



An Analysis of Market Data Fees

Firms' Market Data Costs Anonymized and Aggregated for SEC Staff

AUGUST 2018



Summary and Findings

Context

NYSE Proprietary Market Data Spend Analysis

NYSE CTA Market Data Spend Analysis

Proliferation of Charges and Spend Trend

Additional Breakdowns of Firm Spending Data

Executive Summary

Purpose

- To document how a range of SIFMA member firms have responded to market data product and fee changes over the last 8 years, Expand compiled market data fee changes and corresponding expenses incurred by broker-dealers.

Focus on NYSE Proprietary and CTA Data

- Firm expense data was gathered and analysed for a whole range of “non-core” market data products offered by NYSE-owned and affiliated exchanges (NYSE Proprietary), as well as “core” market data (national best bid and offer and last sale) information administered by the Consolidated Tape Association (CTA).
- There is no reason to believe that the trend lines for firm spending on Nasdaq data would differ substantially from those summarized below for NYSE data.

Methodology and Explanation of Firm Data

- Expand gathered, anonymized, and aggregated market data spending data from a cross-section of ten retail and institutional firms for 2010-2018. The products are uniformly categorized: (1) as either CTA or Proprietary; and (2) by the “Type of Fee.”
- These firms - retail and institutional - represent a cross-section of and proxy for the hundreds of SIFMA member firms and their customers who consume market data.
- This presentation is based on data voluntarily submitted from only ten SIFMA member firms to demonstrate the trends resulting from the changes in market data costs. SIFMA did not and cannot compel members to submit data.

Documentation of Exchange Proprietary and Core Data Fee Changes

- The firms’ market data spending is a reaction to and reflection of the market data fee changes over the last 8 years. Included in this report are the key fee changes for Nasdaq UTP Plan core data as well as CTA core data and NYSE Proprietary data.

Key Findings

- 1 NYSE Proprietary data fees have increased substantially over the last 8 years, while most CTA (and UTP) data fees also have increased at a rate higher than CPI. *(Pages 7 and 13)*
- 2 For individual firms, depending on their business models, the price increases are anywhere from 967% to 2,916% (or more) just to get the same data in 2018 they were getting in 2010. *(Page 8)*
- 3 As shown by the aggregated firm market data spend numbers, both retail and institutional firms have continued to buy both proprietary and CTA data despite the cost increases, resulting in significant expense increases for firms and their clients. *(Pages 9 and 14)*
- 4 This is due in part to the proliferation of charges that firms incur to cover the same basic market information. *(Page 18)*

Summary and Findings

➤ Context

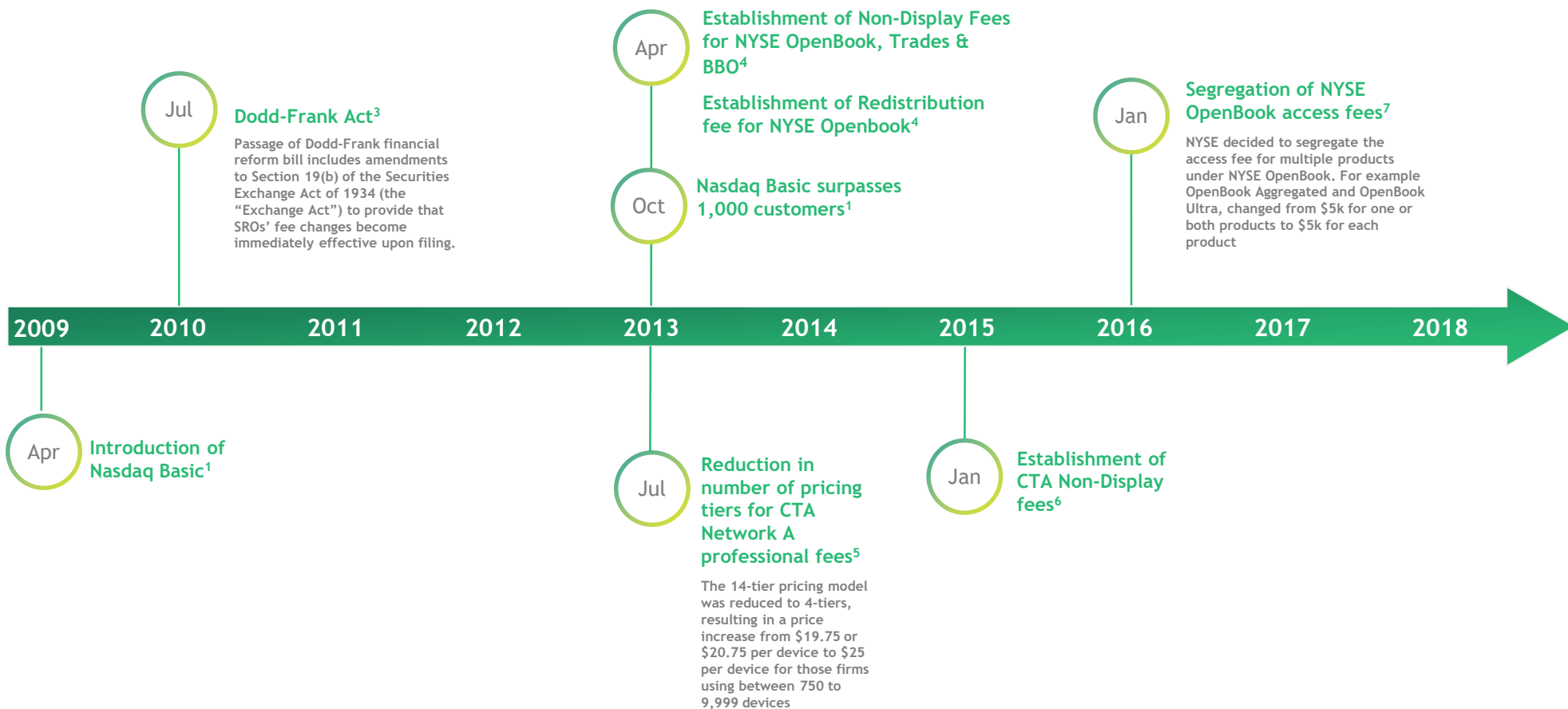
NYSE Proprietary Market Data Spend Analysis

NYSE CTA Market Data Spend Analysis

Proliferation of Charges and Spend Trend

Additional Breakdowns of Firm Spending Data

NYSE's Exchange Policies Have Evolved Significantly since 2009



Summary and Findings

Context

➤ NYSE Proprietary Market Data Spend Analysis

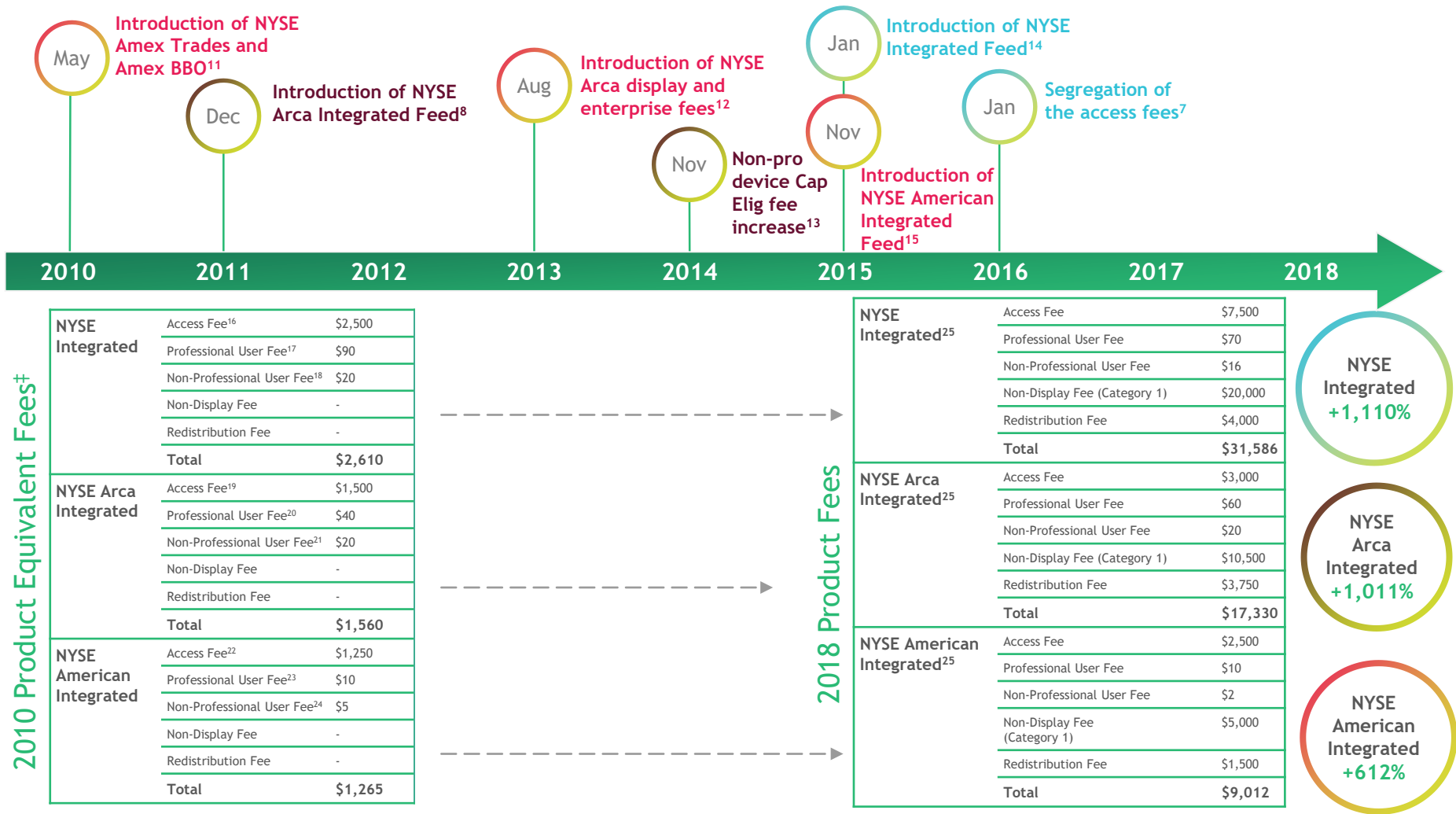
NYSE CTA Market Data Spend Analysis

Proliferation of Charges and Spend Trend

Additional Breakdowns of Firm Spending Data

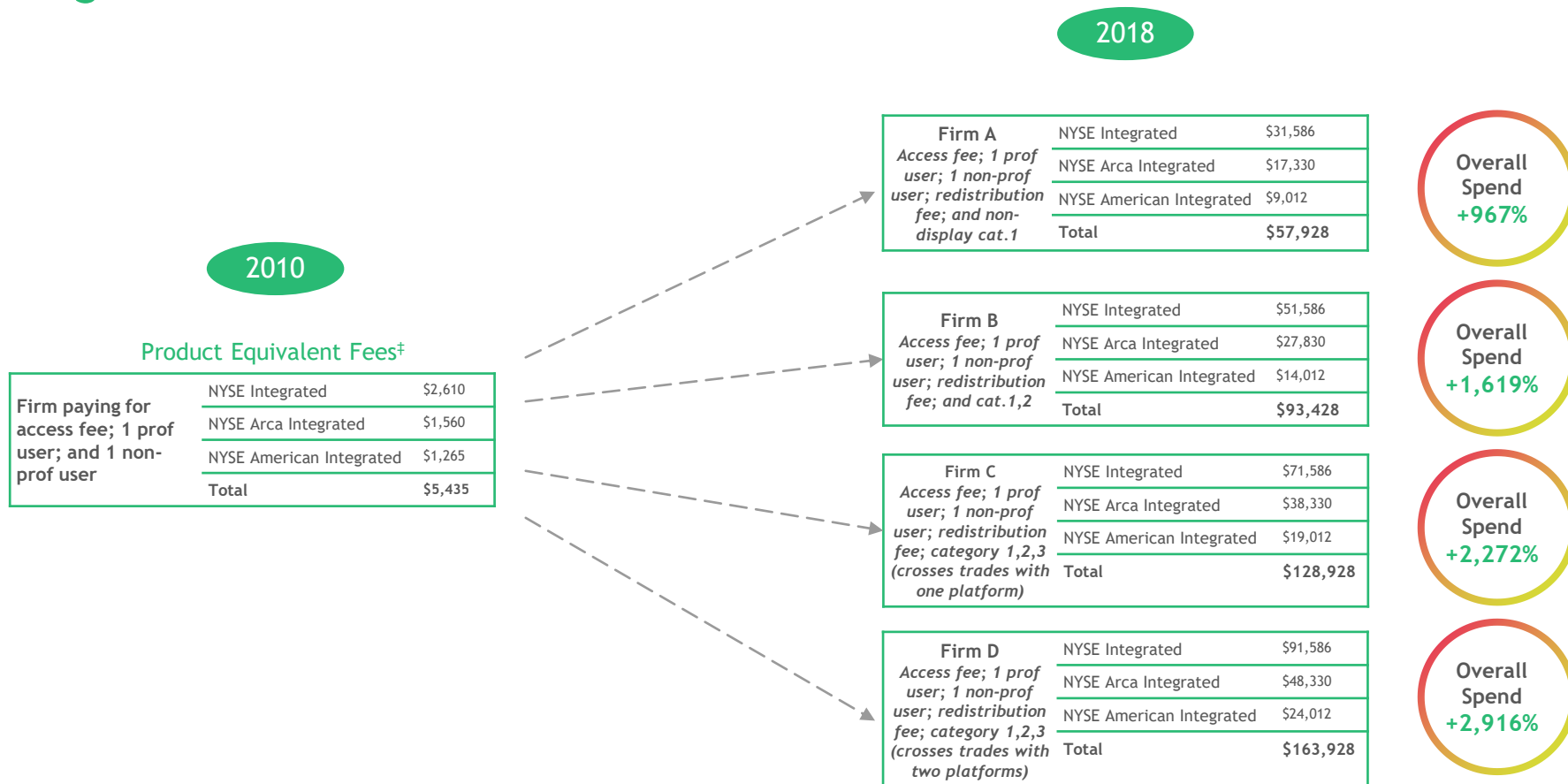
NYSE Proprietary Data Fees Have Increased†

For example, NYSE increased the cost for NYSE Integrated Products from 2010 to 2018 by: (1) increasing fees; and (2) creating new types of fees



†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)
 ‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
 When applicable, firms may also pay enterprise fees up to \$25,000 for NYSE, \$22,000 for Arca, and/or \$3,000 for American
 Source: SIFMA, Expand Research analysis 2018

To Receive the Same Data in 2018 as in 2010, Firms Have to Pay Much More, Regardless of their Business Model†



Examples highlighting the price a firm would have to pay in 2018 to receive the same basic market information as in 2010. See slides 21 - 24 for a more in-depth breakdown.

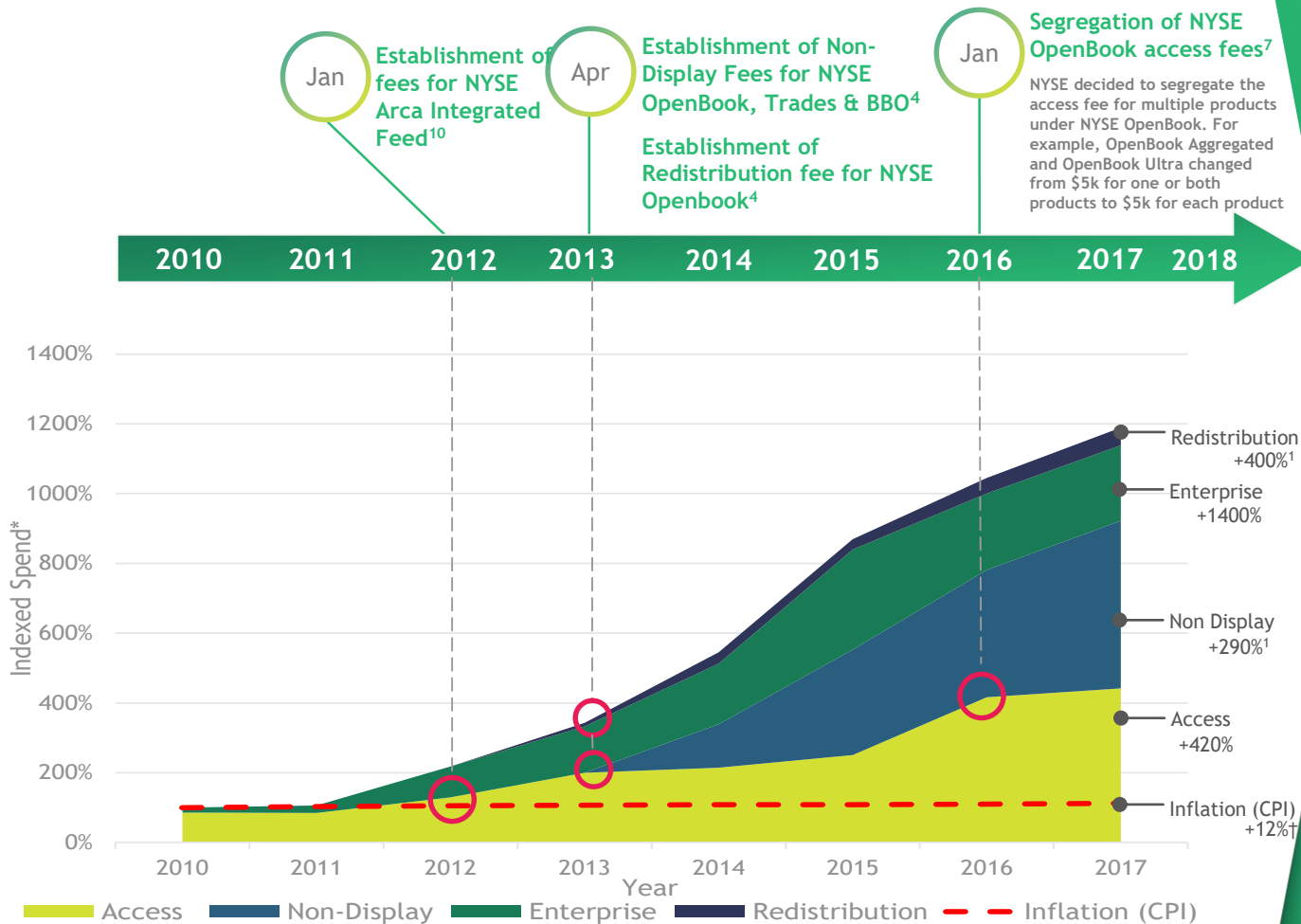
†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)

‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent

(OpenBook, BBO, Trades & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)

Source: SIFMA, Expand Research analysis 2018

Increase in Firms' Spend for NYSE Proprietary Data



Source: Expand Research / SIFMA Analysis 2018

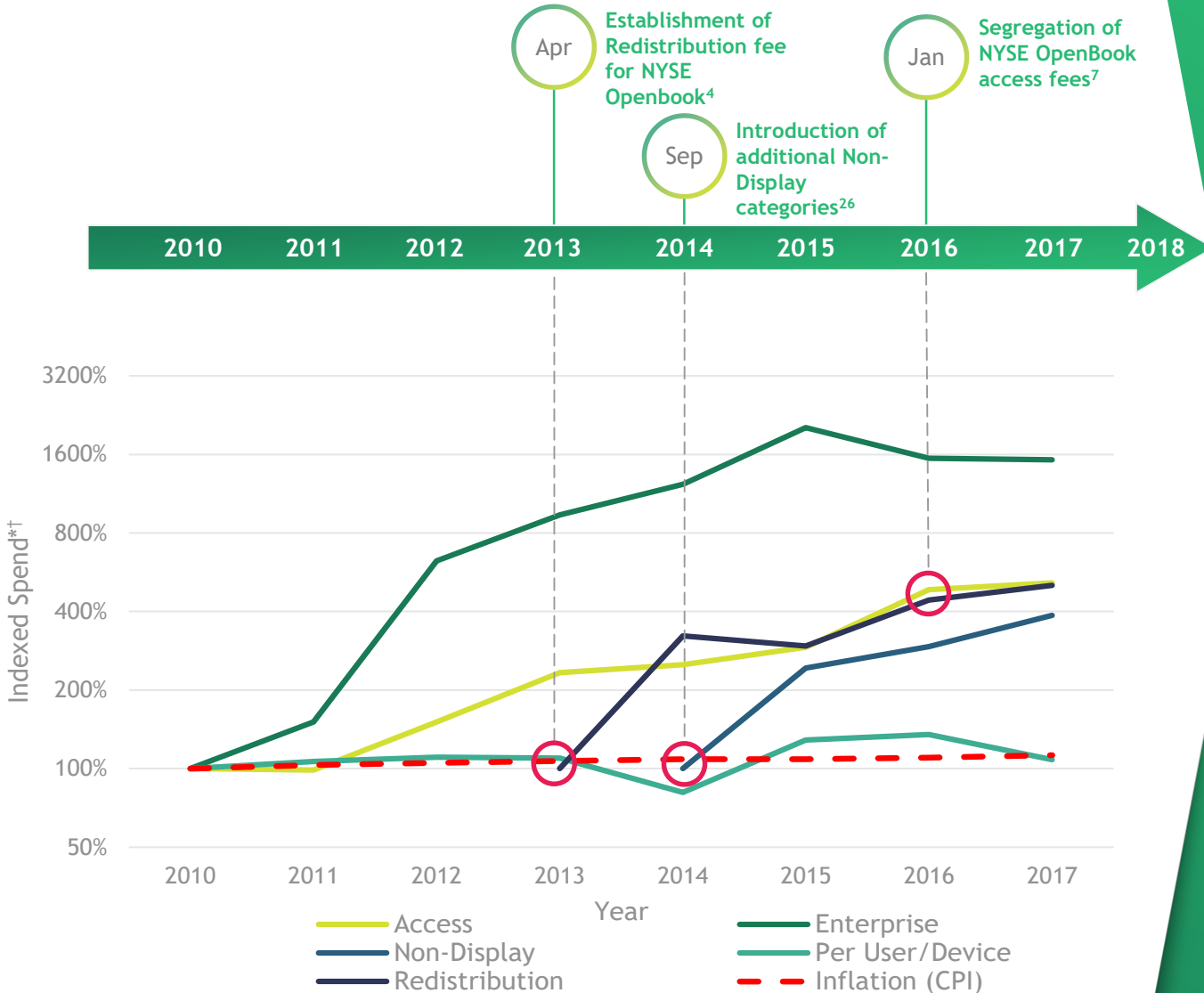
1: Non Display spends indexed against 2014; redistribution indexed against 2013; note that per user/device spending is excluded.

* Indexed to 2010 spend

† Note that whenever the inflation rate is used as a baseline, it is important to note that data processing costs fall with every passing year; according to a study carried out by the Brookings Institution the cost of computing power equal to a single iPad declined from roughly \$10,000 in 2000 to just over \$100 in 2010, a decrease on 99%.

http://www.hamiltonproject.org/charts/cost_of_computing_power_equal_to_an_ipad2

NYSE Proprietary^a Spend: By Fee Type



Per User/Device
+8%
(2010 and 2017)

Access
+420%
(2010 and 2017)

Enterprise
+1400%
(2010 and 2017)

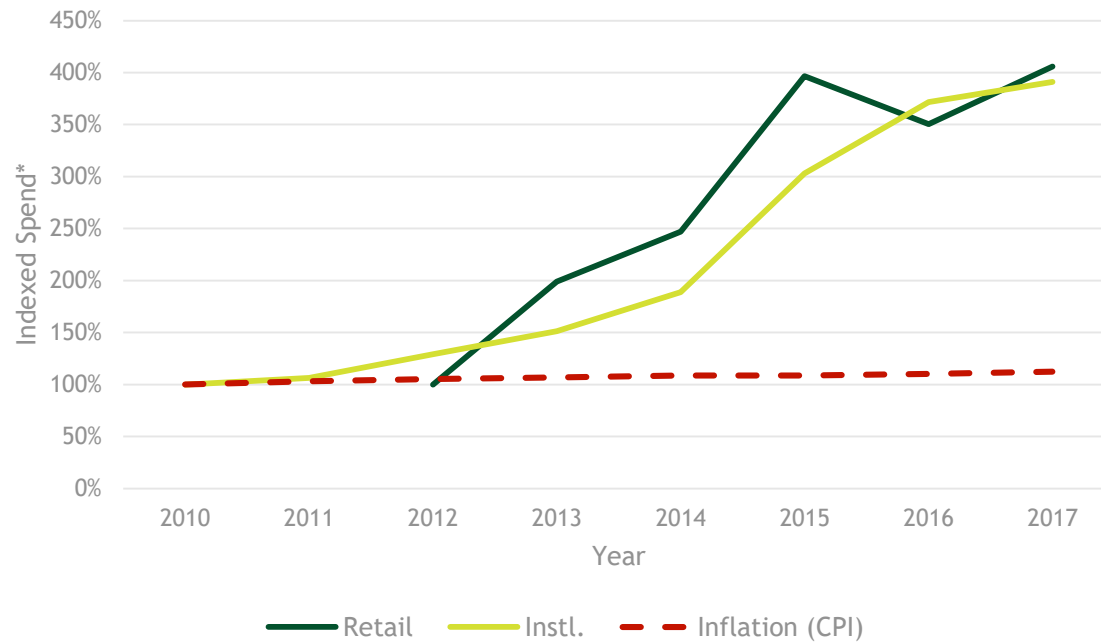
Redistribution
+400%
(2013 and 2017)

Non-Display
+290%
(2014 and 2017)

a.: Consolidated feeds operated by the CTA are distinguished from the proprietary feeds that NYSE sells for additional costs.
Source: Expand Research / SIFMA Analysis 2018

- *Indexed to 2010 Spend
- †Vertical axis log scale to base 2

NYSE Proprietary Spend Total: By Retail and Institutional Firm



Retail
+310%
(2012 and 2017)

Institutional
+290%
(2010 and 2017)

Summary and Findings

Context

NYSE Proprietary Market Data Spend Analysis

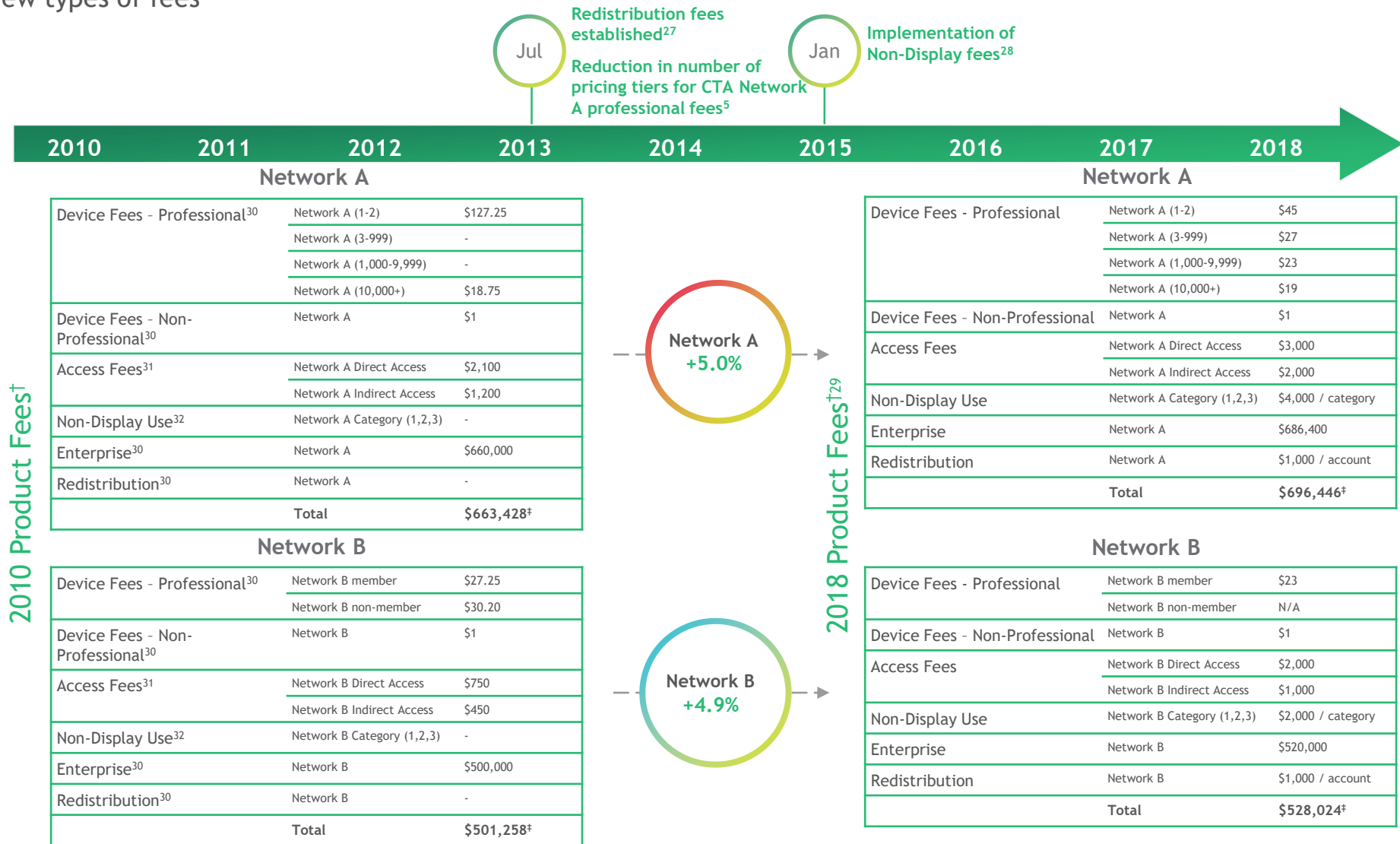
➤ NYSE CTA Market Data Spend Analysis

Proliferation of Charges and Spend Trend

Additional Breakdowns of Firm Spending Data

Evolution of CTA Plan fees (2010 to 2018)[†]

For example, NYSE increased CTA fees, although by less egregious amounts, by: (1) increasing fees; and (2) creating new types of fees



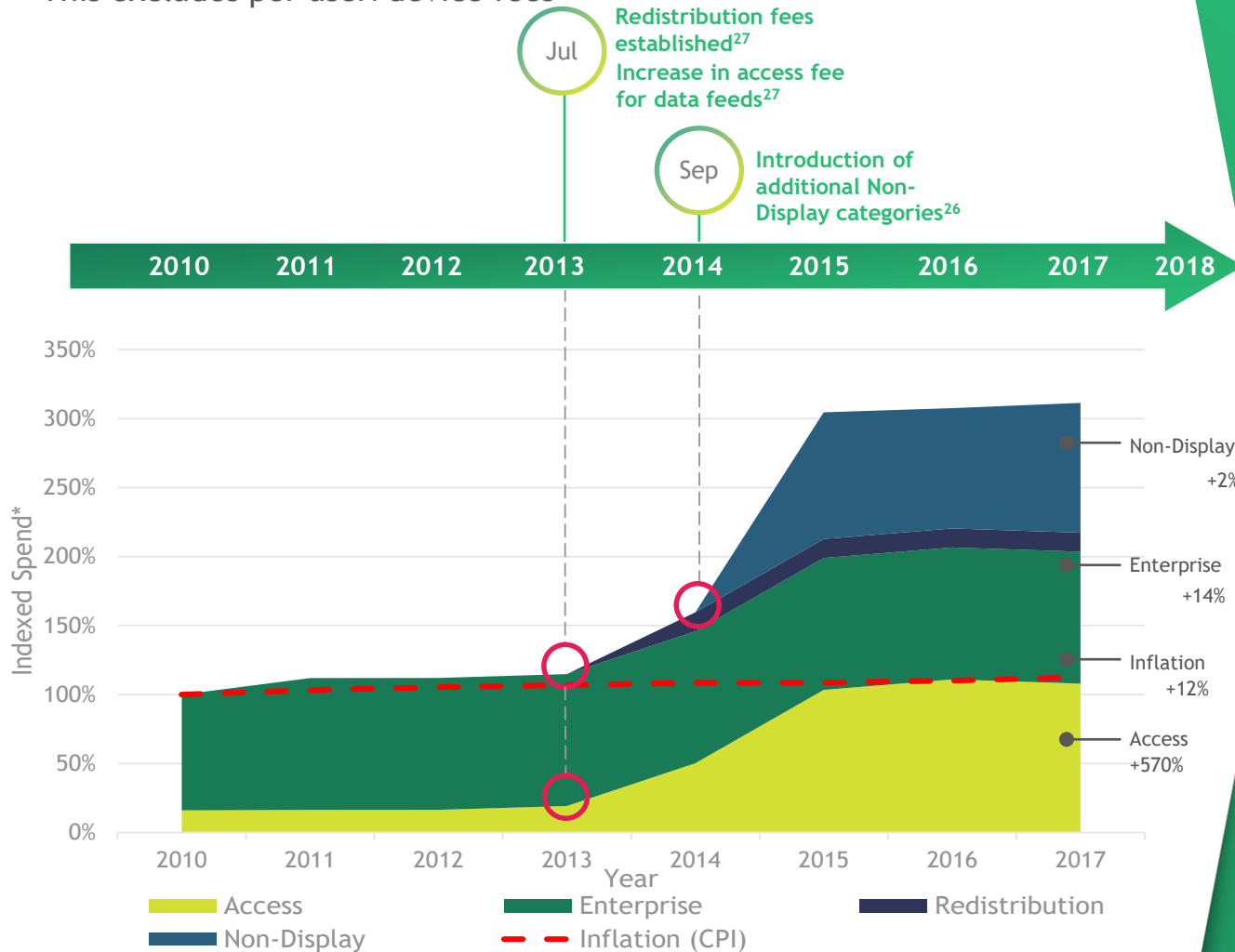
[†] All fees are monthly

[‡] Assumes 1 user and purchase of all products

Source: SIFMA, Expand Research analysis 2018

Increase in Firms' Spend for NYSE CTA Data

This excludes per user/device fees

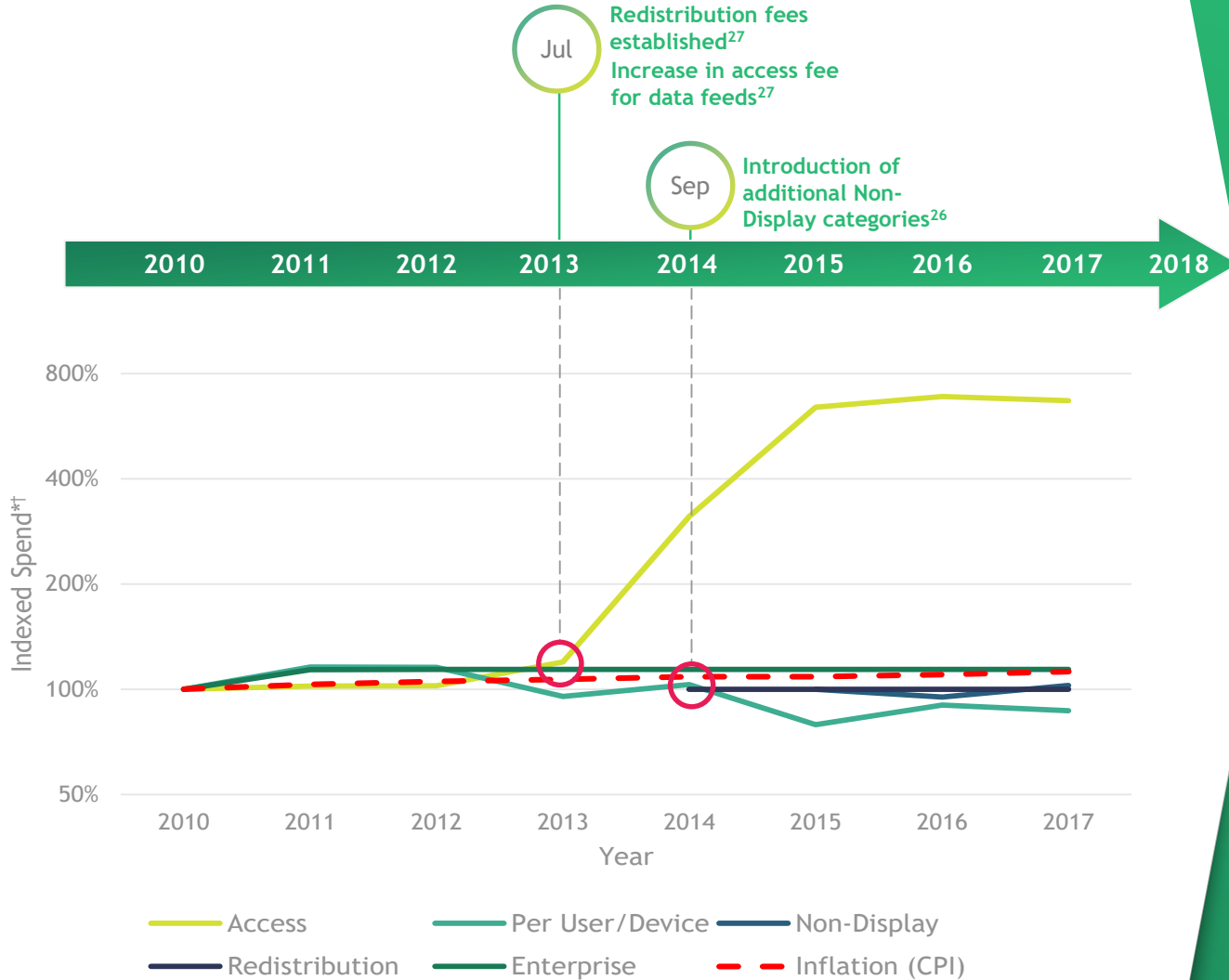


+210%
(2010 and 2017)

Source: Expand Research / SIFMA Analysis 2018

• Indexed to 2010 Spend, except non-display is indexed to 2015 spend

CTA^a Spend: By Fee Type



Access
+570%
(2010 and 2017)

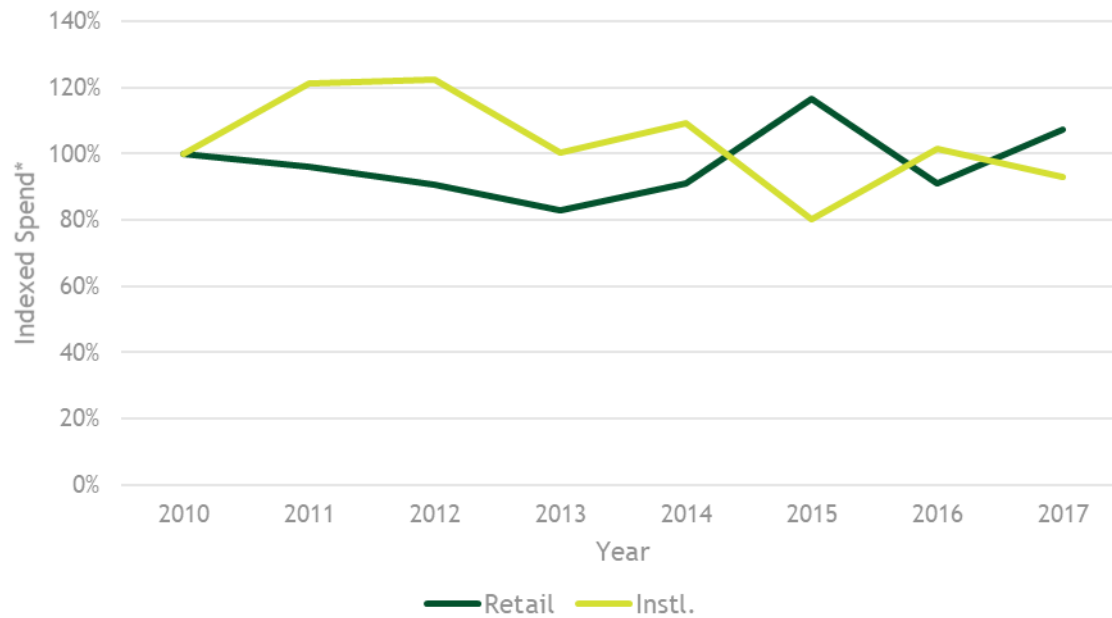
Enterprise
+14%
(2010 and 2017)

Non-Display
+2%
(2015 and 2017)

a.: Consolidated feeds operated by the CTA are distinguished from the proprietary feeds that NYSE sells for additional costs
Source: Expand Research / SIFMA Analysis 2018

- Indexed to 2010 Spend
- † Vertical axis log scale to base 2

CTA Spend Total: By Retail and Institutional Firm



Retail
-4%
(2010 and 2017)

Institutional
+7%
(2010 and 2017)

Summary and Findings

Context

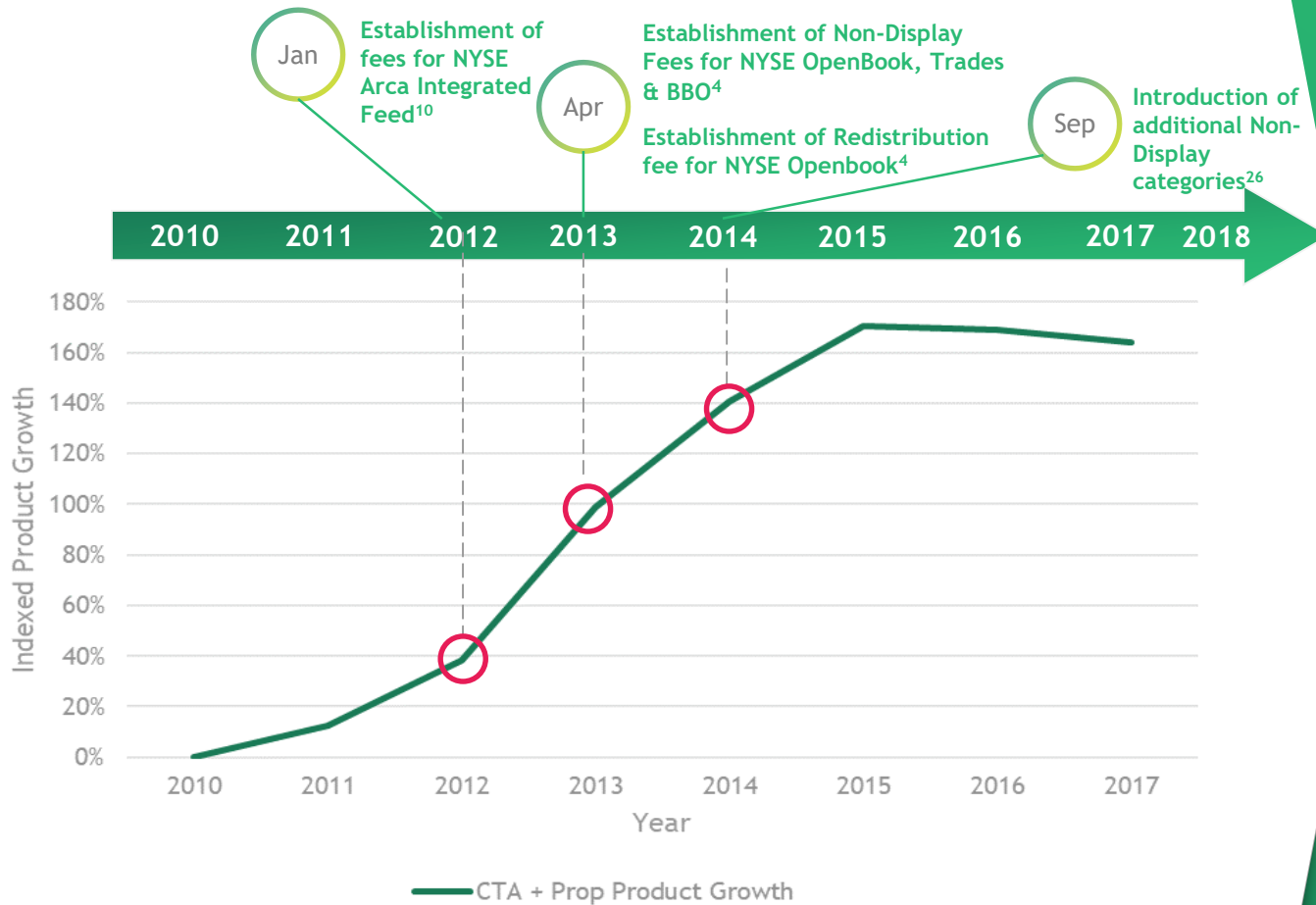
NYSE Proprietary Market Data Spend Analysis

NYSE CTA Market Data Spend Analysis

➤ Proliferation of Charges and Spend Trend

Additional Breakdowns of Firm Spending Data

Growth in Market Data Charges for the Same Market Information: CTA + Prop

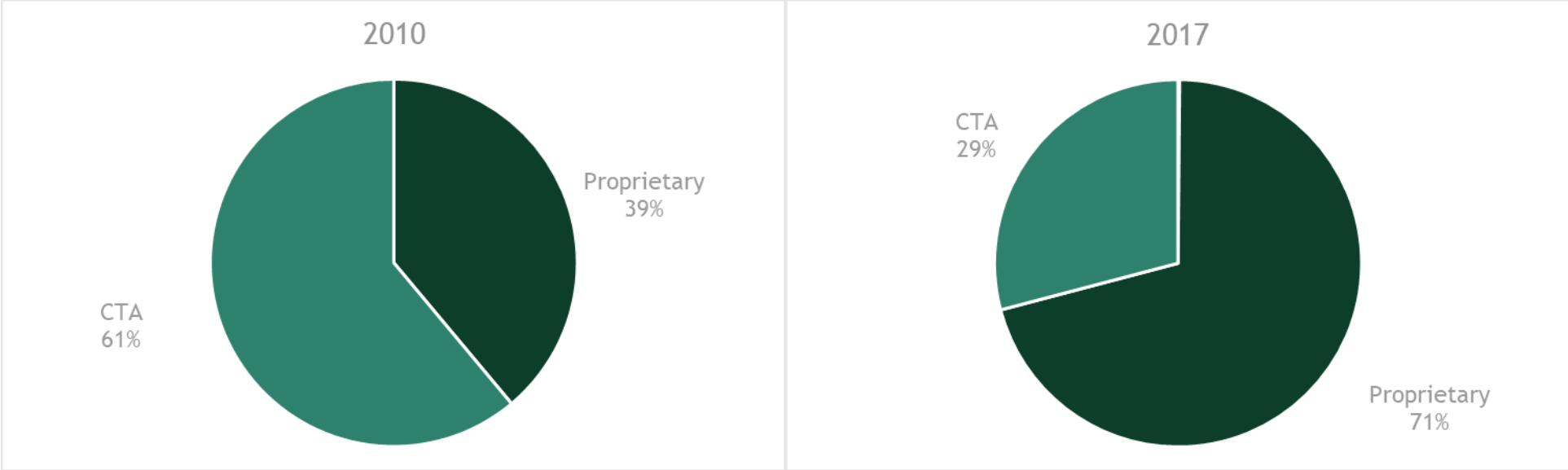


+164%
(2010 and 2017)

The average number of charges firms incurred increased from approximately 80 line items in 2010 to over 200 in 2017 for an average growth rate of 21% per year.

Firms' Spend on Proprietary Data Now Outweighs Firms' Spend on CTA Data

This excludes per user/ device fees



Source: Expand Research / SIFMA Analysis 2018

Summary and Findings

Context

NYSE Proprietary Market Data Spend Analysis

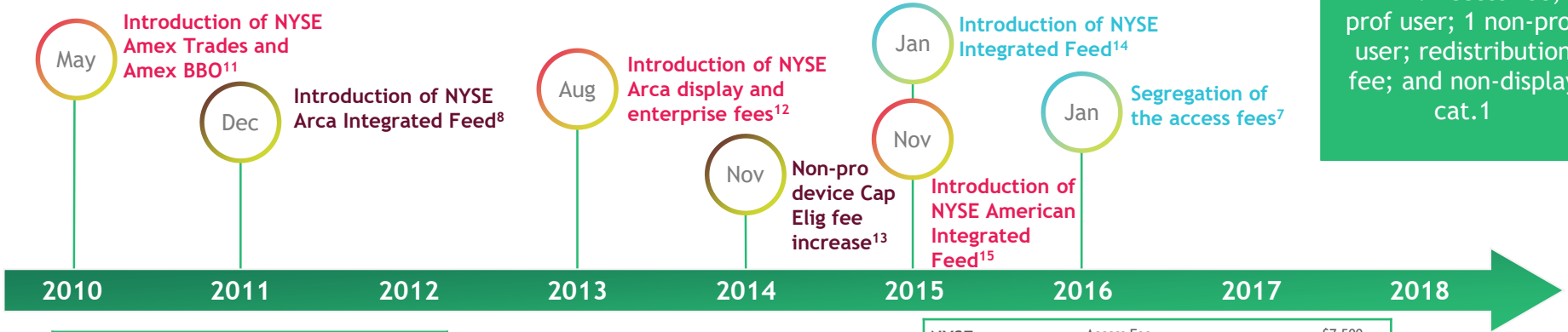
NYSE CTA Market Data Spend Analysis

Proliferation of Charges and Spend Trend

 Additional Breakdowns of Firm Spending Data

Business Model 1: Evolution of NYSE Proprietary Data Fees†

Scenario 1:
 Firm A: Access fee; 1 prof user; 1 non-prof user; redistribution fee; and non-display cat. 1



2010 Product Equivalent Fees‡

NYSE Integrated	Access Fee ¹⁶	\$2,500
	Professional User Fee ¹⁷	\$90
	Non-Professional User Fee ¹⁸	\$20
	Non-Display Fee	-
	Redistribution Fee	-
	Total	\$2,610
NYSE Arca Integrated	Access Fee ¹⁹	\$1,500
	Professional User Fee ²⁰	\$40
	Non-Professional User Fee ²¹	\$20
	Non-Display Fee	-
	Redistribution Fee	-
	Total	\$1,560
NYSE American Integrated	Access Fee ²²	\$1,250
	Professional User Fee ²³	\$10
	Non-Professional User Fee ²⁴	\$5
	Non-Display Fee	-
	Redistribution Fee	-
	Total	\$1,265

2018 Product Fees

NYSE Integrated²⁵	Access Fee	\$7,500
	Professional User Fee	\$70
	Non-Professional User Fee	\$16
	Non-Display Fee (Category 1)	\$20,000
	Redistribution Fee	\$4,000
	Total	\$31,586
NYSE Arca Integrated²⁵	Access Fee	\$3,000
	Professional User Fee	\$60
	Non-Professional User Fee	\$20
	Non-Display Fee (Category 1)	\$10,500
	Redistribution Fee	\$3,750
	Total	\$17,330
NYSE American Integrated²⁵	Access Fee	\$2,500
	Professional User Fee	\$10
	Non-Professional User Fee	\$2
	Non-Display Fee (Category 1)	\$5,000
	Redistribution Fee	\$1,500
	Total	\$9,012

NYSE Integrated +1,110%

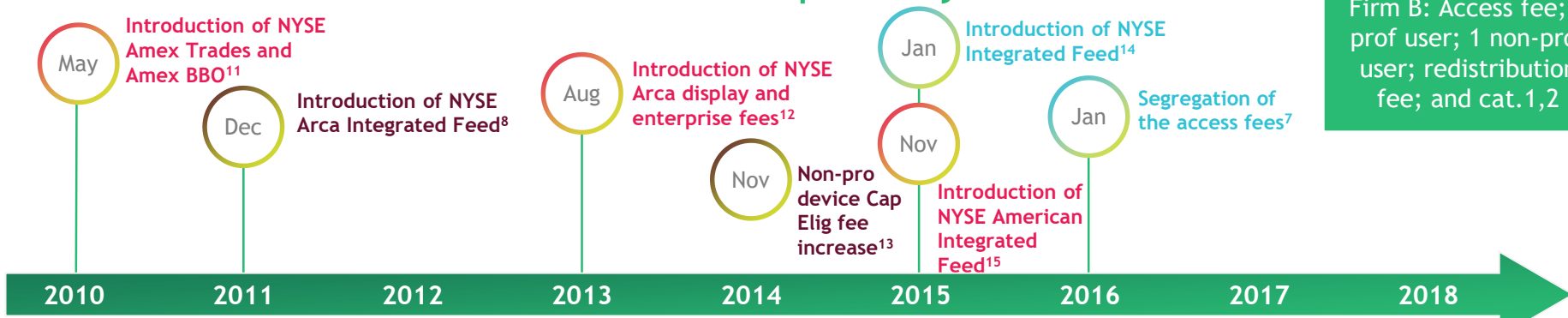
NYSE Arca Integrated +1,011%

NYSE American Integrated +612%

†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)
 ‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances); NYSE American Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
 Source: SIFMA, Expand Research analysis 2018

Business Model 2: Evolution of NYSE Proprietary Data Fees †

Scenario 2:
Firm B: Access fee; 1 prof user; 1 non-prof user; redistribution fee; and cat.1,2



2010 Product Equivalent Fees†			2018 Product Fees		
NYSE Integrated	Access Fee ¹⁶	\$2,500	NYSE Integrated ²⁵	Access Fee	\$7,500
	Professional User Fee ¹⁷	\$90		Professional User Fee	\$70
	Non-Professional User Fee ¹⁸	\$20		Non-Professional User Fee	\$16
	Non-Display Fee	-		Non-Display Fee (Category 1 & 2)	\$40,000
	Redistribution Fee	-		Redistribution Fee	\$4,000
	Total	\$2,610		Total	\$51,586
NYSE Arca Integrated	Access Fee ¹⁹	\$1,500	NYSE Arca Integrated ²⁵	Access Fee	\$3,000
	Professional User Fee ²⁰	\$40		Professional User Fee	\$60
	Non-Professional User Fee ²¹	\$20		Non-Professional User Fee	\$20
	Non-Display Fee	-		Non-Display Fee (Category 1 & 2)	\$21,000
	Redistribution Fee	-		Redistribution Fee	\$3,750
	Total	\$1,560		Total	\$27,830
NYSE American Integrated	Access Fee ²²	\$1,250	NYSE American Integrated ²⁵	Access Fee	\$2,500
	Professional User Fee ²³	\$10		Professional User Fee	\$10
	Non-Professional User Fee ²⁴	\$5		Non-Professional User Fee	\$2
	Non-Display Fee	-		Non-Display Fee (Category 1 & 2)	\$10,000
	Redistribution Fee	-		Redistribution Fee	\$1,500
	Total	\$1,265		Total	\$14,012

NYSE Integrated
+1,876%

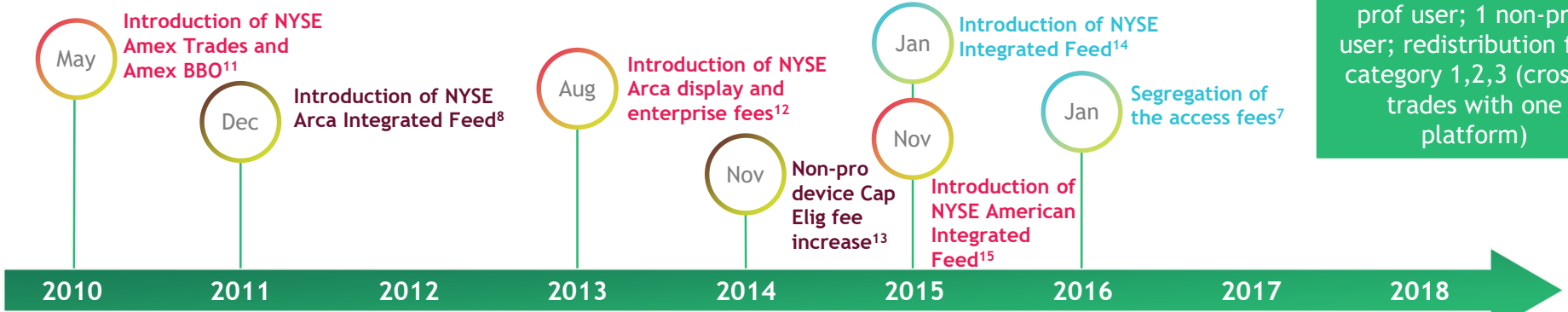
NYSE Arca Integrated
+1,684%

NYSE American Integrated
+1,008%

†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)
‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances); NYSE American Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
Source: SIFMA, Expand Research analysis 2018

Business Model 3: Evolution of NYSE Proprietary Data Fees †

Scenario 3:
 Firm C: Access fee; 1 prof user; 1 non-prof user; redistribution fee; category 1,2,3 (crosses trades with one platform)



2010 Product Equivalent Fees†			2018 Product Fees		
NYSE Integrated	Access Fee ¹⁶	\$2,500	NYSE Integrated ²⁵	Access Fee	\$7,500
	Professional User Fee ¹⁷	\$90		Professional User Fee	\$70
	Non-Professional User Fee ¹⁸	\$20		Non-Professional User Fee	\$16
	Non-Display Fee	-	Non-Display Fee (Category 1 & 2 & 3)	\$60,000	
	Redistribution Fee	-	Redistribution Fee	\$4,000	
	Total	\$2,610		Total	\$71,586
NYSE Arca Integrated	Access Fee ¹⁹	\$1,500	NYSE Arca Integrated ²⁵	Access Fee	\$3,000
	Professional User Fee ²⁰	\$40		Professional User Fee	\$60
	Non-Professional User Fee ²¹	\$20		Non-Professional User Fee	\$20
	Non-Display Fee	-		Non-Display Fee (Category 1 & 2 & 3)	\$31,500
	Redistribution Fee	-		Redistribution Fee	\$3,750
	Total	\$1,560		Total	\$38,330
NYSE American Integrated	Access Fee ²²	\$1,250	NYSE American Integrated ²⁵	Access Fee	\$2,500
	Professional User Fee ²³	\$10		Professional User Fee	\$10
	Non-Professional User Fee ²⁴	\$5		Non-Professional User Fee	\$2
	Non-Display Fee	-		Non-Display Fee (Category 1 & 2 & 3)	\$15,000
	Redistribution Fee	-		Redistribution Fee	\$1,500
	Total	\$1,265		Total	\$19,012

NYSE Integrated
 +2,643%

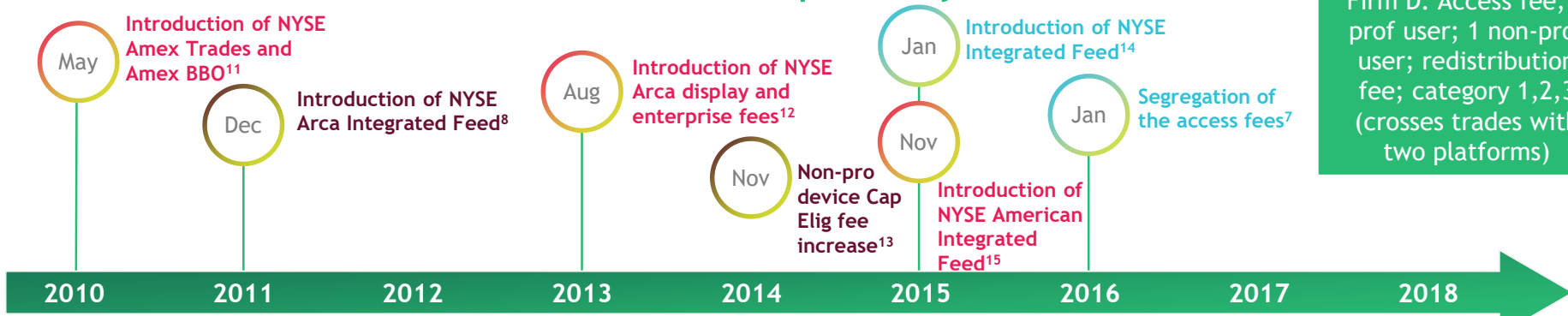
NYSE Arca Integrated
 +2,357%

NYSE American Integrated
 +1,403%

†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)
 ‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances); NYSE American Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
 Source: SIFMA, Expand Research analysis 2018

Business Model 4: Evolution of NYSE Proprietary Data Fees †

Scenario 4:
 Firm D: Access fee; 1 prof user; 1 non-prof user; redistribution fee; category 1,2,3 (crosses trades with two platforms)



2010 Product Equivalent Fees†			2018 Product Fees		
NYSE Integrated	Access Fee ¹⁶	\$2,500	NYSE Integrated ²⁵	Access Fee	\$7,500
	Professional User Fee ¹⁷	\$90		Professional User Fee	\$70
	Non-Professional User Fee ¹⁸	\$20		Non-Professional User Fee	\$16
	Non-Display Fee	-		Non-Display Fee (Category 1,2,3 x2)	\$80,000
	Redistribution Fee	-		Redistribution Fee	\$4,000
	Total	\$2,610		Total	\$91,586
NYSE Arca Integrated	Access Fee ¹⁹	\$1,500	NYSE Arca Integrated ²⁵	Access Fee	\$3,000
	Professional User Fee ²⁰	\$40		Professional User Fee	\$60
	Non-Professional User Fee ²¹	\$20		Non-Professional User Fee	\$20
	Non-Display Fee	-		Non-Display Fee (Category 1,2,3 x2)	\$41,500
	Redistribution Fee	-		Redistribution Fee	\$3,750
	Total	\$1,560		Total	\$48,330
NYSE American Integrated	Access Fee ²²	\$1,250	NYSE American Integrated ²⁵	Access Fee	\$2,500
	Professional User Fee ²³	\$10		Professional User Fee	\$10
	Non-Professional User Fee ²⁴	\$5		Non-Professional User Fee	\$2
	Non-Display Fee	-		Non-Display Fee (Category 1,2,3 x2)	\$20,000
	Redistribution Fee	-		Redistribution Fee	\$1,500
	Total	\$1,265		Total	\$24,012

NYSE Integrated
 +4,119%

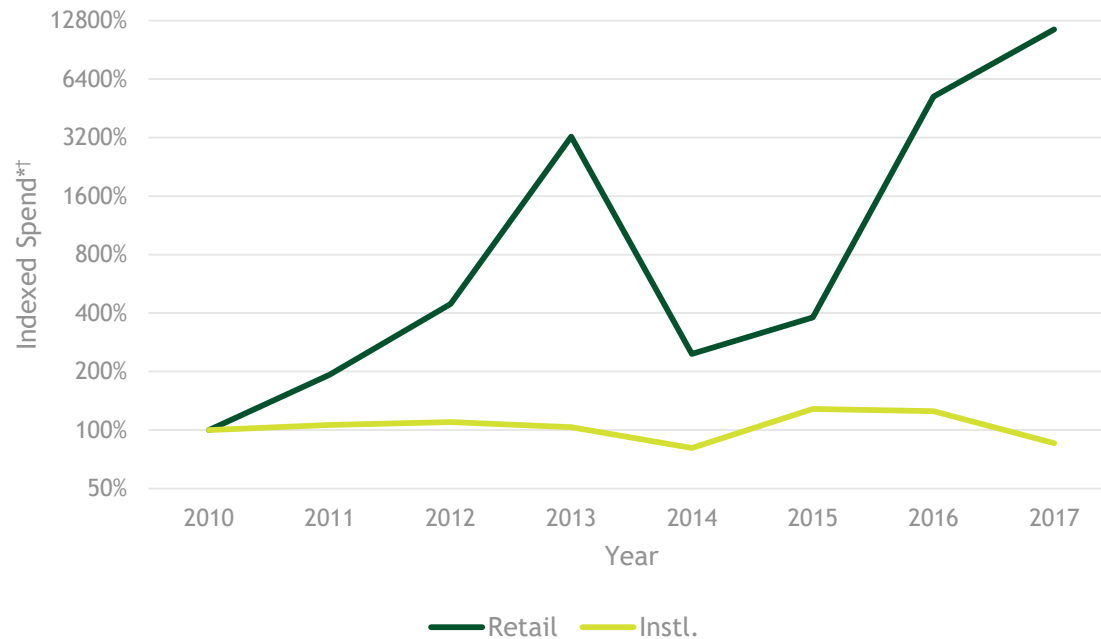
NYSE Arca Integrated
 +2,998%

NYSE American Integrated
 +1,798%

†NYSE Integrated; NYSE Arca Integrated; NYSE American Integrated (formerly NYSE MKT Integrated)
 ‡NYSE Integrated equivalent (OpenBook, BBO, Trades, Alerts & Order Imbalances); NYSE Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances); NYSE American Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
 Source: SIFMA, Expand Research analysis 2018

Retail and Institutional NYSE Proprietary Spend

Per User/Device^a



Retail
+11,000%
(2010 and 2017)

Institutional
-14%
(2010 and 2017)

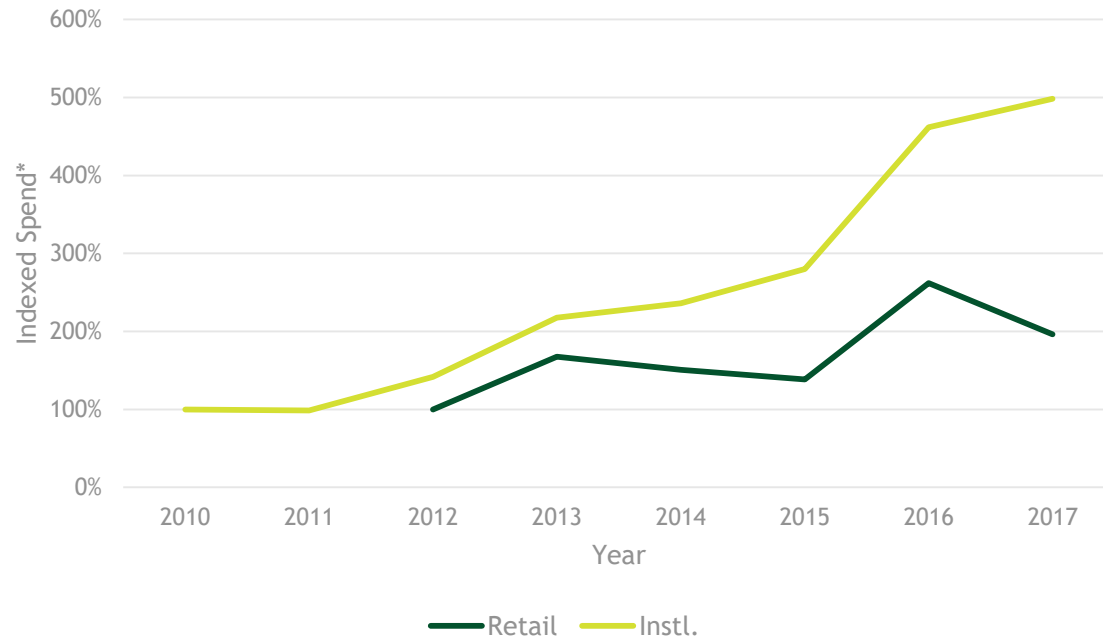
Source: Expand Research / SIFMA Analysis 2018

- Indexed to 2010 Spend
- † Vertical axis log scale to base 2

a.: Products are categorized as per user/device fees for devices displaying data that is visibly available to the data recipient

Retail and Institutional NYSE Proprietary Spend

Access^a



Retail
+96%
(2012 and 2017)

Institutional
+400%
(2010 and 2017)

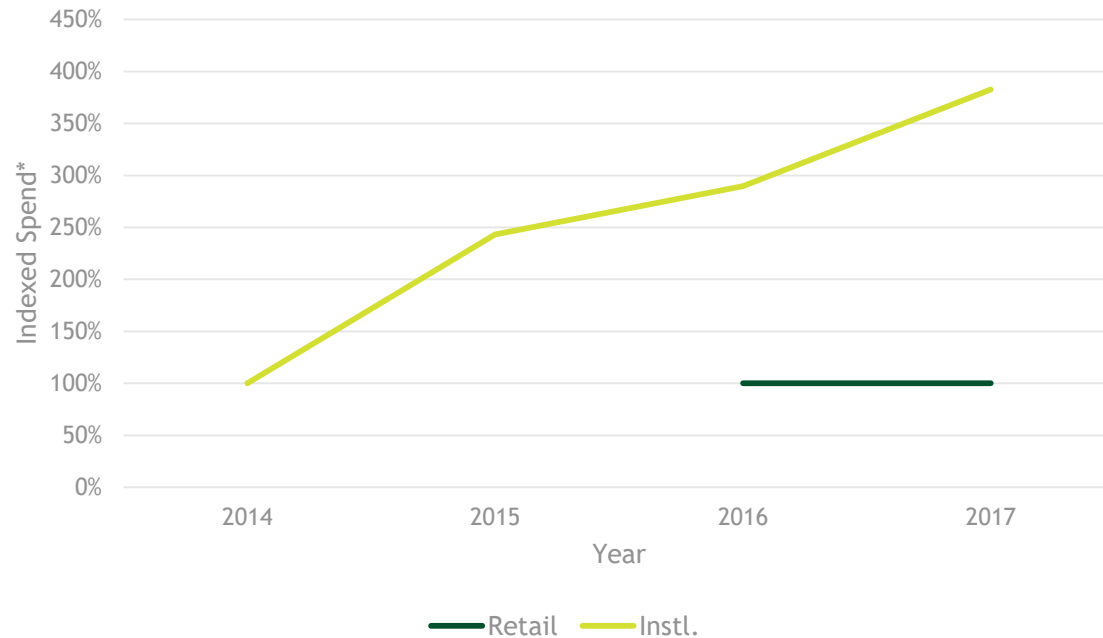
Source: Expand Research / SIFMA Analysis 2018

* Indexed to 2010/2012 Spend

a.: Products are designated as access fees if the data recipient uses the data for non-display or if the recipient receives the data in format that can be manipulated and disseminated to one or more devices, display or otherwise.

Retail and Institutional Proprietary NYSE Spend

Non-Display^a



Retail
+0%

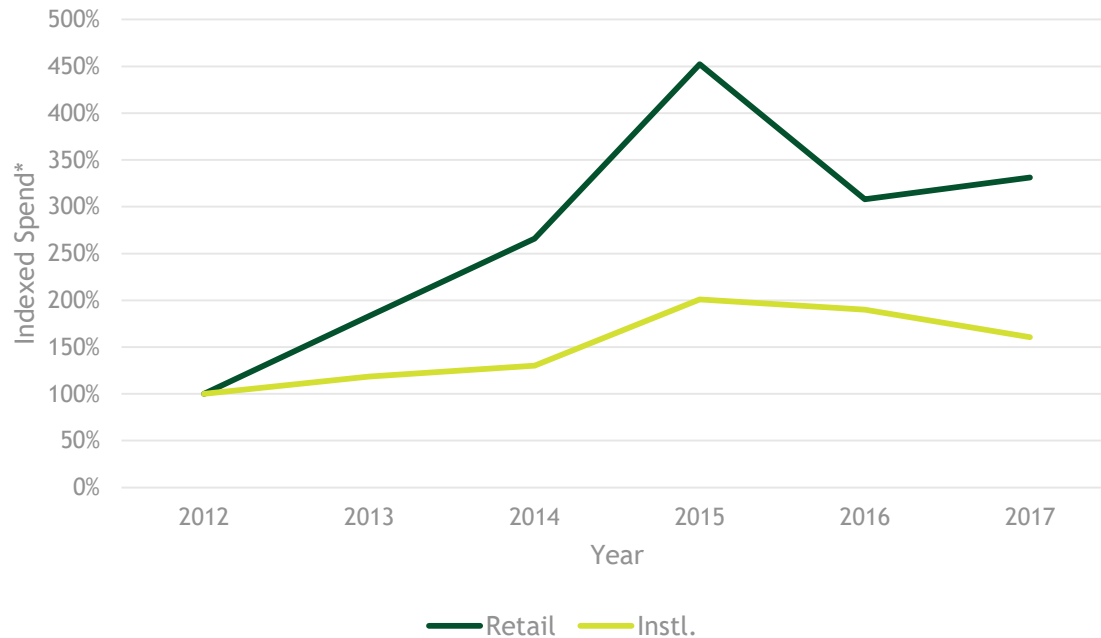
Institutional
+280%
(2014 and 2017)

Source: Expand Research / SIFMA Analysis 2018
* Indexed to 2014/2016 Spend

a.: Products are categorized as non-display fees if device's data is used for a purpose other than in support of the data feed recipient's display on a device

Retail and Institutional Proprietary NYSE Spend

Enterprise^a

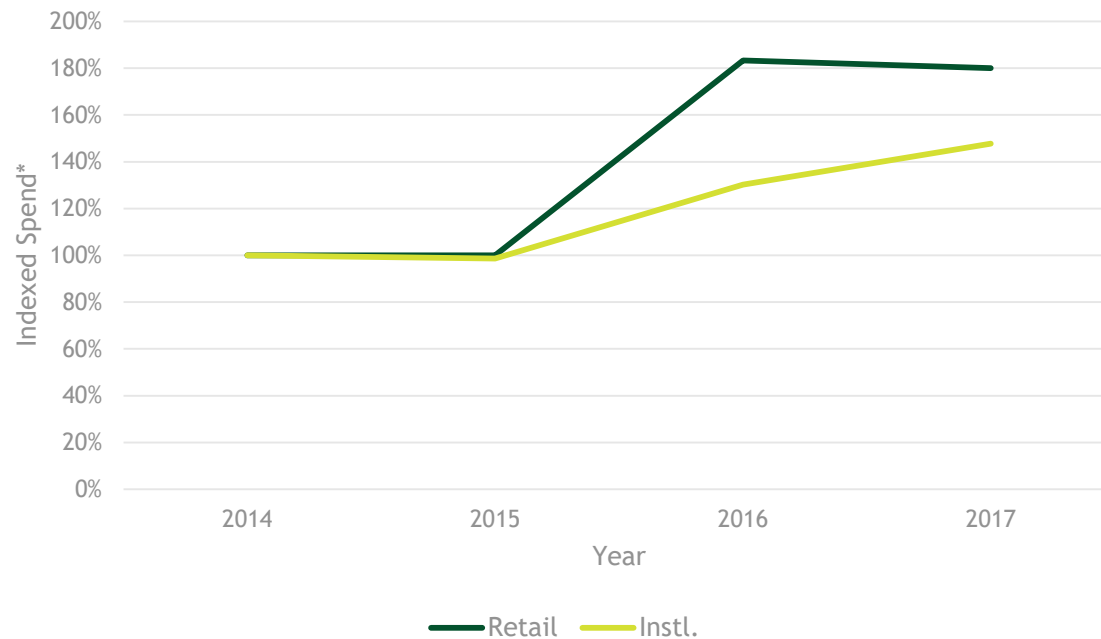


Retail
+230%
(2012 and 2017)

Institutional
+61%
(2012 and 2017)

Retail and Institutional NYSE Proprietary Spend

Redistribution^a

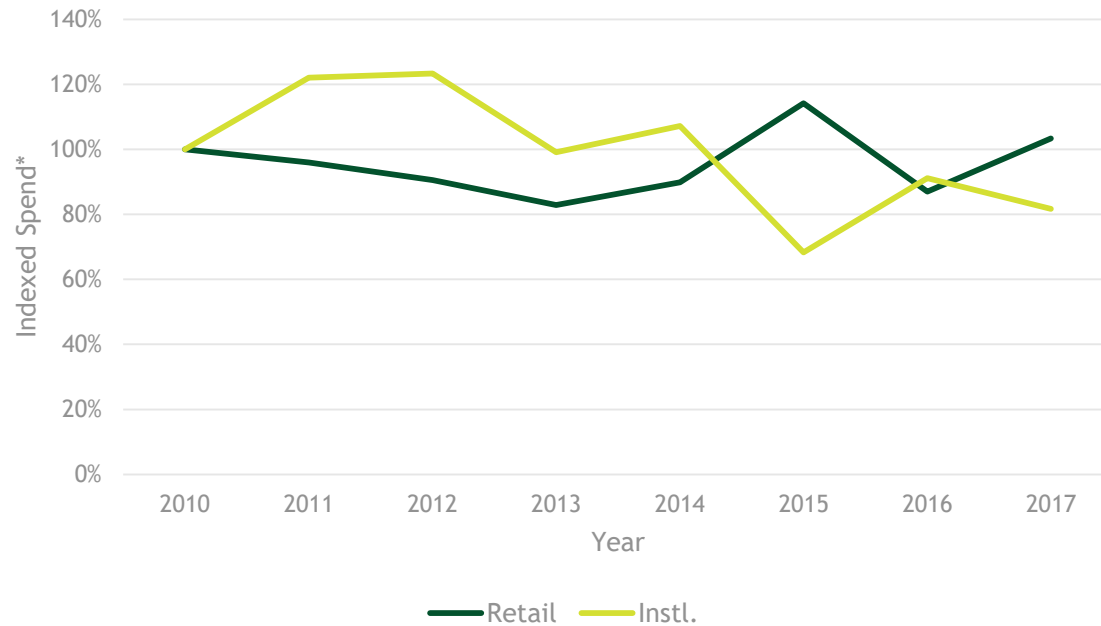


Retail
+80%
(2014 and 2017)

Institutional
+48%
(2014 and 2017)

Retail and Institutional CTA Spend

Per User/Device^a



Retail
+3%
(2010 and 2017)

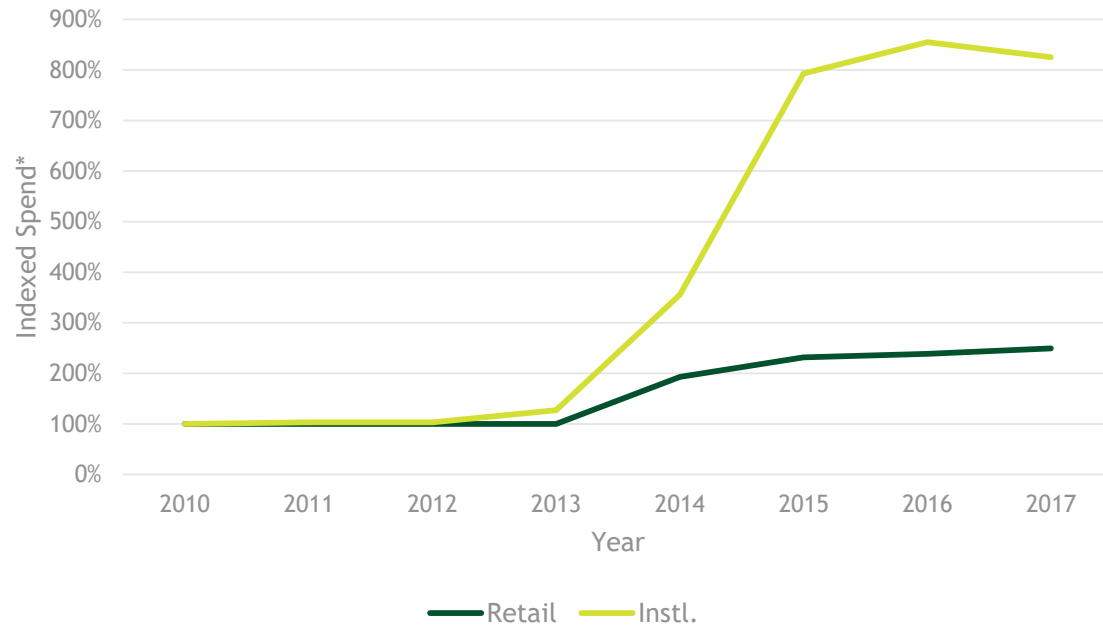
Institutional
-18%
(2010 and 2017)

Source: Expand Research / SIFMA Analysis 2018
* Indexed to 2010 Spend

a.: Products are categorized as per user/device fees for devices displaying data that is visibly available to the data recipient

Retail and Institutional CTA Spend

Access^a



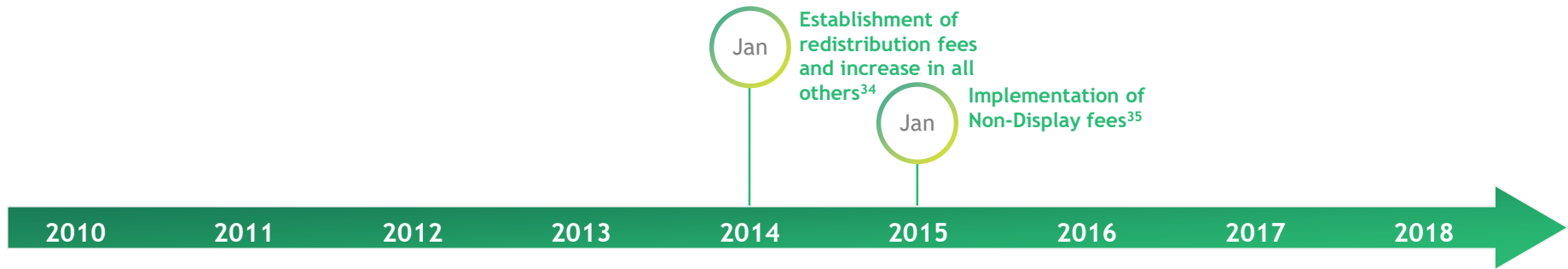
Retail
+149%
(2010 and 2017)

Institutional
+725%
(2010 and 2017)

Source: Expand Research / SIFMA Analysis 2018
* Indexed to 2010 Spend

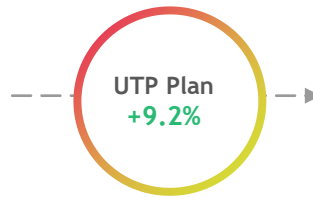
a.: Products are designated as access fees if the data recipient uses the data for non-display or if the recipient receives the data in format that can be manipulated and disseminated to one or more devices, display or otherwise.

Evolution of UTP Plan fees (2010 to 2018)[†]



2010 Product Fees[†]

Device Fees - Professional ³⁶	\$20	
Device Fees - Non-Professional ³⁶	\$1	
Access Fees	Direct Access	-
	Indirect Access	-
Non-Display Use	-	
Enterprise ³⁶	\$600,000	
Redistribution	-	
Total	\$600,021[†]	



2018 Product Fees[†]

Device Fees - Professional ³⁶	\$24	
Device Fees - Non-Professional ³⁶	\$1	
Access Fees ³⁷	Direct Access	\$2,500
	Indirect Access	\$500
Non-Display Use ³⁵	Category 1	\$3,500 /trading system
	Category 2	\$3,500
	Category 3	\$3,500
Enterprise ³⁶	\$648,000	
Redistribution ³⁶	\$1,000	
Total	\$655,525[†]	

[†] All fees are monthly

[‡]Assumes 1 user and purchase of all products

Source: SIFMA, Expand Research analysis 2018

Sources

Ref	Sources
1	ir.nasdaq.com/news-releases/news-release-details/nasdaq-basic-surpasses-1000-customers
3	https://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf
4	https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2013/(SR-NYSE-2013-25)%2034-69278.pdf
5	https://www.sec.gov/rules/sro/nms/2013/34-70010.pdf
6	https://www.sec.gov/rules/sro/nms/2014/34-73278.pdf
7	https://www.sec.gov/rules/sro/nyse/2016/34-76900.pdf
8	https://www.sec.gov/rules/sro/nysearca/2011/34-65669.pdf
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11	https://www.sec.gov/rules/sro/nyseamex/2010/34-62187.pdf
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16	<p>The \$2,500 access fee for NYSE Integrated in 2010 is the sum of (1) the \$1,500 fee for NYSE Trades and NYSE BBO; (2) the \$500 fee for NYSE Order Imbalance Information; and (3) the \$500 fee for NYSE Trades. https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2009/NYSE-2009-05%20SECAAppOrd%201.23.09.pdf; https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2008/34-59543.pdf; https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2004/NYSE-2004-53app.pdf https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2010/(SR-NYSE-2010-30)%2034-62181.pdf; https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/filings/2010/NYSE%202010-30.pdf</p>
17	<p>The \$90 professional user fee for NYSE Integrated in 2010 is the sum of (1) the \$15 fee for NYSE Trades' NYSE Last Sale Information; (2) the \$15 fee for NYSE BBO Information; and (3) the \$60 fee for NYSE OpenBook. See https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2009/NYSE-2009-05%20SECAAppOrd%201.23.09.pdf ("the Exchange submitted a proposed rule change that seeks to establish...a \$15 per month device fee for the end-use of NYSE Trades' NYSE Last Sale Information"); https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2010/(SR-NYSE-2010-30)%2034-62181.pdf ("For the receipt and use of NYSE BBO Information, the Exchange proposes to charge \$15 per month per professional subscriber device"); https://www.sec.gov/rules/sro/nysearca/2010/34-63291.pdf ("NYSE charges \$60 for NYSE OpenBook")</p>
18	<p>The \$20 nonprofessional user fee for NYSE Integrated in 2010 is the sum of (1) the \$15 fee for NYSE Trades' NYSE Last Sale Information; and (2) the \$5 fee for NYSE BBO Information. See https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2009/NYSE-2009-05%20SECAAppOrd%201.23.09.pdf ("the Exchange submitted a proposed rule change that seeks to establish...a \$15 per month device fee for the end-use of NYSE Trades' NYSE Last Sale Information"); https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2010/(SR-NYSE-2010-30)%2034-62181.pdf ("The Exchange proposes to charge each NYSE-Only Vendor \$5.00 per month for each nonprofessional subscriber to whom it provides NYSE BBO Information"); https://www.sec.gov/rules/sro/nyse/2009/34-59544.pdf</p>

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20	https://www.sec.gov/rules/sro/nysearca/2013/34-69315.pdf
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22	The \$1,250 access fee for NYSE American Integrated in 2010 is the sum of (1) the \$750 fee for NYSE Amex Trades and NYSE Amex BBO; and (2) the \$500 fee for NYSE Amex Order Imbalance Information. See https://www.nyse.com/publicdocs/nyse/markets/nyse-american/rule-filings/sec-approvals/2010/(SR-NYSEAmex-2010-35)%2034-62187.pdf (“For the receipt of access to the NYSE Amex Trades and NYSE Amex BBO, the Exchange proposes to charge \$750 per month”); https://www.sec.gov/rules/sro/nyseamex/2009/34-60385.pdf (“The Exchange proposes to charge a \$500 monthly fee to recipients of the NYSE Amex Order Imbalance Information datafeed”)
23	https://www.sec.gov/rules/sro/nyseamex/2010/34-62187.pdf
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**PROPOSAL FOR THE CREATION OF
COMPETING MARKET DATA AGGREGATORS**

Agenda

- Assessment of the Existing SIP Model
- Key Standards for the NBBO and SIPs
- The Need for a Distributed Data Model
- CMDA: Specifications
- CMDA: Performance Standards
- CMDA: Transparency
- CMDA: Revenue Model
- CMDA: Plan Governance
- Key Benefits of CMDAs
- Blackrock Comment Letter on Competing SIPs
- Discussion and Next Steps

The Existing SIP Model is Outdated

The current U.S. model for the dissemination of real-time trade and quote information in national market system (NMS) equity securities does not deliver the standards that market participants should expect in today's high-speed trading environment.

- The existing model includes the underlying architecture, governance structure, and revenue allocation formula utilized for the dissemination of the NBBO.
- In a June 3, 2015 letter to SEC Chair Mary Jo White, Rep. Bill Foster (D-IL) and ten other members of the House New Democrat Coalition Financial Services Task Force stated: ***“We encourage you to continue working with the national securities exchanges and a cross-section of market participants to incentivize investments in the Securities Information Processors to reduce latency and improve their resiliency.”***

SIPs Should Meet High Standards

The market data dissemination and governance model should be evaluated relative to standards, including:

- Does it encourage a **fair and level playing field** among market participants? Does it strive to reduce latency arbitrage opportunities?
- Does it incentivize **competition** and competitive performance standards?
- Does it provide adequate **redundancy and resiliency**, and reduce systemic risk?
- Are there adequate mechanisms in place to address and manage potential **conflicts of interest** among SIP Plan participants and SIP Processors?
- Does the **governance model** adequately incorporate a cross-section of industry views, e.g., for planning, operations, investment, evolution?

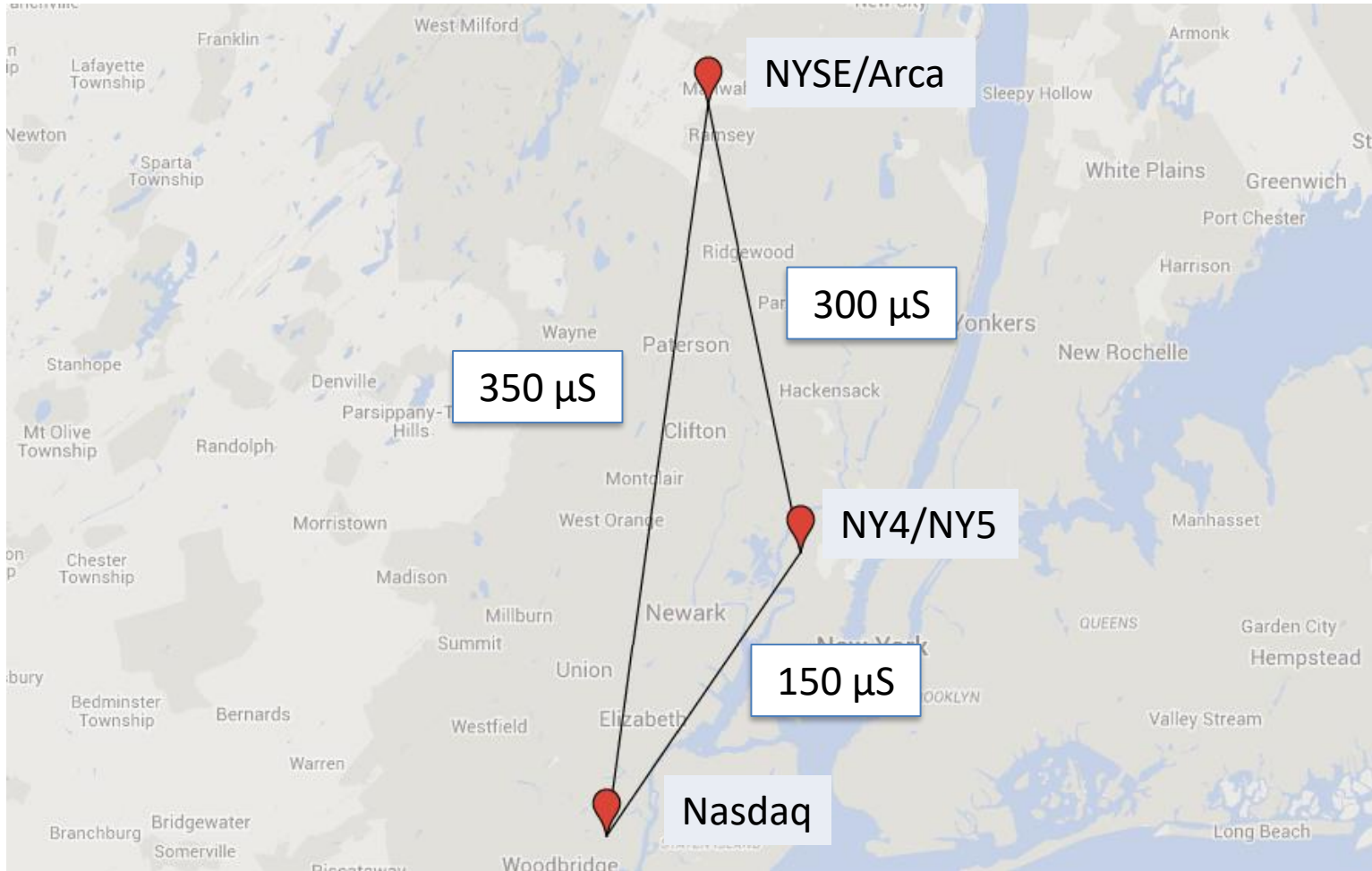
Core Problem: Single Point of Consolidation

A Distributed Model is Necessary

Today's SIP model – and its single-point-of-consolidation architecture – subject the SIP NBBO calculation to an inherent and inevitable weakness as compared to the direct feed (distributed) aggregation model that exists in the private market: the “extra hop” problem.

- As long as each SIP is located in a single data center, data for every participant exchange must be sent there and back (to the data center of said exchange), causing significant latency in the market data for that exchange via the SIP.
- While it is physically impossible for there to be a single best-in-class NBBO simultaneously at all locations, it is possible and desirable for there to be a best-in-class NBBO at each of the major physical data center locations.
 - Note: the private market has largely supplanted the SIP framework with an extremely (and increasingly) expensive approach that efficiently aggregate proprietary (or “direct”) data feeds from the various exchanges.
- **The CMDA proposal, a disbursed model, requires that each CMDA SIP receive all data feeds directly, largely eliminating the “extra hop” problem for SIPs and bringing the SIP architecture in line with competitive private market solutions.**

Latency map



THE CMDA MODEL: The Basics

- CMDAs could be any commercial entity that meets minimum standards for operation and may include exchanges or other financial technology vendors.
- Tape Revenue would support >3 CMDAs
 - Minimum one per major data center (Carteret, Mahwah, NY4/5)
- Distributed Model - Eliminates Extra Hop Problem
- Each CMDA would provide data for all tapes (A, B, and C)
 - Ensures competition and redundancy
- Data would be from fastest (direct) exchange feeds
 - Would be competitive with private market solutions
- CMDAs need to be commercially competitive
 - Must attract subscribers to survive
- Would require revisions to existing SIP Plans
 - One CMDA Plan would suffice for all CMDAs

CMDA: Specifications

- CMDAs would each provide all of the messaging currently provided by SIPs, except that each would provide all primary SIP messaging.
 - Quote and Trade Feeds
 - Regulatory messages, e.g., Trade halts and LULD bands (based on a standard formula)
 - Market status of each contributing market
 - Every message would contain timestamps with microsecond granularity reflecting quote or trade creation within the matching engine so that consumers of SIP data can monitor latency, detect problems, and reconcile the SIP data with the private data products.
- NBBO. Each exchange would provide CMDAs with direct feeds to ensure a fair and world-class standard for the CMDA NBBO.
- Data would be provided by exchanges free of charge, as a precondition of participating in CMDA Plan revenue sharing.
- A “protected quote” marker determined by the CMDA based on latency of incoming feeds. Quotes more than 3+ milliseconds would not be part of the PBBO.
- Depth of Book: Worthy of consideration. Dependent upon demand. Would be priced/sold/negotiated separately.

CMDA: Performance Standards

For CMDAs:

- Throughput and capacity protocols would be based upon fastest possible configurations sold by exchanges to market participants for existing direct fees.
- Operational capabilities and performance metrics tracked would include: latencies at detailed percentiles (including peak vs. non-peak), capacity and throughput, time for consolidation of quotations by time of day, etc.

For Protected Market Centers:

- Protected market centers must enter into service level agreements (SLAs) with performance criteria they must maintain in order to remain protected (e.g., timestamp comparison deltas, out of sequence updates, duplicate messages, latency, outstanding heart beats).
- Minimum SLA requirements will be set by the Plan operating committee.
- If a market center does not satisfy the SLA, then the CMDA operator should be permitted to disconnect that market's session and zero out its quotes (e.g., if a major operational issue) or flag them as slow and unprotected (e.g., if experiencing sporadic delays).

CMDA: Revenue Model

- This Proposal does not address – or intend to change -- existing fees for broker dealers, vendors or other users of SIP market data.
- 80% of all market data revenue would continue to be allocated to all Plan Participants under the current data revenue formula.
- The remaining 20% of tape revenue collected would be split into two (equal 10%) parts: an Operations Pool and Subscription Pool.
- **The Operations Pool** would compensate CMDAs for meeting and maintaining minimum SLA obligations.
 - This is similar to the funding of existing SIP operations, but for 6+ SIPs.
- **The Subscription Pool** would compensate each CMDA for its ability to attract and retain client users based upon its competitiveness.
 - E.g., if CMDA1 attracts users that, in aggregate, contribute \$50 million to Plan revenues, it would be allocated \$5 million.
- CMDAs would *not* be allowed to charge differential prices for product variations that provide for differential latencies.

CMDA: Transparency

- CMDA operators would be required to provide **periodic public disclosure** of **operational capabilities and performance metrics**, including: latency statistics at detailed percentiles (including peak vs. non-peak), capacity and throughput, time for consolidation of quotations by time of day, etc.
- CMDAs would publish data tracking speeds and latencies for provision of data to the CMDA by venue. **Would also publish data on latencies from publishing market centers** as well as frequency of locked and crossed market conditions.
- Transparency would be a requirement of the CMDA Plan, but would be **incentivized naturally from the competitive dynamics** at play among CMDAs. It is worth noting that, today, any commercial aggregator of market data provides detailed and specific metrics as a function of its desire to win business.
- In concert with these CMDA disclosures, **all market centers would be required to report consistent metrics regarding their own NBBO aggregation standards.**
- These transparency elements would be a departure from current SIP practices, especially at the finest levels of detail (99th percentile).

CMDA: Fair Access

- If an exchange chooses to operate an CMDA in its home data center, it will be required to adopt policies and procedures reasonably designed to ensure that all competing CMDAs operating in the same center have equal access to the exchange's feeds at equal latencies.
- To the extent that the exchange offers co-location, the economic terms of that co-location (including space and power) offered to competing CMDAs must be equivalent to the exchange's trading members.

CMDA: Governance

- The existing NMS Plan structure for the SIPs is subject to inherent conflicts, is ineffective and should be modified.
- Governance of SIPs controlled solely by SROs, with an “Advisory Committee” that includes market participants.
- The SIP Operating Committees should include direct industry participation with full voting rights.
 - This inclusion would be consistent with the statutory “fair representation” requirements governing the SROs themselves.
 - Industry participation would help assure that the SIPs operate for public good, not just for the benefit of the participating SROs.
- The “Advisory Committee” construct does not work.
 - Advisory committee members are given no substantive voice in the operation of the SIPs, and the SROs conduct all of the meaningful business of the SIPs in executive session, from which advisory committee members are excluded.
- The Exchange Act and applicable rules do not prohibit full industry participation in the governance and administration of the affairs of the SIPs.

Benefits of the CMDA – Higher Standards

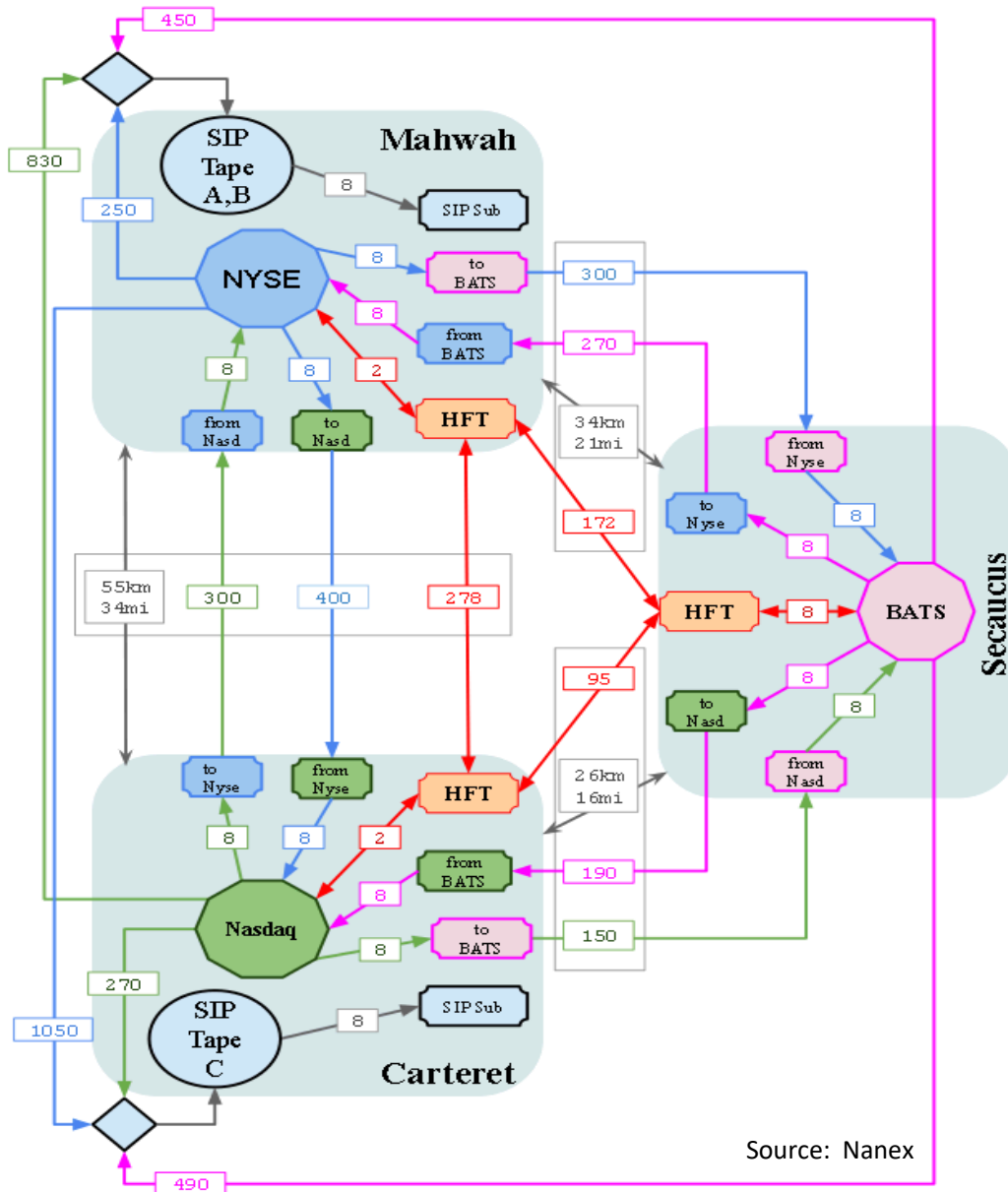
Fairness	CMDA would dramatically reduce significant disparities between SIPs and “direct” models.
Competition	Would stimulate the creation of multiple CMDAs and distribute rewards based upon performance.
Redundancy	CMDA would allocate sufficient funds towards SIP operations to support 3 or more equity SIPs, each of which would support all NMS securities.
Conflicts	Operators and governors of CMDAs would not, by necessity, be the same exchanges that are selling market data products (e.g., “direct feeds”) that compete with the SIPs. If they are, they would be mandated to meet high SLA standards.
Governance	The CMDA model would require cross-industry representation (including broker-dealer and asset manager representatives) and governance. Without such a governance change early in this process, this proposal is not likely to garner serious consideration given the inherent conflicts that exist today.

Not just a Broker-Dealer Issue...

Blackrock Comment Letter

- Regulators should “focus on minimizing the latency and increasing resiliency of the Securities Information Processors (“SIPs”) as an immediate outcome. Exchanges should make the necessary investments in technology to reduce the latency between the SIP and private data feeds to market acceptable standards.
- “At a minimum, SIP performance should be commensurate with that of commercially available market data aggregators.
- “Performance metrics and operating standards must be established to ensure that the SIP continues to receive appropriate funding and support to remain competitive with private aggregation solutions.
- “The NMS Plans should be expanded to permit multiple SIP processors to disseminate consolidated market data instead of relying on a central infrastructure.
- **“Centralized platforms discourage innovation and create a single point of failure that poses systemic risk. A network of multiple operators would stimulate competition in price, performance, and system reliability.**
- “This would also increase redundancy in the consolidated feed which is a critical market utility, as observed by the NASDAQ market outage on August 22, 2013.¹⁶
- Letter to the Honorable Mary Jo White, Chair, US SEC, September 12, 2014, on Equity Market Structure Recommendations, from Richard Prager, et al. Source: <https://www.sec.gov/comments/s7-02-10/s70210-419.pdf>

Market Data and Geographic Latency



Source: Nanex