



**VIRTU FINANCIAL**



## **Second Quarter 2017 - Supplemental Materials**

August 8, 2017

## **CAUTIONARY STATEMENT REGARDING FORWARD LOOKING STATEMENTS**

This presentation may contain “forward-looking statements” made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Statements regarding Virtu Financial, Inc.’s (“Virtu’s” or “our”) business that are not historical facts are forward-looking statements. Forward-looking statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times at, or by which, such performance or results will be achieved. The Company assumes no obligation to update forward-looking statements to reflect actual results, changes in assumptions or changes in other factors affecting forward-looking information, and if the Company does update one or more forward-looking statements, no inference should be drawn that the Company will make additional updates with respect thereto or with respect to other forward-looking statements. Forward-looking statements are based on information available at the time and/or management’s good faith belief with respect to future events, and is subject to risks and uncertainties, some or all of which are not predictable or within Virtu’s control, that could cause actual performance or results to differ materially from those expressed in the statements. Those risks and uncertainties include, without limitation: fluctuations in trading volume and volatilities in the markets in which we operate; the ability of our trading counterparties and various clearing houses to perform their obligations to us; the performance and reliability of our customized trading platform; the risk of material trading losses from our market making activities; swings in valuations in securities or other instruments in which we hold positions; increasing competition and consolidation in our industry; the effect of the acquisition of KCG Holdings, Inc. (“KCG”) on existing business relationships, operating results, and ongoing business operations generally; the significant costs and significant indebtedness that we incurred in connection with the acquisition of KCG; the risk that we may encounter significant difficulties or delays in integrating the two businesses and the anticipated benefits, cost savings and synergies or capital release may not be achieved; the assumption of potential liabilities relating to KCG’s business; the risk that cash flow from our operations and other available sources of liquidity will not be sufficient to fund our various ongoing obligations, including operating expenses, capital expenditures, debt service and dividend payments; regulatory and legal uncertainties and potential changes associated with our industry, particularly in light of increased attention from media, regulators and lawmakers to market structure and related issues; potential adverse results from legal or regulatory proceedings; our ability to remain technologically competitive and to ensure that the technology we utilize is not vulnerable to security risks, hacking and cyber-attacks; risks associated with third party software and technology infrastructure. For a discussion of the risks and uncertainties which could cause actual results to differ from those contained in forward-looking statements, see Virtu’s Securities and Exchange Commission filings, including but not limited to Virtu’s Annual Report on Form 10-K.

## **GAAP AND NON-GAAP RESULTS**

This presentation includes certain non-GAAP financial measures, including Normalized Adjusted Net Income, Normalized Adjusted Pre-Tax Net Income, Normalized Adjusted Free Cash Flow, Net Cash and Trading Capital. Non-GAAP financial measures should be considered only as supplemental to, and not as superior to, financial measures prepared in accordance with GAAP. Other companies may use similarly titled non-GAAP financial measures that are calculated differently from the way we calculate such measures. Accordingly, our non-GAAP financial measures may not be comparable to similar measures used by other companies. We caution investors not to place undue reliance on such non-GAAP measures, but instead to consider them with the most directly comparable GAAP measure. Non-GAAP financial measures have limitations as analytical tools, and should not be considered in isolation, or as a substitute for our results as reported under GAAP. A reconciliation of non-GAAP measures to the most directly comparable financial measure prepared in accordance with GAAP is included in Appendix hereto.

## Business Integration Actions & Opportunities

### Actions Taken Since Signing:

- Closed APAC offices in Singapore and Mumbai
- Reduced legacy KCG Headcount from 952 (FY2016 YE) to 610 (8 Aug 2017)
- Shut down Prop-Trading Business in London

### Opportunities Identified and Benefits

- Strong, “sticky” customer franchises exist in retail market making and agency execution in U.S. and Europe
  - Retail market making will perform incrementally better with Virtu order routing
- Opportunity to solidify and enhance customer facilitation businesses in “cash” trading
  - Particularly in ETF block facilitation, OTC, and institutional agency businesses
  - Virtu analytical tools, transparency, and order routing will allow us to identify better trading opportunities
- Full integration to a single technology platform
  - Apply Virtu tools to all businesses
- Focus London office on serving pan-European clients on U.S. flow in Europe
  - European client franchise is strong

## Expense Comparison & Synergies (\$mm)

	FY 2016		
	KCG	Virtu	Savings
Occupancy, Overhead & Compensation	\$382	\$108	\$180
Technology, communications and data processing	148	71	70
Total expense synergies			\$250
(-) Revenue dis-synergies			(42)
<b>Total expenses</b>	<b>\$530</b>	<b>\$179</b>	<b>\$208</b>
<b>Annualized savings achieved by Sept 30, 2017</b>			<b>\$125</b>

## Capital Return Analysis (\$mm)

	Capital Release
Identified capital synergies	\$440
Tax receivable	50
Other asset sales	TBD
Total expected proceeds to be applied to term loan reduction	\$490 + TBD
<b>Realized to date and applied to term loan paydown</b>	<b>\$100</b>
<b>Remaining expected proceeds to be applied to term loan reduction</b>	<b>\$390 + TBD</b>

# Core Operating Expenses Overview



## Virtu Financial, Inc. and Subsidiaries (Unaudited)

	<u>2Q 2017</u>	<u>1Q 2017</u>	<u>4Q 2016</u>	<u>3Q 2016</u>	<u>2Q 2016</u>	<u>1Q 2016</u>	<u>FY 2016</u>
<i>(in millions)</i>							
Adjusted Net Trading Income	\$ 74.0	\$ 79.4	\$ 100.3	\$ 94.2	\$ 102.3	\$ 117.3	\$ 414.1
Technology services	<u>3.1</u>	<u>2.8</u>	<u>3.1</u>	<u>2.9</u>	<u>2.2</u>	<u>2.1</u>	<u>10.3</u>
Total net revenues	\$ 77.1	\$ 82.2	\$ 103.4	\$ 97.1	\$ 104.5	\$ 119.4	\$ 424.4
Communications and data processing	\$ 19.0	\$ 18.2	\$ 17.4	\$ 17.9	\$ 18.0	\$ 17.7	\$ 71.0
Employee compensation and payroll taxes <sup>1</sup>	16.0	19.0	18.7	19.2	19.3	21.2	78.4
Operations and administrative <sup>1</sup>	8.4	4.8	6.4	5.0	5.7	4.8	21.9
Depreciation and amortization <sup>1</sup>	<u>6.3</u>	<u>6.8</u>	<u>7.0</u>	<u>7.2</u>	<u>7.8</u>	<u>7.7</u>	<u>29.7</u>
Total adjusted core expenses	\$ 49.7	\$ 48.9	\$ 49.5	\$ 49.3	\$ 50.8	\$ 51.4	\$ 201.0
<i>Compensation to net revenues ratio:</i>	<i>20.7%</i>	<i>23.2%</i>	<i>18.1%</i>	<i>19.8%</i>	<i>18.5%</i>	<i>17.8%</i>	<i>18.5%</i>

<sup>1</sup> Excludes certain expenses that are included within the reconciliation from Net Income to Normalized Adjusted Net Income. Refer to the GAAP to Non-GAAP reconciliation.

# Core Operating Expenses (Continued)



## Virtu Financial, Inc. and Subsidiaries

### Reconciliation of operating expenses to the core operating expenses

(Unaudited)

	<u>2Q 2017</u>	<u>1Q 2017</u>	<u>4Q 2016</u>	<u>3Q 2016</u>	<u>2Q 2016</u>	<u>1Q 2016</u>	<u>FY 2016</u>
<i>(in millions)</i>							
Employee compensation and payroll taxes	\$ 17.4	\$ 21.3	\$ 21.1	\$ 20.8	\$ 20.8	\$ 22.6	\$ 85.3
Less:							
Severance	-	(0.9)	(1.0)	(0.1)	-	(0.2)	(1.3)
Charges related to share based compensation at IPO, 2015 Management Incentive Plan	<u>(1.4)</u>	<u>(1.4)</u>	<u>(1.4)</u>	<u>(1.5)</u>	<u>(1.5)</u>	<u>(1.2)</u>	<u>(5.6)</u>
Core employee compensation and payroll taxes	\$ 16.0	\$ 19.0	\$ 18.7	\$ 19.2	\$ 19.3	\$ 21.2	\$ 78.4
 Operations and administrative	 \$ 8.9	 \$ 4.8	 \$ 6.7	 \$ 5.5	 \$ 5.9	 \$ 4.9	 \$ 23.0
Less:							
Transaction advisory fees and expenses	-	-	(0.3)	(0.5)	(0.2)	-	(1.0)
Termination of office leases	-	-	-	-	-	0.3	0.3
Equipment write-off	<u>(0.5)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(0.4)</u>	<u>(0.4)</u>
Core operations and administrative	\$ 8.4	\$ 4.8	\$ 6.4	\$ 5.0	\$ 5.7	\$ 4.8	\$ 21.9
 Depreciation and amortization	 \$ 6.8	 \$ 6.8	 \$ 7.0	 \$ 7.2	 \$ 7.8	 \$ 7.7	 \$ 29.7
Less:							
Equipment write-off	<u>(0.5)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Core depreciation and amortization	\$ 6.3	\$ 6.8	\$ 7.0	\$ 7.2	\$ 7.8	\$ 7.7	\$ 29.7

# GAAP to Non-GAAP Reconciliation



## Virtu Financial, Inc. and Subsidiaries (Unaudited)

(in millions, except for per share data)

	2Q 2017	1Q 2017	4Q 2016	3Q 2016	2Q 2016	1Q 2016
Net Income	\$ 4.4	\$ 21.1	\$ 34.9	\$ 33.0	\$ 39.3	\$ 51.4
Diluted EPS (GAAP)	\$ 0.01	\$ 0.10	\$ 0.18	\$ 0.18	\$ 0.21	\$ 0.26

### Reconciliation of Net Income to Normalized Adjusted Net Income

Net Income	\$ 4.4	\$ 21.1	\$ 34.9	\$ 33.0	\$ 39.3	\$ 51.4
Provision for Income Taxes	0.8	2.8	4.0	4.9	5.1	7.3
Amortization of purchased intangibles and acquired capitalized software	0.1	0.1	0.1	0.1	0.1	0.1
Reserve for legal matter	(2.2)	-	-	-	-	-
Financing interest expense related to KCG transaction	1.6	-	-	-	-	-
Debt issue cost related to debt refinancing	4.5	-	5.6	-	-	-
Severance	-	0.9	0.9	0.1	-	0.2
Transaction advisory fees and expenses	8.5	0.1	0.3	0.5	0.2	-
Termination of office leases	-	-	-	-	-	(0.3)
Equipment write-off	1.1	-	-	-	-	0.4
Trading related settlement income	-	-	-	(3.0)	-	-
Other losses (revenues)	-	(0.1)	(0.1)	0.1	-	-
Share-based compensation including IPO related awards	8.8	9.2	5.3	6.7	6.3	7.2
Normalized Adjusted Net Income before taxes	\$ 27.6	\$ 34.1	\$ 51.0	\$ 42.4	\$ 51.0	\$ 66.3
Normalized provision for income taxes <sup>1</sup>	9.8	12.1	18.1	15.0	18.1	23.6
<b>Normalized Adjusted Net Income</b>	<b>\$ 17.8</b>	<b>\$ 22.0</b>	<b>\$ 32.9</b>	<b>\$ 27.4</b>	<b>\$ 32.9</b>	<b>\$ 42.7</b>
Weighted average shares outstanding <sup>2</sup>	140.8	140.8	139.7	139.7	139.7	139.9
<b>Normalized Adjusted EPS</b>	<b>\$ 0.13</b>	<b>\$ 0.16</b>	<b>\$ 0.24</b>	<b>\$ 0.20</b>	<b>\$ 0.24</b>	<b>\$ 0.31</b>

# GAAP to Non-GAAP Reconciliation (Continued)



(in millions, except for per share data)

	2Q 2017		1Q 2017		4Q 2016		3Q 2016		2Q 2016		1Q 2016	
	Total	/Share	Total	/Share	Total	/Share	Total	/Share	Total	/Share	Total	/Share
<b>Normalized Adjusted Net Income</b>	<b>\$17.8</b>	<b>\$0.13</b>	<b>\$22.0</b>	<b>\$0.16</b>	<b>\$32.9</b>	<b>\$0.24</b>	<b>\$27.4</b>	<b>\$0.20</b>	<b>\$32.9</b>	<b>\$0.24</b>	<b>\$42.7</b>	<b>\$0.31</b>
+ Normalized provision for Income Taxes <sup>1</sup>	9.8		12.1		18.1		15.1		18.1		23.5	
<b>Normalized Adjusted Pre Tax Net Income</b>	<b>27.6</b>		<b>34.1</b>		<b>51.0</b>		<b>42.4</b>		<b>50.9</b>		<b>66.2</b>	
Depreciation and Amortization	6.8		6.8		7.1		7.1		7.8		7.7	
Capital expenditures <sup>3</sup>	(7.5)		(6.5)		(5.3)		(4.3)		(6.5)		(3.3)	
Tax benefit <sup>4</sup>	2.0		2.2		1.8		2.1		2.3		2.7	
Transaction Fees and Expenses <sup>5</sup>	-		-		(0.3)		(1.2)		(0.2)		-	
Principal Payments on Debt <sup>6</sup>	(5.1)		(1.4)		-		(1.3)		(1.3)		(1.3)	
Other Sources (Uses) of Cash <sup>7</sup>	(0.5)		(1.4)		(6.0)		1.3		(0.5)		(0.7)	
<b>Normalized Adjusted Free Cash Flow</b>	<b>\$13.5</b>	<b>\$0.10</b>	<b>\$21.7</b>	<b>\$0.16</b>	<b>\$30.1</b>	<b>\$0.22</b>	<b>\$31.1</b>	<b>\$0.22</b>	<b>\$34.5</b>	<b>\$0.25</b>	<b>\$47.9</b>	<b>\$0.34</b>
Weighted average shares outstanding <sup>2</sup>	140.8		140.8		139.7		139.7		139.7		139.9	

	2Q 2017		1Q 2017	
	Normalized Adj. Net Income	Normalized Adj. Free Cash Flow	Normalized Adj. Net Income	Normalized Adj. Free Cash Flow
<b>Cumulative Per Share</b>	\$ 2.19	\$ 2.24	\$ 2.06	\$ 2.14
<b>Dividends</b>	\$ 2.16	\$ 2.16	\$ 1.92	\$ 1.92
<b>Payout Ratio</b>	<b>99%</b>	<b>96%</b>	<b>93%</b>	<b>90%</b>

## ■ Cash flow characteristics:

- Our trading revenues are realized as cash within a trade settlement cycle, typically 1-3 days
- Low capital expenditure profile – run-rate is below depreciation and amortization
- Positive net cash impact from Tax Receivable Agreement (TRA)
- Liquid balance sheet with \$164.9 million of Cash and cash equivalents (\$151.9 million Net Cash<sup>8</sup>) and \$361.0 million of Trading Capital<sup>8</sup> at 6/30/17

# GAAP to Non-GAAP Reconciliation (Continued)



**(1) Normalized provision for income taxes:** Reflects U.S. federal, state, and local income tax rate applicable to corporations of approximately 35.5%

**(2) Weighted average shares outstanding:** Assumes conversion of all vested and unvested Virtu Financial LLC Units into Class A common stock on a one-for-one basis, including additional shares from dilutive impact of options and restricted stock units outstanding under the 2015 Management Incentive Plan

**(3) Capital expenditures:** Includes costs associated with the purchase of networking and communication equipment plus internally developed software

**(4) Tax benefit:** Represents cash tax savings realized from the amortization of deferred tax assets created from the tax basis step-up on a pro-forma basis, assuming conversion of all Virtu Financial LLC Units into Class A common stock, net of payment obligations under the tax receivable agreements

**(5) Transaction Fees and Expenses:** Includes transaction costs associated with the Secondary Offerings of our Class A common stock in Q4 2015 and Q3 2016, respectively, minority investment in SBI Japannext in Q3 2016, and Teza acquisition in Q4 2016.

**(6) Principal Payments on Debt:** Represents mandatory principal payments on our Senior Secured Credit Facility

**(7) Other Sources (Uses) of Cash:** Includes other miscellaneous items including one-time trading related settlement income, severance, and payments associated with net settlement of Class A shares awarded pursuant to the 2015 Management Incentive Plan, net of withholding taxes

**(8) Net Cash / Trading Capital:** Refer to the next page for reconciliations from GAAP measures



# GAAP to Non-GAAP Reconciliation (Continued)



## Virtu Financial, Inc. and Subsidiaries

### Reconciliation of Statement of Financial Condition to Net Cash

(Unaudited)

<i>(in millions)</i>	June 30, 2017	March 31, 2017	December 31, 2016
From Statement of Financial Condition:			
Cash and cash equivalents	\$ 164.9	\$ 165.0	\$ 181.4
(-) Short-term borrowings	(13.0)	(22.0)	(25.0)
(=) <b>Net Cash</b>	<b>\$ 151.9</b>	<b>\$ 143.0</b>	<b>\$ 156.4</b>

### Reconciliation of Statement of Financial Condition to Trading Capital

(Unaudited)

<i>(in millions)</i>	June 30, 2017	March 31, 2017	December 31, 2016
From Statement of Financial Condition:			
Cash and cash equivalents	\$ 164.9	\$ 165.0	\$ 181.4
(+) Securities borrowed	285.2	358.5	220.0
(+) Receivables from broker-dealers and clearing organizations	385.4	662.3	449.8
(+) Trading assets, at fair value	1,390.6	1,900.0	1,960.1
(-) Short-term borrowings	(13.0)	(22.0)	(25.0)
(-) Securities loaned	(345.2)	(423.7)	(222.2)
(-) Payables to broker-dealers and clearing organizations	(397.9)	(589.7)	(828.2)
(-) Trading liabilities, at fair value	(1,109.0)	(1,673.8)	(1,350.2)
(=) <b>Trading Capital</b>	<b>\$ 361.0</b>	<b>\$ 376.6</b>	<b>\$ 385.7</b>

# GAAP to Non-GAAP Reconciliation (Continued)



## Combined Cash & Capital: Virtu + KCG

### Reconciliation of Statement of Financial Condition to Pro-Forma Trading Capital

As of March 31, 2017

(Unaudited)

(in millions)

From Statement of Financial Condition:

	Pro-Forma Virtu + KCG	Virtu Financial, Inc.	KCG Holdings, Inc.
Cash and cash equivalents	\$ 834.9	\$ 165.0	\$ 669.9
(+) Cash and cash equivalents segregated under federal and other regulations	3.6		3.6
(+) Financial instruments owned, at fair value	4,220.4	1,900.0	2,320.4
(+) Securities borrowed	1,952.9	358.5	1,594.4
(+) Receivable from brokers, dealers and clearing organizations	1,464.0	662.3	801.7
(-) Short-term borrowings	(22.0)	(22.0)	
(-) Financial instruments sold, not yet purchased, at fair value	(3,581.8)	(1,673.8)	(1,908.0)
(-) Securities loaned	(883.2)	(423.7)	(459.5)
(-) Financial instruments sold under agreements to repurchase	(952.6)		(952.6)
(-) Other collateralized financings	(50.0)		(50.0)
(-) Payables to broker-dealers and clearing organizations	(1,085.0)	(589.7)	(495.3)
(-) Payable to customers	(52.3)	-	(52.3)
<b>(=) Pro-forma Trading Capital</b>	<b>\$ 1,848.9</b>	<b>\$ 376.6</b>	<b>\$ 1,472.3</b>

Source: 10-Q filings of Virtu Financial, Inc. and KCG Holdings, Inc. for the quarterly period ended March 31, 2017.

# Market Metrics



									Q2 2017 vs.	Q2 2017 vs.
Americas Equities	Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	2016
<b>Volume Benchmarks (ADV)</b>										
U.S. Equity Consolidated ADV	Shares	M	8,552	7,251	6,470	7,055	6,843	6,852	0.1%	(5.5%)
US Notional Value ADV	\$USD	B	305	264	245	274	270	276	2.2%	4.5%
<b>Volatility Benchmarks (ADV)</b>										
SPX Implied Volatility (VIX) - QTD	#	#	20.49	15.68	13.23	14.10	11.69	11.43	(2.3%)	(27.1%)
SPX Realized Volatility - QTD	#	#	18.38	13.62	9.80	8.54	6.78	7.33	8.1%	(46.2%)
Ratio: Realized Volatility / VIX	Ratio	%	89.7%	86.9%	74.1%	60.6%	58.0%	64.2%	10.7%	(26.2%)
SPX Intraday Volatility - QTD	#	%	1.52%	0.93%	0.69%	0.69%	0.57%	0.55%	(2.4%)	(40.9%)
									Q2 2017 vs.	Q2 2017 vs.
EMEA Equities	Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	2016
<b>Volume Benchmarks (ADV)</b>										
Pan-EU Equity Shares (incl auction)	Shares	M	6,659	6,145	5,127	5,339	4,978	5,340	7.3%	(13.1%)
Pan-EU Notional Value (incl auction)	Euro	B	53.69	46.64	39.79	44.45	45.51	48.58	6.7%	4.2%
<b>Volatility Benchmarks (ADV)</b>										
VSTOXX (V2X) Implied Volatility - QTD	#	#	28.61	25.78	20.73	19.43	15.50	16.27	5.0%	(36.9%)
VSTOXX Realized Volatility - QTD	#	#	27.06	28.12	15.71	11.98	9.71	12.07	24.4%	(57.1%)
Ratio: Realized Volatility / VSTOXX	Ratio	%	95%	109%	76%	62%	63%	74%	18.5%	(32.0%)
SX5E Index Intraday Volatility - QTD	#	%	2.32%	1.80%	1.35%	1.11%	0.86%	0.90%	4.0%	(50.0%)
									Q2 2017 vs.	Q2 2017 vs.
APAC Equities	Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	2016
<b>Volume Benchmarks (ADV)</b>										
TSE ADV	Shares	M	2,901	2,452	2,229	2,533	2,259	2,234	(1.1%)	(8.9%)
TSE Notional Value	¥	B	2,914	2,458	2,450	2,783	2,600	2,759	6.1%	12.3%
OSE Nikkei 225 Futures	Contracts	#	267,739	196,978	163,930	191,117	185,310	176,683	(4.7%)	(10.3%)
<b>Volatility Benchmarks (ADV)</b>										
VNKY Implied Volatility - QTD	#	#	31.83	28.85	24.37	19.81	18.13	16.07	(11.4%)	(44.3%)
NKY Realized Volatility - QTD	#	#	34.71	31.00	18.85	20.77	14.89	10.91	(26.7%)	(64.8%)
Ratio: Realized NKY Volatility / VNKY	Ratio	%	109%	107%	77%	105%	82%	68%	(17.3%)	(36.8%)
NKY Index Intraday Volatility - QTD	#	%	2.15%	1.82%	1.14%	0.96%	0.81%	0.69%	(15.0%)	(62.1%)

# Market Metrics (Continued)



									Q2 2017 vs.	Q2 2017 vs.		
Global Commodities			Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	Q2 2016
<b>Futures Contract Volume (ADV)</b>												
CME Energy ADV	Contracts	M	2.536	2.321	2.293	2.585	2.496	2.632			5.4%	13.4%
ICE Energy ADV	Contracts	M	2.801	2.418	2.318	2.725	2.847	2.892			1.6%	19.6%
Total Energy	Contracts	M	5.337	4.740	4.611	5.311	5.344	5.524			3.4%	16.5%
<b>Volatility Benchmarks (ADV)</b>												
JPM Commodity Volatility - QTD Implied	#	#	160.13	163.34	161.78	162.15	167.39	171.75			2.6%	5.2%
JPM Commodity Volatility - QTD Realized	#	#	13.33	8.87	7.94	8.42	7.88	7.24			(8.1%)	(18.4%)
JPM Commodity Volatility - Ratio	Ratio	%	8.32%	5.43%	4.91%	5.19%	4.71%	4.22%			(10.4%)	(22.4%)
OVX Crude Volatility - QTD Implied	#	#	58.78	42.38	39.96	38.25	29.34	30.93			5.4%	(27.0%)
OVX Crude Volatility - QTD Realized	#	#	72.02	72.59	68.00	92.89	71.97	71.91			(0.1%)	(0.9%)
OVX Crude Volatility - Ratio	Ratio	%	123%	171%	170%	243%	245%	232%			(5.2%)	35.7%
CBOE Energy Sector Vol	#	#	34.73	24.78	21.18	22.34	18.13	18.38			1.4%	(25.8%)
CBOE/COMEX Gold Vol Indx	#	#	18.87	18.03	15.93	16.60	14.38	12.19			(15.2%)	(32.4%)
									Q2 2017 vs.	Q2 2017 vs.		
Global Currencies			Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	Q2 2016
<b>Spot and Futures Volume (ADV)</b>												
Hotspot ADV FX	\$USD	M	29,730	25,931	25,660	27,113	29,238	27,927			(4.5%)	7.7%
Reuters ADV FX	\$USD	M	112,365	102,415	91,121	92,797	89,891	88,323			(1.7%)	(13.8%)
EBS ADV FX	\$USD	M	96,183	85,177	75,818	88,995	87,082	80,347			(7.7%)	(5.7%)
CME FX Notional ADV	\$USD	M	82,815	74,647	68,220	76,003	78,304	77,520			(1.0%)	3.8%
CME FX ADV	Contracts	K	944	838	772	883	894	879			(1.6%)	5.0%
<b>Volatility Benchmarks (ADV)</b>												
Deutsche Bank FX Volatility Index (CVIX) - QTD	#	#	10.67	11.10	9.87	10.15	10.04	7.91			(21.2%)	(28.7%)
CVIX Realized Volatility - QTD	#	#	45.03	60.11	36.04	50.26	50.00	59.74			19.5%	(0.6%)
CVIX Realized to Implied Ratio- QTD	Ratio	%	422%	542%	365%	495%	498%	755%			51.7%	39.5%
JPM FX G7 Volatility - QTD Realized	#	#	42.27	72.83	31.58	40.16	35.16	39.53			12.4%	(45.7%)
JPM FX G7 Volatility - QTD Implied	#	#	10.60	11.12	10.19	10.24	10.10	7.98			(21.0%)	(28.3%)
JPM FX G7 Volatility - Ratio	Ratio	%	399%	655%	310%	392%	348%	495%			42.2%	(24.3%)
CBOE/CME FX € Vol Index	#	#	10.60	10.33	8.12	9.52	8.49	8.29			(2.3%)	(19.7%)
CBOE/CME FX ¥ Vol Index	#	#	12.26	12.94	13.41	12.32	11.72	9.28			(20.8%)	(28.3%)
CBOE/CME FX £ Vol Index	#	#	10.23	16.21	11.02	10.28	10.06	8.38			(16.7%)	(48.3%)
									Q2 2017 vs.	Q2 2017 vs.		
Options, Fixed Income, and Other Securities			Type	Units	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q1 2017	Q2 2016
<b>Futures and Options Contract Volume (ADV)</b>												
OCC ADV	Contracts	M	17.11	15.79	15.21	16.20	16.56	16.68			0.7%	5.6%
VIX futures volume	Contracts	#	216,404	258,126	239,814	235,906	255,174	306,785			20.2%	18.9%