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 March 31, 2020

OR

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

For the transition period from ________ to ________

Commission file number: 001-38855

Nasdaq, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**52-1165937**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**

151 W. 42nd Street, New York, New York	**10036**
(Address of Principal Executive Offices)	**(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)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.01 par value per share	**NDAQ**	**The Nasdaq Stock Market**
0.875% Senior Notes due 2030	**NDAQ30**	**The Nasdaq Stock Market**
1.75% Senior Notes due 2029	**NDAQ29**	**The Nasdaq Stock Market**
1.75% Senior Notes due 2023	**NDAQ23**	**The Nasdaq Stock Market**

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 April 28, 2020
Common Stock, $0.01 par value per share	164,070,840 shares

Nasdaq, Inc.

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 CXC” and “Nasdaq CX2” refer to the Canadian cash equity trading books operated by Nasdaq CXC Limited.
- “Nasdaq First North” refers to our alternative marketplaces for smaller companies and growth companies in the Nordic and Baltic regions.
- “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 and listing venue operated by The Nasdaq Stock Market LLC.

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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

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

2021 Notes: €600 million aggregate principal amount of 3.875% senior unsecured notes due June 7, 2021, repaid in full and terminated in March 2020

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

2029 Notes: €600 million aggregate principal amount of 1.75% senior unsecured notes due March 28, 2029

2030 Notes: €600 million aggregate principal amount of 0.875% senior unsecured notes due February 13, 2030

2050 Notes: $500 million aggregate principal amount of 3.25% senior unsecured notes due April 28, 2050

ASU: Accounting Standards Update

ASU 2016-13: Measurement of Credit Losses on Financial Instruments

AUM: Assets Under Management

CCP: Central Counterparty

EMIR: European Market Infrastructure Regulation

Equity Plan: Nasdaq Equity Incentive Plan

ESPP: Nasdaq Employee Stock Purchase Plan

ETF: Exchange Traded Fund

ETP: Exchange Traded Product

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

LIBOR: London Interbank Offered Rate

NFF: Nasdaq Financial Framework; Nasdaq's end-to-end technology solutions for market infrastructure operators, buy-side firms, sell-side firms and other non-financial markets

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

SaaS: Software as a Service

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

* * * * * *

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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 and Nasdaq First North 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 March 31, 2020, and the "Risk Factors" section in our Form 10-K.

* * * * * *

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.

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 are intended to identify forward-looking statements. These include, among others, statements relating to:

- *our strategic direction;*
- *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;*
- *any litigation, or any regulatory or government investigation or action, to which we are or could become a party or which may affect us; and*
- *the potential impact of the COVID-19 pandemic and the response of governments and other third parties on our business, operations, results of operations, financial condition, workforce or the operations or decisions of our customers, suppliers or business partners.*

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 or transition 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 customers or other customers;*
- *our ability to develop and grow our non-trading businesses, including our technology and analytics offerings;*
- *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, or increased regulatory oversight domestically or internationally.*

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 March 31, 2020 and more fully described in the "Risk Factors" section in our Form 10-K. 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)

	March 31, 2020 (unaudited)	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 1,015	$ 332
Restricted cash	29	30
Financial investments	254	291
Receivables, net	568	422
Default funds and margin deposits	3,241	2,996
Other current assets	163	219
Total current assets	5,270	4,290
Property and equipment, net	375	384
Goodwill	6,326	6,366
Intangible assets, net	2,200	2,249
Operating lease assets	324	346
Other non-current assets	303	289
Total assets	$ 14,798	$ 13,924
Liabilities		
Current liabilities:		
Accounts payable and accrued expenses	$ 183	$ 148
Section 31 fees payable to SEC	161	132
Accrued personnel costs	132	188
Deferred revenue	416	211
Other current liabilities	171	161
Default funds and margin deposits	3,241	2,996
Short-term debt	1,146	391
Total current liabilities	5,450	4,227
Long-term debt	2,962	2,996
Deferred tax liabilities, net	507	552
Operating lease liabilities	310	331
Other non-current liabilities	171	179
Total liabilities	9,400	8,285
Commitments and contingencies		
Equity		
Nasdaq stockholders' equity:		
Common stock, $0.01 par value, 300,000,000 shares authorized, shares issued: 170,589,846 at March 31, 2020 and 171,075,011 at December 31, 2019; shares outstanding: 164,337,766 at March 31, 2020 and 165,094,440 at December 31, 2019	2	2
Additional paid-in capital	2,527	2,632
Common stock in treasury, at cost: 6,252,080 shares at March 31, 2020 and 5,980,571 shares at December 31, 2019	(364)	(336)
Accumulated other comprehensive loss	(1,909)	(1,686)
Retained earnings	5,140	5,027
Total Nasdaq stockholders' equity	5,396	5,639
Noncontrolling interests	2	—
Total equity	5,398	5,639
Total liabilities and equity	$ 14,798	$ 13,924

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 March 31,	
	2020	**2019**
Revenues:		
Market Services	$ 933	$ 638
Corporate Services	128	121
Information Services	211	193
Market Technology	81	77
Other revenues	—	10
Total revenues	1,353	1,039
Transaction-based expenses:		
Transaction rebates	(479)	(331)
Brokerage, clearance and exchange fees	(173)	(74)
Revenues less transaction-based expenses	701	634
Operating expenses:		
Compensation and benefits	195	175
Professional and contract services	27	37
Computer operations and data communications	35	33
Occupancy	25	24
General, administrative and other	61	16
Marketing and advertising	9	10
Depreciation and amortization	48	48
Regulatory	7	7
Merger and strategic initiatives	7	9
Restructuring charges	12	—
Total operating expenses	426	359
Operating income	275	275
Interest income	2	3
Interest expense	(26)	(37)
Net gain on divestiture of business	—	27
Other income	5	—
Net income from unconsolidated investees	17	45
Income before income taxes	273	313
Income tax provision	70	66
Net income attributable to Nasdaq	$ 203	$ 247
Per share information:		
Basic earnings per share	$ 1.23	$ 1.49
Diluted earnings per share	$ 1.22	$ 1.48
Cash dividends declared per common share	$ 0.47	$ 0.44

See accompanying notes to condensed consolidated financial statements.

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

	Three Months Ended March 31,	
	2020	**2019**
Net income	$ 203	$ 247
Other comprehensive loss:		
Foreign currency translation losses	(215)	(106)
Income tax expense[1]	(8)	(9)
Foreign currency translation, net	(223)	(115)
Comprehensive income (loss) attributable to Nasdaq	$ (20)	$ 132

[1] Primarily relates to the tax effect of unrealized gains on Euro denominated notes.

See accompanying notes to condensed consolidated financial statements.

Nasdaq, Inc.
Condensed Consolidated Statements of Changes in Stockholders' Equity
(Unaudited)
(in millions)

	Three Months Ended March 31,			
	2020		2019	
	Shares	$	Shares	$
Common stock	165	2	165	2
Additional paid-in capital				
Beginning balance		2,632		2,716
Share repurchase program	(1)	(122)	—	—
Share-based compensation	1	17	1	16
Ending balance		2,527		2,732
Common stock in treasury, at cost				
Beginning balance		(336)		(297)
Other employee stock activity	(1)	(28)	—	(30)
Ending balance		(364)		(327)
Accumulated other comprehensive loss				
Beginning balance		(1,686)		(1,530)
Other comprehensive loss		(223)		(115)
Ending balance		(1,909)		(1,645)
Retained earnings				
Beginning balance		5,027		4,558
Impact of adoption of ASU 2016-13		(12)		—
Net income		203		247
Cash dividends declared per common share		(78)		(73)
Ending balance		5,140		4,732
Total Nasdaq stockholders' equity		5,396		5,494
Noncontrolling interests		2		—
Total Equity	164	$ 5,398	166	$ 5,494

See accompanying notes to condensed consolidated financial statements.

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

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Cash flows from operating activities:		
Net income	$ 203	$ 247
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	48	48
Share-based compensation	17	16
Deferred income taxes	(1)	(16)
Extinguishment of debt	36	—
Net gain on divestiture of business	—	(27)
Net income from unconsolidated investees	(17)	(45)
Other reconciling items included in net income	(1)	—
Net change in operating assets and liabilities, net of effects of divestiture and acquisitions:		
Receivables, net	(174)	(50)
Other assets	69	(288)
Accounts payable and accrued expenses	28	34
Section 31 fees payable to SEC	29	(40)
Accrued personnel costs	(53)	(79)
Deferred revenue	204	186
Other liabilities	(8)	351
Net cash provided by operating activities	380	337
Cash flows from investing activities:		
Purchases of securities	(92)	(101)
Proceeds from sales and redemptions of securities	114	138
Proceeds from divestiture of business	—	108
Acquisition of businesses, net of cash and cash equivalents acquired	(157)	(193)
Purchases of property and equipment	(26)	(20)
Other investing activities	7	(6)
Net cash used in investing activities	(154)	(74)
Cash flows from financing activities:		
Proceeds from (repayments of) commercial paper, net	(42)	265
Repayments of debt obligations	(671)	(515)
Payment of debt extinguishment cost	(36)	—
Proceeds from utilization of credit commitment	799	15
Proceeds from issuances of long-term debt, net of issuance costs	644	—
Repurchases of common stock	(122)	—
Dividends paid	(78)	(73)
Payments related to employee shares withheld for taxes	(28)	(30)
Proceeds of customer funds	—	36
Other financing activities	2	—
Net cash provided by (used in) financing activities	468	(302)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(12)	(8)
Net increase (decrease) in cash and cash equivalents and restricted cash	682	(47)
Cash and cash equivalents and restricted cash at beginning of period	362	586
Cash and cash equivalents and restricted cash at end of period	$ 1,044	$ 539
Supplemental Disclosure Cash Flow Information		
Cash paid for:		
Interest	$ 33	$ 23
Income taxes, net of refund	$ 41	$ 22

See accompanying notes to condensed consolidated financial statements.

Nasdaq, Inc.

Notes to Condensed Consolidated Financial Statements (Unaudited)

1. Organization and Nature of Operations

Nasdaq is a global technology company serving the capital markets and other industries. Our diverse offerings of data, analytics, software and services enables clients to optimize and execute their business vision with confidence.

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. In November 2019, we sold NFX's futures exchange business to a third party which acquired the core assets of NFX, including the portfolio of open interest in NFX contracts. Customers on the platform are migrating their open interest to other exchanges. Also, in January 2020, management commenced an orderly wind-down of our Nordic broker services operations business. We expect this wind-down to continue through the second quarter of 2021.

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 a Canadian exchange for the trading of certain 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 European commodity-related products and services. Nasdaq Commodities' offerings include derivatives in power, natural gas and carbon emission markets, seafood, electricity certificates and clearing services. These products are listed on Nasdaq Oslo ASA, except for seafood, which is listed on Fishpool, a third party platform.

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, and connectivity to various data feeds. We also provide co-location services to market participants, whereby we offer firms cabinet space and power to house their own equipment and servers within our data centers. Additionally, we offer a number of wireless connectivity routes between select data centers using millimeter wave and microwave technology. Our broker services operations business primarily offers technology and customized securities administration solutions to financial participants in the Nordic market.

Corporate Services

Our Corporate Services segment includes our Listing Services and Corporate Solutions businesses. These businesses deliver critical capital market and governance solutions across the lifecycle of public and private companies.

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 and private funds.

We continue to grow our U.S. Corporate Bond exchange for the listing and trading of corporate bonds. This exchange operates pursuant to The Nasdaq Stock Market exchange license and is powered by NFF. We also continue to grow the Nasdaq Sustainable Bond Network, a platform for increased transparency in the global sustainable bond markets.

As of March 31, 2020, there were 3,146 total listings on The Nasdaq Stock Market, including 412 ETPs. The combined market capitalization was approximately $12.9 trillion. In Europe, the Nasdaq Nordic and Nasdaq Baltic exchanges, together with Nasdaq First North, were home to 1,039 listed companies with a combined market capitalization of approximately $1.3 trillion.

Our Corporate Solutions business includes our Investor Relations Intelligence and Governance Solutions businesses, which serve both public and private companies and organizations. Our public company clients can be companies listed on our exchanges or other U.S. and global exchanges.

We help organizations enhance their ability to understand and expand their global shareholder base and improve corporate governance through our suite of advanced technology, analytics, and consultative services. We provide clients with counsel on a range of governance and sustainability-related issues. Our acquisition of OneReport in February 2020 broadens our environmental, social and governance, or ESG, offerings, which also include our ESG Advisory service and our board assessment and collaboration technology.

Information Services

Our Information Services segment includes our Market Data, Index and Investment Data & Analytics businesses.

Our Market Data business sells and distributes historical and real-time market data 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 sells and distributes historical and real-time index data. As of March 31, 2020, we had 325 ETPs licensed to Nasdaq's indexes which had $206 billion in AUM.

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. In March 2020, we acquired Solovis, which offers multi-asset class, public and private market portfolio management, analytics, and reporting tools used by institutional investors and consultants.

Market Technology

Powering over 100 market infrastructure operators in more than 50 countries, our Market Technology segment is a leading global technology solutions provider and partner to exchanges, clearing organizations, central securities depositories, regulators, banks, brokers, buy-side firms and corporate businesses. Our Market Technology business is the sales channel for our complete global offering to other marketplaces. Our solutions can handle a wide array of assets, including but not limited to cash equities, equity derivatives, currencies, various interest-bearing securities, commodities, energy products and digital currencies. Our solutions can also be used in the creation of new asset classes, and non-capital markets customers, including those in insurance liabilities securitization, cryptocurrencies and sports wagering.

Nasdaq's market technology is utilized by leading markets in the U.S., Europe and Asia as well as emerging markets in the Middle East, Latin America, and Africa. Additionally, more than 160 market participants leverage our surveillance technology globally to manage their integrity obligations and assist them in complying with market rules, regulations and internal market surveillance policies.

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 6, "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. 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 Form 10-K. The year-end condensed balance sheet data was derived from the audited financial statements, but does not include all disclosures required by U.S. GAAP.

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

Accounting Estimates

In preparing our condensed consolidated financial statements, we make assumptions, judgments and estimates that can have a significant impact on our revenue, operating income and net income, as well as on the value of certain assets and liabilities in our condensed consolidated balance sheets. At least quarterly, we evaluate our assumptions, judgments and estimates, and make changes as deemed necessary.

Nasdaq considered the impact of COVID-19 on the assumptions and estimates used in evaluating our assets and liabilities, including but not limited to our goodwill, intangible assets, equity method investments, equity securities and allowance for losses on accounts receivable. We determined that there were no material adverse impacts on our first quarter 2020 results of operations. In addition, there were no material impairment charges recorded for the three months ended March 31, 2020. These estimates may change as new events occur and additional information is obtained. Actual results could differ from these estimates under different assumptions or conditions.

Recently Adopted Accounting Standard

In June 2016, the FASB issued ASU 2016-13, “Measurement of Credit Losses on Financial Instruments.” This standard changes the impairment model for certain financial instruments. The new model is a forward looking expected loss model and applies 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 trade receivables. For available-for-sale debt securities with unrealized losses, credit losses are measured in a manner similar to previous accounting, except that the losses are recognized as allowances rather than reductions in the amortized cost of the securities.

We adopted this standard on January 1, 2020 using the modified retrospective transition method. We recorded a $12 million non-cash cumulative effect adjustment to retained earnings on our opening Condensed Consolidated Balance Sheets as of January 1, 2020.

The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods. We expect the impact of the adoption of the new standard to be immaterial to our net income on an on-going basis.

At the date of adoption, the adjustment impacted by the standard related primarily to an adjustment to trade receivables. We took into consideration all financial instruments held at the date of adoption which were impacted by the standard, including reverse repurchase agreements and commercial paper, and estimated the risk of loss to be immaterial. Therefore, no adjustment was recorded for these instruments.

In accordance with the new standard, Nasdaq must recognize an allowance when a receivable or contract asset is established, regardless of whether there has been an incurred loss. Our receivables are concentrated with our member firms, market data distributors, listed companies and corporate solutions and market technology customers.

In order to assess the appropriate allowance as of January 1, 2020, we disaggregated our trade receivables by business unit and the aging of receivables. We concluded that historical loss information is a reasonable starting point on which to determine expected credit losses for trade receivables held at the date of adoption as the composition of our trade receivables at adoption of the standard is materially consistent with that used in developing the historical loss percentages for each business unit. In order to incorporate our expectation of credit losses over the life of our receivables, we considered corporate default rate averages over an extended period as compared to the period covered by our historical loss data and included an adjustment to historical loss percentages for current conditions and expected future conditions at the date of adoption.

The allowance for losses is reviewed monthly and adjustments may be required if economic conditions at the measurement date reflect stronger or weaker economic performance than the historical data implies. If circumstances change (i.e., higher than expected defaults or an unexpected material adverse change in a major customer’s ability to pay), our estimates of recoverability could be reduced by a material amount. When we deem all or a portion of a receivable uncollectible the allowance for losses is reduced by the amount being written off. Any change in the allowance is included in general, administrative and other expense in the Condensed Consolidated Statements of Income.

Receivables are shown net of the allowance for losses. The total allowance netted against receivables in the Condensed Consolidated Balance Sheets was $21 million as of March 31, 2020 and $9 million as of December 31, 2019.

Subsequent Events

We have evaluated subsequent events through the issuance date of this Quarterly Report on Form 10-Q. For discussion of financing actions subsequent to March 31, 2020, see “3.25% Senior Unsecured Notes Due 2050,” and “2017 Credit Facility,” of Note 8, “Debt Obligations.”

3. Revenue From Contracts With Customers

Disaggregation of Revenue

The following tables summarize the disaggregation of revenue by major product and service and by segment for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31, 2020				
	Market Services	Corporate Services	Information Services	Market Technology	Consolidated
	(in millions)				
Transaction-based trading and clearing, net	$ 209	$ —	$ —	$ —	$ 209
Trade management services	72	—	—	—	72
Listing services	—	75	—	—	75
Corporate solutions	—	53	—	—	53
Market data	—	—	97	—	97
Index	—	—	73	—	73
Investment data & analytics	—	—	41	—	41
Market technology	—	—	—	81	81
Revenues less transaction-based expenses	$ 281	$ 128	$ 211	$ 81	$ 701

	Three Months Ended March 31, 2019					
	Market Services	Corporate Services	Information Services	Market Technology	Other Revenues	Consolidated
	(in millions)					
Transaction-based trading and clearing, net	$ 160	$ —	$ —	$ —	$ —	$ 160
Trade management services	73	—	—	—	—	73
Listing services	—	71	—	—	—	71
Corporate solutions	—	50	—	—	—	50
Market data	—	—	100	—	—	100
Index	—	—	54	—	—	54
Investment data & analytics	—	—	39	—	—	39
Market technology	—	—	—	77	—	77
Other revenues	—	—	—	—	10	10
Revenues less transaction-based expenses	$ 233	$ 121	$ 193	$ 77	$ 10	$ 634

For the three months ended March 31, 2020, approximately 72.0% of Market Services revenues were recognized at a point in time and 28.0% were recognized over time. For the three months ended March 31, 2019, approximately 65.0% of Market Services revenues were recognized at a point in time and 35.0% were recognized over time. The increase in Market Services revenues recognized at a point in time for the three months ended 2020 compared with the same period in 2019 was primarily due to higher U.S. industry trading volumes in our equity derivative trading and clearing business and higher U.S. and European industry trading volumes in our cash equity trading business. Substantially all revenues from the Corporate Services, Information Services and Market Technology segments were recognized over time for the three months ended March 31, 2020 and 2019.

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Contract Balances

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 are net of allowance for losses of $21 million as of March 31, 2020 and $9 million as of December 31, 2019. 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 a material amount of revenue recognized from performance obligations that were satisfied in prior periods. We do not provide disclosures about transaction price allocated to unsatisfied performance obligations if contract durations are less than one year. Excluding our market technology contracts, for contract durations that are one-year or greater, materially all of the transaction price allocated to unsatisfied performance obligations is included in deferred revenue. For our market technology contracts, the portion of transaction price allocated to unsatisfied performance obligations is shown in the table below. 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 as of March 31, 2020. See Note 7, "Deferred Revenue," for our discussion on deferred revenue balances, activity, and expected timing of recognition.

Transaction Price Allocated to Remaining Performance Obligations

As stated above, 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.

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For our market technology contracts, the following table summarizes the amount of the transaction price allocated to performance obligations that are unsatisfied as of March 31, 2020:

	(in millions)
2020[1]	$ 245
2021	259
2022	114
2023	82
2024	59
2025 and thereafter	95
Total	$ 854

[1] Represents performance obligations to be recognized over the remaining nine months of 2020.

Market technology deferred revenue, as discussed in Note 7, "Deferred Revenue," represents consideration received that is yet to be recognized as revenue for unsatisfied performance obligations.

4. Acquisitions and Divestiture

The financial results of the below transactions are included in our condensed consolidated financial statements from the date of each acquisition or divestiture.

2020 Acquisition

Acquisition of Solovis

In March 2020, we acquired Solovis, Inc., which offers multi-asset class, public and private market portfolio management, analytics, and reporting tools used by institutional investors and consultants. Solovis is part of our Information Services segment.

2019 Acquisition and Divestiture

2019 Divestiture

Divestiture of BWise

In March 2019, we sold our BWise enterprise governance, risk and compliance software platform, which was part of our Corporate Solutions business within our Corporate Services segment, to SAI Global and recognized a pre-tax gain on the sale of $27 million, net of disposal costs ($20 million after tax). The pre-tax gain is included in net gain on divestiture of business in the Condensed Consolidated Statements of Income for the three months ended March 31, 2019.

2019 Acquisition

Acquisition of Cinnober

	Purchase Consideration	Total Net Assets Acquired	Total Net Deferred Tax Liability	Acquired Intangible Assets	Goodwill
			(in millions)		
Cinnober	$ 219	$ 18	$ (19)	$ 74	$ 146

In January 2019, we acquired Cinnober, a Swedish financial technology provider to brokers, exchanges and clearinghouses worldwide for $219 million. Cinnober is part of our Market Technology segment.

Nasdaq used cash on hand to fund this acquisition.

The amounts in the table above represent the final allocation of the purchase price. The allocation of the purchase price was subject to revision during 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 are recorded in the reporting period in which the adjustment amounts are determined. In 2019, we recorded a measurement period adjustment of $4 million which resulted in a decrease to net assets acquired and an increase in goodwill and a measurement period adjustment of $5 million which resulted in a decrease to acquired intangible assets and an increase in goodwill. These adjustments relate to new information obtained during the period regarding the acquisition date fair values of an acquired equity investment and an acquired customer relationship intangible asset. These adjustments did not result in an impact to our Condensed Consolidated Statements of Income. The allocation of the purchase price for Cinnober was finalized in December 2019.

See “Intangible Assets” below for further discussion of intangible assets acquired in the Cinnober acquisition.

Intangible Assets

The following table presents the details of the customer relationships intangible asset at the date of acquisition for Cinnober which was the significant acquired intangible asset for this acquisition. All acquired intangible assets with finite lives are amortized using the straight-line method.

Customer relationships (in millions)	$	67
Discount rate used		9.5 %
Estimated average useful life		13 years

Customer Relationships

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

Methodology

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 Rate

The discount rate used reflects 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 Cinnober, 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 5 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.

Pro Forma Results and Acquisition-Related Costs

The condensed consolidated financial statements for the three months ended March 31, 2020 and 2019 include the financial results of the above acquisitions from the dates of these acquisitions. 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. Goodwill and Acquired Intangible Assets

Goodwill

The following table presents the changes in goodwill by business segment during the three months ended March 31, 2020:

	Market Services	Corporate Services	Information Services	Market Technology	Total
			(in millions)		
Balance at December 31, 2019	$ 3,342	$ 460	$ 2,283	$ 281	$ 6,366
Goodwill acquired	—	—	133	—	133
Foreign currency translation adjustment	(91)	(10)	(51)	(21)	(173)
Balance at March 31, 2020	$ 3,251	$ 450	$ 2,365	$ 260	$ 6,326

The goodwill acquired for Information Services shown above relates to our acquisition of Solovis. See “2020 Acquisition,” of Note 4, “Acquisitions and Divestiture,” for further discussion of this acquisition.

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 three months ended March 31, 2020 and 2019; however, events such as extended economic weakness or unexpected significant declines in operating results of any of our reporting units or businesses may result in goodwill impairment charges in the future.

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Acquired Intangible Assets

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

	March 31, 2020			December 31, 2019		
	Gross Amount	Accumulated Amortization	Net Amount	Gross Amount	Accumulated Amortization	Net Amount
		(in millions)			(in millions)	
Finite-Lived Intangible Assets						
Technology	$ 77	$ (16)	$ 61	$ 63	$ (19)	$ 44
Customer relationships	1,599	(576)	1,023	1,596	(532)	1,064
Other	19	(5)	14	18	(5)	13
Foreign currency translation adjustment	(202)	94	(108)	(159)	55	(104)
Total finite-lived intangible assets	$ 1,493	$ (503)	$ 990	$ 1,518	$ (501)	$ 1,017
Indefinite-Lived Intangible Assets						
Exchange and clearing registrations	$ 1,257	$ —	$ 1,257	$ 1,257	$ —	$ 1,257
Trade names	121	—	121	121	—	121
Licenses	52	—	52	52	—	52
Foreign currency translation adjustment	(220)	—	(220)	(198)	—	(198)
Total indefinite-lived intangible assets	$ 1,210	$ —	$ 1,210	$ 1,232	$ —	$ 1,232
Total intangible assets	$ 2,703	$ (503)	$ 2,200	$ 2,750	$ (501)	$ 2,249

Amortization expense for acquired finite-lived intangible assets was $25 million for the three months ended March 31, 2020 and $26 million for the three months ended March 31, 2019. 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 $108 million as of March 31, 2020) of acquired finite-lived intangible assets as of March 31, 2020 is as follows:

		(in millions)
2020[1]	$	83
2021		109
2022		106
2023		100
2024		97
2025 and thereafter		603
Total	$	1,098

(1) Represents the estimated amortization to be recognized over the remaining nine months of 2020.

6. Investments

The following table presents the details of our investments:

	March 31, 2020		December 31, 2019	
	(in millions)			
Financial investments	$	254	$	291
Equity method investments	$	172	$	156
Equity securities	$	44	$	49

Financial Investments

As of March 31, 2020, financial investments are comprised of trading securities, and are primarily comprised of highly rated European government debt securities and highly rated corporate debt, of which $160 million are assets primarily utilized to meet regulatory capital requirements, mainly for our clearing operations at Nasdaq Clearing. As of December 31, 2019, financial investments are comprised of trading securities, and are primarily comprised of highly rated European government debt securities, time deposits and highly rated corporate debt, of which $169 million are assets primarily utilized to meet regulatory capital requirements, mainly for our clearing operations at Nasdaq Clearing.

Equity Method Investments

As of March 31, 2020 and 2019, our equity method investments primarily included our equity interest in OCC.

The carrying amounts of our equity method investments are included in other non-current assets in the Condensed Consolidated Balance Sheets. No material impairments were recorded to reduce the carrying value of our equity method investments for both the three months ended March 31, 2020 and 2019.

Net income recognized from our equity interest in the earnings and losses of these equity method investments was $17 million for the three months ended March 31, 2020 and $45 million for the three months ended March 31, 2019.

The change for the three months ended March 31, 2020 compared with the same period in 2019 is primarily due to an increase in income recognized from our investment in OCC in March 2019. Following the disapproval of the OCC capital plan in February 2019, described below, OCC suspended customer rebates and dividends to owners, including the unpaid dividend on 2018 results which Nasdaq expected to receive in March 2019. We were not able to determine the impact of the disapproval of the OCC capital plan on OCC's 2018 net income until March 2019, when OCC's 2018 financial statements were made available to us. As a result, in March 2019, we recognized $36 million of income relating to our share of OCC's net income for the year ended December 31, 2018. In March 2019, we also recognized our share of OCC's first quarter 2019 net income of $9 million.

OCC Capital Plan

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. Nasdaq PHLX 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 envisioned an annual dividend equal to the portion of OCC’s after-tax income that exceeded OCC’s capital requirements after payment of refunds to OCC’s clearing members (such refunds were generally 50% of the portion of OCC’s pre-tax income that exceeded OCC’s capital requirements). In 2018, 2017 and 2016, OCC disbursed annual dividends under the capital plan and Nasdaq, as the beneficial owner of shares held by Nasdaq PHLX and ISE, received $13 million in 2018 and $10 million in 2017.

In February 2016, after the SEC approved the rule change establishing the OCC capital plan, certain industry participants appealed that approval in the U.S. Court of Appeals. In February 2019, on remand from the Court of Appeals, the SEC disapproved the OCC rule change that established the capital plan. OCC began a phased return of capital contributed under the capital plan, and we received $44 million in February 2019, and the remaining $16 million in November 2019. As a result of the SEC's disapproval of the rule change, we are also released from any future capital replenishment obligations under the 2015 capital plan.

Equity Securities

The carrying amounts of our equity securities are included in other non-current assets in the Condensed Consolidated Balance Sheets. We elected the measurement alternative for primarily all of our equity securities as they do not have a readily determinable fair value. No material adjustments were made to the carrying value of our equity securities for the three months ended March 31, 2020 and 2019. As of March 31, 2020 and December 31, 2019, our equity securities represent various strategic investments made through our corporate venture program as well as investments acquired through various acquisitions.

7. Deferred Revenue

Deferred revenue represents consideration received that is yet to be recognized as revenue. The changes in our deferred revenue during the three months ended March 31, 2020 are reflected in the following table:

	Initial Listing Revenues	Annual Listings Revenues	Corporate Solutions Revenues	Information Services Revenues	Market Technology Revenues	Other[1]	Total
				(in millions)			
Balance at December 31, 2019	$ 69	$ 2	$ 41	$ 82	$ 66	$ 14	$ 274
Deferred revenue billed in the current period, net of recognition	7	181	21	48	16	6	279
Revenue recognized that was included in the beginning of the period	(10)	(1)	(18)	(26)	(18)	(5)	(78)
Translation adjustment	—	—	—	—	(4)	1	(3)
Balance at March 31, 2020	$ 66	$ 182	$ 44	$ 104	$ 60	$ 16	$ 472

[1] Primarily includes deferred revenue from listing of additional shares fees. In the U.S., these fees will continue to run-off as a result of the implementation of our all-inclusive annual fee. Listing of additional shares fees are included in our Listing Services business.

As of March 31, 2020, we estimate that our deferred revenue will be recognized in the following years:

	Initial Listing Revenues	Annual Listings Revenues	Corporate Solutions Revenues	Information Services Revenues	Market Technology Revenues	Other[1]	Total
				(in millions)			
Fiscal year ended:							
2020[2]	$ 21	$ 182	$ 40	$ 94	$ 47	$ 10	$ 394
2021	19	—	4	10	13	4	50
2022	11	—	—	—	—	1	12
2023	8	—	—	—	—	1	9
2024	5	—	—	—	—	—	5
2025 and thereafter	2	—	—	—	—	—	2
Total	$ 66	$ 182	$ 44	$ 104	$ 60	$ 16	$ 472

[1] Other primarily includes revenues from U.S. listing of additional shares fees which are included in our Listing Services business.
[2] Represents the estimated amortization to be recognized for the remaining nine months of 2020.

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.

8. Debt Obligations

The following table presents the changes in the carrying amount of our debt obligations during the three months ended March 31, 2020:

	December 31, 2019	Additions	Payments, Accretion and Other	March 31, 2020
		(in millions)		
Short-term debt:				
Commercial paper	$ 391	$ 989	$ (1,031)	$ 349
$1 billion senior unsecured revolving credit facility due April 25, 2022 (average interest rate of 2.35% for the period January 1, 2020 through March 31, 2020) [(1)(2)]	(2)	799	—	797
Total short-term debt	389	1,788	(1,031)	1,146
Long-term debt:				
3.875% senior unsecured notes repaid on March 16, 2020	671	—	(671)	—
4.25% senior unsecured notes due June 1, 2024	497	—	—	497
1.75% senior unsecured notes due May 19, 2023	668	—	(10)	658
3.85% senior unsecured notes due June 30, 2026	497	—	—	497
1.75% senior unsecured notes due March 28, 2029	665	—	(10)	655
0.875% senior unsecured notes due February 13, 2030	—	644	11	655
Total long-term debt	2,998	644	(680)	2,962
Total debt obligations	$ 3,387	$ 2,432	$ (1,711)	$ 4,108

(1) Opening balance was reclassified to short-term debt as of March 31, 2020.
(2) For further discussion, see "2017 Credit Facility" below.

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 this program. In March 2020, as a result of the uncertainties posed by COVID-19 and related economic impacts, we observed that conditions for Tier 2 commercial paper issuers were deteriorating, impacting both costs and actionable duration of commercial paper issues. To mitigate funding uncertainties and as a precautionary measure to maximize our liquidity and increase our available cash on hand, Nasdaq borrowed $799 million under the revolving credit commitment of the 2017 Credit Facility. See "2017 Credit Facility" below for further discussion of our 2017 Credit Facility. Of the amount borrowed, $350 million is being used to provide liquidity support for the commercial paper program. This amount is recorded in cash and cash equivalents in the Condensed Consolidated Balance Sheets. The effective interest rate of commercial paper issuances fluctuates as short term interest rates and demand fluctuate. The fluctuation of these rates due to market conditions may impact our interest expense.

As of March 31, 2020, 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 20 days to 100 days and as of March 31, 2020, the weighted-average maturity is 51 days with the weighted-average effective interest rate being 1.67% 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 March 31, 2020, 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. For our Euro denominated notes, the "Payments, Accretion and Other" column also includes the impact of foreign currency translation. 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.

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.

Early Extinguishment of 3.875% Senior Unsecured Notes Due 2021

Nasdaq issued the 2021 Notes in June 2013. The 2021 Notes paid interest annually at a rate of 3.875% per annum.

In March 2020, we primarily used the net proceeds from the 2030 Notes to repay in full and terminate our 2021 Notes. For further discussion of the 2030 Notes, see "0.875% Senior Unsecured Notes Due 2030" below. In connection with the early extinguishment of the 2021 Notes, we recorded a charge of $36 million, which primarily included a make-whole redemption price premium. This charge is included in general, administrative and other expense in the Condensed Consolidated Statements of Income for the three months ended March 31, 2020.

4.25% Senior Unsecured Notes Due 2024

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. Such interest rate may vary with Nasdaq's debt rating, to the extent Nasdaq is downgraded below investment grade, up to a rate not to exceed 6.25%.

1.75% Senior Unsecured Notes Due 2023

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. Such interest rate may vary with Nasdaq's debt rating, to the extent Nasdaq is downgraded below investment grade, 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 $10 million noted in the "Payments, Accretion and Other" column in the table above primarily 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 March 31, 2020.

3.85% Senior Unsecured Notes Due 2026

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. Such interest rate may vary with Nasdaq's debt rating, to the extent Nasdaq is downgraded below investment grade, up to a rate not to exceed 5.85%.

1.75% Senior Unsecured Notes Due 2029

In April 2019, Nasdaq issued the 2029 Notes. The 2029 Notes pay interest annually at a rate of 1.75% per annum until March 28, 2029, Such interest rate may vary with Nasdaq's debt rating, to the extent Nasdaq is downgraded below investment grade, up to a rate not to exceed 3.75%. The 2029 Notes may be redeemed by Nasdaq at any time, subject to a make-whole amount.

The 2029 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 $10 million noted in the "Payments, Accretion and Other" column in the table above primarily reflects the translation of the 2029 Notes into U.S. dollars and is recorded in accumulated other comprehensive loss within stockholders' equity in the Condensed Consolidated Balance Sheets as of March 31, 2020.

0.875% Senior Unsecured Notes Due 2030

In February 2020, Nasdaq issued the 2030 Notes. The 2030 Notes pay interest annually in arrears, beginning on February 13, 2021 and may be redeemed by Nasdaq at any time, subject to a make-whole amount. The proceeds from the 2030 Notes, approximately $644 million after deducting the underwriting discount and expenses of the offering, were primarily used to redeem the 2021 Notes and for other general corporate purposes. For further discussion of the 2021 Notes, see "Early Extinguishment of 3.875% Senior Unsecured Notes Due 2021" above.

The 2030 Notes were 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 increase in the carrying amount of $11 million noted in the "Payments, Accretion and Other" column in the table above primarily reflects the translation of the 2030 Notes into U.S. dollars and is recorded in accumulated other comprehensive loss within stockholders' equity in the Condensed Consolidated Balance Sheets as of March 31, 2020.

3.25% Senior Unsecured Notes Due 2050

In April 2020, Nasdaq issued the 2050 Notes. The 2050 Notes pay interest semi-annually in arrears, beginning on October 28, 2020 and may be redeemed by Nasdaq at any time, subject to a make-whole amount. The interest rate of 3.25% may vary with Nasdaq's debt rating, to the extent Nasdaq is downgraded below investment grade, up to a rate not to exceed 5.25% The net proceeds from the 2050 Notes were approximately $485 million after deducting the underwriting discount and expenses of the offering. In April 2020, we used the net proceeds from the 2050 Notes to repay a portion of amounts previously borrowed under the 2017 Credit Facility. See "2017 Credit Facility" below for further discussion of our 2017 Credit Facility.

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. Nasdaq is permitted to repay borrowings under our 2017 Credit Facility at any time in whole or in part, without penalty.

As discussed under "Commercial Paper Program" above, in March 2020, Nasdaq borrowed $799 million under the revolving credit commitment of the 2017 Credit Facility. As of March 31, 2020, the total remaining amount available under the 2017 Credit Facility was $200 million which excludes the amount that supports a letter of credit.

As of March 31, 2020, given we have the ability and intent to repay the amount drawn under the 2017 Credit Facility within the next 12 months, this amount was recorded as short-term debt in the above table.

In April 2020, we used the net proceeds from the 2050 Notes to repay a portion of amounts previously borrowed under the 2017 Credit Facility. As a result, availability under the revolving credit commitment was approximately $700 million as of April 30, 2020, which excludes the amount that supports a letter of credit. For further discussion of the 2050 Notes, see “3.25% Senior Unsecured Notes Due 2050” above.

As of December 31, 2019, no amounts were outstanding on the 2017 Credit Facility. The $(2) million balance represents unamortized debt issuance costs which are being accreted through interest expense over the life of the credit facility.

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. We are charged commitment fees of 0.125% to 0.4%, depending on our credit rating, whether or not amounts have been borrowed. These commitment fees are included in interest expense and were not material for the three months ended March 31, 2020 and 2019.

The 2017 Credit Facility contains 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 make certain restricted payments. The facility also contains 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.

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.

Other Credit Facilities

We also have credit facilities primarily related to our Nasdaq Clearing operations in order to provide further liquidity. These credit facilities, which are available in multiple currencies, totaled $193 million as of March 31, 2020 and $203 million as of December 31, 2019 in available liquidity, none of which was utilized as of March 31, 2020, and of which $15 million was utilized as of December 31, 2019.

Debt Covenants

As of March 31, 2020, we were in compliance with the covenants of all of our debt obligations.

Transition from LIBOR

Nasdaq is currently evaluating the impact of the transition from LIBOR as an interest rate benchmark to other potential alternative reference rates. Currently, Nasdaq has debt instruments in place that reference LIBOR-based rates. As of March 31, 2020, we do not have material risk exposure to LIBOR through our outstanding debt instruments. The transition from LIBOR is estimated to take place in 2021 and Nasdaq will continue to actively assess the related opportunities and risks involved in this transition.

9. 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 $4 million for the three months ended March 31, 2020 and $3 million for the three months ended March 31, 2019.

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 $5 million for both the three months ended March 31, 2020 and 2019.

10. 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 months ended March 31, 2020 and 2019 in the Condensed Consolidated Statements of Income:

	Three Months Ended March 31,			
	2020		2019	
	(in millions)			
Share-based compensation expense before income taxes	$	17	$	16
Income tax benefit		(5)		(4)
Share-based compensation expense after income taxes	$	12	$	12

Common Shares Available Under Our Equity Plan

As of March 31, 2020, we had approximately 10.7 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 to employees below the manager level 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. Restricted stock awards granted to employees at or above the manager level vest 33.3% on the second anniversary of the grant date, 33.3% on the third anniversary of the grant date, and 33.3% on the fourth anniversary of the grant date.

Summary of Restricted Stock Activity

The following table summarizes our restricted stock activity for the three months ended March 31, 2020:

	Restricted Stock		
	Number of Awards	Weighted-Average Grant Date Fair Value	
Unvested balances at January 1, 2020	1,486,756	$	77.38
Granted	24,373	$	102.24
Vested	(365,385)	$	68.48
Forfeited	(32,205)	$	79.09
Unvested balances at March 31, 2020	1,113,539	$	80.79

The awards granted in the above table do not include the all employee grant which occurred on April 1, 2020.

As of March 31, 2020, $51 million of total unrecognized compensation cost related to restricted stock is expected to be recognized over a weighted-average period of 1.6 years.

PSUs

PSUs are based on performance measures that impact the amount of shares that each recipient will receive upon vesting. As of March 31, 2020, we had two performance-based PSU programs for certain officers, a one-year performance-based program and a three-year cumulative performance-based program that focuses on TSR. Effective with new equity awards issued on April 1, 2020, to better align the equity programs for eligible officers, the one-year performance-based program was eliminated and all eligible officers will participate in the three-year cumulative performance-based program. While the performance periods are complete for all PSUs granted under the one-year performance-based program, some shares underlying these PSUs have not vested.

One-Year PSU Program

The grant date fair value of PSUs under the one-year performance-based program was 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 received a target grant of PSUs, but could have received 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.

During 2019, grants of PSUs with a one-year performance period exceeded the applicable performance parameters. As a result, an additional 26,780 units above the original target were granted in the first quarter of 2020.

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 performance 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. 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.

Grants of PSUs that were issued in 2017 with a three-year performance period exceeded the applicable performance parameters. As a result, an additional 43,684 units above the original target were granted in the first quarter of 2020 and were fully vested upon issuance.

Summary of PSU Activity

The following table summarizes our PSU activity for the three months ended March 31, 2020:

	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, 2020	317,251	$ 80.87	797,451	$ 98.31
Granted[(1)]	26,780	$ 84.17	45,091	$ 82.91
Vested	(3,668)	$ 66.12	(300,767)	$ 81.57
Forfeited	(12,833)	$ 82.40	(6,079)	$ 96.22
Unvested balances at March 31, 2020	327,530	$ 81.24	535,696	$ 106.43

(1) Excludes the all employee grant which occurred on April 1, 2020.

As of March 31, 2020, $10 million of total unrecognized compensation cost related to the one-year PSU program is expected to be recognized over a weighted-average period of 1.4 years. For the three-year PSU program, $24 million of total unrecognized compensation cost is expected to be recognized over a weighted-average period of 1.3 years.

Stock Options

There were no stock option awards granted during the three months ended March 31, 2020.

Summary of Stock Option Activity

A summary of stock option activity for the three months ended March 31, 2020 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, 2020	379,102	$ 54.32	5.27	$ 20
Exercised	(27,196)	20.98		
Forfeited	(435)	19.75		
Outstanding and Exercisable at March 31, 2020	351,471	$ 56.94	5.40	$ 13

We received net cash proceeds of $1 million from the exercise of 27,196 stock options for the three months ended March 31, 2020. The net cash proceeds from the exercise of 8,666 stock options for the three months ended March 31, 2019 were immaterial.

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 March 31, 2020 of $94.95 and the exercise price, times the number of shares), 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 March 31, 2020 was 0.4 million and the weighted-average exercise price was $56.94. As of March 31, 2019, 0.4 million outstanding stock options were exercisable and the weighted-average exercise price was $45.25.

The total pre-tax intrinsic value of stock options exercised was $2 million for the three months ended March 31, 2020 and $1 million for the three months ended March 31, 2019.

ESPP

We have an ESPP under which approximately 1.7 million shares of our common stock have been reserved for future issuance as of March 31, 2020. 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 to $1 million for both the three months ended March 31, 2020 and 2019.

11. Nasdaq Stockholders' Equity

Common Stock

As of March 31, 2020, 300,000,000 shares of our common stock were authorized, 170,589,846 shares were issued and 164,337,766 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 shareholder 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 and are therefore not included in the common stock in treasury balance. When treasury shares are reissued, they are recorded at the average cost of the treasury shares acquired. We held 6,252,080 shares of common stock in treasury as of March 31, 2020 and 5,980,571 shares as of December 31, 2019, most of which are related to shares of our common stock withheld for the settlement of employee tax withholding obligations arising from the vesting of restricted stock and PSUs.

Share Repurchase Program

As of March 31, 2020, the aggregate authorized amount under the existing share repurchase program is $510 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 is a summary of our share repurchase activity, reported based on settlement date, for the three months ended March 31, 2020:

	Three Month Ended March 31, 2020
Number of shares of common stock repurchased[(1)]	1,182,114
Average price paid per share	$ 103.17
Total purchase price (in millions)	$ 122

(1) Excludes shares withheld upon vesting of restricted stock and PSUs of 271,509.

As discussed above in "Common Stock in Treasury, at Cost," shares repurchased under our share repurchase program are currently retired and cancelled.

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 March 31, 2020 and 2019, no shares of preferred stock were issued or outstanding.

* * * * * *

Cash Dividends on Common Stock

During the first three months of 2020, our board of directors declared the following cash dividends:

Declaration Date	Dividend Per Common Share	Record Date	Total Amount Paid (in millions)	Payment Date
January 28, 2020	$ 0.47	March 13, 2020	$ 78	March 27, 2020

The total amount paid of $78 million was recorded in retained earnings in the Condensed Consolidated Balance Sheets at March 31, 2020.

In April 2020, the board of directors approved a regular quarterly cash dividend of $0.49 per share on our outstanding common stock which reflects a 4.0% increase from our prior quarterly cash dividend of $0.47. The dividend is payable on June 26, 2020 to shareholders of record at the close of business on June 12, 2020. The estimated amount of this dividend is $81 million. 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.

12. Earnings Per Share

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

	Three Months Ended March 31,	
	2020	2019
Numerator:	(in millions, except share and per share amounts)	
Net income attributable to common shareholders	$ 203	$ 247
Denominator:		
Weighted-average common shares outstanding for basic earnings per share	164,864,077	165,343,968
Weighted-average effect of dilutive securities:		
Employee equity awards(1)	1,912,439	1,682,787
Weighted-average common shares outstanding for diluted earnings per share	166,776,516	167,026,755
Basic and diluted earnings per share:		
Basic earnings per share	$ 1.23	$ 1.49
Diluted earnings per share	$ 1.22	$ 1.48

(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 that the applicable performance criteria would have been met if the performance period ended as of the date of the relevant computation.

Securities that were not included in the computation of diluted earnings per share because their effect was antidilutive were immaterial for the three months ended March 31, 2020 and 2019.

13. 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 March 31, 2020 and December 31, 2019.

	March 31, 2020				December 31, 2019			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
	(in millions)				(in millions)			
Assets at Fair Value								
Debt securities:								
European government	$ 149	$ 149	$ —	$ —	$ 157	$ 157	$ —	$ —
Corporate	52	—	52	—	34	—	34	—
State owned enterprises and municipalities	35	—	35	—	24	—	24	—
Swedish mortgage bonds	18	—	18	—	19	—	19	—
Time deposits	—	—	—	—	57	—	57	—
Total assets at fair value	$ 254	$ 149	$ 105	$ —	$ 291	$ 157	$ 134	$ —

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 investment in OCC is accounted for under the equity method of accounting. We have elected the measurement alternative for the majority of our equity securities, which primarily represent various strategic investments made through our corporate venture program. See "Equity Method Investments," and "Equity Securities," of Note 6, "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 $4.1 billion as of March 31, 2020 and $3.6 billion as of December

31, 2019. 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 March 31, 2020. 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 8, “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 March 31, 2020 and 2019, there were no non-financial assets measured at fair value on a non-recurring basis.

14. 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, 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 align 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 positions. The default resulted in an initial loss of $133 million. In accordance with the liability waterfall, 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. In September 2018, these funds were replenished.

In December 2018, we initiated a capital relief program. The capital relief program was a voluntary program open to each commodities default fund participant; each such participant who agreed to the capital relief program received a proportion of the funds made available under the capital relief program as reflected by their proportionate share of the aggregate of the clearing members' default fund replenishments. As of March 31, 2020, we have disbursed substantially all of the $23 million offered through the program. In addition to the capital relief program, we are pursuing recovery of assets from the defaulted member which will be allocated back to default fund participants.

Default Fund Contributions and Margin Deposits

As of March 31, 2020, clearing member default fund contributions and margin deposits were as follows:

	March 31, 2020		
	Cash Contributions	Non-Cash Contributions	Total Contributions
	(in millions)		
Default fund contributions	$ 414	$ 91	$ 505
Margin deposits	2,827	3,967	6,794
Total	$ 3,241	$ 4,058	$ 7,299

Of the total default fund contributions of $505 million, Nasdaq Clearing can utilize $400 million as capital resources in the event of a counterparty default. The remaining balance of $105 million pertains to member posted surplus balances.

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.

Clearing member cash contributions are maintained in demand deposits held at central banks and large, highly rated financial institutions or secured through direct investments, primarily central bank certificates and European government debt securities with original maturities of 90 days or less, reverse repurchase agreements, supranationals and state owned enterprise debt securities. Investments in reverse repurchase agreements are secured with highly rated government securities with maturity dates that range from 1 day to 14 days. The carrying value of these securities approximates their fair value due to the short-term nature of the instruments and reverse repurchase agreements.

Nasdaq Clearing has invested the total cash contributions of $3,241 million as of March 31, 2020 and $2,996 million as of December 31, 2019, in accordance with its investment policy as follows:

	March 31, 2020	December 31, 2019
	(in millions)	
Demand deposits	$ 1,069	$ 1,328
Central bank certificates	1,024	896
European government debt securities	388	508
Reverse repurchase agreements	482	116
Supranationals and state owned enterprise debt securities	278	148
Total	$ 3,241	$ 2,996

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 March 31, 2020, Nasdaq Clearing committed capital totaling $141 million to the liability waterfall and overall regulatory capital, in the form of government debt securities, which are recorded as financial investments in the Condensed Consolidated Balance Sheets. The combined regulatory capital of the clearing members and Nasdaq Clearing is intended 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 a 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 March 31, 2020.

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 $33 million as of March 31, 2020;
- 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 $20 million as of March 31, 2020; and
- mutualized default fund, which includes capital contributions of the clearing members on a pro-rata basis.

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 $88 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:

	March 31, 2020
	(in millions)
Commodity and seafood options, futures and forwards[1][2][3]	$ 382
Fixed-income options and futures[1][2]	711
Stock options and futures[1][2]	312
Index options and futures[1][2]	172
Total	$ 1,577

(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 three months ended March 31, 2020 and 2019:

	March 31, 2020	March 31, 2019
Commodity and seafood options, futures and forwards[1][2]	198,870	146,249
Fixed-income options and futures	5,842,771	5,404,135
Stock options and futures	6,089,250	6,854,813
Index options and futures	18,995,403	11,743,268
Total	31,126,294	24,148,465

(1) The total volume in cleared power related to commodity contracts was 292 Terawatt hours (TWh) for the three months ended March 31, 2020 and 250 TWh for the three months ended March 31, 2019.

(2) As discussed in our 2019 Form 10-K, in November 2019, Nasdaq sold the core assets of NFX to a third-party and the freight contracts with open interest are being migrated from NFX to other exchanges.

The outstanding contract value of resale and repurchase agreements was $1.0 billion as of March 31, 2020 and $5.5 billion as of March 31, 2019. The total number of contracts cleared was 1,410,884 for the three months ended March 31, 2020 and was 1,885,698 for the three months ended March 31, 2019.

15. Leases

We have operating leases which are primarily real estate leases for our U.S. and European headquarters and for general office space. The following table provides supplemental balance sheet information related to Nasdaq's operating leases:

Leases	Balance Sheet Classification	March 31, 2020	December 31, 2019
		(in millions)	
Assets:			
Operating lease assets	Operating lease assets	$ 324	$ 346
Liabilities:			
Current lease liabilities	Other current liabilities	$ 58	$ 61
Non-current lease liabilities	Operating lease liabilities	310	331
Total lease liabilities		$ 368	$ 392

The following table summarizes Nasdaq's lease cost:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(in millions)	
Operating lease cost[1]	$ 20	$ 20
Variable lease cost	6	5
Sublease income	(1)	(1)
Total lease cost	$ 25	$ 24

[1] Includes short-term lease cost, which was immaterial.

The following table reconciles the undiscounted cash flows for each of the first five years and total of the remaining years to the operating lease liabilities recorded in our condensed consolidated balance sheet.

	March 31, 2020
	(in millions)
2020[1]	$ 56
2021	65
2022	43
2023	40
2024	35
Thereafter	240
Total lease payments	479
Less: interest[2]	(111)
Present value of lease liabilities[3]	$ 368

[1] Represents the estimated lease payments to be made for the remaining nine months of 2020.
[2] Calculated using the interest rate for each lease.
[3] Includes the current portion of $58 million.

Total lease payments in the above table exclude $128 million of legally binding minimum lease payments for leases signed but not yet commenced primarily related to the expansion of our world headquarters. These leases will commence in 2020 with a lease term of 16 years.

The following table provides information related to Nasdaq's lease term and discount rate:

	March 31, 2020
Weighted-average remaining lease term (in years)	10.5
Weighted-average discount rate	4.6 %

The following table provides supplemental cash flow information related to Nasdaq's operating leases:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(in millions)	
Cash paid for amounts included in the measurement of operating lease liabilities	$ 20	$ 18
Lease assets obtained in exchange for new operating lease liabilities	$ —	$ 16

16. Income Taxes

Income Tax Provision

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

	Three Months Ended March 31,		Percentage Change
	2020	2019	
	(in millions)		
Income tax provision	$ 70	$ 66	6.1 %
Effective tax rate	25.6 %	21.1 %	

The higher effective tax rate in the first quarter of 2020 is primarily due to a tax benefit recorded in 2019 from a dividends received deduction related to capital distributions from the OCC and the reversal of a previously accrued tax penalty in Finland.

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.

Tax Audits

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. We are subject to examination by federal, state and local, and foreign tax authorities. Federal income tax returns for the years 2008 through 2016 are currently under examination by the Internal Revenue Service and we are subject to examination by the Internal Revenue Service for 2017 and 2018. Several state tax returns are currently under examination by the respective tax authorities for the years 2007 through 2018. Non-U.S. tax returns are subject to examination by the respective tax authorities for the years 2013 through 2018. We regularly assess the likelihood of additional assessments by each jurisdiction and have established tax reserves that we believe are adequate in relation to the potential for additional assessments. Examination outcomes and the timing of examination settlements are subject to uncertainty. 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. We do not expect to settle any material tax audits in the next twelve months.

We are subject to examination by federal, state and local, and foreign tax authorities. We regularly assess the likelihood of additional assessments by each jurisdiction and have established tax reserves that we believe are adequate in relation to the potential for additional assessments. We believe that the resolution of tax matters will not have a material effect on our financial condition but may be material to our operating results for a particular period and the effective tax rate for that period.

17. 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 14, “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 $10 million as of March 31, 2020 and $11 million as of December 31, 2019. As discussed in “Other Credit Facilities,” of Note 8, “Debt Obligations,” we also have credit facilities primarily related to our Nasdaq Clearing operations, which are available in multiple currencies, and totaled $193 million as of March 31, 2020 and $203 million as of December 31, 2019 in available liquidity, none of which was utilized as of March 31, 2020, and of which $15 million was utilized as of December 31, 2019.

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 March 31, 2020, 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.

Other 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 14, “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 issued annually 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 March 31, 2020, these escrow agreements provide for future payment by us of up to an aggregate of $5 million, which is included in other 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.

Legal and Regulatory Matters

Litigation

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. The plaintiffs appealed the judgment of dismissal to the United States Court of Appeals for the Second Circuit (although opting not to appeal the dismissal with respect to Barclays PLC or the dismissal of claims under Section 6(b) of the Exchange Act). 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. On May 18, 2018, the exchanges filed a motion to dismiss the amended complaint, raising issues not addressed in the proceedings to date. On May 28, 2019, the district court denied the exchanges’ renewed motion to dismiss. On June 17, 2019, the exchanges filed a motion to certify the district court’s order for immediate review by the Second Circuit and on July 16, 2019, the district court denied the motion. 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.

Nasdaq Commodities Clearing Default

During September 2018, a clearing member of Nasdaq Clearing's commodities market was declared in default. We have been cooperating fully with the SFSA in the associated regulatory audits. While we are currently unable to predict the final outcome of this matter, it could include penalties, such as a fine. We do not expect this matter will have a material impact on our consolidated financial statements. See "Nasdaq Commodities Clearing Default," of Note 14, "Clearing Operations," for further information on this event.

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 annual 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 also appealed this decision to the U.S. Court of Appeals for the District of Columbia Circuit. We are unable to predict the outcome or the timing of the ultimate resolution of these matters.

Other Matters

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

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. Our chief operating decision maker does not review total assets or statements of income below operating income by segments as key performance metrics; therefore, such information is not presented below.

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. See "Tax Audits," of Note 16, "Income Taxes," for further discussion.

The following table presents certain information regarding our business segments for the three months ended March 31, 2020 and 2019:

	Market Services	Corporate Services	Information Services	Market Technology	Corporate Items	Consolidated
	(in millions)					
Three Months Ended March 31, 2020						
Total revenues	$ 933	$ 128	$ 211	$ 81	$ —	$ 1,353
Transaction-based expenses	(652)	—	—	—	—	(652)
Revenues less transaction-based expenses	281	128	211	81	—	701
Operating income (loss)	$ 178	$ 45	$ 134	$ 8	$ (90)	$ 275
Three Months Ended March 31, 2019						
Total revenues	$ 638	$ 121	$ 193	$ 77	$ 10	$ 1,039
Transaction-based expenses	(405)	—	—	—	—	(405)
Revenues less transaction-based expenses	233	121	193	77	10	634
Operating income (loss)	$ 135	$ 44	$ 124	$ 7	$ (35)	$ 275

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, which are shown in the table below, include the following:

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 useful representation of our segments' ongoing activity in each period.

Merger and strategic initiatives expense: We have pursued various strategic initiatives and completed acquisitions and divestitures in recent years that 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. Management does not consider merger and strategic initiatives 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 merger and strategic initiatives expense provide management with a useful representation of our segments' ongoing activity in each period.

Restructuring charges: We initiated the transition of certain technology platforms to advance our strategic opportunities as a technology and analytics provider and continue the re-alignment of certain business areas. See Note 19, “Restructuring Charges,” for further discussion of our 2019 restructuring plan. We believe performance measures excluding restructuring charges provide management with a useful representation of our segments' ongoing activity in each period.

2019 divestiture: We have included in corporate items the revenues and expenses of BWise which were part of the Corporate Solutions business within our Corporate Services segment as BWise was sold in March 2019. See “2019 Divestiture,” of Note 4, “Acquisitions and Divestiture,” for further discussion.

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 months ended March 31, 2020, other significant items include a loss on extinguishment of debt and charitable contributions made to the COVID-19 response and relief efforts which are recorded in general, administrative and other expense in our Condensed Consolidated Statements of Income.

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.

A summary of our corporate items is as follows:

	Three Months Ended March 31,	
	2020	2019
	(in millions)	
Revenues - divested business	$ —	$ 10
Expenses:		
Amortization expense of acquired intangible assets	25	26
Merger and strategic initiatives expense	7	9
Restructuring charges	12	—
Extinguishment of debt	36	—
Expenses - divested business	—	8
Other	10	2
Total expenses	90	45
Operating loss	$ (90)	$ (35)

For further discussion of our segments' results, see "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations-Segment Operating Results."

19. Restructuring Charges

In September 2019, we initiated the transition of certain technology platforms to advance the company's strategic opportunities as a technology and analytics provider and continue the re-alignment of certain business areas. In connection with these restructuring efforts, we are retiring certain elements of our marketplace infrastructure and technology product offerings as we implement NFF and other technologies internally and externally. This represents a fundamental shift in our strategy and technology as well as executive re-alignment. As a result of these actions, we expect to incur $90 million to $100 million in pre-tax charges over a two year period related primarily to non-cash items such as asset impairments, accelerated depreciation as well as third-party consulting costs. Severance and employee-related charges also will be incurred. Restructuring charges are recorded on restructuring plans that have been committed to by management and are, in part, based upon management's best estimates of future events.

The following table presents a summary of the 2019 restructuring plan charges in the Condensed Consolidated Statements of Income for the three months ended March 31, 2020 which primarily consisted of consulting services, asset impairment charges primarily related to capitalized software that was retired, and accelerated depreciation expense on certain assets as a result of a decrease in their useful life.

	Three Months Ended March 31, 2020
	(in millions)
Asset impairment charges and accelerated depreciation expense	$ 3
Consulting services	3
Contract terminations	2
Severance and employee-related costs	1
Other	3
Total restructuring charges	$ 12

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.

Impact of COVID-19 on Our Business

We are closely monitoring developments related to COVID-19 and we continue to assess its impact on our business. While still evolving, COVID-19 has caused significant economic and financial turmoil both in the U.S. and around the world. We have implemented risk management and contingency plans and have taken preventive measures and other precautions to maintain normal business operations. As COVID-19 spread across the world, we moved quickly to transition our global workforce to a remote operating environment, through a combination of work-from-home and split teams for critical on-site employees.

As of March 31, 2020, 98 percent of our global team are working from home. For the limited staff around the world who are performing critical on-site functions in our offices, we are deploying extra precautions to protect their safety. As conditions change at our locations around the world, certain offices may reopen sooner than others. We will evaluate the opening of each office location on a case-by-case basis, with the priority on the safety and well-being of our employees. In the meantime, as an added precaution, corporate travel has been suspended and we have distributed face masks to employees.

During the first quarter of 2020, our operations have continued with minimal disruption. As of March 31, 2020, COVID-19 did not have a significant negative impact on our business operations, employee availability, financial condition, liquidity or cash flows.

We have taken actions to strengthen our liquidity and cash position and address refinancing risks in response to the uncertainties posed by COVID-19 and related economic impacts. For further discussion, see Item 2. “Management’s Discussion and Analysis of Financial Condition and Results of Operations-Liquidity and Capital Resources.” Although we have not experienced any significant negative impacts to our operations as a result of COVID-19, due to the uncertainty surrounding the pandemic, it is possible that the outbreak may impact our results of operations for the remainder of the year and possibly beyond as an economic downturn could adversely impact the demand for our services. The potential impact to each of our segments is discussed below.

Market Services

We believe that it is difficult to predict trading volumes from quarter to quarter. While trading volumes were unusually high during the first quarter, there is no assurance that volumes will continue at that level during the remainder of 2020. We observed continued trading volume strength in April 2020 in U.S. equities and U.S. equity options. Additionally, we believe that the combination of continued global economic uncertainty, and the upcoming U.S. election, may lead to continued, elevated volumes for our markets in the months ahead.

Corporate Services

In our Corporate Services segment, we entered 2020 with incredibly strong momentum, maintaining our U.S. listings leadership through what had been a very busy period for IPOs. In addition, we steadily grew the issuer base in Nasdaq’s Nordic markets, and in our Corporate Solutions business, after many years of investing, restructuring, and re-positioning, we saw growth re-emerge.

While we entered 2020 with strong momentum in our listings and Corporate Solutions businesses, we are beginning to see the impacts of the pandemic influence corporate issuer behavior in the near-term. In Listing Services, we have observed that the majority of IPO candidates are delaying their offerings. In Corporate Solutions, while our Investor Relations Intelligence offering has seen increased demand from clients seeking short-term solutions regarding underlying activity in their stocks, we are more generally seeing companies delaying purchasing decisions, and in some cases, looking to reduce near-term discretionary spend.

Information Services

In our Information Services segment, the dynamics of the environment bring varied implications for each of our businesses.

Our Market Data business has demonstrated resilience across prior recessionary periods, but is not completely immune when economic downturns are more protracted. While we have recently diversified our client base outside our traditional U.S. markets, we may see reduced demand from these new clients if they view real-time data to be discretionary in a time of economic pressure.

Our Index business is currently demonstrating strong resilience, and is strengthened by continued, elevated volumes in its futures products. However, it is difficult to predict at this time how the market performance of index products will develop as the economic impact of COVID-19 continues to evolve. Investment inflows have mitigated the downward pressure on AUM from the drop in market values. Further changes in market values could have an adverse or beneficial impact on our Index business.

In our Investment Data & Analytics business, while we have not yet experienced a measurable change in our clients’ behaviors, we are monitoring the possibility of increased client attrition, through closures of smaller asset managers or consolidation, as well as the potential for moderated spend per client, or delayed purchase decisions by new client prospects.

Market Technology

In our Market Technology segment, we have a large, diverse, and well-established customer base across market infrastructure operators and banks and brokers, with long-term contracts supporting this business. During 2019, we successfully executed agreements with new clients and renewed agreements with certain key existing clients. However, our early observations of the impact of COVID-19 on our Market Technology segment makes us more cautious about our short-term growth prospects for the remainder of the year.

Specifically, our clients are dealing with the challenges of a surge in trading volumes and the logistical challenges of the health crisis with their staff working remotely. As a result, we have observed that our clients are taking longer than is typical to make upgrades and new purchasing decisions and are extending implementation schedules.

Additionally, while we believe that our sales pipeline remains strong, we expect that purchase and market launch decisions will likely come under additional scrutiny and review while those prospects evaluate the economic impacts of COVID-19 on their business and spending.

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 March 31, 2020	Three Months Ended March 31, 2019
Market Services		
Equity Derivative Trading and Clearing		
U.S. equity options		
Total industry average daily volume (in millions)	25.3	17.3
Nasdaq PHLX matched market share	12.8 %	16.0 %
The Nasdaq Options Market matched market share	10.6 %	9.2 %
Nasdaq BX Options matched market share	0.2 %	0.3 %
Nasdaq ISE Options matched market share	8.4 %	8.6 %
Nasdaq GEMX Options matched market share	3.8 %	4.1 %
Nasdaq MRX Options matched market share	0.3 %	0.2 %
Total matched market share executed on Nasdaq's exchanges	36.1 %	38.4 %
Nasdaq Nordic and Nasdaq Baltic options and futures		
Total average daily volume of options and futures contracts(1)	457,819	353,454
Cash Equity Trading		
Total U.S.-listed securities		
Total industry average daily share volume (in billions)	10.97	7.52
Matched share volume (in billions)	126.8	90.6
The Nasdaq Stock Market matched market share	16.8 %	16.8 %
Nasdaq BX matched market share	1.2 %	2.2 %
Nasdaq PSX matched market share	0.6 %	0.7 %
Total matched market share executed on Nasdaq's exchanges	18.6 %	19.7 %
Market share reported to the FINRA/Nasdaq Trade Reporting Facility	30.2 %	29.9 %
Total market share(2)	48.8 %	49.6 %
Nasdaq Nordic and Nasdaq Baltic securities		
Average daily number of equity trades executed on Nasdaq's exchanges	1,021,963	574,195
Total average daily value of shares traded (in billions)	$ 6.4	$ 5.1
Total market share executed on Nasdaq's exchanges	74.5 %	66.8 %
FICC		
Fixed Income		
U.S. fixed income volume ($ billions traded)	$ 2,067	$ 2,715
Total average daily volume of Nasdaq Nordic and Nasdaq Baltic fixed income contracts	115,137	116,262
Commodities		
Power contracts cleared (TWh)(3)	292	250
Corporate Services		
IPOs		
The Nasdaq Stock Market	27	37
Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic	7	4
Total new listings		
The Nasdaq Stock Market(4)	56	59
Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic(5)	9	9
Number of listed companies		
The Nasdaq Stock Market(6)	3,146	3,059
Exchanges that comprise Nasdaq Nordic and Nasdaq Baltic(7)	1,039	1,018
Information Services		
Number of licensed ETPs	325	346
ETP AUM tracking Nasdaq indexes (in billions)	$ 206	$ 196
Market Technology		
Order intake (in millions)(8)	$ 80	$ 54
Annualized recurring revenue, or ARR (in millions)(9)	$ 257	$ 236

(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 412 ETPs as of March 31, 2020 and 388 as of March 31, 2019.
(7) Represents companies listed on the Nasdaq Nordic and Nasdaq Baltic exchanges and companies on the alternative markets of Nasdaq First North.
(8) Total contract value of orders signed during the period.
(9) ARR for a given period is the annualized revenue of Market Technology support and SaaS subscription contracts. ARR is currently one of our key performance metrics to assess the health and trajectory of our business. ARR does not have any standardized definition and is therefore unlikely to be comparable to similarly titled measures presented by other companies. ARR should be viewed independently of revenue and deferred revenue and is not intended to be combined with or to replace either of those items. ARR is not a forecast and the active contracts during the reporting period used in calculating ARR may or may not be extended or renewed by our customers.

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Financial Summary

The following table summarizes our financial performance for the three months ended March 31, 2020 as compared to the same period in 2019. The comparability of our results of operations between reported periods is impacted by the divestiture of the BWise enterprise governance, risk and compliance software platform in March 2019 and a decrease in net income from unconsolidated investees. See "2019 Divestiture," of Note 4, "Acquisitions and Divestiture," and "Equity Method Investments," of Note 6, "Investments," 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 March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions, except per share amounts)		
Revenues less transaction-based expenses	$ 701	$ 634	10.6 %
Operating expenses	426	359	18.7 %
Operating income	275	275	— %
Interest expense	(26)	(37)	(29.7)%
Net gain on divestiture of business	—	27	(100.0)%
Net income from unconsolidated investees	17	45	(62.2)%
Income before income taxes	273	313	(12.8)%
Income tax provision	70	66	6.1 %
Net income attributable to Nasdaq	$ 203	$ 247	(17.8)%
Diluted earnings per share	$ 1.22	$ 1.48	(17.6)%
Cash dividends declared per common share	$ 0.47	$ 0.44	6.8 %

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."

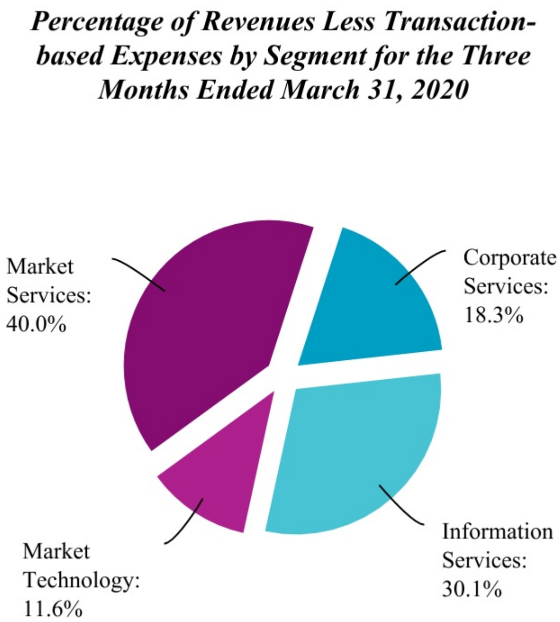
Segment Operating Results

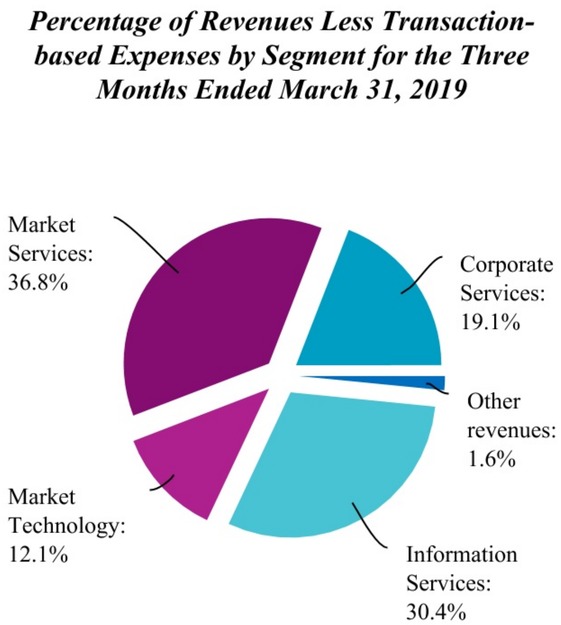
The following table shows our revenues by segment, transaction-based expenses for our Market Services segment and total revenues less transaction-based expenses:

	Three Months Ended March 31, 2020	2019	Percentage Change
	(in millions)		
Market Services	$ 933	$ 638	46.2 %
Transaction-based expenses	(652)	(405)	61.0 %
Market Services revenues less transaction-based expenses	281	233	20.6 %
Corporate Services	128	121	5.8 %
Information Services	211	193	9.3 %
Market Technology	81	77	5.2 %
Other revenues[1]	—	10	(100.0) %
Total revenues less transaction-based expenses	$ 701	$ 634	10.6 %

[1] Includes the revenues from the BWise enterprise governance, risk and compliance software platform which was sold in March 2019. Prior to the sale date, these revenues were included in our Corporate Solutions business within our Corporate Services segment. See “2019 Divestiture,” of Note 4, “Acquisitions and Divestiture,” to the condensed consolidated financial statements for further discussion.

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 $701 million for the three months March 31, 2020 and $634 million for the three months March 31, 2019:





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 March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Market Services Revenues:			
Equity Derivative Trading and Clearing Revenues[1]	$ 285	$ 193	47.7 %
Transaction-based expenses:			
Transaction rebates	(172)	(113)	52.2 %
Brokerage, clearance and exchange fees[1]	(19)	(8)	137.5 %
Equity derivative trading and clearing revenues less transaction-based expenses	**94**	**72**	**30.6 %**
Cash Equity Trading Revenues[2]	558	352	58.5 %
Transaction-based expenses:			
Transaction rebates	(307)	(217)	41.5 %
Brokerage, clearance and exchange fees[2]	(153)	(66)	131.8 %
Cash equity trading revenues less transaction-based expenses	**98**	**69**	**42.0 %**
FICC Revenues	18	20	(10.0) %
Transaction-based expenses:			
Transaction rebates	—	(1)	(100.0) %
Brokerage, clearance and exchange fees	(1)	—	N/M
FICC revenues less transaction-based expenses	**17**	**19**	**(10.5) %**
Trade Management Services Revenues	**72**	**73**	**(1.4) %**
Total Market Services revenues less transaction-based expenses	**$ 281**	**$ 233**	**20.6 %**

(1) Includes Section 31 fees of $17 million in the first quarter of 2020 and $7 million in the first quarter of 2019. 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 $145 million in in the first quarter of 2020 and $62 million in in the first quarter of 2019. 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 first quarter of 2020 compared with the same period in 2019. The increase in equity derivative trading and clearing revenues was primarily due to higher U.S. industry trading volumes, a higher U.S. gross capture rate, and higher Section 31 pass-through fee revenue, partially offset by lower overall U.S. matched market share executed on Nasdaq's exchanges. The increase in equity derivative trading and clearing revenues less transaction-based expenses was primarily due to higher U.S. industry trading volumes, partially offset by lower overall U.S. matched market share executed on Nasdaq's exchanges, and a lower U.S. net 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. Section 31 fees increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher average SEC fee rates and higher dollar value traded on Nasdaq's exchanges.

Transaction rebates, in which we credit a portion of the per share execution charge to the market participant, increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher U.S. industry trading volumes and an increase in the U.S. rebate capture rate, partially offset by a decrease in our overall U.S. matched market share executed on Nasdaq's exchanges.

Brokerage, clearance and exchange fees increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher Section 31 pass-through fees, as discussed above.

Cash Equity Trading Revenues

Cash equity trading revenues and cash equity trading revenues less transaction-based expenses increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher U.S. and European industry trading volumes, partially offset by lower overall U.S. matched market share executed on Nasdaq's exchanges. Also contributing to the increase in cash equity trading revenues was higher Section 31 pass-through fee revenue and a higher U.S. gross capture rate while a higher net U.S. capture rate also contributed to the increase in cash equity trading revenues less transaction-based expenses.

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. Section 31 fees increase in the first quarter of 2020 compared with the same period in 2019 primarily due to higher average SEC fee rates and higher dollar value traded on Nasdaq's exchanges.

Transaction rebates increased in the first quarter of 2020 compared with the same period in 2019. For The Nasdaq Stock Market, Nasdaq PSX and Nasdaq CXC, we credit a portion of the per share execution charge to the market participant that provides the liquidity, and for Nasdaq BX and Nasdaq CX2, we credit a portion of the per share execution charge to the market participant that takes the liquidity. The increase in the first quarter of 2020 was primarily due to higher U.S. industry trading volumes, partially offset by lower overall U.S. matched market share executed on Nasdaq's exchanges.

Brokerage, clearance and exchange fees increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher Section 31 pass-through fees, as discussed above, and lower routing fees.

FICC Revenues

FICC revenues and FICC revenues less transaction-based expenses decreased in the first quarter of 2020 compared with the same period in 2019 primarily due to the sale of the core assets of our NFX business and lower U.S. fixed income products revenues, partially offset by higher European commodity products revenues.

CORPORATE SERVICES

The following table shows revenues from our Corporate Services segment:

	Three Months Ended March 31,		Percentage Change
	2020	2019	
	(in millions)		
Corporate Services:			
Listing Services	$ 75	$ 71	5.6 %
Corporate Solutions	$ 53	$ 50	6.0 %
Total Corporate Services	$ 128	$ 121	5.8 %

Listing Services Revenues

Listing services revenues increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher listings revenues due to an increase in the total number of listed companies and annual listing fees.

Corporate Solutions Revenues

Corporate solutions revenues increased in the first quarter of 2020 compared with the same period in 2019 reflecting an increase in governance solutions revenues and investor relations intelligence revenues.

Trade Management Services Revenues

Trade management services revenues decreased slightly in the first quarter 2020 compared with the same period in 2019.

INFORMATION SERVICES

The following table shows revenues from our Information Services segment:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Information Services:			
Market Data	$ 97	$ 100	(3.0)%
Index	73	54	35.2 %
Investment Data & Analytics	41	39	5.1 %
Total Information Services	$ 211	$ 193	9.3 %

Market Data Revenues

Market data revenues decreased in the first quarter of 2020 compared with the same period in 2019 primarily due to lower collections from under-reported data usage, partially offset by new sales, including continued geographic expansion globally.

Index Revenues

Index revenues increased in the first quarter of 2020 compared with the same period in 2019 primarily due to higher licensing revenue from higher average AUM in ETPs linked to Nasdaq indexes and higher licensing revenues from futures trading linked to the Nasdaq 100 Index, and a $5 million collection related to prior period usage.

Investment Data & Analytics Revenues

Investment data & analytics revenues increased in the first quarter of 2020 compared with the same period in 2019 primarily due to growth in eVestment.

MARKET TECHNOLOGY

The following table shows revenues from our Market Technology segment:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Market Technology	$ 81	$ 77	5.2 %

Market Technology Revenues

Market technology revenues increased in the first quarter of 2020 compared with the same period in 2019. The increase is due to an increase in SaaS surveillance revenues and an increase in software delivery and support projects, partially offset by a decrease in change request revenues and an unfavorable impact from foreign exchange of $2 million.

OTHER REVENUES

Other revenues include the revenues from the BWise enterprise governance, risk and compliance software platform, which was sold in March 2019. Prior to the sale date, these revenues were included in our Corporate Solutions business. See “2019 Divestiture,” of Note 4, “Acquisitions and Divestiture,” to the condensed consolidated financial statements for further discussion of this divestiture.

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Expenses

Operating Expenses

The following table shows our operating expenses:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Compensation and benefits	$ 195	$ 175	11.4 %
Professional and contract services	27	37	(27.0)%
Computer operations and data communications	35	33	6.1 %
Occupancy	25	24	4.2 %
General, administrative and other	61	16	281.3 %
Marketing and advertising	9	10	(10.0)%
Depreciation and amortization	48	48	— %
Regulatory	7	7	— %
Merger and strategic initiatives	7	9	(22.2)%
Restructuring charges	12	—	N/M
Total operating expenses	$ 426	$ 359	18.7 %

N/M Not meaningful.

The increase in compensation and benefits expense in the first three months of 2020 was primarily due to higher performance incentives partially offset by lower compensation costs resulting from our 2019 divestiture and a favorable impact from foreign exchange of $3 million.

Headcount increased to 4,555 employees as of March 31, 2020 from 4,281 as of March 31, 2019 primarily due to our 2020 acquisition and growth in our Market Technology and Investment Data & Analytics businesses, partially offset by our 2019 divestiture.

Professional and contract services expense decreased in the first three months of 2020 primarily due to lower consulting costs, lower litigation costs and our 2019 divestiture.

Computer operations and data communications expense increased in the first three months of 2020 primarily due to higher market data feed costs.

Occupancy expense increased in the first three months of 2020 mainly due to higher costs associated with additional facility and rent costs resulting from expansion of our new U.S. headquarters in New York.

General, administrative and other expense increased in the first three months of 2020 primarily due to a loss on the early extinguishment of our 2021 Notes and charitable contributions made to the COVID-19 response and relief efforts.

Merger and strategic initiatives expense decreased in the first three months of 2020. We have pursued various strategic initiatives and completed acquisitions and divestitures 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 and will vary based on the size and frequency of the activities described above.

Restructuring charges were $12 million in the first three months of 2020. See Note 19, "Restructuring Charges," to the condensed consolidated financial statements for further discussion of our 2019 restructuring plan and charges associated with this plan.

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Non-operating Income and Expenses

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

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Interest income	$ 2	$ 3	(33.3)%
Interest expense	(26)	(37)	(29.7)%
Net interest expense	(24)	(34)	(29.4)%
Net gain on divestiture of business	—	27	(100.0)%
Other income	5	—	N/M
Net income from unconsolidated investees	17	45	(62.2)%
Total non-operating income (expenses)	$ (2)	$ 38	(105.3)%

N/M Not meaningful.

Interest Expense

Interest expense decreased in the first three months of 2020 compared with the same period in 2019 primarily due to the refinancing of our 5.55% senior notes in May 2019 with the 2029 Notes at a lower interest rate and the repayment of our senior unsecured floating rate notes in March 2019 with commercial paper issuances and cash on hand. See Note 8, "Debt Obligations," to the condensed consolidated financial statements for further discussion of our debt obligations.

The following table shows our interest expense:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	(in millions)		
Interest expense on debt	$ 24	$ 35	(31.4)%
Accretion of debt issuance costs and debt discount	1	2	(50.0)%
Other fees	1	—	N/M
Interest expense	$ 26	$ 37	(29.7)%

N/M Not meaningful.

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Net Gain on Divestiture of Business

The net gain on divestiture of business in the first three months of 2019 primarily related to our divestiture of BWise. See "2019 Divestiture," of Note 4, "Acquisitions and Divestiture," to the condensed consolidated financial statements for further discussion.

Net Income from Unconsolidated Investees

Net income from unconsolidated investees decreased in the first three months of 2020 compared with the same period in 2019 primarily due to income recognized from our equity method investment in OCC in March 2019. See "Equity Method Investments," of Note 6, "Investments," to the condensed consolidated financial statements for further discussion.

Tax Matters

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

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019	Percentage Change
	($ in millions)		
Income tax provision	$ 70	$ 66	6.1 %
Effective tax rate	25.6 %	21.1 %	

For further discussion of our tax matters, see Note 16, “Income Taxes,” to the condensed consolidated financial statements.

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. In addition, other companies, including companies in our industry, may calculate such measures differently, which reduces their usefulness as comparative measures. Investors should not rely on any single financial measure when evaluating our business. This non-GAAP information should be considered as supplemental in nature and is not meant as a substitute for our operating results in accordance with U.S. GAAP. 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 expense therefore provide investors with a useful representation of our businesses’ ongoing activity in each period.

Merger and strategic initiatives expense: We have pursued various strategic initiatives and completed acquisitions and divestitures in recent years that 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.

Restructuring charges: We initiated the transition of certain technology platforms to advance our strategic opportunities as a technology and analytics provider and continue the re-alignment of certain business areas. See Note 19, “Restructuring Charges,” to the condensed consolidated financial statements for further discussion of our 2019 restructuring plan. Charges associated with this plan represent a fundamental shift in our strategy and technology as well as executive re-alignment and will be excluded for purposes of calculating non-GAAP measures as they are not reflective of ongoing operating performance or comparisons in Nasdaq's performance between periods.

Net income from unconsolidated investee: See “OCC Capital Plan,” of Note 6, “Investments,” to the condensed consolidated financial statements for further discussion. Our income on our investment in OCC may vary significantly compared to prior years due to the disapproval of the OCC's capital plan. Accordingly, we will exclude this income from current and prior periods 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.

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 months ended March 31, 2020, other significant items include a loss on extinguishment of debt and charitable contributions made to the COVID-19 response and relief efforts which are recorded in general, administrative and other expense in our Condensed Consolidated Statements of Income.

For the three months ended March 31, 2019, other significant items primarily included a net gain on divestiture of business which represents our pre-tax net gain of $27 million on the sale of BWise.

Significant tax items:

The non-GAAP adjustment to the income tax provision included the tax impact of each non-GAAP adjustment and:

- for the three months ended March 31, 2020 and 2019, excess tax benefits related to employee share-based compensation to reflect the recognition of the income tax effects of share-based awards when awards vest or are settled. 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.

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The following table shows 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 March 31, 2020		Three Months Ended March 31, 2019	
	(in millions, except share and per share amounts)			
	Net Income	Diluted Earnings Per Share	Net Income	Diluted Earnings Per Share
U.S. GAAP net income attributable to Nasdaq and diluted earnings per share	$ 203	$ 1.22	$ 247	$ 1.48
Non-GAAP adjustments:				
Amortization expense of acquired intangible assets	25	0.15	26	0.16
Merger and strategic initiatives expense	7	0.04	9	0.05
Restructuring charges	12	0.07	—	—
Net income from unconsolidated investee	(16)	(0.10)	(45)	(0.27)
Extinguishment of debt	36	0.22	—	—
Net gain on divestiture of business	—	—	(27)	(0.16)
Other	5	0.03	2	0.01
Total non-GAAP adjustments	69	0.41	(35)	(0.21)
Adjustment to the income tax provision to reflect non-GAAP adjustments and other tax items	(18)	(0.11)	(4)	(0.03)
Excess tax benefits related to employee share-based compensation	(3)	(0.02)	(4)	(0.02)
Total non-GAAP tax adjustments	(21)	(0.13)	(8)	(0.05)
Total non-GAAP adjustments, net of tax	48	0.28	(43)	(0.26)
Non-GAAP net income attributable to Nasdaq and diluted earnings per share	$ 251	$ 1.50	$ 204	$ 1.22
Weighted-average common shares outstanding for diluted earnings per share		166,776,516		167,026,755

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. Currently, our cost and availability of funding remain healthy.

In response to the uncertainties posed by COVID-19 and related economic impacts, we have taken actions to strengthen our liquidity and cash position and to reduce our refinancing risk.

In March 2020, we observed that conditions in the market for Tier 2 commercial paper issuers were deteriorating, impacting both costs and actionable duration of commercial paper issues. To mitigate funding uncertainties and as a precautionary measure to maximize our liquidity and increase our available cash on hand, Nasdaq borrowed $799 million under the revolving credit commitment of the 2017 Credit Facility. See “2017 Credit Facility” of Note 8, “Debt Obligations,” to the condensed consolidated financial statements for further discussion of our 2017 Credit Facility. Of the amount borrowed, $350 million is being used to provide liquidity support for the commercial paper program. This amount is recorded in cash and cash equivalents in the Condensed Consolidated Balance Sheets. As of March 31, 2020, the total remaining amount available under the 2017 Credit Facility was $200 million, which excludes the amount that supports a letter of credit. In April 2020, we issued the 2050 Notes and used the net proceeds from the 2050 Notes to repay a portion of amounts previously borrowed under the 2017 Credit Facility. As a result, availability under the revolving credit commitment was approximately $700 million as of April 30, 2020, which excludes the amount that supports a letter of credit. For further discussion of the 2050 Notes, see “3.25% Senior Unsecured Notes Due 2050,” of

Note 8, “Debt Obligations,” to the condensed consolidated financial statements.

In February 2020, we issued the 2030 Notes. We primarily used the net proceeds from the 2030 Notes to redeem the 2021 Notes and for other general corporate purposes. See “0.875% Senior Unsecured Notes Due 2030,” and “Early Extinguishment of 3.875% Senior Unsecured Notes Due 2021,” of Note 8, “Debt Obligations,” to the condensed consolidated financial statements for further discussion. The above reduced our borrowing costs and also eliminated near-term bond maturities until May 2023.

We will continue to closely monitor and manage our liquidity and capital resources. In addition, we continue to prudently assess our capital deployment strategy through balancing acquisitions, internal investments, debt repayments, and shareholder return activity including share repurchases and dividends.

In the near term, we expect that our operations and the remaining 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.

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 through 2027. See “Non-Cash Contingent Consideration,” of Note 17, “Commitments, Contingencies and Guarantees,” to the condensed consolidated financial statements for further discussion.

The value of various assets and liabilities, including cash and cash equivalents, receivables, accounts payable and accrued expenses, the current portion of long-term debt, and commercial paper, can fluctuate from month to month. Working capital (calculated as current assets less current liabilities) was $(180) million as of March 31, 2020, compared with $63 million as of December 31, 2019, a decrease of $243 million. Current asset balance changes increased working capital by $980 million, with increases in cash and cash equivalents, default funds and margin deposits, and receivables, net, partially offset by decreases in other current assets, financial investments, and restricted cash. Current liability balance changes decreased working capital by $1,223 million, due to increases in short-term debt, default funds and margin deposits, deferred revenue, accounts payable and accrued expenses, Section 31 fees payable to the SEC, and other current liabilities, partially offset by a decrease in accrued personnel costs,

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;
- volatility or disruption in the public debt and equity markets; and
- the impact of the COVID-19 pandemic on our business.

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

Financial Assets

The following table summarizes our financial assets:

	March 31, 2020	December 31, 2019
	(in millions)	
Cash and cash equivalents	$ 1,015	$ 332
Restricted cash	29	30
Financial investments	254	291
Total financial assets	$ 1,298	$ 653

Cash and Cash Equivalents and Restricted Cash

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 March 31, 2020, our cash and cash equivalents of $1,015 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 equivalents as of March 31, 2020 increased $683 million from December 31, 2019, primarily due to:

- proceeds from utilization of the revolving credit commitment of the 2017 Credit Facility;
- proceeds from issuances of long-term debt, net of issuance costs; and
- net cash provided by operating activities, partially offset by;
- repayments of debt obligations;
- cash paid for acquisitions, net of cash and cash equivalents acquired;
- repurchases of our common stock;
- cash dividends paid on our common stock;
- payments of commercial paper, net;

- payment of debt extinguishment costs;
- payment related to employee shares withheld for taxes; and
- purchases of property and equipment.

See "Cash Flow Analysis" below for further discussion.

Restricted cash is restricted from withdrawal due to contractual or regulatory requirements or is not available for general use. Restricted cash was $29 million as of March 31, 2020 and $30 million as of December 31, 2019, a decrease of $1 million. The decrease primarily relates to a decrease in cash pledged as collateral. 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 $149 million as of March 31, 2020 and $160 million as of December 31, 2019. The remaining balance held in the U.S. totaled $866 million as of March 31, 2020 and $172 million as of December 31, 2019.

Unremitted earnings of subsidiaries outside of the U.S. are used to finance our international operations and are considered to be indefinitely reinvested.

Share Repurchase Program

See "Share Repurchase Program," of Note 11, "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:

	2020	2019
First quarter	$ 0.47	$ 0.44

See "Cash Dividends on Common Stock," of Note 11, "Nasdaq Stockholders' Equity," to the condensed consolidated financial statements for further discussion of the dividends.

Financial Investments

Our financial investments totaled $254 million as of March 31, 2020 and $291 million as of December 31, 2019 and are primarily comprised of highly rated European government debt securities. Of these securities, $160 million as of March 31, 2020 and $169 million as of December 31, 2019 are assets primarily utilized to meet regulatory capital requirements, mainly for our clearing operations at Nasdaq Clearing. See Note 6, "Investments," to the condensed consolidated financial statements for further discussion.

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Debt Obligations

The following table summarizes our debt obligations by contractual maturity:

	Maturity Date	March 31, 2020	December 31, 2019
		(in millions)	
Short-term debt:			
Commercial paper	Weighted-average maturity of 51 days	$ 349	$ 391
$1 billion senior unsecured revolving credit facility[1][2]	April 2022	797	(2)
Total short-term debt		1,146	389
Long-term debt:			
3.875% senior unsecured notes	Repaid March 2020	—	671
1.75% senior unsecured notes	May 2023	658	668
4.25% senior unsecured notes	June 2024	497	497
3.85% senior unsecured notes	June 2026	497	497
1.75% senior unsecured notes	March 2029	655	665
0.875% senior unsecured notes	February 2030	655	—
Total long-term debt		2,962	2,998
Total debt obligations		$ 4,108	$ 3,387

(1) Opening balance was reclassified to short-term debt as of March 31, 2020.
(2) For further discussion, see "2017 Credit Facility," of Note 8, "Debt Obligations," to the condensed consolidated financial statements.

In addition to the $1 billion senior unsecured revolving credit facility, we also have other credit facilities primarily related to our Nasdaq Clearing operations in order to provide further liquidity. Other credit facilities, which are available in multiple currencies, totaled $193 million as of March 31, 2020 and $203 million as of December 31, 2019 in available liquidity, none of which was utilized as of March 31, 2020, and of which $15 million was utilized as of December 31, 2019.

As of March 31, 2020, we were in compliance with the covenants of all of our debt obligations.

See Note 8, "Debt Obligations," to the condensed consolidated financial statements for further discussion of our debt obligations.

Regulatory 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 March 31, 2020, our required regulatory capital of $140 million is comprised of highly rated European government debt securities that are included in financial investments 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. As of March 31, 2020, the combined required minimum net capital totaled $1 million and the combined excess capital totaled $42 million, substantially all of which is held in cash and cash equivalents in the Condensed Consolidated Balance Sheets. The required minimum net capital is included in restricted cash in the Condensed Consolidated Balance Sheets.

Nordic and Baltic Exchange Regulatory Capital Requirements

The entities that operate trading venues in the Nordic and Baltic countries are each subject to local regulations and are required to maintain regulatory capital intended to ensure their general financial soundness and liquidity. As of March 31, 2020, our required regulatory capital of $31 million is invested in European government debt securities that are included in financial investments and restricted cash in the Condensed Consolidated Balance Sheets.

Other Capital Requirements

We operate several other businesses which are subject to local regulation and are required to maintain certain levels of regulatory capital. As of March 31, 2020, other required regulatory capital was $8 million and was primarily included in restricted cash and financial investments in the Condensed Consolidated Balance Sheets.

* * * * * *

Cash Flow Analysis

The following table summarizes the changes in cash flows:

	Three Months Ended March 31,		
	2020	2019	Percentage Change
Net cash provided by (used in):	(in millions)		
Operating activities	$ 380	$ 337	12.8 %
Investing activities	(154)	(74)	108.1 %
Financing activities	468	(302)	(255.0)%
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(12)	(8)	50.0 %
Net increase (decrease) in cash and cash equivalents and restricted cash	682	(47)	(1,551.1)%
Cash and cash equivalents and restricted cash at beginning of period	362	586	(38.2)%
Cash and cash equivalents and restricted cash at end of period	$ 1,044	$ 539	93.7 %

Net Cash Provided by Operating Activities

Net cash provided by operating activities primarily consists of net income adjusted for certain non-cash items such as: depreciation and amortization expense of property and equipment; amortization expense of acquired finite-lived intangible assets; expense associated with share-based compensation; and net income from unconsolidated investees.

Net cash provided by operating activities is also impacted by the effects of changes in operating assets and liabilities such as: accounts receivable which is impacted by the timing of customer billings and related collections from our customers; accounts payable and accrued expenses due to timing of payments; accrued personnel costs which are impacted by employee performance targets and the timing of payments related to employee bonus incentives; and Section 31 fees payable to the SEC, which is impacted by the timing of collections from customers and payments to the SEC.

Net cash provided by operating activities increased $43 million for the three months ended March 31, 2020 compared with the same period in 2019. The increase was primarily driven by growth in our cash equity trading and equity derivative trading and clearing revenues less transaction-based expenses, primarily due to higher industry trading volumes, lower performance incentive payments made in the first quarter of 2020 compared with the same period in 2019 primarily due to prior year performance, and growth in our annual customer billings related to our listing services business.

Net Cash Used in Investing Activities

Net cash used in investing activities for the three months ended March 31, 2020 primarily relates to $157 million of cash used for acquisitions, net of cash and cash equivalents acquired and $26 million of purchases of property and equipment, partially offset by $22 million of proceeds from the net sales of securities.

Net cash used in investing activities for the three months ended March 31, 2019 primarily relates to $193 million of cash used for acquisitions, net of cash and cash equivalents acquired and $20 million of purchases of property and equipment, partially offset by receipt of cash of $108 million related to our 2019 divestiture and $37 million of proceeds from the net sales of securities.

Net Cash Provided by (Used in) Financing Activities

Net cash provided by financing activities for the three months ended March 31, 2020 primarily relates to proceeds received of $799 million related to the utilization of the revolving credit commitment of the 2017 Credit Facility, $644 million from proceeds related to long-term debt issuances, partially offset by $671 million in repayments of debt obligations, $122 million in repurchases of common stock, $78 million of dividend payments to our shareholders, $42 million of net repayments of commercial paper, and a $36 million payment for debt extinguishment costs.

Net cash used in financing activities for the three months ended March 31, 2019 primarily relates to $515 million in repayments of debt obligations and $73 million of dividend payments to our shareholders, partially offset by $265 million in net borrowings of commercial paper.

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

See Note 8, “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 11, “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.

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Contractual Obligations and Contingent Commitments

Nasdaq has contractual obligations to make future payments under debt obligations by contract maturity, operating lease payments, and other obligations. The following table shows these contractual obligations as of March 31, 2020.

	Payments Due by Period				
Contractual Obligations	**Total**	**Less than 1 year**	**1-3 years**	**3-5 years**	**More than 5 years**
			(in millions)		
Debt obligations by contract maturity[1]	$ 4,571	$ 1,226	$ 139	$ 1,278	$ 1,928
Operating lease obligations[2]	479	73	102	70	234
Real estate obligations[3]	128	—	12	27	89
Purchase obligations[4]	45	26	19	—	—
Other obligations[5]	5	5	—	—	—
Total	$ 5,228	$ 1,330	$ 272	$ 1,375	$ 2,251

(1) Our debt obligations include both principal and interest obligations. As of March 31, 2020, an interest rate of 1.82% was used to compute the amount of the contractual obligations for interest on the 2017 Credit Facility. 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 March 31, 2020. See Note 8, “Debt Obligations,” to the condensed consolidated financial statements for further discussion.

(2) Operating lease obligations represent our undiscounted operating lease liabilities as of March 31, 2020. See Note 15, “Leases,” to the condensed consolidated financial statements for further discussion of our leases.

(3) Real estate obligations include legally binding minimum lease payments for leases signed but not yet commenced.

[4] Purchase obligations primarily represent minimum outstanding obligations due under software license agreements.
[5] Other obligations primarily consist of potential future escrow agreement payments related to prior acquisitions.

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Non-Cash Contingent Consideration

See “Non-Cash Contingent Consideration,” of Note 17, “Commitments, Contingencies and Guarantees,” to the condensed consolidated financial statements for further discussion.

Off-Balance Sheet Arrangements

For discussion of off-balance sheet arrangements see:

- Note 14, “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 17, “Commitments, Contingencies and Guarantees,” to the condensed consolidated financial statements for further discussion of:
  - Guarantees issued and credit facilities available;
  - 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

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 March 31, 2020, our investment portfolio was primarily comprised of highly rated European government debt securities, which pay a fixed rate of interest. These securities are subject to interest rate risk and the fair value of these securities will decrease if market interest rates increase. If market interest rates were to increase immediately and uniformly by 100 basis points from levels as of March 31, 2020, the fair value of this portfolio would have declined by $6 million.

Debt Obligations

As of March 31, 2020, the majority of our debt obligations are fixed-rate obligations, provided that the interest rates on certain tranches of notes are subject to adjustment if our debt rating is downgraded below investment grade, as further discussed in Note 8, “Debt Obligations,” to the condensed consolidated financial statements. 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 borrowings under our 2017 Credit Facility, as the interest rate on this facility has a variable interest rate. We are also exposed to changes in interest rates as a result of the amounts outstanding from the sale of commercial paper under our commercial paper program, which have variable interest rates. As of March 31, 2020, the principal amount outstanding under the 2017 Credit Facility was $799 million. A hypothetical 100 basis points increase in interest rates on the 2017 Credit Facility would increase annual interest expense by approximately $8 million based on borrowings as of March 31, 2020. As of March 31, 2020 we had principal amounts outstanding of $350 million of commercial paper. A hypothetical 100 basis points increase in interest rates on our outstanding commercial paper would increase annual interest expense by approximately $3 million based on borrowings as of March 31, 2020.

Foreign Currency Exchange Rate Risk

We are subject to foreign currency exchange rate risk. Our primary transactional exposure to foreign currency denominated revenues less transaction-based expenses and operating income for the three months ended March 31, 2020 is presented in the following table:

	Euro	Swedish Krona	Other Foreign Currencies	U.S. Dollar	Total
	(in millions, except currency rate)				
Three Months Ended March 31, 2020					
Average foreign currency rate to the U.S. dollar	1.1024	0.1034	#	N/A	N/A
Percentage of revenues less transaction-based expenses	7.8 %	6.8 %	4.7 %	80.7 %	100.0 %
Percentage of operating income	2.1 %	(3.7)%	(5.3)%	106.9 %	100.0 %
Impact of a 10% adverse currency fluctuation on revenues less transaction-based expenses	$ (5)	$ (5)	$ (3)	$ —	$ (13)
Impact of a 10% adverse currency fluctuation on operating income	$ (1)	$ (1)	$ (2)	$ —	$ (4)

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. The financial statements of these subsidiaries are translated into U.S. dollars for consolidated reporting using a current rate of exchange, with net gains or losses 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 March 31, 2020 is presented in the following table:

	Net Assets	Impact of a 10% Adverse Currency Fluctuation
	(in millions)	
Swedish Krona[(1)]	$ 3,129	$ (313)
British Pound	193	(19)
Norwegian Krone	143	(14)
Canadian Dollar	110	(11)
Australian Dollar	95	(9)
Euro	31	(3)

(1) Includes goodwill of $2,265 million and intangible assets, net of $563 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 evaluating the counterparties with which we make investments and execute agreements. For our investment portfolio, our 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 March 31, 2020, 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. 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.

On January 1, 2020, we adopted ASU 2016-13, "Measurement of Credit Losses on Financial Instruments." See "Recently Adopted Accounting Standard," of Note 2, "Basis of Presentation and Principles of Consolidation," to the condensed consolidated financial statements for further discussion. This ASU changes the impairment model for certain financial instruments. The new model is a forward looking expected loss model and applies 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 trade receivables.

We also are exposed to credit risk through our clearing operations with Nasdaq Clearing. See Note 14, "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 supranational debt instruments.

Item 4. Controls and Procedures

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.

Changes in 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 March 31, 2020 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

See "Legal and Regulatory Matters - Litigation," of Note 17, "Commitments, Contingencies and Guarantees," to the condensed consolidated financial statements, which is incorporated herein by reference.

Item 1A. Risk Factors

In addition to the other information set forth in this Quarterly Report on Form 10-Q, you should carefully consider the factors discussed under "Risk Factors" in our Form 10-K. These risks could materially and adversely affect our business, financial condition and results of operations. The risks and uncertainties 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.

Risks Relating to our Business

The COVID-19 pandemic could have a material adverse effect on our business, financial condition, liquidity or results of operations.

We are closely monitoring the evolving impact of the COVID-19 pandemic on our industry and business in the United States and worldwide, including its effect on our customers, employees, vendors and other stakeholders. The COVID-19 pandemic has created significant volatility, uncertainty and economic disruption, which may adversely affect our business, financial condition, liquidity or results of operations.

While results in our Market Services business were strong in the first quarter reflecting unusually high trading volumes amidst the COVID-19 pandemic, there is no assurance that such trading levels will continue. In our Corporate Services segment, we are experiencing reduced demand, as many companies are delaying initial public offerings and some customers are delaying or reducing discretionary spending for our Corporate Services offerings. Some Market Technology customers are delaying purchasing decisions or extending implementation schedules. In our Information Services segment, some customers are seeking new products to help analyze the potential impact of COVID-19, while others are scrutinizing their discretionary spending. As the COVID-19 pandemic and its resultant economic effects continue, other existing customers in our each of our segments may reduce or cancel spending for our products and services. Additionally, our sales pipeline with new client prospects may be further affected as new clients may delay or cancel purchase decisions while they evaluate the impact of COVID-19. Finally, there is downward pressure on AUMs in our Index business due to the overall decline in market values of the underlying assets; further declines could have an adverse impact on that business.

In response to COVID-19, we have shifted to having a majority of our staff work from home, which may cause heightened cybersecurity, information security and operational risks. We also could face disruption to our business or operations if a significant number of our employees or any of our key employees becomes ill due to the virus. Any disruption to our ability to deliver services to our clients could result in liability to our customers, regulatory fines, penalties or other sanctions, increased operational costs or harm to our reputation and brand. This, in turn, may have a material adverse effect on our business, financial condition, liquidity or results of operations.

Due to the pandemic, we may be exposed to increased credit risk from third parties, including our customers, who may be unable to pay our bills when they become due. We also may be exposed to increased counterparty default risk, including at Nasdaq Clearing and in our FICC business, which could pose a risk to our liquidity. In addition, we may be exposed to liquidity and credit risk with respect to our investments; if the value of those investments becomes impaired, we may be required to incur charges relating to such impairments. If any of these risks materialize, we may experience adverse consequences to our operating results or ability to conduct our business.

The extent to which the COVID-19 pandemic impacts our business, financial condition, liquidity or results of operations will depend on future developments, which are uncertain and cannot be predicted, including the scope and duration of the COVID-19 pandemic, the length of time government, commercial and travel limitations are in place, the effectiveness of our remote work arrangements, the successful execution of plans in connection with our eventual return to our worldwide offices, actions taken by governmental authorities and other third parties in response to the pandemic, as well as other direct and indirect impacts on us, our exchanges, our customers, our vendors and other stakeholders. To the extent the COVID-19 pandemic adversely affects our business, financial condition, liquidity or results of operations, it may also have the effect of heightening many of the other risks described in the section entitled “Risk Factors” in our most recent Annual Report on Form 10-K and any subsequent Quarterly Reports on Form 10-Q.

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

Issuer Purchases of Equity Securities

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 March 31, 2020:

Period[1][2]	(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)
January 2020				
Share repurchase program	—	$ —	—	$ 632
Employee transactions	1,960	$ 115.40	N/A	N/A
February 2020				
Share repurchase program	402,483	$ 115.03	402,483	$ 586
Employee transactions	138,109	$ 112.41	N/A	N/A
March 2020				
Share repurchase program	779,631	$ 97.05	779,631	$ 510
Employee transactions	131,440	$ 99.39	N/A	N/A
Total Quarter Ended March 31, 2020				
Share repurchase program	1,182,114	$ 103.17	1,182,114	$ 510
Employee transactions	271,509	$ 106.13	N/A	N/A

N/A Not applicable.

(1) See “Share Repurchase Program,” of Note 11, “Nasdaq Stockholders’ Equity,” to the condensed consolidated financial statements for further discussion of our share repurchase program.

(2) Represents shares surrendered to us to satisfy tax withholding obligations arising from the vesting of restricted stock and PSUs issued to employees.

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

Item 6. Exhibits

Exhibit Number	
4.1	Seventh Supplemental Indenture, dated February 13, 2020, among Nasdaq, Inc., Wells Fargo Bank, National Association, as Trustee, and HSBC Bank USA, National Association, as paying agent and as registrar and transfer agent (incorporated by reference to Exhibit 4.2 to the Form 8-A filed on February 13, 2020).
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	The following materials from the Nasdaq, Inc. Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, formatted in iXBRL (Inline eXtensible Business Reporting Language): (i) Condensed Consolidated Balance Sheets as of March 31, 2020 and December 31, 2019; (ii) Condensed Consolidated Statements of Income for the three months ended March 31, 2020 and 2019; (iii) Condensed Consolidated Statements of Comprehensive Income (Loss) for the three months ended March 31, 2020 and 2019; (iv) Condensed Consolidated Statements of Changes in Stockholders' Equity for the three months ended March 31, 2020 and 2019; (v) Condensed Consolidated Statements of Cash Flows for the three months ended March 31, 2020 and 2019; and (vi) notes to condensed consolidated financial statements.
104	Cover Page Interactive Data File, formatted in iXBRL and contained in Exhibit 101.

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.	
		(Registrant)	
Date:	May 6, 2020	**By:**	/s/ Adena T. Friedman
		Name:	**Adena T. Friedman**
		Title:	**President and Chief Executive Officer**

Date:	May 6, 2020	**By:**	/s/ Michael Ptasznik
		Name:	**Michael Ptasznik**
		Title:	**Executive Vice President, Corporate Strategy and Chief Financial 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 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 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: May 6, 2020

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 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 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: May 6, 2020

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 March 31, 2020 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:	May 6, 2020

	/s/ Michael Ptasznik
Name:	Michael Ptasznik
Title:	Executive Vice President, Corporate Strategy and Chief Financial Officer
Date:	May 6, 2020

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.