basis, in arrears. Our potential exposure to credit losses on these transactions is represented by the receivable balances in our Condensed Consolidated Balance Sheets. On an ongoing basis, we review and evaluate changes in the status of our counterparties' creditworthiness. Credit losses such as those described above could adversely affect our consolidated financial position and results of operations.

We also are exposed to credit risk through our clearing operations with Nasdaq Clearing. See Note 15, "Clearing Operations," to the condensed consolidated financial statements for further discussion. Our clearinghouse holds material amounts of clearing member cash deposits which are held or invested primarily to provide security of capital while minimizing credit, market and liquidity risks. While we seek to achieve a reasonable rate of return, we are primarily concerned with preservation of capital and managing the risks associated with these deposits. As the clearinghouse may pass on interest revenues (minus costs) to the members, this could include negative or reduced yield due to market conditions. The following is a summary of the risks associated with these deposits and how these risks are mitigated.

- *Credit Risk.* When the clearinghouse has the ability to hold cash collateral at a central bank, the clearinghouse utilizes its access to the central bank system to minimize credit risk exposures. When funds are not held at a central bank, we seek to substantially mitigate credit risk by ensuring that investments are primarily placed in highly rated government and supranational debt instruments.

- *Liquidity Risk.* Liquidity risk is the risk a clearinghouse may not be able to meet its payment obligations in the right currency, in the right place and the right time. To mitigate

this risk, the clearinghouse monitors liquidity requirements closely and maintains funds and assets in a manner which minimizes the risk of loss or delay in the access by the clearinghouse to such funds and assets. For example, holding funds with a central bank where possible or investing in highly liquid government or supranational debt instruments serves to reduce liquidity risks.

- *Interest Rate Risk.* Interest rate risk is the risk that interest rates rise causing the value of purchased securities to decline. If we were required to sell securities prior to maturity, and interest rates had risen, the sale of the securities might be made at a loss relative to the latest market price. Our clearinghouse seeks to manage this risk by making short term investments of members cash deposits. In addition, the clearinghouse investment guidelines allow for direct purchases or repurchase agreements of high quality sovereign debt (for example, European government and U.S. Treasury securities), central bank certificates and supranational debt instruments with short dated maturities.
- *Security Issuer Risk.* Security issuer risk is the risk that an issuer of a security defaults on its payment when the security matures. This risk is mitigated by limiting allowable investments and collateral under reverse repurchase agreements to high quality sovereign, government agency or supernatural debt instruments.

**Item 4. Controls and Procedures.**

(a) ***Disclosure controls and procedures.*** Nasdaq's management, with the participation of Nasdaq's President and Chief Executive Officer, and Executive Vice President, Corporate Strategy and Chief Financial Officer, has evaluated the effectiveness of Nasdaq's disclosure controls and procedures (as defined in Rule 13a-15(e) and Rule 15d-15(e) under the Exchange Act) as of the end of the period covered by this report. Based upon that evaluation, Nasdaq's President and Chief Executive Officer and Executive Vice President, Corporate Strategy and Chief Financial Officer, have concluded that, as of the end of such period, Nasdaq's disclosure controls and procedures are effective.

(b) ***Internal control over financial reporting***. There have been no changes in Nasdaq's internal control over financial reporting (as defined in Rule 13a-15(f) and Rule 15d-15(f) under the Exchange Act) that occurred during the quarter ended September 30, 2018 that have materially affected, or are reasonably likely to materially affect, Nasdaq's internal control over financial reporting.

## PART II - OTHER INFORMATION

**Item 1. Legal Proceedings.**

As previously disclosed, we are named as one of many defendants in City of Providence v. BATS Global Markets, Inc., et al., 14 Civ. 2811 (S.D.N.Y.), which was filed on April 18, 2014 in the United States District Court for the Southern District of New York. The district court appointed lead counsel, who filed an amended complaint on September 2, 2014. The amended complaint names as defendants seven national exchanges, as well as Barclays PLC, which operated a private alternative trading system. On behalf of a putative class of securities traders, the plaintiffs allege that the defendants engaged in a scheme to manipulate the markets through high-frequency trading; the amended complaint asserts claims against us under Section 10(b) of the Exchange Act and Rule 10b-5, as well as under Section 6(b) of the Exchange Act. The plaintiffs seek injunctive and monetary relief of an unspecified amount. We filed a motion to dismiss the amended complaint on November 3, 2014. In response, the plaintiffs filed a second amended complaint on November 24, 2014, which names the same defendants and alleges essentially the same violations. We then filed a motion to dismiss the second amended complaint on January 23, 2015. On August 26, 2015, the district court entered an order dismissing the second amended complaint in its entirety with prejudice, concluding that most of the plaintiffs' theories were foreclosed by absolute immunity and in any event that the plaintiffs failed to state any claim. The plaintiffs appealed the judgment of dismissal to the United States Court of Appeals for the Second Circuit. On December 19, 2017, the Second Circuit issued an opinion vacating the district court's judgment of dismissal and remanding to the district court for further proceedings. The exchanges filed a petition before the Second Circuit seeking panel or en banc rehearing on January 31, 2018, which the Second Circuit denied on March 13, 2018. On May 18, 2018, the exchanges filed a motion to dismiss the amended complaint, raising issues not addressed in the proceedings to date. Given the preliminary nature of the proceedings, we are unable to estimate what, if any, liability may result from this litigation. However, we believe that the claims are without merit and will continue to litigate vigorously.

**Item 1A. Risk Factors.**

In addition to the other information set forth in this Quarterly
Report on Form 10-Q, including the information under "SEC Decisions," of Note 19, "Subsequent Events," to the condensed consolidated financial statements, you should carefully consider the factors discussed under "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 as filed with the SEC on February 28, 2018, our Quarterly Report on Form 10-Q for the quarter ended March 31, 2018, as filed with the SEC on May 2, 2018, and our Quarterly Report on Form 10-Q for the quarter ended June 30, 2018, as filed with the SEC on August 1, 2018. These risks could materially and adversely affect our business, financial condition and results of operations. The risks and uncertainties

disclosed in our Form 10-K and Form 10-Q are not the only ones facing us. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business.

**Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.**

**Issuer Purchases of Equity Securities**

***Share Repurchase Program***

See "Share Repurchase Program," of Note 12, "Nasdaq Stockholders' Equity," to the condensed consolidated financial statements for further discussion of our share repurchase program.

***Employee Transactions***

During the fiscal quarter ended September 30, 2018, we purchased shares from employees in connection with the settlement of employee tax withholding obligations arising from the vesting of restricted stock and PSUs. 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 September 30, 2018:

| Period | (a) Total Number of Shares Purchased | (b) Average Price Paid Per Share | (c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs | (d) Maximum Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs (in millions) |
|---|---|---|---|---|
| **July 2018** | | | | |
| Share repurchase program | 37,342 | $ 94.77 | 37,342 | $ 382 |
| Employee transactions | 4,479 | 91.29 | N/A | N/A |
| **August 2018** | | | | |
| Share repurchase program | 479,982 | $ 92.79 | 479,982 | $ 338 |
| Employee transactions | 5,233 | 93.95 | N/A | N/A |
| **September 2018** | | | | |
| Share repurchase program | 61,582 | $ 95.12 | 61,582 | $ 332 |
| Employee transactions | 275 | 93.08 | N/A | N/A |
| **Total Quarter Ended September 30, 2018** | | | | |
| Share repurchase program | 578,906 | $ 93.17 | 578,906 | $ 332 |
| Employee transactions | 9,987 | $ 92.73 | N/A | N/A |

**Item 3. Defaults Upon Senior Securities.**

None.

**Item 4. Mine Safety Disclosures.**

Not applicable.

**Item 5. Other Information.**

Not applicable.

**Item 6. Exhibits.**

| Exhibit Number | |
|---|---|
| 10.1 | Employment Agreement between Nasdaq and Edward S. Knight, effective as of July 29, 2018.* |
| 31.1 | Certification of President and Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (“Sarbanes-Oxley”). |
| 31.2 | Certification of Executive Vice President, Corporate Strategy and Chief Financial Officer pursuant to Section 302 of Sarbanes-Oxley. |
| 32.1 | Certifications Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of Sarbanes-Oxley. |
| 101.INS | XBRL Instance Document.* |
| 101.SCH | XBRL Taxonomy Extension Schema. |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase. |
| 101.DEF | Taxonomy Extension Definition Linkbase. |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase. |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase. |

* Management contract or compensatory plan or arrangement.

** The following materials from the Nasdaq, Inc. Quarterly Report on Form 10-Q for the three and nine months ended September 30, 2018, formatted in XBRL (eXtensible Business Reporting Language): (i) Condensed Consolidated Balance Sheets as of September 30, 2018 and December 31, 2017; (ii) Condensed Consolidated Statements of Income for the three and nine months ended September 30, 2018 and 2017; (iii) Condensed Consolidated Statements of Comprehensive Income for the three and nine months ended September 30, 2018 and 2017; (iv) Condensed Consolidated Statements of Cash Flows for the nine months ended September 30, 2018 and 2017; and (v) notes to condensed consolidated financial statements.

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

| | | |
|---|---|---|
| | Nasdaq, Inc.<br>(Registrant) | |
| Date: November 6, 2018 | **By:** | /s/ Adena T. Friedman |
| | **Name:** | **Adena T. Friedman** |
| | **Title:** | **President and Chief Executive Officer** |
| Date: November 6, 2018 | **By:** | /s/ Michael Ptasznik |
| | **Name:** | **Michael Ptasznik** |
| | **Title:** | **Executive Vice President, Corporate Strategy and Chief Financial Officer** |

**Exhibit 10.1**

# EMPLOYMENT AGREEMENT

This Employment Agreement ("*Agreement*"), is made and entered into and effective as of July 29, 2018 (the "*Effective Date*"), by and between Nasdaq, Inc. (the "*Company*") and Edward S. Knight (the "*Executive*"). This Agreement fully supersedes and replaces Executive's December 29, 2000 Employment Agreement and all four (4) Amendments to that Agreement.

In consideration of the mutual covenants herein, and for other good and valuable consideration, the parties hereby agree as follows:

1. *Term of Employment*. The term of this Agreement shall commence on the Effective Date and end on December 31, 2020 (the "Term"), subject to Section 8 below.

2. *Position.*

(a) *Duties.* Executive shall continue to serve as the Company's Executive Vice President and Global Chief Legal and Policy Officer ("EVP/CLPO") and shall have such other duties as agreed to by the Executive, the Chief Executive Officer ("CEO"), and the Board of Directors of the Company (the "*Board*"). During the Term, the Executive shall have such duties and authority as shall be determined from time to time by the CEO and as shall be consistent with the by-laws of the Company as in effect from time to time. Additionally, during the Term, the Executive and CEO will have the option to mutually agree upon a date for Executive to transition to serve as a Vice Chairman of the Company ("*Transition*"); hereinafter, any reference to a Transition in this Agreement is on the assumption that such mutual agreement and approval does occur. During the Term, Executive shall continue to devote his full time and best efforts to his duties as EVP/CLPO and/or Vice Chairman. The Executive shall continue to report directly to the CEO for the entirety of the Term, both pre- and post-Transition.

(b) *Company Code of Ethics.* The Executive shall comply in all respects with the Company's Code of Ethics and all applicable corporate policies referenced in the Code of Ethics, as may be amended from time to time (the "*Code of Ethics*"). The Executive may, in accordance with the Code of Ethics, (i) engage in personal activities involving charitable, community, educational, religious or similar organizations and (ii) manage his personal investments; provided, however, that, in each case, such activities are in all respects consistent with applicable law, the Employee Continuing Obligations Agreement signed and agreed to on July 29, 2018, attached as Exhibit A ("*Confidentiality Agreement*"), and Section 9 below.

3. *Base Salary.* During the Term up through Transition, the Company shall pay the Executive a base salary (the "*Base Salary*") at an annual rate of not less than $550,000. Upon an approved Transition, the Company shall pay the Executive a base salary commensurate with his Vice Chairman role, as determined by the CEO (the "*Vice Chairman Base Salary*"). The Base Salary or Vice Chairman Base Salary, as the case may be, shall be payable in regular payroll

installments in accordance with the Company's payroll practices as in effect from time to time (but no less frequently than monthly).

4. *Annual Bonus.*

(a) *Annual Bonus.* During the Term up through Transition, the Executive shall be eligible to participate in the Executive Corporate Incentive Plan of the Company (the "*Bonus Program*") in accordance with the terms and provisions of such Bonus Program as established from time to time by the Compensation Committee and pursuant to which the Executive will be eligible to earn an annual cash bonus (the "*Annual Bonus*"). Pursuant to the terms of the Bonus Program, the Executive shall be eligible to earn a target Annual Bonus of not less than $825,000 (the "*Target Bonus*") based upon the achievement of one or more performance goals established for such year by the CEO and the Compensation Committee, pro-rated based on an approved Transition date and the EVP Pro-Rata Calculation.

"*EVP Pro-Rata Calculation*" is determined by multiplying the Target Bonus by a fraction, the numerator of which is the number of days in the fiscal year in which the EVP Target Bonus was applicable and the denominator of which is three hundred sixty-five.

Following a Transition, the Executive shall be eligible to earn a target Annual Bonus (pro-rated, depending on Transition date and Pro-Rata Target Bonus Calculation) commensurate with his Vice-Chairman position, as determined by the CEO (the *"Vice Chairman Target Bonus*") based upon the achievement of one or more performance goals established for such year by the CEO.

"*Vice Chairman Pro-Rata Calculation*" is determined by multiplying the Target Bonus by a fraction, the numerator of which is the number of days in the fiscal year in which the Vice Chairman Target Bonus was applicable and the denominator of which is three hundred sixty-five.

The Executive shall have the opportunity to make suggestions to the CEO and/or the Compensation Committee, as applicable, prior to the determination of the performance goals for the Bonus Program for each performance period..

(b) *Timing and Deferral of Annual Bonus.* The Annual Bonus for each year shall be paid to the Executive as soon as reasonably practicable following the end of such year, but in no event later than March 15th following the end of the calendar year to which such Annual Bonus relates. Payment shall be based on the applicable pro-rata amounts for which Executive is eligible, if a Transition occurs in the middle of a calendar year.

5. *Equity Compensation.* Based on the CEO's and/or Compensation Committee's evaluation of the performance of the Company and Executive, peer group market data, internal equity and consistent with past practices with respect to the combined aggregate value of the grants of options, restricted shares and performance share units, the Executive may be granted equity awards pursuant to the Company's Equity Incentive Plan (the "*Stock Plan*"), which has been adopted by the Board and may from time to time be amended. The applicable provisions of the Company's Stock Plan or each equity award agreement executed by the Executive and the Company shall

govern the treatment of the equity awards; *provided*, *however*, to the extent there is any inconsistency between the terms of any such agreements and/or the Stock Plan and the terms of this Agreement, the terms most favorable to the Executive shall govern.

6. *Employee Benefits.* During the Term, the Company shall provide the Executive with benefits on the same basis as benefits are generally made available to other senior executives of the Company, including, without limitation, medical, dental, vision, disability and life insurance, financial and tax planning services and retirement benefits. The Executive shall be entitled to four weeks of paid vacation to be used in accordance with the Company's then current vacation policy; provided, however, that, in the event the Executive's employment ends for any reason, the Executive shall be paid only for unused vacation that accrued in the calendar year his employment terminated and any unused vacation for any prior year shall be forfeited. Executive will have the ability to take a four (4) week paid sabbatical for development and/or research purposes consistent with the long term legal interests of the Company, during a time period mutually agreed upon between the Executive and CEO. Time spent on sabbatical by Executive shall not count against vacation or any other form of paid leave.

7. *Business and Other Expenses.* During the Term, the Company shall reimburse the Executive for reasonable business expenses incurred by him in the performance of his duties hereunder in accordance with the Company's policy.

8. *Termination.* Notwithstanding any other provision of this Agreement, subject to the further provisions of this Section 8, the Company may terminate the Executive's employment or the Executive may resign such employment for any reason or no stated reason at any time, subject to the notice and other provisions set forth below:

(a) *Generally.* In the event of the termination of the Executive's employment for any reason, the Executive shall receive payment of (i) any unpaid Base Salary through the Date of Termination (as defined below), to be paid in accordance with Section 3 above; (ii) subject to Section 6 above, any accrued but unpaid vacation through the Date of Termination payable within 14 days of the Date of Termination; and (iii) any earned but unpaid Annual Bonus with respect to the calendar year ended prior to the Date of Termination, payable in accordance with Section 4(b) (the "*Base Obligations*"). In addition, in the event of the Executive's termination of employment, the applicable provisions of the Company's Stock Plan or each equity award agreement executed by the Executive and the Company shall govern the treatment of the equity awards.

For purposes of this Agreement, "*Date of Termination*" means (i) in the event of a termination of the Executive's employment by the Company for Cause or by the Executive for Good Reason, the date specified in a written notice of termination (or, if not specified therein, the date of delivery of such notice), but in no event earlier than the expiration of the cure periods set forth in Section 8(b)(ii) or 8(b)(iii) below, respectively; (ii) in the event of a termination of the Executive's employment by the Company without Cause, the date specified in a written notice of termination (or if not specified therein, the date of delivery of such notice); (iii) in the event of a termination of the Executive's employment by the Executive without Good Reason, the date specified in a written notice of termination, but in no event less than 60 days following the date of delivery of such notice;

(iv) in the event of a termination of the Executive's employment due to Permanent Disability (as defined below), the date the Company terminates the Executive's employment following the certification of the Executive's Permanent Disability; or (v) in the event of a termination of employment due to the Executive's death, the date of the Executive's death.

(b) *Termination Without Cause, or by the Executive for Good Reason (other than Change in Control), or by the Executive for any Reason after February 28, 2019 with 60 Days' Notice of Retirement.*

(i) The Executive's employment hereunder may be terminated by the Company without Cause or by the Executive for Good Reason (other than Change in Control), or by the Executive with 60 days' notice of retirement for any reason after February 28, 2019. Upon the termination of the Executive's employment pursuant to this Section 8(b), the Executive shall, subject to Section 8(h) below, be entitled to receive, in addition to the Base Obligations, the following payments and benefits (the "*Retirement Benefits*"):

(A) *Payments.* The Executive shall, subject to Section 8(h), be entitled to receive, in addition to the Base Obligations, a Pro Rata Target Bonus or Vice Chairman Target Bonus with respect to the calendar year in which the Date of Termination occurs, determined in accordance with the Pro Rata Target Bonus Calculation and payable in substantially equal monthly installments for the twelve month period following the Executive's Date of Termination with the first installment to be paid in the month following the month in with the Release Effective Date occurs (provided that if the 60 day period described in Section 8(h) below begins in one calendar year and ends in another, the Pro Rata Target Bonus or Vice Chairman Target Bonus shall be paid not earlier than January 1 of the calendar year following the Date of Termination), the equity awards described in Section 5 and continued vesting of outstanding performance share units, and/or other forms of equity compensation issued prior to the Date of Termination as though the Executive were employed through all applicable performance periods ("Continued Vesting Period"), based on actual performance during the respective performance periods. Any vested stock options shall remain exercisable until the expiration date specified in the applicable award agreement.

Target Bonus or Vice Chairman Target Bonus is intended to be a fixed severance payment and not a performance-contingent payment dependent on current year or prior year performance. "*Pro-Rata Target Bonus Calculation*" is determined by multiplying the Target Bonus or Vice Chairman Target Bonus by a fraction, the numerator of which is the number of days in the fiscal year in which the Date of Termination occurs through the Date of Termination and the denominator of which is three hundred sixty-five.

The Executive acknowledges and agrees that the compensation paid under this Section 8(b) is fair and reasonable, and are his sole and exclusive remedy, in lieu of all other remedies at law or in equity, with respect to the termination of his employment hereunder, and is subject to the Executive complying in all material respects with his obligations under Section 9 or the Confidentiality Agreement; and

(B) *Benefits*. The Company shall pay to the Executive on a monthly basis during the Coverage Period a taxable cash payment equal to the Consolidated Omnibus Budget Reconciliation Act ("*COBRA*") premium for the highest level of coverage available under the Company's group health plans, but reduced by the monthly amount that the Executive would pay for such coverage if the Executive was an active employee. "*Coverage Period*" shall mean the period commencing on the Date of Termination and ending on the expiration of 18 months from the Date of Termination. The payments provided by this Section shall be conditioned upon the Executive being covered by the Company's health care plans immediately prior to the Date of Termination.

The Company will continue to provide, for a period of 24 months following the Date of Termination, financial and tax services (currently provided by Ayco) and executive physical exams (currently provided by EHE International).

All other benefits, if any, due the Executive following termination pursuant to this Section 8(b) shall be determined in accordance with the plans, policies and practices of the Company; provided, however, that the Executive shall not participate in any severance plan, policy or program of the Company. The Retirement Benefits are payments and benefits to which the Executive is not otherwise entitled, are given in consideration for the Release (as described in Section 8(h) below) and are in lieu of any severance plan, policy or program of the Company or any of its subsidiaries that may now or hereafter exist. The payments and benefits to be provided pursuant to this Section 8(b)(i) shall constitute liquidated damages and shall be deemed to satisfy and be in full and final settlement of all obligations of the Company to the Executive under this Agreement. The Executive acknowledges and agrees that such amounts are fair and reasonable, and are his sole and exclusive remedy, in lieu of all other remedies at law or in equity, with respect to the termination of his employment hereunder. If, during the Continued Vesting Period, the Executive breaches in any material respect any of his obligations under Section 9, or the Confidentiality Agreement, the Company may, upon written notice to the Executive terminate the Continued Vesting Period and cease any benefits continuation coverage or payments, except in each case as required by applicable law.

(ii) For purposes of this Agreement, "*Cause*" shall mean (A) the Executive's conviction of, or pleading nolo contendere to, any crime, whether a felony or misdemeanor, involving the purchase or sale of any security, mail or wire fraud, theft, embezzlement, moral turpitude, or Company property (with the exception of minor traffic violations or similar misdemeanors); (B) the Executive's repeated neglect of his duties to the Company (except where due to physical or mental incapacity); or (C) the Executive's willful misconduct in connection with the performance of his duties or other material breach by the Executive of this Agreement provided that the Company may not terminate the Executive's employment for Cause unless (x) the Company first gives the

Executive written notice of its intention to terminate and of the grounds for such termination within 90 days following the date the Board is informed of such grounds at a meeting of the Board and (y) the Executive has not, within 30 days following receipt of such notice, cured such Cause (if capable of cure) in a manner that is reasonably satisfactory to the Board.

(iii) For purposes of this Agreement, "*Good Reason*" shall mean the Company (A) reducing the Executive's position, duties, or authority, other than as specifically related to his change in position, duties, or authority (including compensation changes) to the Vice Chairman position to occur following a Transition date, as determined solely by the CEO; (B) failing to secure the agreement of any successor entity to the Company that the Executive shall continue in his position without reduction in position, duties or authority; (C) relocating the Executive’s principal work location beyond a 50 mile radius of his work location as of the Effective Date, without his request or permission to do so (provided that this Clause (C) shall apply only to a relocation that occurs beginning upon a Change of Control, as defined below, and ending two years thereafter); or (D) committing any other material breach of this Agreement; provided, however, that the occurrence of a Change in Control, following which the Company continues to have its common stock publicly traded and the Executive is offered continued employment with substantially the same duties and authority as he has hereunder of such publicly traded entity, shall not be deemed to give rise to an event or condition constituting Good Reason; and provided further that no event or condition shall constitute Good Reason unless (x) the Executive gives the Company a Notice of Termination specifying his objection to such event or condition within 90 days following the occurrence of such event or condition, (y) such event or condition is not cured, in all material respects, by the Company in a manner that is reasonably satisfactory to the Executive within 30 days following the Company's receipt of such notice and (z) the Executive resigns from his employment with the Company not more than 30 days following the expiration of the 30-day period described in the foregoing clause (y).

(c) *Permanent Disability.* The Executive's employment hereunder shall terminate upon his Permanent Disability. Upon termination of the Executive's employment due to Permanent Disability, the Executive shall, subject to Section 8(h) below, be entitled to receive, in addition to the Base Obligations, (A) a pro rata Target Bonus with respect to the calendar year in which the Date of Termination occurs, determined in accordance with the Pro Rata Target Bonus Calculation and payable in a lump sum within 30 days following the Release Effective Date (provided that if the 60 day period described in Section 8(h) below begins in one calendar year and ends in another, the pro rata Target Bonus shall be paid not earlier than January 1 of the calendar year following the Date of Termination) and (B) accelerated vesting of all unvested equity compensation awarded to the Executive by the Company as of the Effective Date and, in accordance with Section 5, each equity award agreement executed by the Executive and the Company shall describe the treatment of the equity awards under this Section 8(c). All other benefits, if any, due the Executive following termination pursuant to this Section 8(c) shall be determined in accordance with the plans, policies and practices of the Company; *provided*, *however*, that the Executive shall not participate in any other severance plan, policy or program of the Company.

For purposes of this Agreement, *"Permanent Disability"* means either (i) the inability of the Executive to engage in any substantially similar gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than 12 months or (ii) the Executive is, by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than 12 months, receiving income replacement benefits for a period of not less than three months under an accident and health plan covering employees of the Company.

The Executive shall be deemed Permanently Disabled if he is determined to be (i) totally disabled by the Social Security Administration or (ii) disabled in accordance with a disability insurance program, provided such definition of disabled under the program complies with the definition of Permanent Disability hereunder. Otherwise, such Permanent Disability shall be certified by a physician chosen by the Company and reasonably acceptable to the Executive (unless he is then legally incapacitated, in which case such physician shall be reasonably acceptable to the Executive's authorized legal representative).

(d) *Death.* The Executive's employment hereunder shall terminate due to his death. Upon termination of the Executive's employment hereunder due to death, the Executive's estate shall, subject to Section 8(h) below, be entitled to receive, in addition to the Base Obligations, (A) a pro rata Target Bonus with respect to the calendar year in which the Date of Termination occurs, determined in accordance with the Pro Rata Target Bonus Calculation and payable in a lump sum within 30 days following the Release Effective Date (provided that if the 60 day period described in Section 8(h) below begins in one calendar year and ends in another, the pro rata Target Bonus shall be paid not earlier than January 1 of the calendar year following the Date of Termination) and (B) accelerated vesting of all unvested equity compensation awarded to the Executive by the Company as of the Effective Date and, in accordance with Section 5, each equity award agreement executed by the Executive and the Company shall describe the treatment of the equity awards under this Section 8(d). All other benefits, if any, due the Executive's estate following termination pursuant to this Section 8(d) shall be determined in accordance with the plans, policies and practices of the Company.

(e) *For Cause by the Company, or Without Good Reason prior to March 1, 2019, or by Executive for Any Reason Without 60 days' Notice After February 28, 2019.* Upon termination of the Executive's employment for Cause, or without Good Reason prior to March 1, 2019, or by Executive for any reason without 60 days' notice after February 28, 2019, pursuant to this Section 8(e), the Executive shall have no further rights to any compensation (including any Annual Bonus) or any other benefits under this Agreement other than the Base Obligations. All other benefits, if any, due the Executive following the Executive's termination of employment pursuant to this Section 8(e) shall be determined in accordance with the plans, policies and practices of the Company; provided, however, that the Executive shall not participate in any severance plan, policy, or program of the Company.

(f) *Termination in Connection with Change in Control, either by the Company Without Cause or by the Executive for Good Reason.*

(i) If, within the period beginning on a Change in Control (as defined herein below), and ending two (2) years following such Change in Control, the Executive's employment is terminated by the Company, either without Cause or by the Executive for Good Reason, the Executive shall, subject to Section 8(h) below, be entitled to receive, in addition to the Base Obligations, the following payments and benefits (the "*CIC Severance Benefits*"):

(A) *CIC Severance Payment*. On the first day of the seventh (7th) month following the Executive's Date of Termination, the Company shall pay the Executive a lump sum cash payment equal to the sum of (I) applicable Base Salary or Vice Chairman Base Salary from the date of Executive's Date of Termination through the remaining Term of Employment, and (II) the applicable Target Bonus or Vice Chairman bonus for the fiscal years remaining in the Term of Employment. Target Bonus or Vice Chairman Target Bonus is intended to be a fixed severance payment and not a performance-contingent payment dependent on current year or prior year performance. In addition, if the Executive's employment hereunder is terminated by the Company without Cause or by the Executive for Good Reason within one (1) year following a Change in Control, as defined in the Stock Plan, Executive's outstanding performance share units, and/or any other forms of equity compensation issued prior to Executive's Date of Termination, shall vest in accordance with the terms of the Stock Plan.

If (i) any amounts payable to the Executive under this Agreement or otherwise are characterized as excess parachute payments pursuant to Section 4999 of the Internal Revenue Code of 1986, as amended (the "*Section 4999*"), and (ii) the Executive thereby would be subject to any United States federal excise tax due to that characterization, the Executive's termination benefits hereunder will be reduced to an amount so that none of the amounts payable constitute excess parachute amounts payments if this would result, after taking into account the applicable federal, state and local income taxes and the excise tax imposed by Section 4999, in Executive's receipt on an after-tax basis of the greatest amount of termination and other benefits. The determination of any reduction required pursuant to this section (including the determination as to which specific payments shall be reduced) shall be made by a neutral party designated by the Company and such determination shall be conclusive and binding upon the Company or any related corporation for all purposes.

(B) *Health and Welfare Benefits*. The Company shall pay to Executive on a monthly basis during the CIC Coverage Period a taxable monthly cash payment equal to the COBRA premium for the highest level of coverage available under the Company's group health plans, but reduced by the monthly amount that Executive would pay for such coverage if the Executive was an active employee. "*CIC Coverage Period*" shall mean the period (I) commencing on the first day of the month following the Release Effective Date (provided that if the 60 day period described in Section 8(h) below begins in one calendar year and ends in another, the CIC Coverage Period shall commence not earlier than January 1 of the calendar year following the Date of Termination) and (II) ending on the earlier of (x) the expiration of 24 months from the first day of the CIC Coverage Period, and (y) the date that the Executive is eligible for coverage under the health care plans of a subsequent employer. The payments provided by this Section shall be conditioned upon the Executive being covered by the Company's health care plans immediately prior to the Date of Termination. The foregoing payments are not intended to limit or otherwise reduce any entitlements that Executive may have under COBRA. In addition, the Company shall continue to provide the Executive with the same level of accident (AD&D) and life insurance benefits upon substantially the same terms and conditions (including contributions required by the Executive for such benefits) as existed immediately prior to the Executive's Date of Termination (or, if more favorable to the Executive, as such benefits and terms and conditions existed immediately prior to the Change in Control) for the same period for which the Company shall provide the Executive with continued health care coverage payments.

All other benefits, if any, due the Executive following termination pursuant to this Section 8(f) shall be determined in accordance with the plans, policies and practices of the Company; provided, however, that the Executive shall not participate in any severance plan, policy or program of the Company. The payments and other benefits provided for in this Section 8(f) are payments and benefits to which the Executive is not otherwise entitled, are given in consideration for the Release and are in lieu of any severance plan, policy or program of the Company or any of its subsidiaries that may now or hereafter exist. The payments and benefits to be provided pursuant to this Section 8(f)(i) shall constitute liquidated damages and shall be deemed to satisfy and be in full and final settlement of all obligations of the Company to the Executive under this Agreement. The Executive acknowledges and agrees that such amounts are fair and reasonable, and are his sole and exclusive remedy, in lieu of all other remedies at law or in equity, with respect to the termination of his employment hereunder. If, during the CIC Coverage Period, the Executive breaches in any material respect any of his obligations under Section 9 or the Confidentiality Agreement, the Company may, upon written notice to the Executive, (x) terminate the CIC Coverage Period and cease to make any further payments of the CIC Severance Payment and (y) cease any health and welfare benefits and payments, except in each case as required by applicable law.

(ii) For purposes of this Agreement "Change in Control" means the first to occur of any one of the following events:

(A) any "Person," as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934 (the "*Exchange Act*") (other than (1) the Company, (2) any Person who becomes the "beneficial owner" (as defined in Rule 13d-3 under the Exchange Act) of more than 50% of the Company's then outstanding securities eligible to vote in the election of the Board ("*Voting Securities*") as a result of a reduction in the number of Voting Securities outstanding due to the repurchase of Voting Securities by the Company unless and until such Person, after becoming aware that such Person has become the beneficial owner of more than 50% of the then outstanding Voting Securities, acquires beneficial ownership of additional Voting Securities representing 1% or more of the Voting Securities then outstanding, (3) any trustee or other fiduciary holding securities under an employee benefit plan of the Company, and (4) any entity owned, directly or indirectly, by the stockholders of the Company in substantially the same proportions as their ownership of Voting Securities), is or becomes the beneficial owner, directly or indirectly, of more than 50% of the Voting Securities (not including any securities acquired directly (or through an underwriter) from the Company or the Companies);

(B) the date on which, within any twelve (12) month period (beginning on or after the Effective Date), a majority of the directors then serving on the Board are replaced by directors not endorsed by at least two-thirds (2/3) of the members of the Board before the date of appointment or election;

(C) there is consummated a merger or consolidation of the Company with any other corporation or entity or the Company issues Voting Securities in connection with a merger or consolidation of any direct or indirect subsidiary of the Company with any other corporation, other than (1) a merger or consolidation that would result in the Voting Securities outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into Voting Securities of the surviving or parent entity) more than 50% of the Company's then outstanding Voting Securities or more than 50% of the combined voting power of such surviving or parent entity outstanding immediately after such merger or consolidation or (2) a merger or consolidation effected to implement a recapitalization of the Company (or similar transaction) in which no Person, directly or indirectly, acquired more than 50% of the Company's then outstanding Voting Securities (not including any securities acquired directly (or through an underwriter) from the Company or the Companies); or

(D) the consummation of an agreement for the sale or disposition by the Company of all or substantially all of the Company’s assets (or any transaction having a similar effect), provided that such agreement or transaction of similar effect shall in all events require the disposition, within any twelve (12) month period, of at least 40% of the gross fair market value of all of the Company’s then assets; other than a sale or disposition by the Company of all or substantially all of the Company’s assets to an entity, at least 50% of the combined voting power of the voting securities of which are owned directly or indirectly by stockholders of the Company in substantially the same proportions as their ownership of the Company immediately prior to such sale.

Notwithstanding the foregoing, in no event shall a Change in Control be deemed to occur hereunder unless such event constitutes a change in ownership of the Company, a change in effective control of the Company or a change in ownership of a substantial portion of the Company’s assets within the meaning of Section 409A.

(g) *Mitigation; Offset.* Following the termination of his employment under any of the above clauses of this Section 8, the Executive shall have no obligation or duty to seek subsequent employment or engagement as an employee (including self-employment) or as a consultant or otherwise mitigate the Company's obligations hereunder; nor shall the payments provided by this Section 8 be reduced by the compensation earned by the Executive as an employee or consultant from such subsequent employment or consultancy.

(h) *Release.* Notwithstanding anything to the contrary in this Agreement, receipt of the Retirement Benefits and the CIC Severance Benefits or other compensation or benefits under this Section 8 (other than the Base Obligations), if any, by the Executive is subject to the Executive executing and delivering to the Company a general release of claims following the Date of Termination, in substantially the form attached as Exhibit B (the "*Release*"), that, within 60 days following the Executive’s Date of Termination, has become irrevocable by the Executive (such date the Release becomes irrevocable being the “*Release Effective Date*”). If the Executive dies or becomes legally incapacitated prior to the Release Effective Date, then the Release requirements described in the preceding sentence shall apply with respect to the Executive’s estate and the Release shall be modified as reasonably necessary to allow for execution and delivery by the personal representative of the Executive’s estate or the Executive’s authorized legal representative, as applicable.

9. *Non-Competition.* The Executive acknowledges and recognizes the highly competitive nature of the businesses of the Company and, *only to the extent Executive acts in a non-Legal capacity during the last 12 months of his employment*, he accordingly agrees as follows:

(a) *Non-Competition.* For a period of two years following the Date of Termination (the "*Restricted Period*"), regardless of the circumstances surrounding such termination of employment, the Executive will not, directly or indirectly (i) engage in any "Competitive Business" (as defined below) for the Executive’s own account while he is in self-employment or acting as a sole proprietor, (ii) enter the employ of, or render any services to, any person engaged in a Competitive Business, (iii) acquire a financial interest in, or otherwise become actively involved with, any person engaged in a Competitive Business, directly or indirectly, as an individual, partner, shareholder, officer, director, principal, agent, trustee or consultant, or (iv) interfere with business relationships (whether formed before or after the Effective Date) between the Company and customers or suppliers of the Company. For purposes of this Agreement, "*Competitive Business*" shall mean (x) any national securities exchange registered with the Securities and Exchange Commission, (y) any electronic communications network or (z) any other entity that engages in substantially the same business as the Company, in each case in North America or in any other location in which the Company operates. For purposes of this Agreement, "*person*" shall mean an individual, corporation, partnership, limited partnership, limited liability company, syndicate, person (including, without limitation, a "person" as defined in Section 13(d)(3) of the Securities Exchange Act of 1934, as amended), trust, association or entity or government, political subdivision, agency or instrumentality of a government.

(b) *Securities Ownership.* Notwithstanding anything to the contrary in this Agreement, the Executive may, directly or indirectly, own, solely as an investment, securities of any person engaged in the business of the Company which are publicly traded on a national or regional stock exchange or on the over-the-counter market if the Executive (i) is not a controlling person of, or a member of a group which controls, such person and (ii) does not, directly or indirectly, own five percent or more of any class of securities of such person.

(c) *Severability.* It is expressly understood and agreed that, although the Executive and the Company consider the restrictions contained in this Section 9 to be reasonable, if a final judicial determination is made by a court of competent jurisdiction that the time or territory or any other restriction contained in this Agreement is an unenforceable restriction against the Executive, the provisions of this Agreement shall not be rendered void, but shall be deemed amended to apply as to such maximum time and territory and to such maximum extent as such court may judicially determine or indicate to be enforceable. Alternatively, in the event that any one or more of the provisions of this Agreement shall be or become invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions of this Agreement shall not be affected thereby.

10. *Specific Performance* The Executive acknowledges and agrees that the Company's remedies at law for a breach or threatened breach of Section 9 above would be inadequate and, in recognition of this fact, the Executive agrees that, in the event of such a breach or threatened breach, in addition to any remedies at law, the Company, without posting any bond, shall be entitled to obtain equitable relief in the form of specific performance, temporary restraining order, temporary or permanent injunction or any other equitable remedy which may then be available.

11. *Disputes.* Except as provided in Section 10 above, any dispute arising between the parties under this Agreement, under any statute, regulation, or ordinance, under any other agreement between the parties, and/or in way relating to the Executive’s employment, shall be submitted to binding arbitration before the American Arbitration Association (“*AAA*”) for resolution. Such arbitration shall be conducted in New York, New York, and the arbitrator will apply New York law,

including federal law as applied in New York courts. The arbitration shall be conducted in accordance with the AAA's Employment Arbitration Rules as modified herein. The arbitration shall be conducted by a panel of three arbitrators that is mutually agreeable to both the Executive and the Company, all in accordance with AAA's Employment Arbitration Rules then in effect. If the Executive and the Company cannot agree upon the panel of arbitrators, the arbitration shall be settled before a panel of three arbitrators, one to be selected by the Company, one by the Executive, and the third to be selected by the two persons so selected, all in accordance with AAA's Employment Arbitration Rules. With respect to any and all costs and expenses associated with any such arbitration that are not assignable to one of the parties by the arbitrator, each party shall pay their own costs and expenses, including without limitation, attorney's fees and costs, except that the Company shall pay the cost of the arbitrators and the filing fees charged to Executive by the AAA, provided he is the claimant or counter claimant in such arbitration and is the prevailing party. The award of the arbitrators shall be final and binding on the parties, and judgment on the award may be confirmed and entered in any state or federal court in the State and City of New York. The arbitration shall be conducted on a strictly confidential basis, and Executive shall not disclose the existence of a claim, the nature of a claim, any documents, exhibits, or information exchanged or presented in connection with such a claim, or the result of any action (collectively, "*Arbitration Materials*"), to any third party, with the sole exception of the Executive's legal counsel, who also shall be bound by confidentiality obligations no less protective than the provisions set forth in the Confidentiality Agreement. In the event of any court proceeding to challenge or enforce an arbitrators' award, the parties hereby consent to the exclusive jurisdiction of the state and federal courts in New York, New York and agree to venue in that jurisdiction. The parties agree to take all steps necessary to protect the confidentiality of the Arbitration Materials in connection with any such proceeding, agree to file all Confidential Information, as defined in the Confidentiality Agreement (and documents containing Confidential Information) under seal, subject to court order and agree to the entry of an appropriate protective order encompassing the confidentiality terms of this Agreement. Nothing contained in this Section 11 shall be construed to preclude the Company from exercising its rights under Section 10 above.

12. *Miscellaneous.*

(a) *Acceptance.* The Executive hereby represents and warrants, as a material inducement to the Company's agreement to enter into this Agreement, that there are no legal, contractual or other impediments precluding the Executive from entering into this Agreement or from performing the services with the Company contemplated hereby. Any violation of this representation and warranty by the Executive shall render all of the obligations of the Company under this Agreement void *ab initio* and of no force and effect.

(b) *Entire Agreement; Amendments.* This Agreement, together with the equity award agreements between the Executive and the Company contain the entire understanding of the parties with respect to the employment of the Executive by the Company, and shall supersede any and all previous contracts, arrangements or understandings between the Company and the Executive with respect to the subject matter set forth herein. There are no restrictions, agreements, promises, warranties, or covenants by and between the Company and the Executive and undertakings between the parties with respect to the subject matter herein other than those expressly set forth herein. This Agreement may not be altered, modified or amended except by written instrument signed by the parties hereto.

(c) *No Waiver.* The failure of a party to insist upon strict adherence to any term of this Agreement on any occasion shall not be considered a waiver of such party's rights or deprive such party of the right thereafter to insist upon strict adherence to that term or any other term of this Agreement.

(d) *Successor; Assignment.* This Agreement is confidential and personal and neither of the parties hereto shall, without the consent of the other, assign or transfer this Agreement or any rights or obligations hereunder. Without limiting the foregoing, the Executive's right to receive payments hereunder shall not be assignable or transferable whether by pledge, creation of a security interest or otherwise, other than a transfer by the Executive's will or by the laws of descent and distribution. In the event of any attempted assignment or transfer contrary to this Section 12(d), the Company shall have no liability to pay the assignee or transferee any amount so attempted to be assigned or transferred. The Company shall cause this Agreement to be assumed by any entity that succeeds to all or substantially all of the Company's business or assets and this Agreement shall be binding upon any successor to all or substantially all of the Company's business or assets; provided, however, that no such assumption shall release the Company of its obligations hereunder, to the extent not satisfied by such successor, without the Executive's prior written consent.

(e) *Confidentiality of Tax Treatment and Structure.* Notwithstanding anything herein to the contrary, each party and its representatives may consult any tax advisor regarding the tax treatment and tax structure of this Agreement and may disclose to any person, without limitation of any kind, the tax treatment and tax structure of this Agreement and all materials (including opinions or other tax analyses) that are provided relating to such treatment or structure.

(f) *Notice*. For the purpose of this Agreement, notices and all other communications provided for in this Agreement shall be in writing and shall be deemed to have been duly given when delivered or mailed by United States registered mail, return receipt requested, postage prepaid, addressed to the respective addresses set forth on the execution page of this Agreement, provided that all notices to the Company shall be directed to the attention of the General Counsel or to such other address as either party may have furnished to the other in writing in accordance herewith, except that notice of change of address shall be effective only upon receipt:

if to the Company:

The Office of the General Counsel
Nasdaq, Inc.
One Liberty Plaza
New York, NY 10006

if to the Executive:

his address as shown in the records of the Company

(g) *Withholding Taxes.* The Company may withhold from any amounts payable under this Agreement such federal, state and local taxes as may be required to be withheld pursuant to any applicable law or regulation.

(h) *Section 409A*. Notwithstanding any other provision of this Agreement, any payment, settlement or benefit triggered by termination of the Executive's employment with the Company shall not be made until six months and one day following Date of Termination if such delay is necessary to avoid the imposition of any tax, penalty or interest under Section 409A of the Internal Revenue Code of 1986, as amended (Section "*409A*"). Any installment payments that are delayed pursuant to this Section 12(h) shall be accumulated and paid in a lump sum on the day that is six months and one day following the Date of Termination (or, if earlier, upon the Executive's death) and the remaining installment payments shall begin on such date in accordance with the schedule provided in this Agreement. For purposes of this Agreement, termination or severance of employment will be read to mean a "separation from service" within the meaning of Section 409A where it is reasonably anticipated that no further services would be performed after that date or that the level of services the Executive would perform after that date (whether as an employee or independent contractor) would permanently decrease to no more than 20 percent of the average level of bona fide services performed over the immediately preceding thirty-six (36) month period. Additionally, the amount of expenses eligible for reimbursement or in-kind benefits to be provided during one calendar year may not affect the expenses eligible for reimbursement or any in-kind benefits to be provided in any other calendar year and the right to reimbursement or in-kind benefits is not subject to liquidation or exchange for another benefit. All reimbursements shall be made no later than the last day of the calendar year following the calendar year in which the Executive incurs the reimbursable expense. This Agreement is intended to comply with the requirements of Section 409A (including the exceptions thereto), to the extent applicable, and the Agreement shall be administered and interpreted in accordance with such intent. If any provision contained in the Agreement conflicts with the requirements of Section 409A (or the exemptions intended to apply under the Agreement), the Agreement shall be deemed to be reformed to comply with the requirements of Section 409A (or the applicable exemptions thereto). The Company, after consulting with the Executive, may amend this Agreement or the terms of any award provided for herein in any manner that the Company considers necessary or advisable to ensure that cash compensation, equity awards or other benefits provided for herein are not subject to United States federal income tax, state or local income tax or any equivalent taxes in territories outside the United States prior to payment, exercise, vesting or settlement, as applicable, or any tax, interest or penalties pursuant to Section 409A. Any such amendments shall be made in a manner that preserves to the maximum extent possible the intended benefits to the Executive. This Section 12(h) does not create an obligation on the part of the Company to modify this Agreement and does not guarantee that the amounts or benefits owed under the Agreement will not be subject to interest and penalties under Section 409A. For purposes of this Agreement, all rights to payments and benefits hereunder shall be treated as rights to receive a series of separate payments and benefits to the fullest extent allowed by Section 409A.

(i) *Clawback*. The Executive agrees that compensation and benefits provided by the Company under this Agreement or otherwise will be subject to recoupment or clawback by the Company under any applicable clawback or recoupment policy of the Company that is generally applicable to the Company's executives, as may be in effect from time-to-time, or as required by applicable law.

(j) *Audit Rights*. Any and all equity compensation of any kind due hereunder to Executive after the Date of Termination shall be accompanied by a detailed statement from the Company showing the calculation for such compensation for the period being measured. Within thirty (30) days after the delivery of such statement, the Executive may notify the Company of any objections or changes thereto, specifying in reasonable detail any such objections or changes. If the Executive does not notify the Company of any objections or changes thereto or if within twenty (20) days of the delivery of an objection notice the Executive and the Company agree on the resolution of all objections or changes, then such statements delivered by the Company, with such changes as are agreed upon, shall be final and binding. If the parties shall fail to reach an agreement with respect to all objections or changes within such twenty (20) day period, then all disputed objections or changes shall, be subject to resolution in accordance with Section 11 above.

(k) *Counterparts.* This Agreement may be signed in counterparts, each of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument.

(l) *Governing Law.* This Agreement shall be governed by and construed in accordance with the laws of the State of New York.

*  *  *

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the day and year first above written.

EXECUTIVE

By: <u>/s/ Edward S. Knight</u>
Edward S. Knight

Nasdaq, Inc.

By: <u>/s/ Adena Friedman</u>
Adena Friedman, President and CEO, Nasdaq, Inc.

**Exhibit A**

**<u>NASDAQ CONTINUING OBLIGATIONS AGREEMENT</u>**

During the course of my employment or engagement with Nasdaq, Inc. and/or its subsidiaries and affiliates (collectively, the "***Company***"), I understand that I will have or be given access to, and/or receive, certain non-public, confidential, and proprietary information and or specialized training and trade secrets pertaining to the business of the Company and Company's customers or prospective customers ("***Company Parties***"). Any unauthorized disclosure or use of such information would cause grave harm to the Company Parties. Therefore, to assure the confidentiality and proper use of Confidential Information and other Company Property (each as defined herein), and in consideration of my engagement with the Company, my access to confidential information, training and trade secrets, and the compensation paid or to be paid for my services during that engagement, and the mutual covenants and promises contained herein, I agree to the following:

**1. <u>Confidentiality and Company Property</u>.**

All Confidential Information and Company Property is owned by and for the Company Parties exclusively; is intended solely for authorized, work-related purposes on behalf of the Company Parties; and shall not be used for personal or other non-work related purposes. I acknowledge that such Confidential Information is a valuable and unique asset of the Company and covenant that I will not disclose any Confidential Information to any person (except as my duties for the Company may require or as required by law or in a judicial or administrative proceeding) without the prior written authorization of the Company. Specifically, without limitation, I shall not, directly or indirectly, at any time during or after engagement with the Company, without prior express written authorization from the Company: (a) divulge, disclose, transmit, reproduce, convey, summarize, quote, share, or make accessible to any other person or entity Confidential Information or non-public Company Property; (b) use any Confidential Information or Company Property for any purpose outside the course of performing the authorized duties of my work with the Company; (c) remove Company Property or Confidential Information from the Company Parties' premises without obtaining prior express written authorization from the Company; or (d) review or seek to access any Confidential Information or Company Property except as required in connection with my work for the Company.

**2. <u>Non-Solicitation of Customers, Potential Customers and Employees (Applicable BOTH to Employees and Contractors)</u>.**

I agree that, for a period of twelve (12) months following my separation from service for any reason, I shall not, directly or indirectly, without express written consent from Company's Office of General Counsel:

i) Interfere with any customer relationship the Company has with any of its current customers or potential customers that I had any involvement with, directly or indirectly, during the last twelve (12) months of my employment; or

ii) Solicit, or induce to enter into any business arrangement with, any employee or contractor of the Company with whom I had any contact or a relationship with during the last twelve (12) months of my employment; or

iii) Solicit, or induce to enter into any business arrangement with, any employee or contractor of the Company's customers that I knew, or reasonably could be expected to know, was solicited by the Company for any technology, operations, sales or business role during the last twelve (12) months of my employment with the Company.

**3. <u>Inventions Assignment</u>.**

**a) <u>Ownership of Nasdaq Inventions by the Company</u>.**

(i) As between me and the Company, all Nasdaq Inventions are owned by the Company. I hereby assign to the Company, without any further consideration, all right, title, and interest in and to the Nasdaq Inventions, including all Intellectual Property Rights associated therewith. I agree that the foregoing assignment includes a present conveyance to the Company of ownership of Nasdaq Inventions that are not yet in existence as of the Effective Date.

(ii) I hereby acknowledge that, to the extent permitted under applicable law, the Nasdaq Inventions constitute "works made for hire" and are deemed to be authored by the Company.

(iii) To the extent, if any, that this Agreement does not provide the Company with full ownership, right, title and interest in and to the Nasdaq Inventions, I hereby grant the Company an exclusive, perpetual, irrevocable, fully-paid, royalty-free, worldwide license to use, exploit, reproduce, perform (publicly or otherwise), display (publicly or otherwise), create derivative works from, modify, improve, develop, distribute, import, make, have made, sell, offer to sell or otherwise dispose of the Nasdaq Inventions, effective immediately on its creation, with the right to sublicense each and every such right, including through multiple tiers, alone or in combination. To the extent that any Moral Rights in the Nasdaq Inventions cannot be assigned under applicable law, I hereby unconditionally and irrevocably waive and agree not to enforce any and all Moral Rights, including any limitation on subsequent modification, to the extent permitted under applicable law.

(iv) I agree to promptly make full disclosure to the Company of any and all Nasdaq Inventions. On request, such disclosure shall be made in writing. During and after my employment or engagement and at the Company's request and expense, I will (i) assist the Company in every proper way to establish or perfect the Company's rights in the Nasdaq Inventions and associated Intellectual Property Rights throughout the world, including by executing in favor of the Company or its designee(s) any necessary or desirable documents, including patent and copyright assignment documents, and (ii) consent to or join in any action to enforce any Intellectual Property Right associated with the Nasdaq Inventions. I agree that, if the Company is unable, because of my unavailability, mental or physical incapacity, or for any other reason, to secure my signature with respect to the purposes set forth in the preceding sentence, then I hereby irrevocably designate and appoint the Company and its duly authorized officers and agents as my agent and attorney-in-fact, to act for and on my behalf to execute and file any papers and oaths, and to do all other lawfully permitted acts with respect to such Nasdaq Inventions and associated Intellectual Property Rights to further the prosecution, issuance, and enforcement of such Intellectual Property Rights with the same legal force and effect as if executed by me. This power of attorney shall be deemed coupled with an interest, and shall be irrevocable.

(v) I agree not to challenge the validity of the Nasdaq Inventions or the Intellectual Property Rights associated therewith, or the ownership by the Company (or its designee(s)) of the Nasdaq Inventions or the Intellectual Property Rights associated therewith.

**b)** **Exception to Designation of Nasdaq Inventions as Works Made for Hire (Applicable ONLY to Consultants/Independent Contractors in California).**

I understand and acknowledge that California Labor Code Section 3351.5(c) provides that, under some circumstances, an employee/employer relationship may be created between parties when the parties enter into a written instrument that designates a work of authorship as a "work made for hire." This Section 3 is not intended to create an employee/employer relationship when no such relationship exists; accordingly, notwithstanding Paragraph 3(a)(ii), to the extent that any Nasdaq Inventions are made, conceived, expressed, developed, or reduced to practice by me, such Nasdaq Inventions do NOT constitute "works made for hire" under applicable law. For clarity, all of the other provisions within this Section 3 that relate to the Company's ownership of the Nasdaq Inventions (including the assignment provisions in Paragraph 3(a)(i)) remain in full effect.

**c)** **Certain Exceptions to Assignment of Rights (Applicable ONLY in California).**

I understand and acknowledge that the provisions of this Agreement related to the Company's ownership of the Nasdaq Inventions do not apply to any invention that qualifies fully under the provisions of California Labor Code Section 2870, which is reproduced in its entirety as follows:

CALIFORNIA LABOR CODE SECTION 2870
INVENTION ON OWN TIME-EXEMPTION FROM AGREEMENT

(a) Any provision in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either:

(1) Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or

(2) Result from any work performed by the employee for the employer.

(b) To the extent a provision in an employment agreement purports to require an employee to assign an invention otherwise excluded from being required to be assigned under subdivision (a), the provision is against the public policy of this state and is unenforceable.

**4. Non-Disparagement.**

I agree that I shall not issue, circulate, publish or utter any false or disparaging, statement, remarks, opinions or rumors about the Company or its shareholders unless giving truthful testimony under subpoena or court order. Notwithstanding the preceding sentence, I understand that I may provide truthful information to any governmental agency or self-regulatory organization with or without subpoena or court order. With the exception of communications made in a private corporate communication as an employee or consultant with regard to a listing decision of my employer or my consulting client, I agree that public communications regarding a preference for listing a security on a market other than the Company, that the quality of the Company as a securities market is in any way inferior to any other securities market or exchange, and/or that the regulatory efforts and programs of the Company are or have been lax in any way, are specifically defined as disparaging and will constitute a material breach of this Agreement. Nothing in this paragraph, however, shall prevent me from making good faith, factual and truthful statements related to listing with the Company as long as my statements are not based on proprietary information.

**5. Cooperation.**

If I receive a subpoena or process from any person or entity (including, but not limited to, any governmental agency) which may or will require me to disclose documents or information or provide testimony (in a deposition, court proceeding, or otherwise) regarding, in whole or in part, any of the Company Parties or any Confidential Information or Company Property, I shall: (a) to the extent permissible by law, notify Nasdaq's Office of the General Counsel of the subpoena or other process within twenty-four (24) hours of receiving it; and (b) to the maximum extent possible, not make any disclosure until the Company Parties have had a reasonable opportunity to contest the right of the requesting person or entity to such disclosure, limit the scope or nature of such disclosure, and/or seek to participate in the proceeding or matter in which the disclosure is sought.

**6. Return Of Confidential Information And Company Property.**

Upon my termination of engagement with the Company, for any reason, or if the Company so requests, I shall promptly deliver to the Company all Confidential Information and Company Property, including Nasdaq Inventions in my possession or under my control, as well as all documents, disks, tapes, or other electronic, digital, or computer means of storage, and all copies of such information and property. If at any time after the termination of employment I determine that I have any Confidential Information in my possession or control, I shall immediately return to the Company all such Confidential Information, including all copies and portions thereof.

**7. Immunity for Disclosure of Trade Secrets in Certain Circumstances.**

I understand and acknowledge that, pursuant to 18 U.S.C. §1833 (as defined in the Defend Trade Secrets Act of 2016) and notwithstanding anything else in this Agreement, I am permitted to disclose trade secrets to third parties under certain circumstances.

The relevant portion of 18 U.S.C. § 1833 is reproduced as follows:

> (b) Immunity From Liability for Confidential Disclosure of a Trade Secret to the Government or in a Court Filing.—
>
> (1) Immunity.—An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that—
> (A) is made—
> (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and
> (ii) solely for the purpose of reporting or investigating a suspected violation of law; or
> (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal.
>
> (2) Use of trade secret information in anti-retaliation lawsuit.—An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual—
> (A) files any document containing the trade secret under seal; and
> (B) does not disclose the trade secret, except pursuant to court order.

I understand that nothing in this Agreement prohibits me from communicating with or reporting possible violations of law or regulation to any federal, state, or local governmental office, official, agency or entity, and that notwithstanding my confidentiality obligations set forth in this Agreement, I will not be held civilly or criminally liable under any U.S. Federal or State trade secret law for disclosure of a trade secret made in accordance with the provisions of 18 U.S.C. §1833. I understand that if a disclosure of trade secrets was not done in good faith pursuant to 18 U.S.C. §1833, then I may be subject to criminal or civil liability, including, without limitation, punitive damages and attorneys' fees.

**8. Injunctive Action.**

I acknowledge that the provisions and restrictions of this Agreement are reasonable and necessary for the protection of the Company Parties and their respective businesses. These obligations are not limited in time to the duration of my engagement and rather shall survive the termination of my engagement by the Company, regardless of the reason for its termination. I agree that my breach of any of the foregoing provisions will result in irreparable injury to the Company Parties, that monetary relief alone will be inadequate to redress such a breach, and further that the Company shall be entitled to obtain an injunction to prevent and/or remedy such a breach (without first having to post a bond).

In any proceeding for an injunction and upon any motion for a temporary or permanent injunction ("Injunctive Action"), the Company's right to receive monetary damages shall not be a bar or interposed as a defense to the granting of such injunction. The Company's right to an injunction is in addition to, and not in lieu of, any other rights and remedies available to the Company under law

or in equity, including any remedy the Company may seek in any arbitration brought pursuant to Section 9 of this Agreement.

I hereby irrevocably submit to the jurisdiction of the courts of New York in any Injunctive Action and waive any claim or defense of inconvenient or improper forum or lack of personal jurisdiction under any applicable law or decision. Upon the issuance (or denial) of an injunction, the underlying merits of any such dispute shall be resolved in accordance with Section 9 of this Agreement.

**9. Governing Law; Amendment; Waiver; Severability.**

This Agreement shall be construed in accordance with and shall be governed by the laws of the State of New York, excluding any choice of law principles. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter hereof, and may not be amended, discharged, or terminated, nor may any of its provisions be waived, except upon the execution of a valid written instrument executed by me and the Company.
If any term or provision of this Agreement (or any portion thereof) is determined by an arbitrator or a court of competent jurisdiction to be invalid, illegal, or incapable of being enforced, all other terms and provisions of this Agreement shall nevertheless remain in full force and effect.

Upon a determination that any term or provision (or any portion thereof) is invalid, illegal, or incapable of being enforced, the Company and I agree that an arbitrator or reviewing court shall have the authority to amend or modify this Agreement so as to render it enforceable and effect the original intent of the Parties to the fullest extent permitted by applicable law.

**10. Definitions.**

"***Confidential Information***" means any non-public, proprietary information regarding the Company Parties, whether in writing or not, whether in digital, hardcopy, or another format, including all personal information, all personnel information, financial data, commercial data, trade secrets, business plans, business models, organizational structures and models, business strategies, pricing and advertising techniques and strategies, research and development activities, software development, market development, exchange registration, studies, market penetration plans, listing retention plans and strategies, marketing plans and strategies, communication and/or public relations products, plans, programs, recruiting strategies, databases, processes, work product or inventions, financial formulas and methods relating to Company Parties' business, computer software programs, accounting policies and practices, and all strategic plans or other matters, strategies, and financial or operating information pertaining to current or potential customers or transactions (including information regarding each Company Party's current or prospective customers, customer names, and customer representatives), templates and agreements, and all other information about or provided by the Company Parties, including information regarding any actual or prospective business opportunities, employment opportunities, finances, investments, and other proprietary information and trade secrets. Notwithstanding the above, Confidential Information shall not include any information that: (a) was known to me prior to my engagement with the Company as evidenced by written records in my possession prior to such disclosure; or (b) is generally and publicly available and known to all persons in the industries where the Company conducts business, other than because of any unauthorized disclosure by me.

"***Company Property***" means all property and resources of the Company Parties, or any Company Party, including Confidential Information, each Company Party's products, each Company Party's computer systems and all software, e-mail, web pages and databases, telephone and facsimile services, and all other administrative and/or support services provided by the Company Parties. I further agree that "Company Property" shall include Nasdaq Inventions that I conceive, originate, develop, author, or create, solely or joi1tly with others, during or as a result of my employment with the Company, or using Company Property, and without regard to whether any of the foregoing also may be included within "Confidential Information" as defined under this Agreement.

"***Intellectual Property Rights***" shall mean any or all statutory or common law rights in, to, or arising under the following, worldwide: (a) patents, patent applications, and design rights (including industrial design rights); (b) works of authorship, including copyrights, Moral Rights, and mask work rights; (c) trade secrets and other rights in know-how and confidential or proprietary information; (d) trademarks, trade names, logos and service marks; (e) domain names, web addresses and social media identifiers; (f) databases; (g) any registrations or applications for registration for any of the foregoing (a)-(f), including any provisionals, divisions, continuations, continuations-in-part, renewals, reissuances, rights subject to and/or arising out of post-grant review (including re-examinations) and extensions (as applicable); (h) all contract and licensing rights and all claims and causes of action of any kind with respect to any of the foregoing (a)-(h), including the right to sue and recover damages or other compensation and/or obtain equitable relief for any past, present, or future infringement or misappropriation thereof; and (i) analogous rights to those set forth above.

"***Moral Rights***" shall mean all rights of attribution, paternity, integrity, modification, disclosure and withdrawal, and any other rights throughout the world that may be known as or referred to as "moral rights," "artist's rights," "droit moral," or the like.

"***Nasdaq Inventions***" means ideas, improvements, trade secrets, know-how, data, confidential technical or business information, sales and other commercial relationships, potential sales and other commercial relationships, business methods or processes, copyrightable expression, research, marketing plans, computer software (including source code(s)), computer programs, original works of authorship, industrial designs, trade dress, developments, discoveries, trading systems, trading strategies and methodologies, improvements, modifications, technology, algorithms and designs, (regardless of whether any of the foregoing are subject to patent or copyright protection), that are (a) made, conceived, expressed, developed, or reduced to practice by me (solely or jointly with others) during or as a result of my employment with the Company or using Company Property and (b) which relate in any manner to the Company, the business of the Company (including the services the Company provides to any of the Company Parties), or my engagement by the Company.

**11. Miscellaneous.**

This Agreement (a) may be executed in identical counterparts, which together shall constitute a single agreement, and (b) shall be fairly interpreted in accordance with its terms and without any strict construction in favor of or against either Party, notwithstanding which Party may have drafted it. The headings herein are included for reference only and are not intended to affect the meaning or interpretation of the Agreement. This Agreement is binding upon, and shall inure to the benefit of, me and the Company and our respective heirs, executors, administrators, successors and assigns.
Without limiting the scope or generality of the terms of this Agreement in any way, I acknowledge and agree that the terms of this Agreement and all discussions regarding this Agreement are confidential, and accordingly I agree not to disclose any such information to any third party, except to my attorney(s), or as otherwise may be required by law. Notwithstanding the foregoing, I may disclose to any prospective employer the fact and existence of this Agreement, and provide copies of this Agreement to such entity. The Company also has the right to apprise any prospective employer or other entity or person of the terms of this Agreement and provide copies to any such persons or entities.

**12. Signature.**

**I hereby acknowledge and accept the terms of this Agreement as of the Effective Date, by signature below.**

**Signature: ______________________________________ Date: ________________________**

**Print Name: _____________________________________**

**Exhibit B**

**RELEASE OF CLAIMS AGREEMENT**

WHEREAS, Edward S. Knight (hereinafter referred to as the "*Executive*") and Nasdaq, Inc. (hereinafter referred to as "*Employer*") are parties to an Employment Agreement, dated ______________ (the "*Employment Agreement*"), which provided for the Executive's employment with Employer on the terms and conditions specified therein; and

WHEREAS, the Executive has agreed to execute a release of the type and nature set forth herein as a condition to his entitlement to certain payments and benefits upon his termination of employment with Employer.

NOW, THEREFORE, in consideration of the premises and mutual promises herein contained and for other good and valuable consideration received or to be received by the Executive in accordance with the terms of the Employment Agreement, it is agreed as follows:

1. Your Release of Claims. You, for yourself and your heirs, executors, administrators, assigns, agents and beneficiaries, if any, do hereby agree to execute and be bound by this General Release of Claims. You acknowledge and agree that the Payment provided to you and on your behalf pursuant to this Agreement is not a payment to which you would be otherwise entitled and constitutes adequate consideration for this Agreement. You release the Company from all Claims (as defined below) through the date of this Agreement. You agree not to file a lawsuit or arbitration to assert any such Claim. Further, you agree that should any other person, organization or entity file a lawsuit or arbitration to assert any such Claim, you will not seek or accept any personal relief in such action.

2. Company's Release of Claims. In exchange for your release of claims, as well as your other undertakings hereunder, the Company hereby releases all Claims (as defined below) against you, your heirs, executors, administrators, assigns, agents and beneficiaries through the date of this Agreement. The Company agrees not to file a lawsuit or arbitration to assert any such Claim.

a. Definition of "Claims." Except as stated below, "Claims" includes without limitation all actions or demands of any kind that you or the Company may now have or have had or reasonably known it or you should have had through the date of execution of this Agreement (although neither party is being asked to waive Claims that may arise after the date of this Agreement). More specifically, Claims include rights, causes of action, damages, penalties, losses, attorneys' fees, costs, expenses, obligations, agreements, judgments and all other liabilities of any kind or description whatsoever, either in law or in equity, whether known or unknown, suspected or unsuspected. The nature of Claims covered by this release includes without limitation all actions or demands in any way based on your employment with the Company or any terms and conditions of such employment. More specifically, all of the following are among the types of Claims which are waived and barred by this General Release of Claims to the extent allowable under applicable law:

- Contract Claims, whether express or implied;
- Tort Claims, such as for defamation or emotional distress;
- Claims under federal, state and municipal laws, regulations, ordinance or court decisions of any kind;
- Claims of discrimination, harassment or retaliation, whether based on race, color, religion, gender, sex, age, sexual orientation, handicap and/or disability, genetic information, national origin, or any other legally protected class;
- Claims under the AGE DISCRIMINATION IN EMPLOYMENT ACT, Title VII of the Civil Rights Act of 1964, as amended, the Americans with Disabilities Act as amended, the Genetic Information Nondiscrimination Act, the Family and Medical Leave Act, and similar state and local statutes, laws and ordinances;
- Claims under the Employee Retirement Income Security Act, the Occupational Safety and Health Act, the False Claims Act, and similar state and local statutes, laws and ordinances;
- Claims for attorneys' fees, including litigation expenses and/or costs.

The foregoing description of claims is intended to be illustrative and is not exhaustive.

b. Exclusions: Notwithstanding any other provision of this release, the following are not barred by the release: (a) Claims relating to the validity of this Agreement or the terms of your Employment Agreement; (b) Claims by either party to enforce this Agreement; (c) Claims which are not legally waiveable, including, but not limited to, SEC whistleblowing claims pursuant to Rule 21F-17 (d) Claims you may have to vested employee benefits under any Company employee benefit program or policy, or (e) any rights the Executive may have to obtain contribution or indemnity against Employer or any other Releasee pursuant to contract, Employer's certificate of incorporation and by-laws or otherwise. Moreover, the parties acknowledge that your employment with the Company is of a continuing nature and that nothing herein shall affect the terms or conditions of your continued employment with the Company, the terms or conditions of the Agreement which governs your employment or any compensation or benefits to which you are otherwise entitled as a Company employee. In addition, this General Release of Claims will not operate to limit or bar your right to file an administrative charge of discrimination with the Equal Employment Opportunity Commission (EEOC) or to testify, assist or participate in an investigation, hearing or proceeding conducted by the EEOC. However, the release does bar your right to recover any personal or monetary relief, including if you or anyone on your behalf seeks to file a lawsuit or arbitration on the same basis as the charge of discrimination.

3. The Executive understands that he has been given a period of 21 days to review and consider this General Release before signing it pursuant to the Age Discrimination In Employment Act of 1967, as amended. The Executive further understands that he may use as much of this 21-day period as the Executive wishes prior to signing.

4. The Executive acknowledges and represents that he understands that he may revoke the waiver of his rights under the Age Discrimination in Employment Act of 1967, as amended, effectuated in this Agreement within 7 days of signing this Agreement. Revocation can be made by delivering a written notice of revocation to Office of the President and CEO, Nasdaq, Inc., One Liberty Plaza, New York, New York 10006. For this revocation to be effective, written notice must be received by the President and CEO no later than the close of business on the seventh day after the

Executive signs this Agreement. If the Executive revokes the waiver of his rights under the Age Discrimination in Employment Act of 1967, as amended, Employer shall have no obligations to the Executive under Section 8 (other than the Base Obligations) of the Employment Agreement.

5. The Executive and Employer respectively represent and acknowledge that in executing this Agreement neither of them is relying upon, and has not relied upon, any representation or statement not set forth herein made by any of the agents, representatives or attorneys of the Releasees with regard to the subject matter, basis or effect of this Agreement or otherwise.

6. This Agreement shall not in any way be construed as an admission by any of the Releasees that any Releasee has acted wrongfully or that the Executive has any rights whatsoever against any of the Releasees except as specifically set forth herein, and each of the Releasees specifically disclaims any liability to any party for any wrongful acts.

7. It is the desire and intent of the parties hereto that the provisions of this Agreement be enforced to the fullest extent permissible under law. Should there be any conflict between any provision hereof and any present or future law, such law will prevail, but the provisions affected thereby will be curtailed and limited only to the extent necessary to bring them within the requirements of law, and the remaining provisions of this Agreement will remain in full force and effect and be fully valid and enforceable.

8. The Executive represents and agrees (a) that the Executive has to the extent he desires discussed all aspects of this Agreement with his attorney, (b) that the Executive has carefully read and fully understands all of the provisions of this Agreement, and (c) that the Executive is voluntarily entering into this Agreement.

9. This General Release shall be governed by, and construed in accordance with, the laws of the State of New York, without giving effect to the conflicts of laws principles thereof or to those of any other jurisdiction which, in either case, could cause the application of the laws of any jurisdiction other than the State of New York. This General Release is binding on the successors and assigns of, and sets forth the entire agreement between, the parties hereto; fully supersedes any and all prior agreements or understandings between the parties hereto pertaining to the subject matter hereof; and may not be changed except by explicit written agreement to that effect subscribed by the parties hereto.

PLEASE READ CAREFULLY. THIS GENERAL RELEASE INCLUDES A RELEASE OF ALL KNOWN AND UNKNOWN CLAIMS.

This General Release is executed by the Executive and Employer as of the ____ day of ______, 2018.

______________________________
Edward S. Knight

Nasdaq, Inc.

By: ____________
Name: Adena T. Friedman
Title: President and Chief Executive Officer

**Exhibit 31.1**

**CERTIFICATION**

I, Adena T. Friedman, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Nasdaq, Inc.;

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

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

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

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

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

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

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

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

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

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

/s/ Adena T. Friedman

Name: Adena T. Friedman

Title: President and Chief Executive Officer

Date: November 6, 2018

**Exhibit 31.2**

**CERTIFICATION**

I, Michael Ptasznik, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Nasdaq, Inc.;

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

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

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

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

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

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

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

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

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

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

| | |
|---|---|
| | /s/ Michael Ptasznik |
| Name: | Michael Ptasznik |
| Title: | Executive Vice President, Corporate Strategy and Chief Financial Officer |

Date: November 6, 2018

**Exhibit 32.1**

**Certification of CEO and CFO Pursuant to**
**18 U.S.C. Section 1350**
**as Adopted Pursuant to**
**Section 906 of the Sarbanes-Oxley Act of 2002**

In connection with the Quarterly Report on Form 10-Q of Nasdaq, Inc. (the "Company") for the period ended September 30, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), Adena T. Friedman, as President and Chief Executive Officer of the Company, and Michael Ptasznik, as Executive Vice President, Corporate Strategy and Chief Financial Officer of the Company, each hereby certifies, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to the best of her or his knowledge:

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

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of the operations of the Company.

| | |
|---|---|
| | /s/ Adena T. Friedman |
| Name: | Adena T. Friedman |
| Title: | President and Chief Executive Officer |
| Date: | November 6, 2018 |

| | |
|---|---|
| | /s/ Michael Ptasznik |
| Name: | Michael Ptasznik |
| Title: | Executive Vice President, Corporate Strategy and Chief Financial Officer |
| Date: | November 6, 2018 |

This certification accompanies the Report pursuant to § 906 of the Sarbanes-Oxley Act of 2002 and shall not, except to the extent required by the Sarbanes-Oxley Act of 2002, be deemed filed by the Company for purposes of § 18 of the Securities Exchange Act of 1934, as amended.