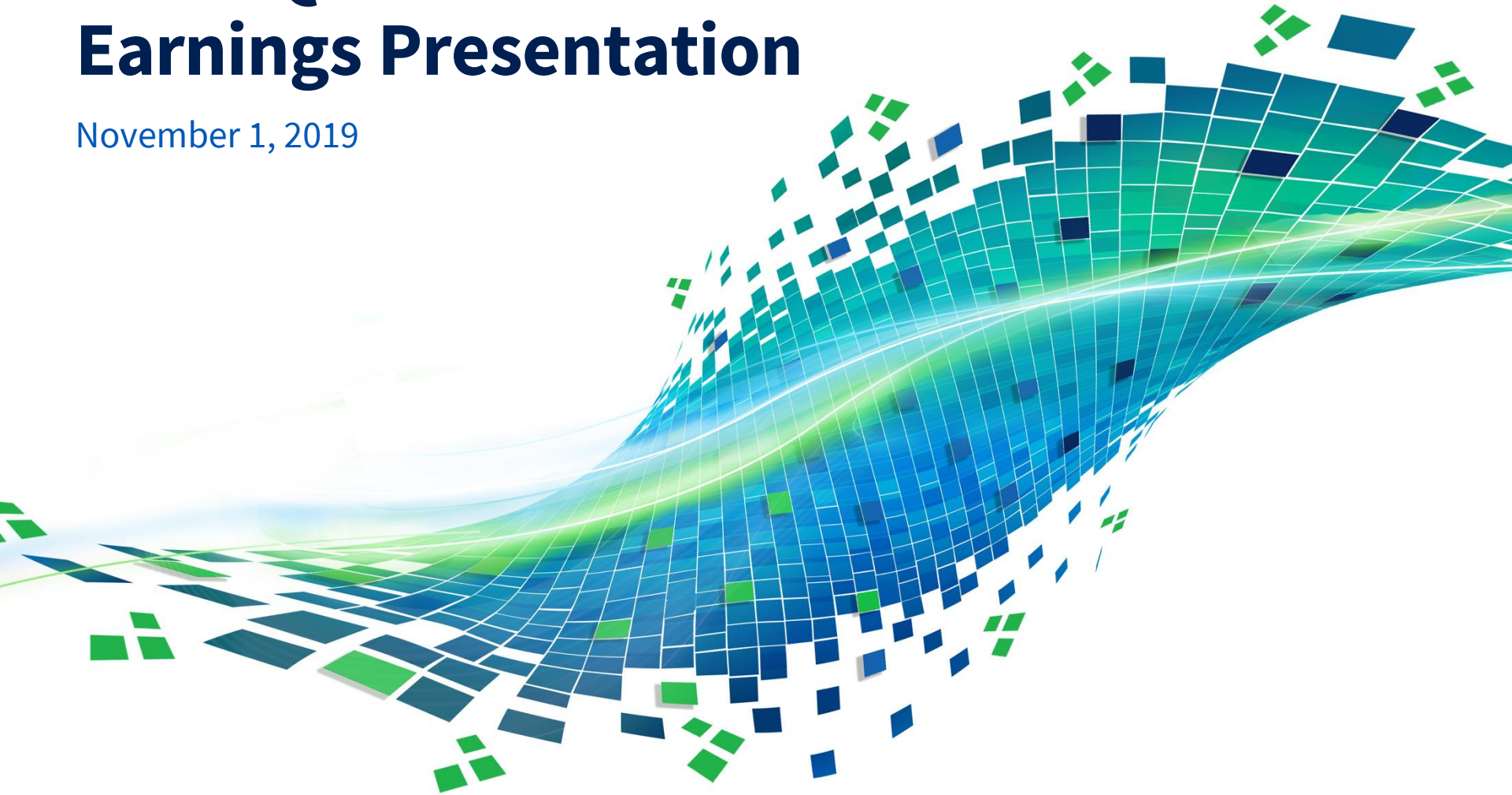


# Third Quarter 2019 Earnings Presentation

November 1, 2019



## **Strategic Review**

**Edward Tilly**

*Chairman, President and Chief Executive Officer*

## **Financial Review**

**Brian Schell**

*Executive Vice President, CFO and Treasurer*

## **Questions and Answers**

**Edward Tilly**

**Brian Schell**

**Chris Isaacson**

*Executive Vice President and Chief Operating Officer*

**John Deters**

*Chief Strategy Officer*

# Cautionary Statements Regarding Forward-Looking Information

*This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 that involve a number of risks and uncertainties. You can identify these statements by forward-looking words such as “may,” “might,” “should,” “expect,” “plan,” “anticipate,” “believe,” “estimate,” “predict,” “potential” or “continue,” and the negative of these terms and other comparable terminology. All statements that reflect our expectations, assumptions or projections about the future other than statements of historical fact are forward-looking statements. These forward-looking statements, which are subject to known and unknown risks, uncertainties and assumptions about us, may include projections of our future financial performance based on our growth strategies and anticipated trends in our business. These statements are only predictions based on our current expectations and projections about future events. There are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from those expressed or implied by the forward-looking statements.*

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

*Some factors that could cause actual results to differ include: the loss of our right to exclusively list and trade certain index options and futures products; economic, political and market conditions; compliance with legal and regulatory obligations; price competition and consolidation in our industry; decreases in trading volumes, market data fees or a shift in the mix of products traded on our exchanges; legislative or regulatory changes; our ability to protect our systems and communication networks from security risks, cybersecurity risks, insider threats and unauthorized disclosure of confidential information; increasing competition by foreign and domestic entities; our dependence on and exposure to risk from third parties; fluctuations to currency exchange rates; our index providers’ ability to maintain the quality and integrity of their indexes and to perform under our agreements; our ability to operate our business without violating the intellectual property rights of others and the costs associated with protecting our intellectual property rights; our ability to attract and retain skilled management and other personnel, including those experienced with post-acquisition integration; our ability to accommodate trading volume and transaction traffic, including significant increases, without failure or degradation of performance of our systems; misconduct by those who use our markets or our products; challenges to our use of open source software code; our ability to meet our compliance obligations, including managing potential conflicts between our regulatory responsibilities and our for-profit status; damage to our reputation; the ability of our compliance and risk management methods to effectively monitor and manage our risks; our ability to manage our growth and strategic acquisitions or alliances effectively; restrictions imposed by our debt obligations; our ability to maintain an investment grade credit rating; impairment of our goodwill, investments or intangible assets; and the accuracy of our estimates and expectations. More detailed information about factors that may affect our actual results to differ may be found in our filings with the SEC, including in our Annual Report on Form 10-K for the year ended December 31, 2018 and other filings made from time to time with the SEC.*

*We do not undertake, and we expressly disclaim, any duty to update any forward-looking statement whether as a result of new information, future events or otherwise, except as required by law. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof.*

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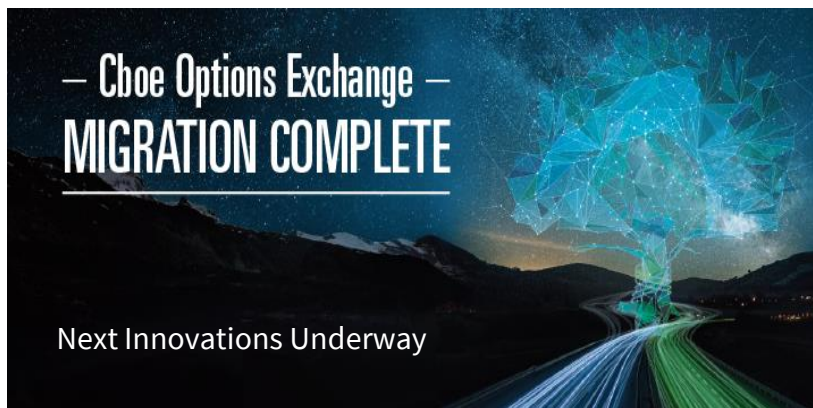


**Strategic Review**  
**Edward Tilly**  
**Chairman, President and CEO**

# Continue to Focus on Executing Our Strategic Initiatives to Drive Long-Term Growth

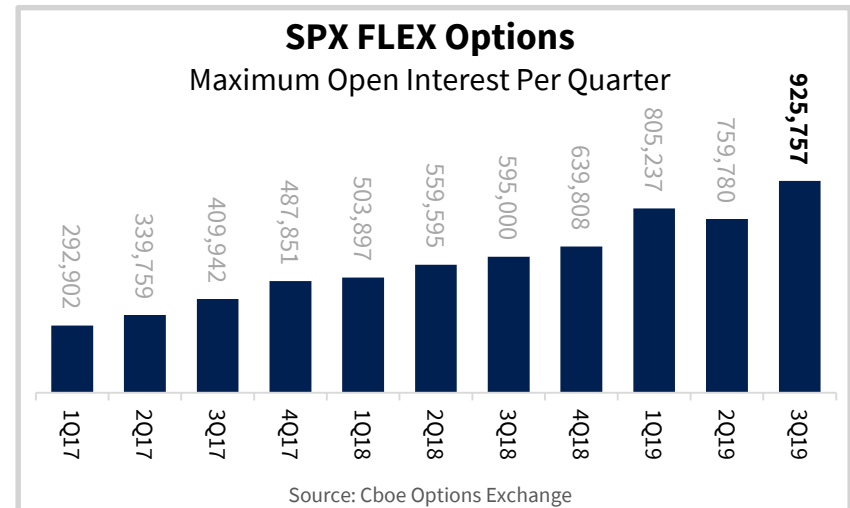
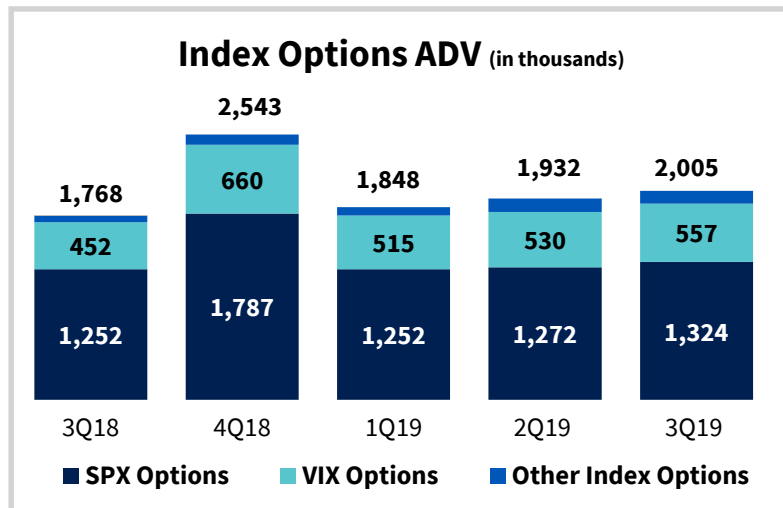
## Completed final step in our multi-exchange technology migration on October 7<sup>th</sup>

- ❖ Provides customers with a single, world-class trading experience across markets
- ❖ Enables Cboe to redirect technology efforts to building new technologies
  - Development of a state-of-the-art research and data platform
  - Enhancing global distribution of our products



# 3Q19 Results Primarily Driven by Higher Trading in Our Proprietary Products

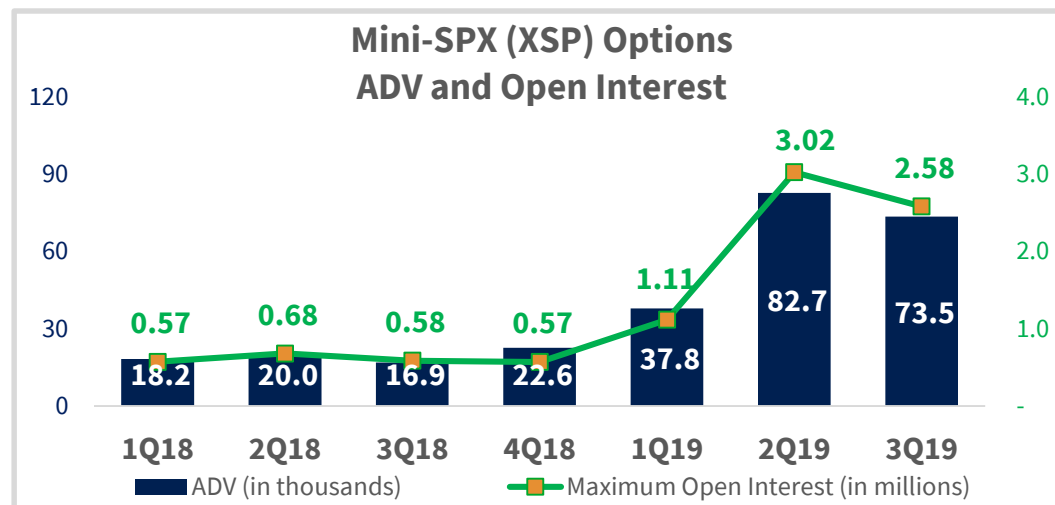
- ❖ Index options ADV increased 13% in 3Q19 vs 3Q18
  - VIX options up 23%
  - SPX options up 6%
- ❖ SPX Flex open interest hit a new all-time high in 3Q19 of over 925,000 contracts
  - Flex options allow investors to customize exercise prices, exercise styles and expiration dates
  - Centrally-cleared alternative to OTC market



# 3Q19 Results Primarily Driven by Higher Trading in Our Proprietary Products

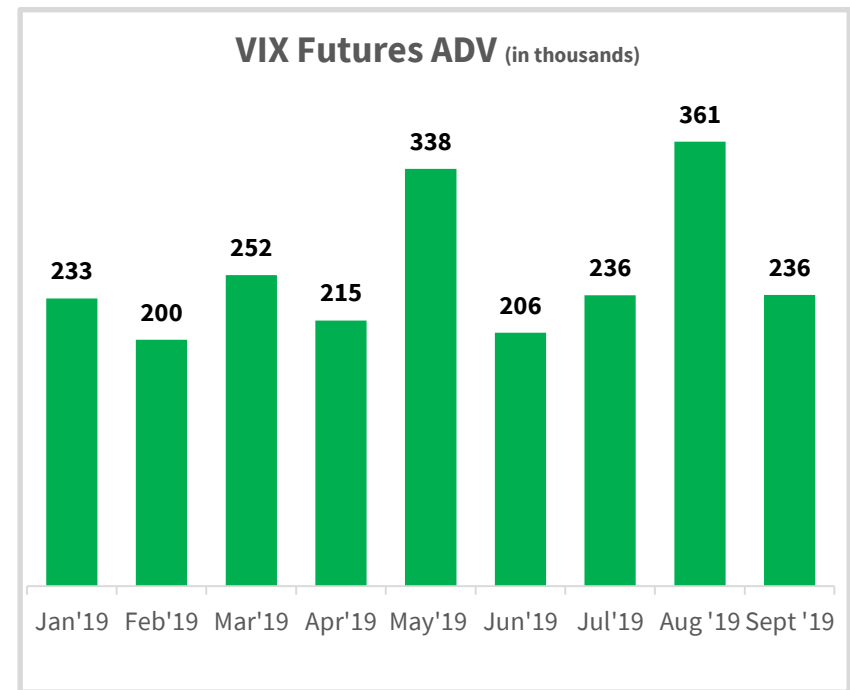
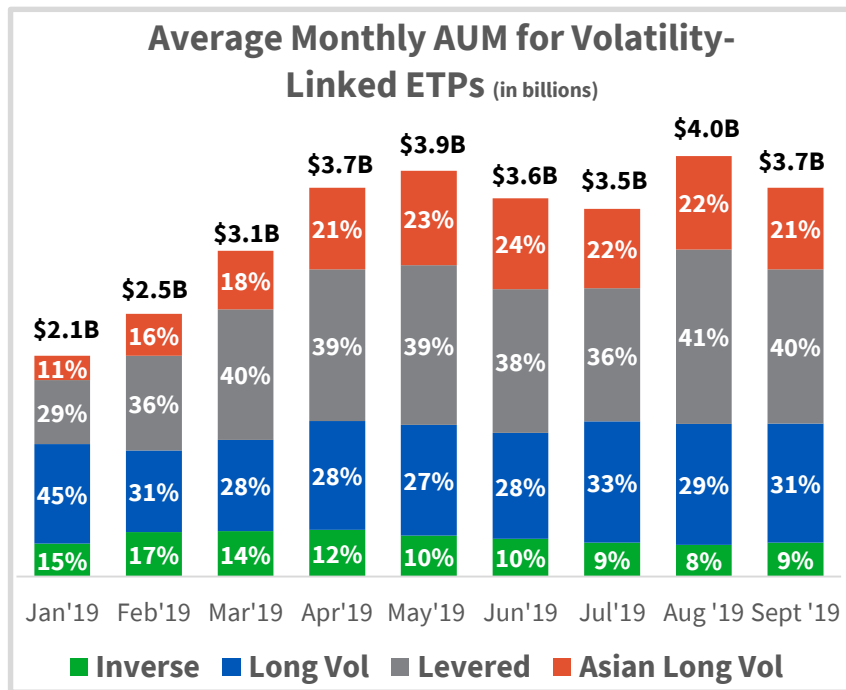
## Responding to customer demand

- ❖ Options-based strategies used by mutual funds and ETFs continue to be a growth driver
  - AUM tied to options-based strategies up 24% through August this year
- ❖ Added Monday expiring options to XSP, our mini-SPX contract
- ❖ Listed October 20 and November 20, 2020 Friday SPX options expirations
  - Provides greater precision going into the 2020 presidential election



# 3Q19 Results Primarily Driven by Higher Trading in Our Proprietary Products

- ❖ 19% increase in VIX futures ADV in 3Q19 versus 3Q18
- ❖ AUM in volatility-linked ETPs hit \$4.8B in early Oct.; highest level since Jan. 2018
- ❖ Average AUM of \$3.7B for 3Q19, unchanged from 2Q19



Source: Bloomberg;  
 Inverse = XIV and SVXY; Long Vol = VXX and VIXY; Levered = UVXY and TVIX; New = Fubon and Kokusai



# Focused on Growing our Proprietary Products Through Customer Education and Outreach



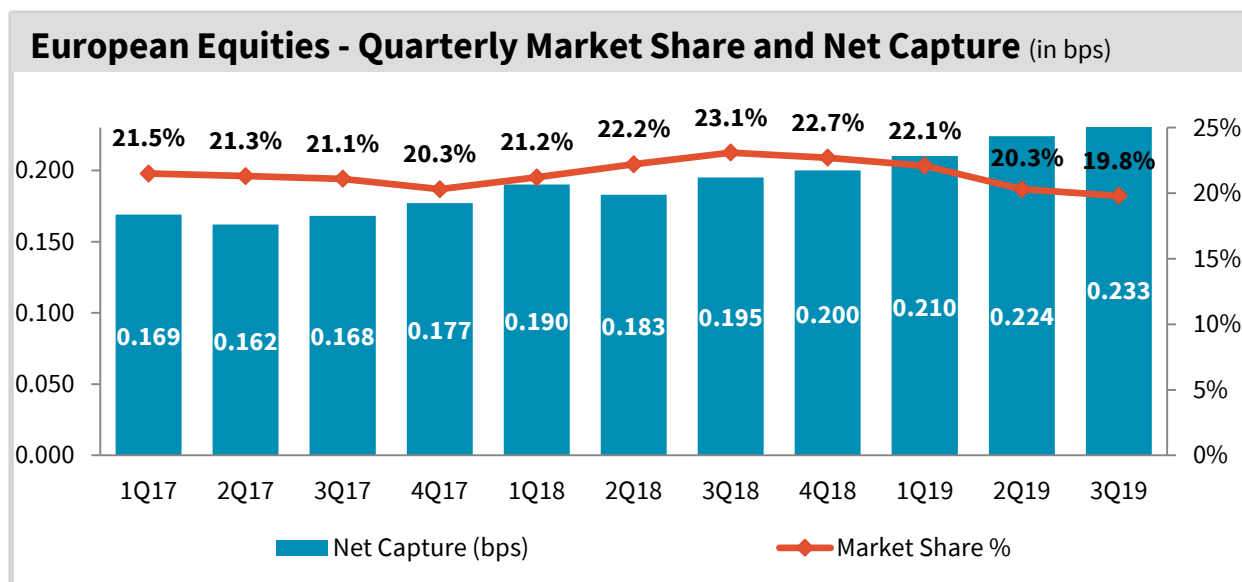
## Organic growth remains our primary focus

- ❖ Hosted 8<sup>th</sup> Annual RMC Europe on September 9-11, 2019 in Munich, Germany
- ❖ Attendees included participants from 16 different countries
- ❖ Industry experts delivered over 20 different presentations
- ❖ Continue to evolve our sales and coverage teams
- ❖ Educational forums dedicated to exploring the latest products, trading strategies and tactics used to manage risk exposure and enhance yields

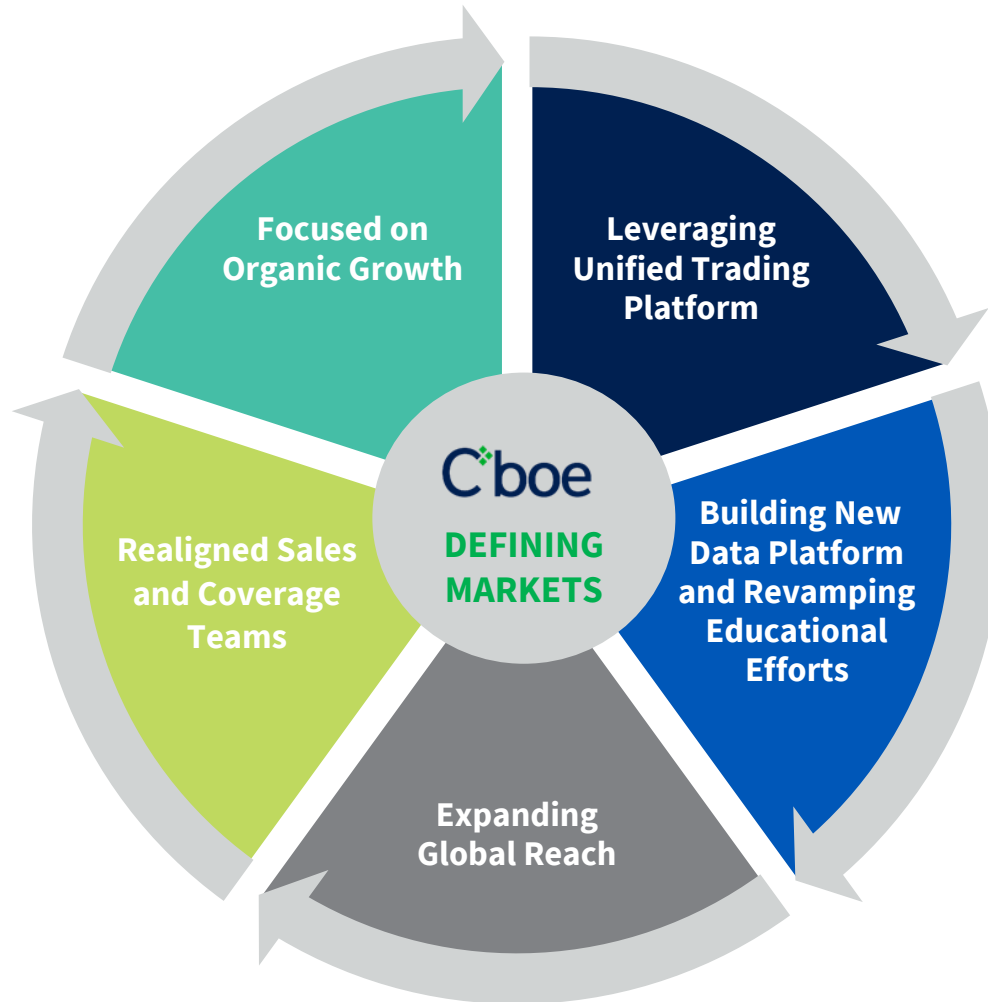


# European Equities – Preparing to Operate in a Post-Brexit Environment

- ❖ Leadership transition
- ❖ Lighter overall market volumes for European equities in 3Q19 vs 3Q18
- ❖ Launched our Dutch venue on October 1, with European Economic Area (EEA) stocks available for trading
- ❖ Our UK venue will continue to trade UK, as well as EEA stocks
- ❖ Launched Cboe Closing Cross on August 16



# Laying the Foundation for Future Growth

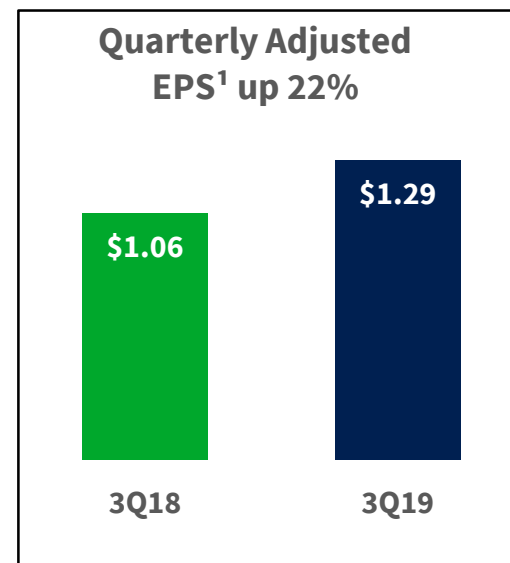
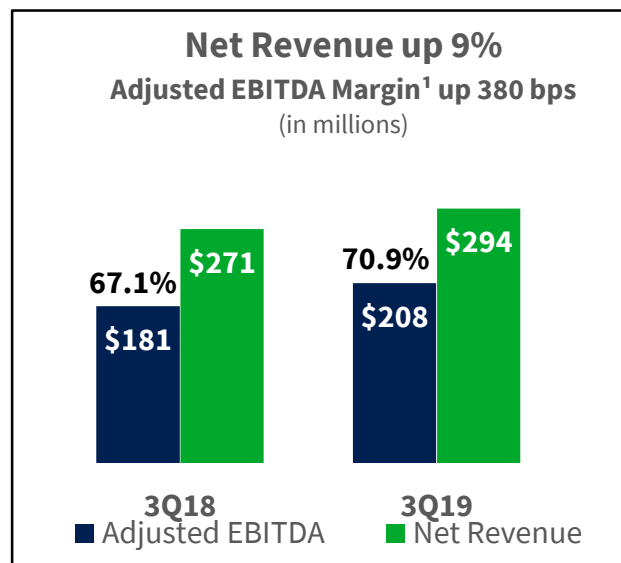
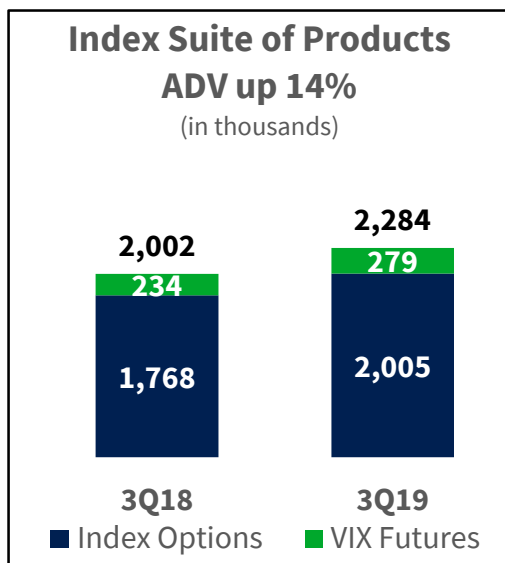




**Financial Overview and Guidance**  
**Brian Schell**  
**EVP, CFO and Treasurer**

# Business Highlights – Key Performance Drivers

- ❖ Higher trading volumes in proprietary products and lower volumes in other business segments and industrywide
- ❖ Net transaction fees<sup>1</sup> up 7%; non-transaction net revenue up 11%
- ❖ Continued expense discipline resulted in growth of EBITDA<sup>1</sup> and EBITDA<sup>1</sup> margin

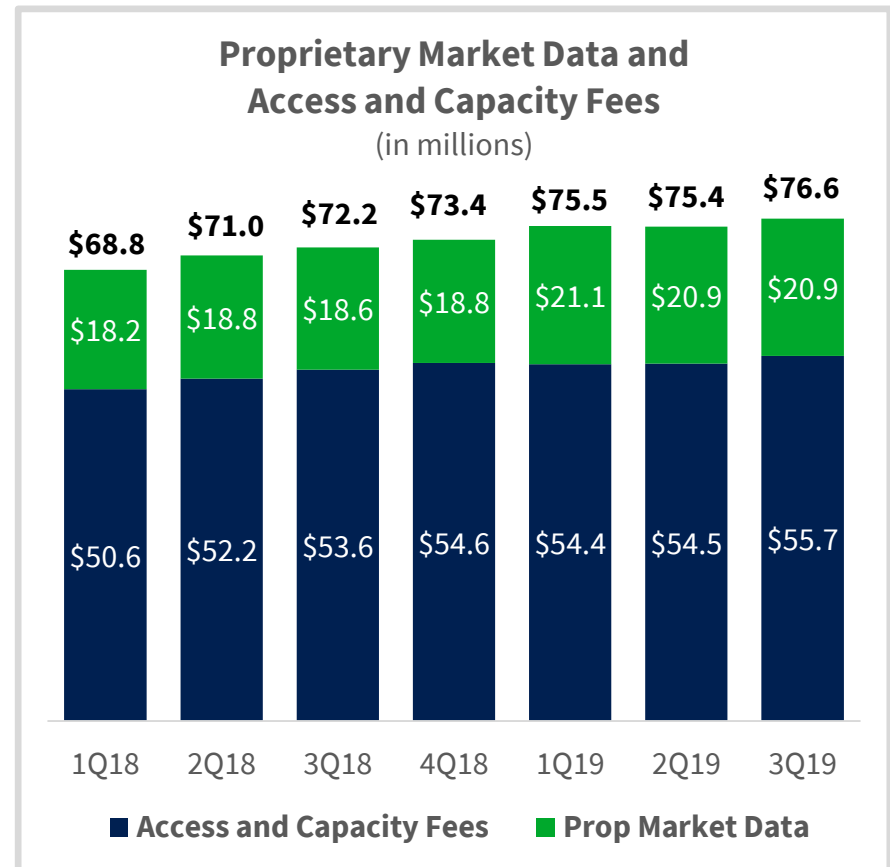


<sup>1</sup>See appendix for “Non-GAAP Information.”

# Grew Recurring Non-Transaction Revenue Streams

## Recurring proprietary non-transaction net revenue up 6% in 3Q19 vs 3Q18; up 7% YTD

- ❖ Expect growth in proprietary market data and access and capacity fees combined to be mid- to high-single digit in 2019
- ❖ About 75% of proprietary market data revenue growth in 3Q19 driven by additional subscriptions
- ❖ Nearly 85% of access and capacity fees were attributable to incremental units in 3Q19
- ❖ Technology migration expected to provide opportunities longer term



# Options 3Q19 Net Revenue Up 10%

- ❖ 3Q19 revenue increase primarily driven by growth in trading volume
- ❖ RPC variance primarily reflects higher volume-related discounts in multi-listed options as we captured higher market share
- ❖ Transaction revenue up 13%; non-transaction revenue up 4%

Options Selected Revenue Data (\$ in millions)	3Q19	3Q18	Chg
<b>Net Revenue</b>	<b>\$146.5</b>	<b>\$133.2</b>	<b>10%</b>
Net transaction fees <sup>1</sup>	\$116.7	\$103.5	13%
Index options	96.4	82.1	17%
Multi-listed options	20.3	21.4	-5%
Access and capacity	\$26.0	\$25.1	4%
Market data	\$13.8	\$10.6	30%
Market data – proprietary	7.0	4.6	52%
Market data – industry	6.8	6.0	13%

Options Key Operating Stats (in thousands, except RPC)	3Q19	3Q18	Chg
<b>Total market share</b>	<b>39.0%</b>	<b>36.8%</b>	<b>2.2 pts</b>
Index options	99.1%	98.9%	0.2 pts
Multi-listed options	32.2%	30.1%	2.1 pts
<b>Total ADV</b>	<b>7,720</b>	<b>6,733</b>	<b>15%</b>
Index options	2,005	1,768	13%
Multi-listed options	5,715	4,965	15%
<b>Total RPC</b>	<b>\$0.236</b>	<b>\$0.244</b>	<b>-3%</b>
Index options	\$0.751	\$0.737	2%
Multi-listed options	\$0.056	\$0.068	-18%

<sup>1</sup>See appendix for “Non-GAAP Information.”

# Futures 3Q19 Net Revenue Up 28%

- ❖ Revenue increase primarily driven by net transaction fees resulting from higher trading volume and RPC
- ❖ RPC increase primarily reflects new pricing schedules implemented in August and December of 2018 and lower volume-based rebates

<b>Futures Selected Revenue Data</b> (\$ in millions)	<b>3Q19</b>	<b>3Q18</b>	<b>Chg</b>
<b>Net Revenue</b>	<b>\$38.3</b>	<b>\$30.0</b>	<b>28%</b>
Net transaction fees <sup>1</sup>	\$31.2	\$25.7	21%
Access and capacity	\$4.0	\$3.8	5%
Market data - proprietary	\$1.6	\$1.7	-6%

<b>Futures Key Operating Stats</b> (in thousands, except RPC)	<b>3Q19</b>	<b>3Q18</b>	<b>Chg</b>
Total ADV	279	239	17%
Total RPC	\$1.746	\$1.709	2%

<sup>1</sup>See appendix for “Non-GAAP Information.”



# U.S. Equities 3Q19 Net Revenue Up 6%



- ❖ Revenue increase primarily due to higher SIP market data revenue, driven primarily by audit recoveries of \$4.3 million in 3Q19 versus none in 3Q18
- ❖ Transaction fees decreased 15%, reflecting lower net capture on relatively flat matched ADV, reflecting fee changes implemented to capture market share
- ❖ 3Q19 market share up 160 bps versus 2Q19

U.S. Equities Selected Revenue Data (\$ in millions)	3Q19	3Q18	Chg
<b>Net Revenue</b>	<b>\$75.4</b>	<b>\$71.4</b>	<b>6%</b>
Net transaction fees <sup>1</sup>	\$16.0	\$18.8	-15%
Market data	\$37.7	\$32.0	18%
Market data - SIP <sup>2</sup>	28.6	23.0	25%
Market data - proprietary	9.1	9.0	1%
Access and capacity fees	\$20.1	\$19.5	3%

U.S. Equities Key Operating Stats (shares in billions)	3Q19	3Q18	Chg
Total market share	17.2%	17.5%	-0.3 pts
Market ADV	6.9	6.3	10%
ADV (matched shares)	1.2	1.2	--
Net capture (per 100 touched shares)	\$0.020	\$0.026	-23%

<sup>1</sup>See appendix for "Non-GAAP Information."

<sup>2</sup>Includes \$4.3 million in SIP audit recoveries

# European Equities 3Q19 Net Revenue Down 2% on Local Currency Basis



- ❖ Net revenue decrease reflects lower net transaction fees and unfavorable foreign-currency translation
- ❖ On local currency basis, net transaction fees decreased 13% and non-transaction revenue increased 16%
- ❖ Decline in net transaction fees driven by lower overall industry volume and market share, offset somewhat by higher net capture

European Equities Selected Revenue Data (in millions)	3Q19	3Q18	Chg (\$)	Chg (£)
<b>Net Revenue (\$)</b>	<b>\$20.7</b>	<b>\$22.3</b>	<b>-7%</b>	<b>-2%</b>
Net transaction fees <sup>1</sup>	\$11.7	\$14.1	-17%	-13%
Access and capacity fees	\$3.9	\$3.6	8%	14%
Market data	\$3.0	\$3.1	-3%	4%
Other	\$2.1	\$1.5	40%	42%

European Equities Key Operating Stats (in billions, except net capture)	3Q19	3Q18	Chg
Total market share	19.8%	23.1%	-3.3 pts
Market ADV ( in billions)	€34.2	€41.4	-17%
Net capture (per matched notional value, in bps)	0.233	0.195	20%

<sup>1</sup>See appendix for “Non-GAAP Information.”

<sup>2</sup>Includes trade reporting

# Global FX 3Q19 Net Revenue Down 4%

- ❖ Revenue decline reflects lower market volume offset somewhat by higher net capture
- ❖ Higher net capture due to the impact of fee changes implemented in 2018

	3Q19	3Q18	Change
<b>FX Net Revenue</b> (in millions)	<b>\$13.1</b>	<b>\$13.6</b>	<b>-4%</b>
<b>Key Operating Statistics:</b>			
Market share <sup>1</sup>	14.1%	14.8%	-0.7 pts
Average Daily Notional Value (\$ in billions)	\$30.3	\$34.6	-12%
Net capture (per one million dollars traded)	\$2.80	\$2.63	7%

<sup>1</sup>Market share represents Cboe FX volume divided by the total volume of publicly reporting spot FX venues (Cboe FX, EBS, Refinitiv, and FastMatch).

# Adjusted Operating Expenses Down 3%

## 3Q19 vs 3Q18:

- ❖ Compensation and benefits down due to decrease in incentive – and equity-based compensation, offset somewhat by higher benefits
- ❖ Lowering full-year 2019 adjusted operating expense guidance to a range of \$390 to \$395 million, a decrease of \$15 to \$18 million

Adjusted Operating Expenses <sup>1</sup> (in millions)	3Q19	3Q18	% Chg
Compensation and benefits	\$49.7	\$51.8	-4%
Depreciation and amortization <sup>1</sup>	9.5	10.9	-13%
Technology support services	10.6	10.6	--
Professional fees and outside services	17.5	16.6	5%
Travel and promotional	2.7	2.6	4%
Facilities costs	2.7	3.3	-18%
Other expenses	3.8	3.3	15%
Total <sup>1</sup>	\$96.5	\$99.1	-3%

<sup>1</sup>Adjusted to reflect the impact of certain items. See Appendix for “Non-GAAP Information.”

# Factors Influencing 2020 Adjusted Operating Expenses

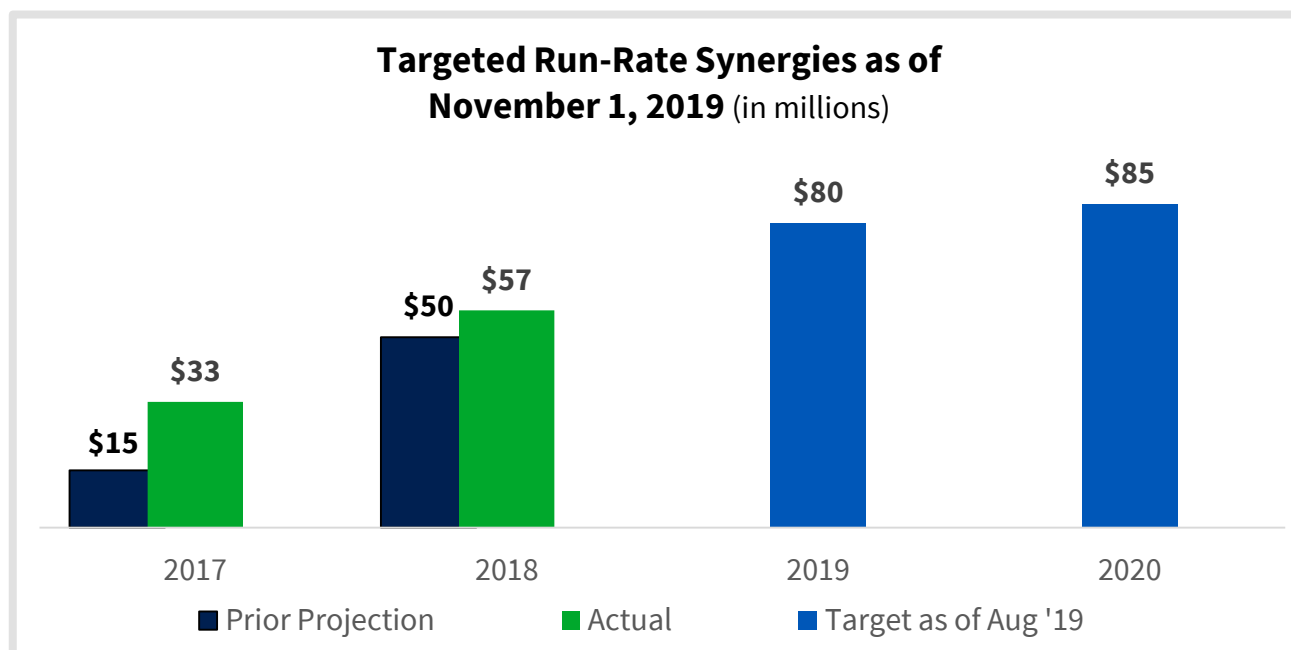


- ❖ 2020 adjusted operating expenses<sup>1</sup> expected to be in a range of \$420 to \$428 million, which takes into account the following potential factors:
  - Achieving targeted incentive compensation in 2020
  - Absence of \$6 million in favorable expense adjustments realized in 2019
  - Transition to new corporate headquarters in 2020 and trading floor move in 2021
  - Benefit of synergies expected to be realized in 2020
  - Continuation of investing in our strategic growth initiatives
  - Any potential negative P&L impact from software development expense versus capitalization

<sup>1</sup>Subject to revision based upon finalization of our 2020 business plan

# Maintaining Synergy Targets

- ❖ Maintaining 2019 run-rate synergy target of \$80 million and 2020 target of \$85 million
- ❖ Remaining synergies of \$5 million in 2020 will be reflected in a reduction in cost of revenues versus expenses



# 2019 Full-Year Guidance

<b>2019 Full-Year Guidance</b> (\$ in millions)	<b>Guidance as of</b> <b>Aug. 2, 2019</b>	<b>Guidance as of</b> <b>Nov. 1, 2019</b>
<b>Adjusted operating expenses<sup>1,4</sup></b>	\$405 to \$413 million	\$390 to \$395 million
<b>Depreciation and amortization (excluding amortization of acquired intangible assets)</b>	\$35 to \$40 million	\$35 to \$40 million
<b>Effective tax rate on adjusted earnings</b>	27% to 29% <sup>2</sup>	25.5% to 27.5%
<b>Capital expenditures</b>	\$50 to \$55 million <sup>3</sup>	\$35 to \$40 million

<sup>1</sup>Adjusted operating expenses for 2019 exclude acquisition-related expenses and amortization of acquired intangible assets, which are expected to be \$138 million for 2019. Adjustments included in the non-GAAP reconciliation.

<sup>2</sup>Expect effective tax rate on adjusted earnings for 2019 to be at lower end of guidance range.

<sup>3</sup>Expect capital expenditures to be at the lower end of the guidance range.

<sup>4</sup>Adjusted operating expenses for 2020 expected to be in a range of \$420 to \$428 million, excluding acquisition-related expenses and amortization of intangible assets.

# Focused on Efficient Allocation of Capital to Create Long-Term Shareholder Value



## Preserving balance sheet flexibility is a priority

- ❖ Returned capital through dividends and opportunistic share repurchases - nearly \$93MM in 3Q19; \$197MM YTD 2019
- ❖ Utilized cash to reduce debt - \$50MM in 3Q19 and \$350MM YTD
- ❖ Increased share repurchase authorization by \$250MM

Debt Outstanding (\$ in millions)	Sept. 30, 2019	June 30, 2019	Mar. 31, 2019	Dec. 31, 2018	Sept. 30, 2018
<b>3.650% Senior Notes (10Y; Due 2027)</b>	\$650	\$650	\$650	\$650	\$650
<b>1.950% Senior Notes (2Y; Due 2019)</b>	-	-	300	300	300
<b>Term Loan Facility</b>	225	275	275	275	275
<b>Total Debt (Gross)</b>	<b>\$ 875</b>	<b>\$ 925</b>	<b>\$ 1,225</b>	<b>\$ 1,225</b>	<b>\$ 1,225</b>
<b>Debt to EBITDA TTM<sup>1</sup></b>	<b>1.1x</b>	<b>1.2x</b>	<b>1.5x</b>	<b>1.5x</b>	<b>1.6x</b>
<b>Adjusted Cash &amp; Financial Investments<sup>1</sup></b>	<b>\$151</b>	<b>\$136</b>	<b>\$348</b>	<b>\$258</b>	<b>\$138</b>
<b>Dividends Paid</b>	<b>\$40.4</b>	<b>\$34.8</b>	<b>\$34.8</b>	<b>\$34.7</b>	<b>\$34.7</b>
<b>Share Repurchases</b>	<b>\$52.4</b>	<b>--</b>	<b>\$35.0</b>	<b>--</b>	<b>\$49.1</b>

<sup>1</sup>See Appendix for "Non-GAAP Information."



# Delivering on Sources of Operating Leverage and Key Strategic Initiatives While Defining Markets Globally



## Growth of Core Proprietary Products

- Focused on growing proprietary index products

## Strengthen Recurring Revenue Stream

- Growth in recurring revenue

## Scale of Business Model

- Disciplined expense management

## Synergies Realization

- Complete integration plan and deliver on our synergies

## Capital Allocation

- Returned capital through dividends
- Focused on maintaining balance sheet flexibility
- Reduced debt; leverage ratio at 1.1x at Sept. 30, 2019

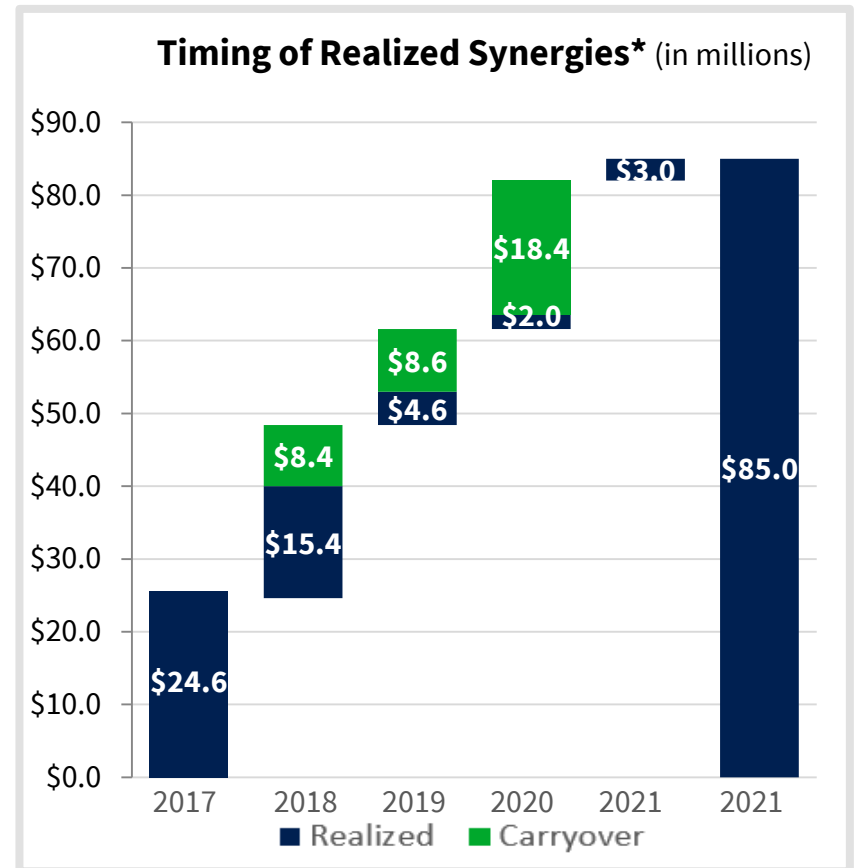
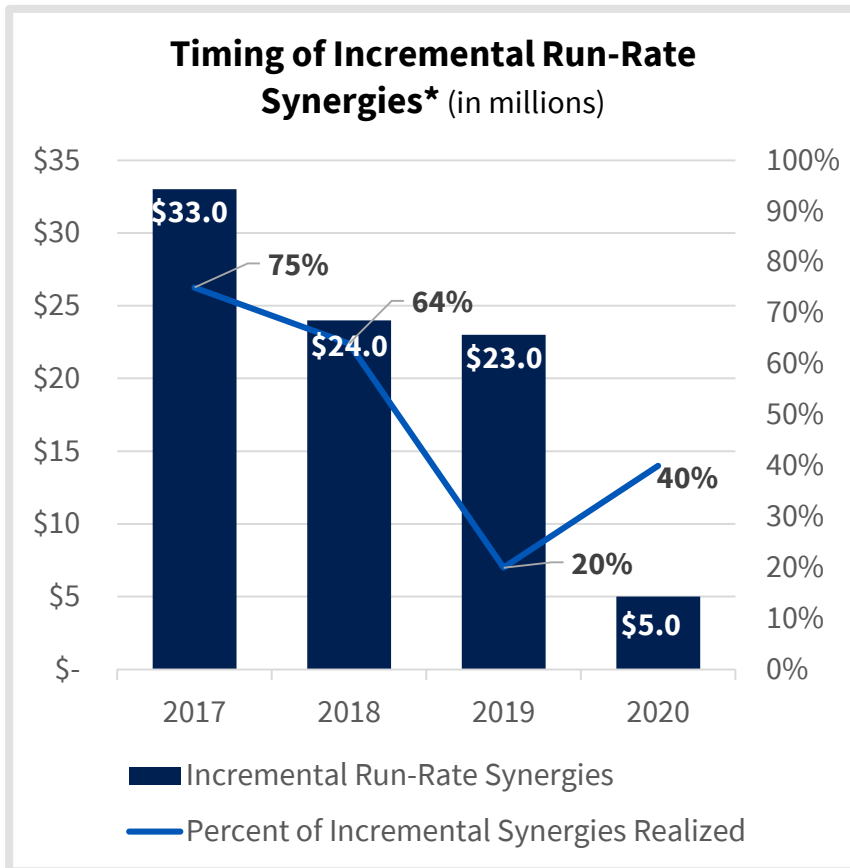
# Questions & Answers

# Appendix Materials



# Realized Versus Run-Rate Synergies

**2019 realized synergies expected to be lower due to timing of C1 migration in October 2019**



\*Actual through 2018; reflects target as of November 1, 2019, for 2019 and 2020.

# Targeted Run-Rate Synergies Realization

(in millions)	Targeted Run-Rate Synergies	Increase in Run-Rate Each Year	% of Incremental Run-Rate Synergies Realized/Targeted	Actual/Targeted Realized Synergies	Carryover from Prior Year Run-Rate	Total Synergies Realized/Targeted by Year	Cumulative Synergies Realized/Targeted
2017 Actual	\$33.0	\$33.0	75%	\$24.6	\$0.0	\$24.6	\$24.6
2018 Actual	\$57.0	24.0	64%	15.4	8.4	23.8	\$48.4
2019 Target*	\$80.0	23.0	20%	4.6	8.6	13.2	\$61.6
2020 Target*	\$85.0	5.0	40%	2.0	18.4	20.4	\$82.0
2021 Target*					3.0	3.0	\$85.0
<b>Total</b>		<b>\$85.0</b>		<b>\$46.6</b>	<b>\$38.4</b>	<b>\$85.0</b>	

\*Reflects target as of November 1, 2019

# 3Q19 Financial Overview

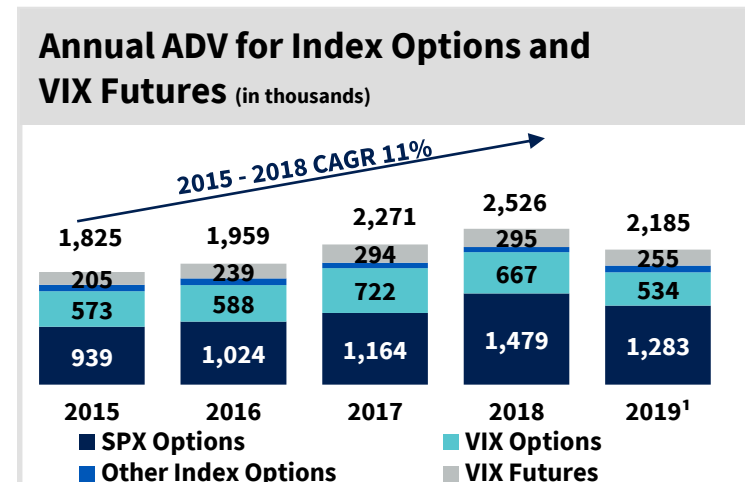
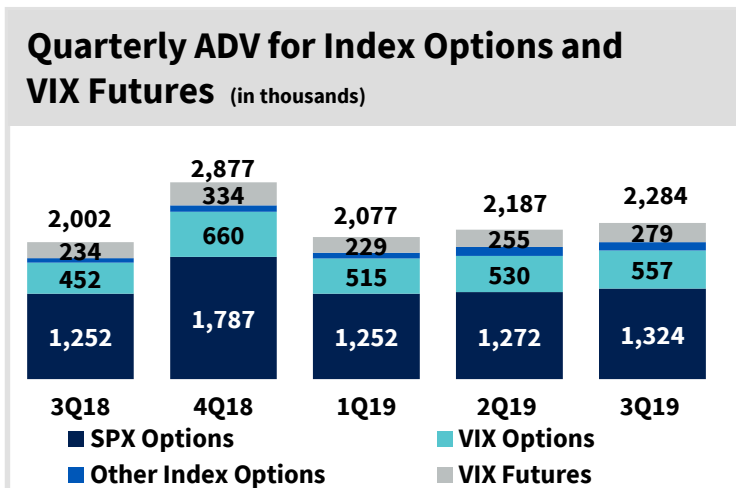
<b>Adjusted Financial Results<sup>1</sup></b> (\$ in millions, except per share)	<b>3Q19</b>	<b>3Q18</b>	<b>% Chg</b>
Net Revenue <sup>2</sup>	\$294.0	\$270.5	9%
Adjusted Operating Expenses <sup>1</sup>	96.5	99.1	-3%
Adjusted Operating Income <sup>1</sup>	\$197.5	\$171.4	15%
<i>Adjusted Operating Margin<sup>1</sup></i>	<i>67.2%</i>	<i>63.4%</i>	<i>380 bps</i>
Adjusted Net Income Allocated to Common Stockholders <sup>1</sup>	\$144.6	\$118.3	22%
Adjusted Diluted EPS <sup>1</sup>	\$ 1.29	\$ 1.06	22%
Adjusted EBITDA <sup>1</sup>	\$208.3	\$181.4	15%
<i>Adjusted EBITDA Margin<sup>1</sup></i>	<i>70.9%</i>	<i>67.1%</i>	<i>380 bps</i>

<sup>1</sup>Adjusted to reflect the impact of certain items. See Appendix for “Non-GAAP Information.”

<sup>2</sup>Net revenue referenced in this presentation represents revenue less cost of revenue.

# 3Q19 Results Primarily Driven by Higher Trading in Our Proprietary Products

- ❖ Index suite ADV increased 14% in 3Q19 vs 3Q18
- ❖ Index options ADV increased 13%
  - 23% increase in VIX options
  - 6% increase in SPX options
- ❖ VIX futures increased 19%



<sup>1</sup>Adjusted to reflect the impact of certain items. See Appendix for “Non-GAAP Information.”

<sup>1</sup>Through September 30, 2019

# 3Q19 Net Revenue Detail

## 3Q19 net transaction fees up 7%; non-transaction net revenue up 11%

<b>Net Revenue</b> (in millions)	<b>3Q19</b>	<b>3Q18</b>	<b>% Chg</b>
Net transaction fees <sup>1</sup>	\$186.8	\$173.9	7%
Access and capacity fees	55.7	53.6	4%
Market data fees	56.3	47.6	18%
Regulatory fees	8.7	8.4	4%
Royalty fees	(22.9)	(20.7)	11%
Other revenue	9.4	7.7	22%
<b>Total</b>	<b>\$294.0</b>	<b>\$270.5</b>	<b>9%</b>

<sup>1</sup>See Appendix for “Non-GAAP Information.”



# Supplemental Segment Information

3Q19 Supplemental Net Revenue by Segment (in millions)	Options	U.S. Equities	Futures	European Equities	Global FX	Total <sup>1</sup>
Net transaction fees <sup>2</sup>	\$116.7	\$16.0	\$31.2	\$11.7	\$11.2	\$186.8
Proprietary net transaction fees included above	\$96.4		\$31.2			\$127.6
Access and capacity fees	\$26.0	\$20.1	\$4.0	\$3.9	\$1.7	\$55.7
Market data fees	\$13.8	\$37.7 <sup>3</sup>	\$1.6	\$3.0	\$0.2	\$56.3
Proprietary market data fees included above	\$7.0	\$9.1	\$1.6	\$3.0	\$0.2	\$20.9

3Q18 Supplemental Net Revenue by Segment (in millions)	Options	U.S. Equities	Futures	European Equities	Global FX	Total <sup>1</sup>
Net transaction fees <sup>2</sup>	\$103.5	\$18.8	\$25.7	\$14.1	\$11.8	\$173.9
Proprietary net transaction fees included above	\$82.1		\$25.7			\$107.8
Access and capacity fees	\$25.1	\$19.5	\$3.8	\$3.6	\$1.6	\$53.6
Market data fees	\$10.6	\$32.0	\$1.7	\$3.1	\$0.2	\$47.6
Proprietary market data fees included above	\$4.6	\$9.0	\$1.7	\$3.1	\$0.2	\$18.6

<sup>1</sup>Totals may not foot due to rounding.

<sup>2</sup>A full reconciliation of our non-GAAP results to our GAAP results is included in the following tables. See "Non-GAAP Information" in the accompanying financial tables.

<sup>3</sup>Includes \$4.3 million in SIP audit recoveries

# Non-GAAP Information



## Non-GAAP Information

In addition to disclosing results determined in accordance with GAAP, Cboe Global Markets has disclosed certain non-GAAP measures of operating performance. These measures are not in accordance with, or a substitute for GAAP, and may be different from or inconsistent with non-GAAP financial measures used by other companies. The non-GAAP measures provided in this presentation include net transaction fees, adjusted operating expenses, adjusted operating income, adjusted operating margin, adjusted net income allocated to common stockholders and adjusted diluted earnings per share, adjusted tax rate, adjusted cash and financial investments, EBITDA, EBITDA margin, adjusted EBITDA and adjusted EBITDA margin.

Management believes that the non-GAAP financial measures presented in this presentation, including adjusted operating income and adjusted operating expenses, provide additional and comparative information to assess trends in our core operations and a means to evaluate period-to-period comparisons. Non-GAAP financial measures disclosed by management are provided as additional information to investors in order to provide them with an alternative method for assessing our financial condition and operating results.

*Amortization expense of acquired intangible assets:* We amortize intangible assets acquired in connection with various acquisitions. Amortization of intangible assets is inconsistent in amount and frequency and is significantly affected by the timing and size of our acquisitions. 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 the company. Therefore, we believe performance measures excluding intangible asset amortization expense provide investors with an additional basis for comparison across accounting periods.

*Acquisition-related expenses:* From time to time, we have pursued small bolt-on acquisitions and in 2017 completed a larger transformative acquisition, which have resulted in expenses which would not otherwise have been incurred in the normal course of the company's business operations. These expenses 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 an additional analysis of Cboe's ongoing operating performance or comparisons in Cboe's performance between periods.

**The tables below show the reconciliation of each financial measure from GAAP to non-GAAP. The non-GAAP financial measures exclude the impact of those items detailed below and are referred to as adjusted financial measures.**

## Non-GAAP Information

<b>Reconciliation of Net Transaction Fees by Segment</b>						
<b>For the Three Months Ended Sept. 30, 2019</b>						
<b>(in millions)</b>	<b>Options</b>	<b>U.S. Equities</b>	<b>Futures</b>	<b>European Equities</b>	<b>Global FX</b>	<b>Total</b>
Transaction fees	\$ 207.1	\$ 199.4	\$ 31.2	\$ 16.9	\$ 11.2	\$ 465.8
Liquidity payments	(86.9)	(177.6)	-	(5.2)	-	(269.7)
Routing and clearing	(3.5)	(5.8)	-	-	-	(9.3)
Net transaction fees	<u>\$ 116.7</u>	<u>\$ 16.0</u>	<u>\$ 31.2</u>	<u>\$ 11.7</u>	<u>\$ 11.2</u>	<u>\$ 186.8</u>
<b>For the Three Months Ended Sept. 30, 2018</b>						
<b>(in millions)</b>	<b>Options</b>	<b>U.S. Equities</b>	<b>Futures</b>	<b>European Equities</b>	<b>Global FX</b>	<b>Total</b>
Transaction fees	\$ 175.2	\$ 176.7	\$ 25.7	\$ 22.4	\$ 11.8	\$ 411.8
Liquidity payments	(68.2)	(152.7)	-	(8.3)	-	(229.2)
Routing and clearing	(3.5)	(5.2)	-	-	-	(8.7)
Net transaction fees	<u>\$ 103.5</u>	<u>\$ 18.8</u>	<u>\$ 25.7</u>	<u>\$ 14.1</u>	<u>\$ 11.8</u>	<u>\$ 173.9</u>

# Non-GAAP Information

(in millions, except per share amounts)	1Q18	2Q18	3Q18	4Q18	2018	1Q19	2Q19	3Q19
<b>Reconciliation of Net Income Allocated to Common Stockholders to Non-GAAP</b>								
Net income allocated to common stockholders	\$ 117.3	\$ 82.4	\$ 85.0	\$ 137.3	\$ 422.1	\$ 94.6	\$ 87.6	\$ 105.5
Acquisition-related expenses (1)	8.8	8.6	5.9	6.7	30.0	2.3	20.8	16.7
Amortization of acquired intangible assets (2)	42.1	39.7	39.4	39.4	160.6	37.6	34.1	33.4
Change in contingent consideration	-	-	-	0.1	0.1	-	-	-
<b>Total Non-GAAP operating expense adjustments</b>	<b>50.9</b>	<b>48.3</b>	<b>45.3</b>	<b>46.2</b>	<b>190.7</b>	<b>39.9</b>	<b>54.9</b>	<b>50.1</b>
Interest and other borrowing costs	-	-	-	-	-	-	-	-
Provision for uncollectable convertible notes receivable	-	-	-	-	-	-	-	-
Change in redemption value of noncontrolling interest	0.3	0.3	0.3	0.4	1.3	0.2	0.2	0.1
<b>Total Non-GAAP adjustments - pretax</b>	<b>51.2</b>	<b>48.6</b>	<b>45.6</b>	<b>46.6</b>	<b>192.0</b>	<b>40.1</b>	<b>55.1</b>	<b>50.2</b>
Income tax expense related to the items above	(13.0)	(12.6)	(12.1)	(11.7)	(49.4)	(10.0)	(13.2)	(11.0)
Tax provision re-measurement	-	-	-	(0.4)	(0.4)	-	-	-
Impairment charges attributed to noncontrolling interest	-	-	-	-	-	-	(3.6)	-
Net income allocated to participating securities - effect on reconciling items	(0.3)	(0.2)	(0.2)	(0.2)	(0.9)	(0.2)	(0.2)	(0.1)
<b>Adjusted net income allocated to common stockholders</b>	<b>\$ 155.2</b>	<b>\$ 118.2</b>	<b>\$ 118.3</b>	<b>\$ 171.6</b>	<b>\$ 563.4</b>	<b>\$ 124.5</b>	<b>\$ 125.7</b>	<b>\$ 144.6</b>
<b>Reconciliation of Diluted EPS to Non-GAAP</b>								
Diluted earnings per common share	\$ 1.04	\$ 0.73	\$ 0.76	\$ 1.23	\$ 3.76	\$ 0.85	\$ 0.78	\$ 0.94
Per share impact of non-GAAP adjustments noted above	0.34	0.32	0.30	0.31	1.26	0.26	0.35	0.35
<b>Adjusted diluted earnings per common share</b>	<b>\$ 1.38</b>	<b>\$ 1.05</b>	<b>\$ 1.06</b>	<b>\$ 1.54</b>	<b>\$ 5.02</b>	<b>\$ 1.11</b>	<b>\$ 1.13</b>	<b>\$ 1.29</b>
<b>Reconciliation of Operating Margin to Non-GAAP</b>								
Revenue less cost of revenue	\$ 328.5	\$ 283.5	\$ 270.5	\$ 334.4	\$ 1,216.9	\$ 280.5	\$ 283.2	\$ 294.0
Non-GAAP adjustments noted above	-	-	-	-	-	-	-	-
<b>Adjusted revenue less cost of revenue</b>	<b>\$ 328.5</b>	<b>\$ 283.5</b>	<b>\$ 270.5</b>	<b>\$ 334.4</b>	<b>\$ 1,216.9</b>	<b>\$ 280.5</b>	<b>\$ 283.2</b>	<b>\$ 294.0</b>
<b>Operating expenses (3)</b>								
Non-GAAP expense adjustments noted above	(50.9)	(48.3)	(45.3)	(46.2)	(190.7)	(39.9)	54.9	50.1
<b>Adjusted operating expenses</b>	<b>\$ 109.9</b>	<b>\$ 106.1</b>	<b>\$ 99.1</b>	<b>\$ 111.8</b>	<b>\$ 426.8</b>	<b>\$ 94.1</b>	<b>\$ 103.1</b>	<b>\$ 96.5</b>
Operating income	\$ 167.7	\$ 129.1	\$ 126.1	\$ 176.4	\$ 599.4	\$ 146.5	\$ 125.2	\$ 147.4
Non-GAAP expense adjustments noted above	50.9	48.3	45.3	46.2	190.7	39.9	54.9	50.1
<b>Adjusted operating income</b>	<b>\$ 218.6</b>	<b>\$ 177.4</b>	<b>\$ 171.4</b>	<b>\$ 222.6</b>	<b>\$ 790.1</b>	<b>\$ 186.4</b>	<b>\$ 180.1</b>	<b>\$ 197.5</b>
<b>Adjusted operating margin (4)</b>	<b>66.5%</b>	<b>62.6%</b>	<b>63.4%</b>	<b>66.6%</b>	<b>64.9%</b>	<b>66.5%</b>	<b>63.6%</b>	<b>67.2%</b>
<b>Reconciliation of Income Tax Rate to Non-GAAP</b>								
Income before income taxes	\$ 159.4	\$ 119.8	\$ 116.3	\$ 175.6	\$ 571.2	\$ 127.8	\$ 119.6	\$ 140.9
Non-GAAP adjustments noted above	51.2	48.6	45.6	46.6	192.0	40.1	55.1	50.2
<b>Adjusted income before income taxes</b>	<b>\$ 210.6</b>	<b>\$ 168.4</b>	<b>\$ 161.9</b>	<b>\$ 222.2</b>	<b>\$ 763.2</b>	<b>\$ 167.9</b>	<b>\$ 174.7</b>	<b>\$ 191.1</b>
Income tax (benefit) expense	\$ 41.3	\$ 36.8	\$ 30.6	\$ 37.3	\$ 146.0	\$ 32.6	\$ 35.1	\$ 35.0
Non-GAAP adjustments noted above	13.0	12.6	12.1	11.7	49.4	10.0	13.2	11.0
<b>Adjusted income tax (benefit) expense</b>	<b>\$ 54.3</b>	<b>\$ 49.4</b>	<b>\$ 42.7</b>	<b>\$ 49.0</b>	<b>\$ 195.4</b>	<b>\$ 42.6</b>	<b>\$ 48.3</b>	<b>\$ 46.0</b>
<b>Adjusted income tax rate</b>	<b>25.8%</b>	<b>29.4%</b>	<b>26.4%</b>	<b>22.1%</b>	<b>25.6%</b>	<b>25.4%</b>	<b>27.7%</b>	<b>24.1%</b>

(1) This amount includes professional fees and outside services, severance, facilities expenses, impairment charges and other costs related to the company's acquisitions.

(2) This amount represents the amortization of acquired intangible assets related to the company's acquisitions.

(3) The company sponsors deferred compensation plans held in a rabbi trust. The expenses related to the deferred compensation plans are included in "Compensation and benefits" (\$30 thousand and \$3.7 million in expense in the three and nine months ended September 30, 2019, respectively), and are directly offset by deferred compensation income, expenses and dividends included within "Other income (expense)" (\$30 thousand and \$3.7 million in income, expense and dividends in the three and nine months ended September 30, 2019, respectively), on the consolidated statements of income. The deferred compensation plans' expenses are not adjusted out of "adjusted operating expenses" and do not have an impact on "Income before income taxes."

(4) Adjusted operating margin represents adjusted operating income divided by adjusted revenue less cost of revenue.

# Non-GAAP Information

## **EBITDA Reconciliations**

EBITDA (earnings before interest, income taxes, depreciation and amortization) and Adjusted EBITDA are widely used non-GAAP financial measures of operating performance. EBITDA margin represents EBITDA divided by revenues less cost of revenues (net revenue). It is presented as supplemental information that the company believes is useful to investors to evaluate its results because it excludes certain items that are not directly related to the company's core operating performance. EBITDA is calculated by adding back to net income interest expense, income tax expense, depreciation and amortization. Adjusted EBITDA is calculated by adding back to EBITDA acquisition-related expenses and impairment charges attributed to noncontrolling interest. EBITDA and Adjusted EBITDA should not be considered as substitutes either for net income, as an indicator of the company's operating performance, or for cash flow, as a measure of the company's liquidity. In addition, because EBITDA and Adjusted EBITDA may not be calculated identically by all companies, the presentation here may not be comparable to other similarly titled measures of other companies. Adjusted EBITDA margin represents Adjusted EBITDA divided by net revenue.

<b>Reconciliation of Net Income Allocated to Common Stockholders to EBITDA and Adjusted EBITDA</b>								
<b>(in millions, except per share amounts)</b>	<b>1Q18</b>	<b>2Q18</b>	<b>3Q18</b>	<b>4Q18</b>	<b>2018</b>	<b>1Q19</b>	<b>2Q19</b>	<b>3Q19</b>
<b>Net income allocated to common stockholders</b>	\$ 117.3	\$ 82.4	\$ 85.0	\$ 137.3	\$ 422.1	\$ 94.6	\$ 87.6	\$ 105.5
Interest expense	9.6	9.3	9.6	9.7	38.2	9.9	10.0	8.2
Income tax provision	41.3	36.8	30.6	37.3	146.0	32.6	35.1	35.0
Depreciation and amortization	54.2	50.4	50.3	49.1	204.0	47.2	43.7	42.9
<b>EBITDA</b>	<b>\$ 222.4</b>	<b>\$ 178.9</b>	<b>\$ 175.5</b>	<b>\$ 233.4</b>	<b>\$ 810.3</b>	<b>\$ 184.3</b>	<b>\$ 176.4</b>	<b>\$ 191.6</b>
<b>EBITDA Margin</b>	<b>67.7%</b>	<b>63.1%</b>	<b>64.9%</b>	<b>69.8%</b>	<b>66.6%</b>	<b>65.7%</b>	<b>62.3%</b>	<b>65.2%</b>
<b>Non-GAAP adjustments not included in above line items</b>								
Acquisition-related expenses	8.8	8.6	5.9	6.7	30.0	2.3	20.8	16.7
Impairment charges attributed to noncontrolling interest	-	-	-	-	-	-	(3.6)	-
Other	-	-	-	0.1	0.1	-	-	-
<b>Adjusted EBITDA</b>	<b>\$ 231.2</b>	<b>\$ 187.5</b>	<b>\$ 181.4</b>	<b>\$ 240.2</b>	<b>\$ 840.4</b>	<b>\$ 186.6</b>	<b>\$ 193.6</b>	<b>\$ 208.3</b>
<b>Adjusted EBITDA Margin</b>	<b>70.4%</b>	<b>66.1%</b>	<b>67.1%</b>	<b>71.8%</b>	<b>69.1%</b>	<b>66.5%</b>	<b>68.4%</b>	<b>70.9%</b>

## Non-GAAP Information

### Adjusted Debt to EBITDA - Trailing Twelve Months<sup>1</sup>

(in millions)	4Q18	1Q19	2Q19	3Q19	LTM
Net income allocated to common stockholders	\$ 137.3	\$ 94.6	\$ 87.6	\$ 105.5	\$ 425.0
Interest expense, net	9.7	9.9	10.0	8.2	37.8
Income tax provision	37.3	32.6	35.1	35.0	140.0
Depreciation and amortization	49.1	47.2	43.7	42.9	182.9
EBITDA	\$ 233.4	\$ 184.3	\$ 176.4	\$ 191.6	\$ 785.7
Non-GAAP adjustments not included in above line items:					
Acquisition-related expenses	6.7	2.3	20.8	16.7	46.5
Impairment charges attributed to noncontrolling interest	-	-	(3.6)		(3.6)
Other	0.1	-	-	-	0.1
Adjusted EBITDA	\$ 240.2	\$ 186.6	\$ 193.6	\$ 208.3	\$ 828.7
Debt at end of period					\$ 875.0
<b>Debt to EBITDA</b>					<b>1.1x</b>

<sup>1</sup>A full reconciliation of our non-GAAP to our GAAP results are available in this section.

### Adjusted Cash

Adjusted cash is a non-GAAP measure and represents cash and cash equivalents plus financial investments minus deferred compensation plan assets and cash collected for Section 31 fees, which will need to be remitted in the near term. We have presented adjusted cash because we consider it an important supplemental measure of our liquidity and believe that it is frequently used by analysts, investors and other interested parties in the evaluation of companies.

Adjusted Cash (in millions)	As of	As of	As of	As of	As of	As of	As of
	3/31/18	6/30/18	9/30/18	12/31/18	3/31/19	6/30/19	9/30/19
Cash and cash equivalents	\$ 166.3	\$ 140.0	\$ 88.5	\$ 275.1	\$ 346.2	\$ 161.3	\$ 150.0
Financial investments	64.0	131.8	49.2	35.7	30.2	82.9	21.4
Less deferred compensation plan assets	-	-	-	-	-	(20.3)	(20.9)
Less cash collected for Section 31 fees	(64.0)	(155.8)	-	(53.1)	(28.6)	(88.0)	-
<b>Adjusted Cash</b>	<b>\$ 166.3</b>	<b>\$ 116.0</b>	<b>\$ 137.7</b>	<b>\$ 257.7</b>	<b>\$ 347.8</b>	<b>\$ 135.9</b>	<b>\$ 150.5</b>



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