sifma

Invested in America

October 24, 2018

Brent J. Fields
Secretary
Securities and Exchange Commission
100 F Street NE., Washington, DC 20549

Re: ***File No. 4-729: Roundtable on Market Data and Market Access***

Dear Mr. Fields:

The Securities Industry and Financial Markets Association ("SIFMA")[1] thanks the U.S. Securities and Exchange Commission ("Commission") for organizing the Roundtable on Market Data and Market Access ("Roundtable") to be held on October 25 and 26, 2018. These are very important issues for the markets, and we appreciate the Commission's attention in this area.

SIFMA has been extremely active in market data issues for more than a decade. We have advocated for market data reforms that will increase market efficiency by providing greater transparency and benefit retail investors by requiring more reasonable fees. In this area, we have advocated mainly on two fronts: first, the need to reform fees for exchanges' market data products; and second, the need to address the conflicts of interest affecting the quality and operation of the Securities Information Processors ("SIPs").

Below, we describe the meaningful market-data reforms that SIFMA supports. In addition, we describe flaws in policy papers that NYSE and Nasdaq have issued in advance of the Roundtable.

The Commission recently took a critical step in ordering the exchanges to provide factual and legal support to demonstrate that their market data fees are fair and reasonable as required by the Securities Exchange Act of 1934 ("Exchange Act"). In addition, the Commission should address the issue of speed and content differentials between the market data feeds provided by the SIPs and the proprietary products sold by the exchanges. Both retail investors and market

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[1] SIFMA is the leading trade association for broker-dealers, investment banks and asset managers operating in the U.S. and global capital markets. On behalf of our industry's nearly 1 million employees, we advocate for legislation, regulation and business policy, affecting retail and institutional investors, equity and fixed income markets and related products and services. We serve as an industry coordinating body to promote fair and orderly markets, informed regulatory compliance, and efficient market operations and resiliency. We also provide a forum for industry policy and professional development. SIFMA, with offices in New York and Washington, D.C., is the U.S. regional member of the Global Financial Markets Association (GFMA). For more information, visit http://www.sifma.org.

professionals should have access to the most complete and up-to-date market information possible to make informed investing decisions.

I. SIFMA Activities to Promote Market Data Reform

Many of the current issues with market data are linked to requirements under the Commission's Regulation National Market System ("NMS").[2] Under Regulation NMS, exchanges must make their best bids and offers available to a SIP. The SIPs are operated by the exchanges, and they distribute the so-called "public" market data feed, which includes only "top of book" market information – *i.e.*, the best bid and offer across all displayed markets. In addition, Regulation NMS allows the exchanges to sell so-called "proprietary" market data products, which provide "depth of book" information – *i.e.*, the best bids and offers available on the exchange, as well as limit order information in an exchange's order book at prices away from the best bids and offers. Regulation NMS prohibits exchanges from providing data via their proprietary feeds on a timelier basis than providing it to the SIPs. However, the exchanges' proprietary feeds generally are faster than the SIP feeds.

a. SIFMA's Challenge on Exchange Proprietary Data Products

SIFMA has been challenging the fees for exchange proprietary data products since 2006, when we challenged an NYSE Arca proposed rule change with the Commission to charge for a proprietary depth-of-book product.[3] Our challenge has gone through several procedural rounds, both at the Commission and in the U.S. Court of Appeals for the D.C. Circuit.[4]

On October 16, 2018, the Commission ruled in the most recent proceeding, finding that Nasdaq and NYSE Arca failed to meet their burden to justify that the fees are "fair and reasonable and not unreasonably discriminatory."[5] The Commission also remanded over 400

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2 70 Fed. Reg. 37495 (June 29, 2005)

3 Release No. 34-53952, File No. SR-NYSEArca-2006-21 (*filed* May 23, 2006), *available* at https://www.sec.gov/rules/sro/nysearca/2006/34-53952.pdf.

4 *NetCoalition v. SEC*, 615 F.3d 525 (D.C. Cir. 2010) ("NetCoalition I") (The Court vacated the Commission's approval of the NYSE Arca depth-of-book fees). *NetCoalition v. SEC*, 715 F.3d 342, 353 (D.C. Circ. 2013) ("*NetCoalition II*") (The Court declined to consider challenges to the Commission's non-suspension of NYSE Arca's depth-of-book fees but suggested challenging the fees through a denial of access proceeding under Section 19(d) of the Exchange Act). *In the Matter of the Application of SIFMA*, Initial Decision Release No. 1015 (June 1, 2016) (SEC Administrative Law Judge Brenda Murray's ruled against SIFMA in its application under Section 19(d) of the Exchange Act for denial of access to an exchange facility – i.e., market data – resulting from excessive fees).

5 *In the Matter of the Application of SIFMA*, Review of Action Release No. 84432 (Oct. 16, 2018).

exchange filings to increase fees for proprietary market data products that SIFMA has challenged since its first challenge to NYSE Arca's market data fees.[6]

More recently, SIFMA worked on a report of market data costs with Expand Research, a company of the Boston Consulting Group, which specializes in market data benchmarking for financial institutions. The report documents market data policy and fee changes since 2010, and the fees paid by 10 firms over that time period, to show the impact of those changes. The data comes from firms' NYSE January invoices since 2010. The 10 firms represent both retail and institutional consumers of market data and voluntarily submitted this data so Expand Research could anonymize, aggregate, organize and analyze it. The Expand report demonstrates that proprietary data fees have increased substantially over the last eight years, while most SIP fees have also increased. SIFMA members continue to purchase both SIP and proprietary data despite the growing fees. In particular, the presentation shows that the NYSE has used various types of fee changes to increase the surveyed members' cost for proprietary market data products by over 1,100% over the last eight years. A copy of the report is attached as an appendix to this letter.

b. SIFMA Challenges to the Operation and Governance of the SIPs

In addition to selling their own proprietary market data products, exchanges also operate – and earn revenue from – the public market data feeds distributed by the SIPs. There have always been speed and content differentials between the SIPs and the exchanges' proprietary products.

Public attention to the SIPs increased after an outage of the Nasdaq SIP caused an hours-long trading halt in all Nasdaq-listed securities in all venues on August 22, 2013. The Nasdaq trading halt created significant confusion in the equities markets. After this outage, SEC Chair Mary Jo White set up workstreams to identify concrete measures to improve the market systems.[7] In response to the Nasdaq outage, SIFMA commented on the workstreams and advocated for the Commission to: (1) revamp the governance of the SIPs and address the conflicts of interest; (2) increase transparency in the SIPs operations; and (3) increase the SIPs efficiencies by introducing competitive forces.[8]

Since then, the exchanges have not made any changes to the governance of the SIPs or sufficiently increased transparency on their operations. For example, Nasdaq announced after the outage that it would withdraw from acting as the processor for the SIP distributing data for Nasdaq-listed securities. However, Nasdaq later changed its mind, and it was reinstated as the processor by the exchanges through a selection process carried out in private with no input from

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6 *In the Matter of the Applications of SIFMA and Bloomberg*, Exchange Act Release No. 84433 (Oct. 16, 2018).

7 https://www.sec.gov/news/press-release/2013-178#.Unpu3VCfgqY

8 Letter from T.R. Lazo to SEC Chair Mary Jo White (Dec. 5, 2013) *available at* http://www.sifma.org/wp-content/uploads/2017/05/sifma-submits-comments-to-the-sec-on-securities-information-processors-and-operational-resiliency.pdf.

other affected industry participants such as broker-dealers or asset managers.[9] This flawed selection process highlighted the problems with SROs exclusively operating the SIPs, and it reinforced the view that the exchanges may operate the SIPs for the benefit of the participating SROs rather than for the public good.[10]

In July 2014, as part of a larger set of recommendations on equity market structure, SIFMA recommended that the Commission promote the equitable distribution of market data by requiring improvements to the SIPs, reforming their governance structure, and introducing greater competition.[11] While Regulation NMS currently prohibits exchanges from providing proprietary data to participants sooner than to the SIP, technology enhancements have in effect allowed market participants to receive proprietary data faster than the SIP due to the speed differentials between the two market data feeds.[12] To their credit, the SIPs have improved and latencies have decreased significantly, and we urge the exchanges to continue to improve the SIP infrastructure to decrease latencies even further.

However, there are additional ways the exchanges could further increase transparency and improve the effectiveness of the SIPs. In this regard, we additionally have urged the Commission to improve governance of the SIPs by allowing broker-dealers and asset managers to have representation on the SIP operating committees with full voting rights.[13] SIFMA also advocated for increasing the transparency of SIPs by requiring public disclosures of the SIPs operations, accounting and technology.[14] SIFMA also suggested ways to increase SIP efficiencies and promote competition by (1) determining whether the SIP should include more in-depth data in the public quote or if displaying the single best bid and offer is sufficient; and (2) establishing a maximum allowable delta between the SIPs and direct data feeds with respect to latency and speed.[15] In addition, SIFMA has developed a proposal for the creation of

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9 Letter from T.R. Lazo and Melissa MacGregor to Thomas Knorring, Chairman, Nasdaq/UTP Plan Operating Committee (October 14, 2014) at 4 *available a*t https://www.sifma.org/wp-content/uploads/2017/05/sifma-writes-letter-to-nasdaq-utp-plan-operating-committee-on-selection-of-processor-for-the-nasdaq-sip.pdf.

10 *Id.*

11 Letter from T.R. Lazo to SEC Chair Mary Jo White at 8 (October 24, 2014) *available at* https://www.sifma.org/wp-content/uploads/2017/05/sifma-submits-comments-to-the-sec-with-recommendations-for-equity-market-structure-reforms.pdf ("SIFMA Equity Market Recommendations Letter").

12 Exchange Act Release No. 61358, SEC Concept Release on Equity Market Structure (Jan. 14, 2010) at 26.

13 SIFMA Equity Market Recommendations Letter at 10-11.

14 *Id.*

15 *Id.* at 6.

competing market data aggregators, or "CMDAs," which would provide a competitive alternative to the current monopolistic SIP structure.[16]

II. SIFMA Comments on the NYSE Study and Nasdaq Proposal

Recently, NYSE and Nasdaq have published policy papers on market data. In August 2018, NYSE published a study that it commissioned.[17] Nasdaq released a paper describing a set of proposals on market data.[18] SIFMA disagrees with several of the arguments made in these papers which we highlight below.

a. SIFMA's Analysis of NYSE's Study

NYSE's paper includes its standard argument that market data fees are constrained by competition and that market participants can use exchanges' proprietary products interchangeably. SIFMA has argued repeatedly, with supporting evidence, that broker-dealers engaged in comprehensive trading services are effectively required to purchase depth-of-book data from all the exchanges. To remain competitive in today's markets, broker-dealers must have the fastest and deepest possible information for a full view of the market, both for themselves and to provide their retail and institutional customers. Paradoxically, NYSE's study describes the importance of seeing the entire market, as opposed to a small subset of the transactions,[19] and then four pages later states the conviction of there being little need to purchase market data from all the exchanges,[20] even though each of the exchanges executes its own discrete subset of transactions. Hence, market participants cannot use exchanges' market data feeds interchangeably, and the existence of other proprietary feeds does not create competitive forces that constrain prices.

NYSE's paper states that the price of market data is not important because of a perceived cost of market data relative to exchanges and banks' revenues.[21] Putting aside SIFMA's disagreements with these assumptions on market data costs and broker-dealers' revenues, an entity's alleged ability to pay has no bearing on whether exchanges charge market data fees that are fair and reasonable. The fees either satisfy the requirements of the Exchange Act or they do not; a broker-dealer's ability to pay the fees has nothing to do with it. This argument also ignores

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16 A copy of SIFMA's CMDA proposal is attached as an appendix to this letter.

17 Charles M. Jones, Understanding the Market for U.S. Equity Market Data (Aug. 31, 2018) *available at* https://www0.gsb.columbia.edu/faculty/cjones/papers/2018.08.31%20US%20Equity%20Market%20Data%20Paper.pdf ("NYSE Commissioned Paper").

18 Nasdaq, Promoting Transparency: Nasdaq's Market Data Proposals (2018) *available at* https://business.nasdaq.com/media/Market_Data_Policy_Statement_tcm5044-65695.pdf ("Nasdaq Market Data Proposals").

19 NYSE Commissioned Paper at 9.

20 *Id.* at 13.

21 *Id.* at 21-33.

the fact that reasonableness must take into account the cost of data to retail investors, either through direct charges or indirectly through trading fees.

The NYSE paper concludes that broker-dealers do not have to subscribe to depth-of-book data to comply with its best execution obligations because FINRA Regulatory Notice 15-46 "does not suggest that firms that do not already subscribe to proprietary feeds for their own internal use would need to start doing so as a result of the notice."[22] Taking aside that specific FINRA notice, regulators have never given broker-dealers express comfort that they can satisfy regulatory best execution obligations without buying depth-of-book products. Broker-dealers interpret their best execution obligations as requiring them to use the best available data to find their customers the best reasonably available price[23] and most are unwilling to assume the regulatory risk of violating best execution obligations when the prevailing law is unclear. If the Commission and FINRA believe that broker-dealers can comply with best execution by relying only on the SIP, they should clarify that through rulemaking or guidance. However, even if the regulators provided that clarification, most broker-dealers require the faster and deeper information to participate effectively in the market and provide customers with the competitive order routing quality.

NYSE's paper claims that "overpricing [market data] can cause them [the exchanges] to lose order flow" and that new exchange entrants compete for order flow by offering free market data.[24] However, any potential correlation would not prove that overpricing market data causes an exchange to lose order flow. The primary determinant of a market participant's order routing decision is the variable immediate cost of execution. Further, and importantly, a broker-dealer's control over its order routing choice is limited by its regulatory obligations of best execution and compliance with the order protection rule, which do not include cost of market data as a consideration. Conversely, there is no evidence that a new exchange entrant attracts order flow simple by virtue of the price (or lack thereof) of market data. Offering free market data was not the prevailing reason that Arca, Bats, Direct Edge and IEX increased their respective market share. If it were, Arca, Bats and Direct Edge would have seen a corresponding decrease in order flow once it began charging for market data. If a causal link between market data and order flow exists, then each exchange would see a corresponding drop-in market share every time there was a fee increase. NYSE also fails to address the impact of market data fees on retail investors, who are are key purchasers and users of market data, either directly or through their brokerage firms.

The NYSE paper suggests that market data products face competition by comparing the market for market data—one with monopolistic pricing for proprietary data—to a market for automobiles—a fully competitive market.[25] In a competitive market, companies cannot

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22 *Id.* at 16.

23 U.S. Treasury Report at 63.

24 NYSE Commissioned Paper at 11.

25 *Id.* at 12-13.

significantly increase prices over cost because if a company earned excess profits, other companies would drive profits down through less expensive products. As shown in the attached study, the pricing of equivalent NYSE Integrated, NYSE Arca Integrated and NYSE American Integrated product data increased from 2010 to 2018 by approximately 1,110%, 1,011% and 612% respectively. Further, depending on the size and usage of that consumer, these price increases could translate into as much as a 3,000% increase in total spend in 2018 to receive the equivalent market data content as in 2010. The significantly large price increases for market data compared to automobiles shows these two markets are not similar and that exchanges charge any price it wants as customers have no alternatives.

b. SIFMA's Analysis of Nasdaq's Proposal

Nasdaq's recommendation that all market participants—exchanges, broker-dealers, asset managers and retail investors—should play an active role in the governance of the SIPs is an idea that SIFMA supports. However, Nasdaq does not go far enough in its suggestion. Nasdaq only suggests improving the role of the advisory committees, and SIFMA believes SIP governance (and that of all other NMS Plans) should include voting representation by both broker-dealers and asset managers. In this regard, the Commission should direct the SROs to make these governance changes.

Nasdaq also raises an important issue with mitigating potential conflicts of interest[26] but neglects the fact that, as recognized by an SEC Commissioner,[27] exchanges offer their own proprietary feeds, some of which are designed to compete with the SIPs, while at the same time the exchanges operate the SIPs and control the SIP operating committees. Nasdaq additionally neglects to acknowledge its own conflict of interest when it proposes to allocate more SIP revenue for "lit" quotes, which effectively would send more order flow to the exchanges. We agree with Nasdaq that the SIP governance should be enhanced, but the Commission should recognize and mitigate all potential conflicts of interest through giving voting representation to broker-dealers and asset managers.

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[26] Nasdaq Market Data Proposals at 9.

[27] *See* Commissioner Jackson Speech, Unfair Exchange: The State of America's Stock Markets, George Mason University (Sept. 19, 2018) *available at* https://www.sec.gov/news/speech/jackson-unfair-exchange-state-americas-stock-markets, stating:

> Importantly, however, the exchanges run the public feed. And, at the same time, the exchanges sell private data feeds. The result has been a public feed that is slower and less robust than the private feeds the exchanges sell. Unsurprisingly, exchanges have underinvested in the public feed—a product they compete with. It's like letting Barnes & Noble run our public libraries. Nobody should be surprised to find that our libraries don't have enough books.

* * *

SIFMA appreciates the Commission's consideration of the issues raised above and would be pleased to discuss these comments in greater detail with the Commission and the Staff. If you have any questions or need any additional information, please contact Melissa MacGregor (at 202-962-7385 or mmacgregor@sifma.org) or T.R. Lazo (at 202-962-7383 or tlazo@sifma.org).

Sincerely,

/Melissa MacGregor/

Melissa MacGregor
Managing Director and
Associate General Counsel

Theodore R. Lazo
Managing Director and
Associate General Counsel

Expand
A Company of The Boston Consulting Group

sifma

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

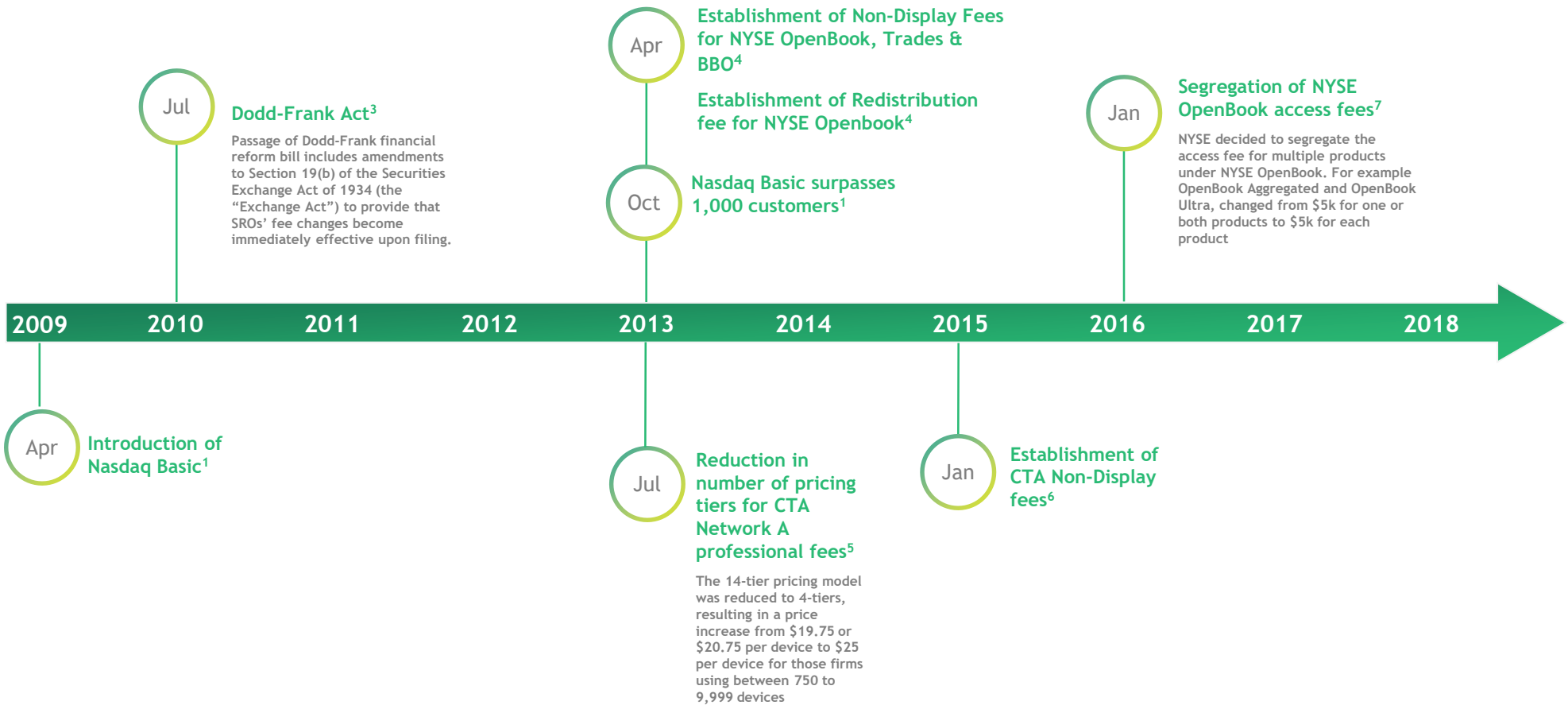
NYSE Proprietary Market Data Spend Analysis

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



Source: Expand Research / SIFMA Analysis 2018
Numbered sources listed in the Appendix

Summary and Findings

Context

NYSE Proprietary Market Data Spend Analysis

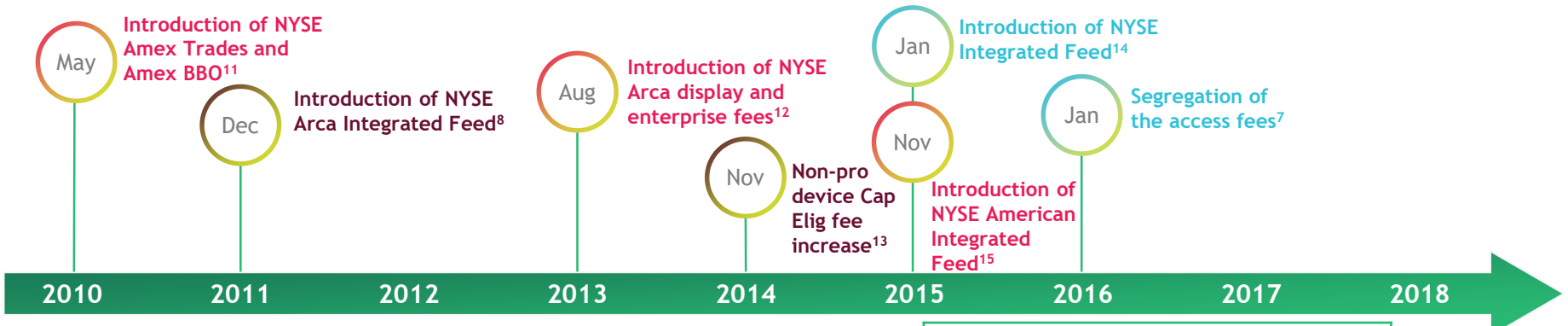
NYSE CTA Market Data Spend Analysis

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 news types of fees



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 Integrated[25]	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 Integrated[25]	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 Integrated[25]	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 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†

2010

Product Equivalent Fees‡

Firm paying for access fee; 1 prof user; and 1 non-prof user	NYSE Integrated	$2,610
	NYSE Arca Integrated	$1,560
	NYSE American Integrated	$1,265
	Total	**$5,435**

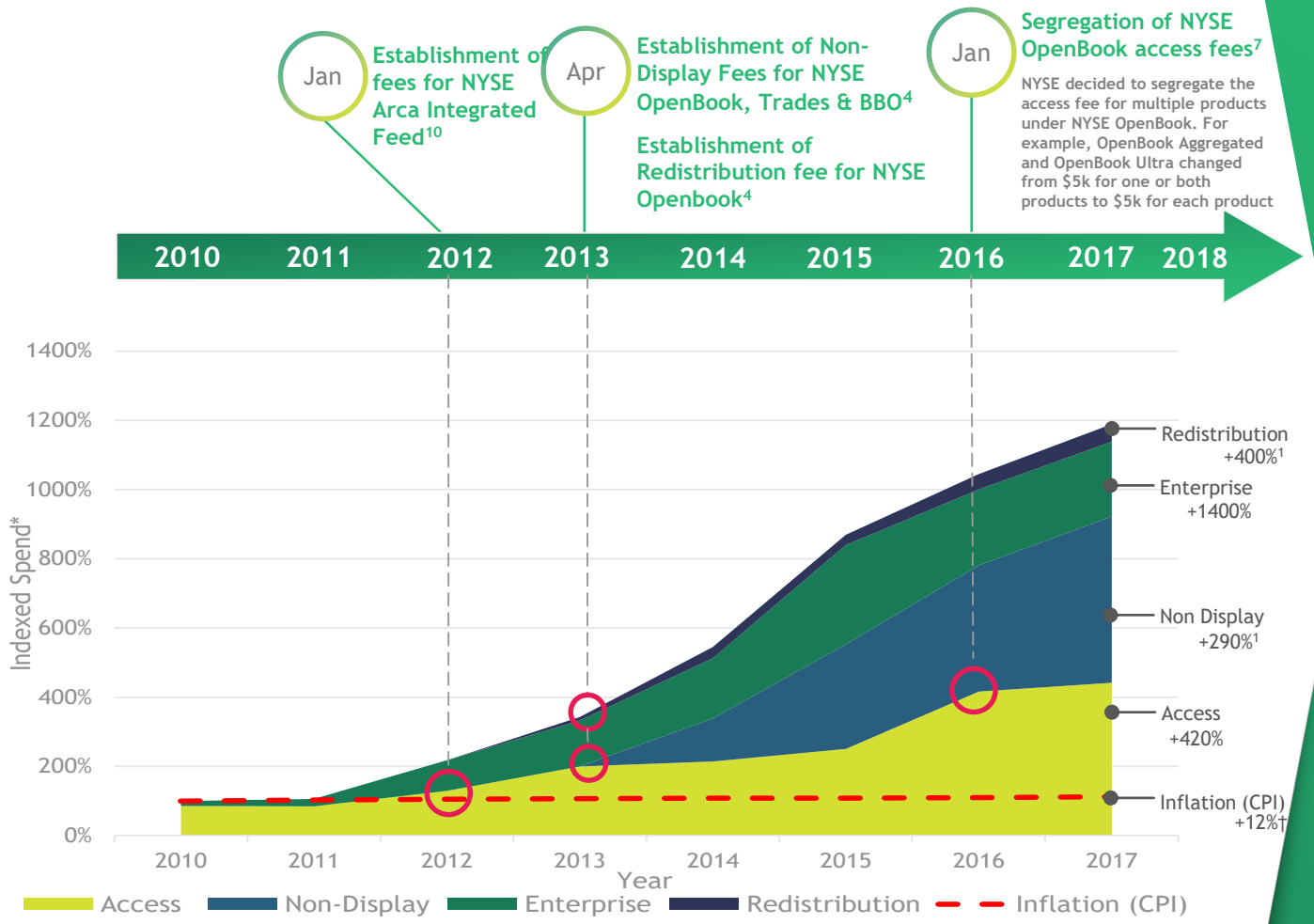
2018

Firm A *Access fee; 1 prof user; 1 non-prof user; redistribution fee; and non-display cat.1*	NYSE Integrated	$31,586	Overall Spend +967%
	NYSE Arca Integrated	$17,330	
	NYSE American Integrated	$9,012	
	Total	**$57,928**	
Firm B *Access fee; 1 prof user; 1 non-prof user; redistribution fee; and cat.1,2*	NYSE Integrated	$51,586	Overall Spend +1,619%
	NYSE Arca Integrated	$27,830	
	NYSE American Integrated	$14,012	
	Total	**$93,428**	
Firm C *Access fee; 1 prof user; 1 non-prof user; redistribution fee; category 1,2,3 (crosses trades with one platform)*	NYSE Integrated	$71,586	Overall Spend +2,272%
	NYSE Arca Integrated	$38,330	
	NYSE American Integrated	$19,012	
	Total	**$128,928**	
Firm D *Access fee; 1 prof user; 1 non-prof user; redistribution fee; category 1,2,3 (crosses trades with two platforms)*	NYSE Integrated	$91,586	Overall Spend +2,916%
	NYSE Arca Integrated	$48,330	
	NYSE American Integrated	$24,012	
	Total	**$163,928**	

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

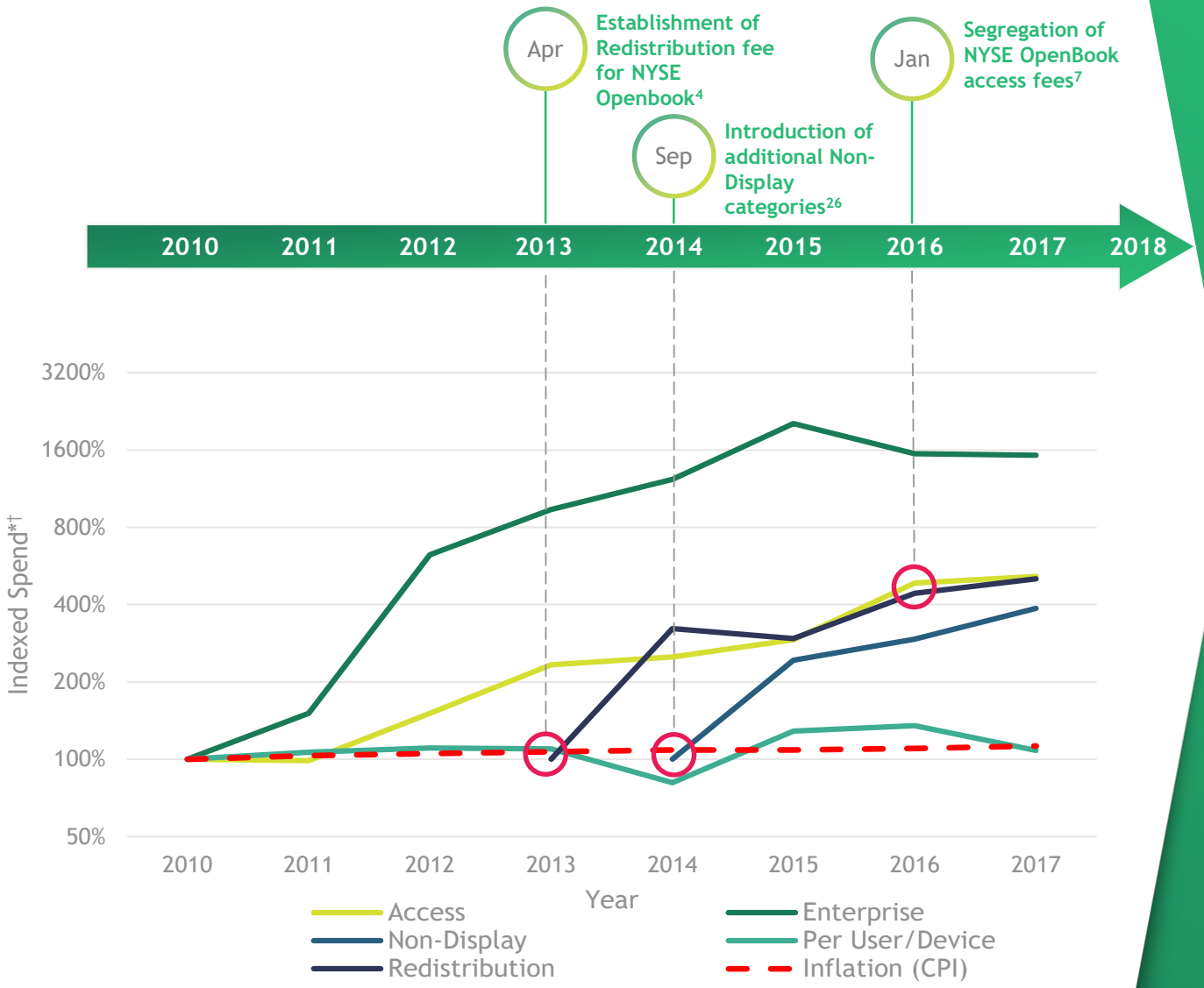
Increase in Firms' Spend for NYSE Proprietary Data



+1100%
(2010 and 2017)

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)

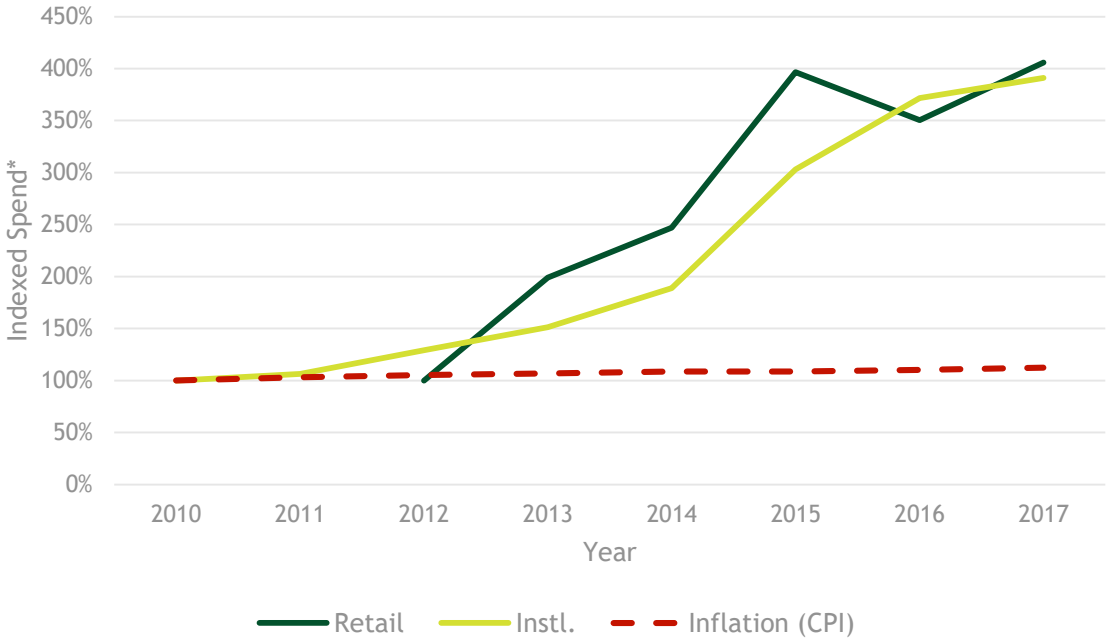
Redistribution
+400%
(2013 and 2017)

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)

Source: Expand Research / SIFMA Analysis 2018
* Indexed to 2010/2012 Spend

Summary and Findings

Context

NYSE Proprietary Market Data Spend Analysis

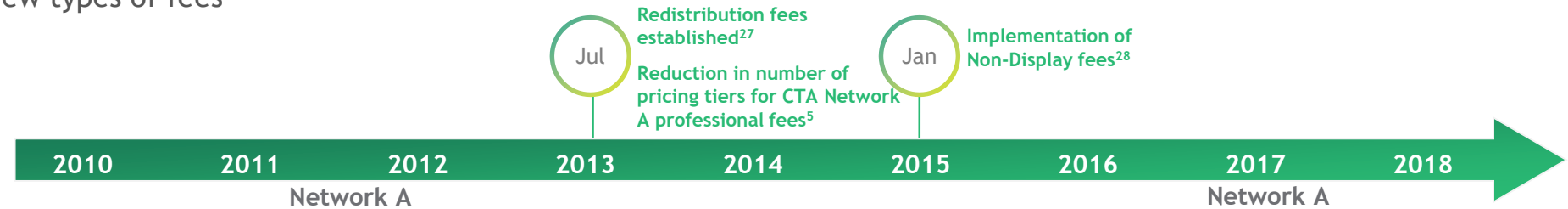
NYSE CTA Market Data Spend Analysis

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



2010 Product Fees†

Network A

Device Fees – Professional[30]	Network A (1-2)	$127.25
	Network A (3-999)	-
	Network A (1,000-9,999)	-
	Network A (10,000+)	$18.75
Device Fees – Non-Professional[30]	Network A	$1
Access Fees[31]	Network A Direct Access	$2,100
	Network A Indirect Access	$1,200
Non-Display Use[32]	Network A Category (1,2,3)	-
Enterprise[30]	Network A	$660,000
Redistribution[30]	Network A	-
	Total	**$663,428‡**

Network B

Device Fees – Professional[30]	Network B member	$27.25
	Network B non-member	$30.20
Device Fees – Non-Professional[30]	Network B	$1
Access Fees[31]	Network B Direct Access	$750
	Network B Indirect Access	$450
Non-Display Use[32]	Network B Category (1,2,3)	-
Enterprise[30]	Network B	$500,000
Redistribution[30]	Network B	-
	Total	**$501,258‡**

2018 Product Fees†[29]

Network A

Device Fees - Professional	Network A (1-2)	$45
	Network A (3-999)	$27
	Network A (1,000-9,999)	$23
	Network A (10,000+)	$19
Device Fees – Non-Professional	Network A	$1
Access Fees	Network A Direct Access	$3,000
	Network A Indirect Access	$2,000
Non-Display Use	Network A Category (1,2,3)	$4,000 / category
Enterprise	Network A	$686,400
Redistribution	Network A	$1,000 / account
	Total	**$696,446‡**

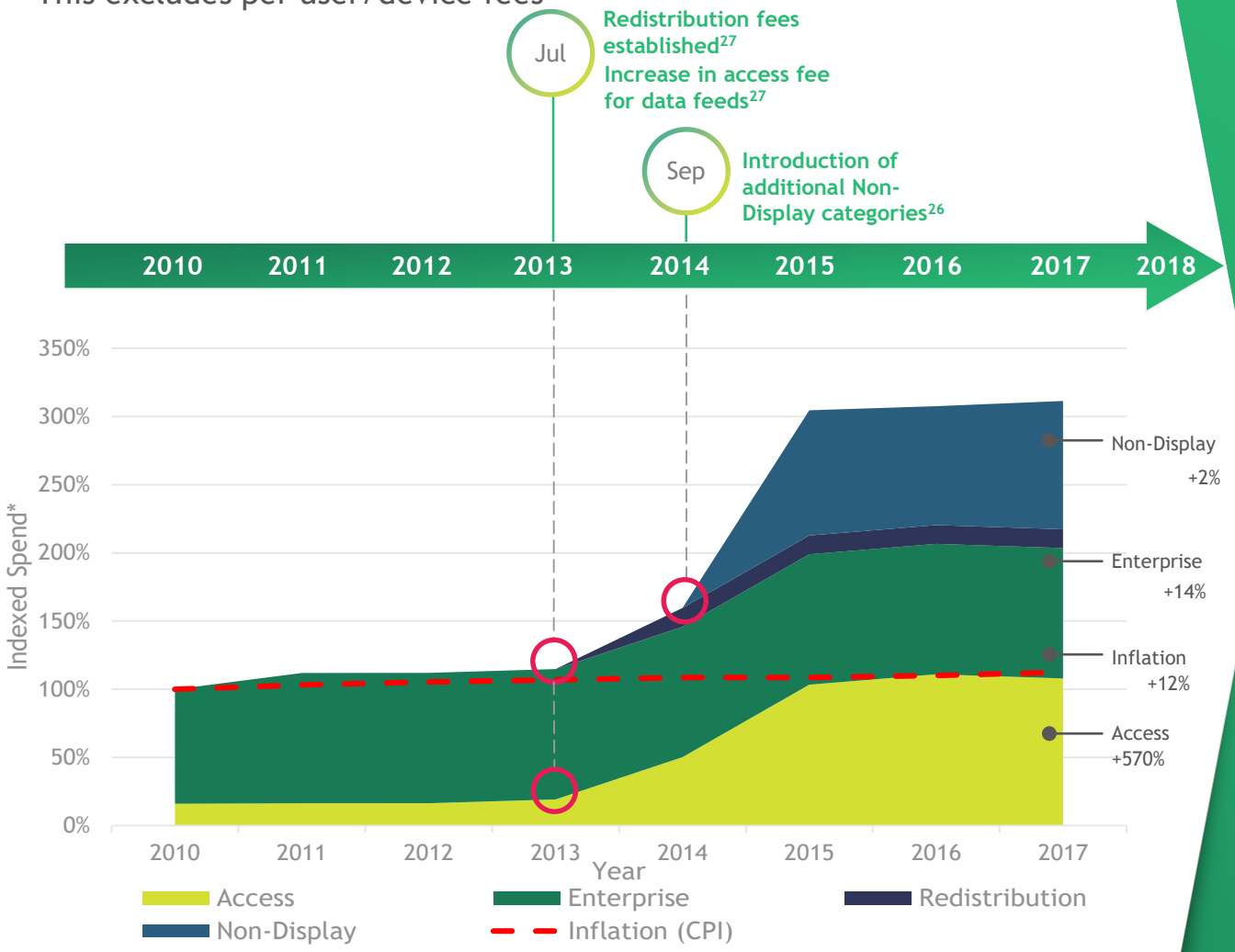
Network B

Device Fees - Professional	Network B member	$23
	Network B non-member	N/A
Device Fees – Non-Professional	Network B	$1
Access Fees	Network B Direct Access	$2,000
	Network B Indirect Access	$1,000
Non-Display Use	Network B Category (1,2,3)	$2,000 / category
Enterprise	Network B	$520,000
Redistribution	Network B	$1,000 / account
	Total	**$528,024‡**

† 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

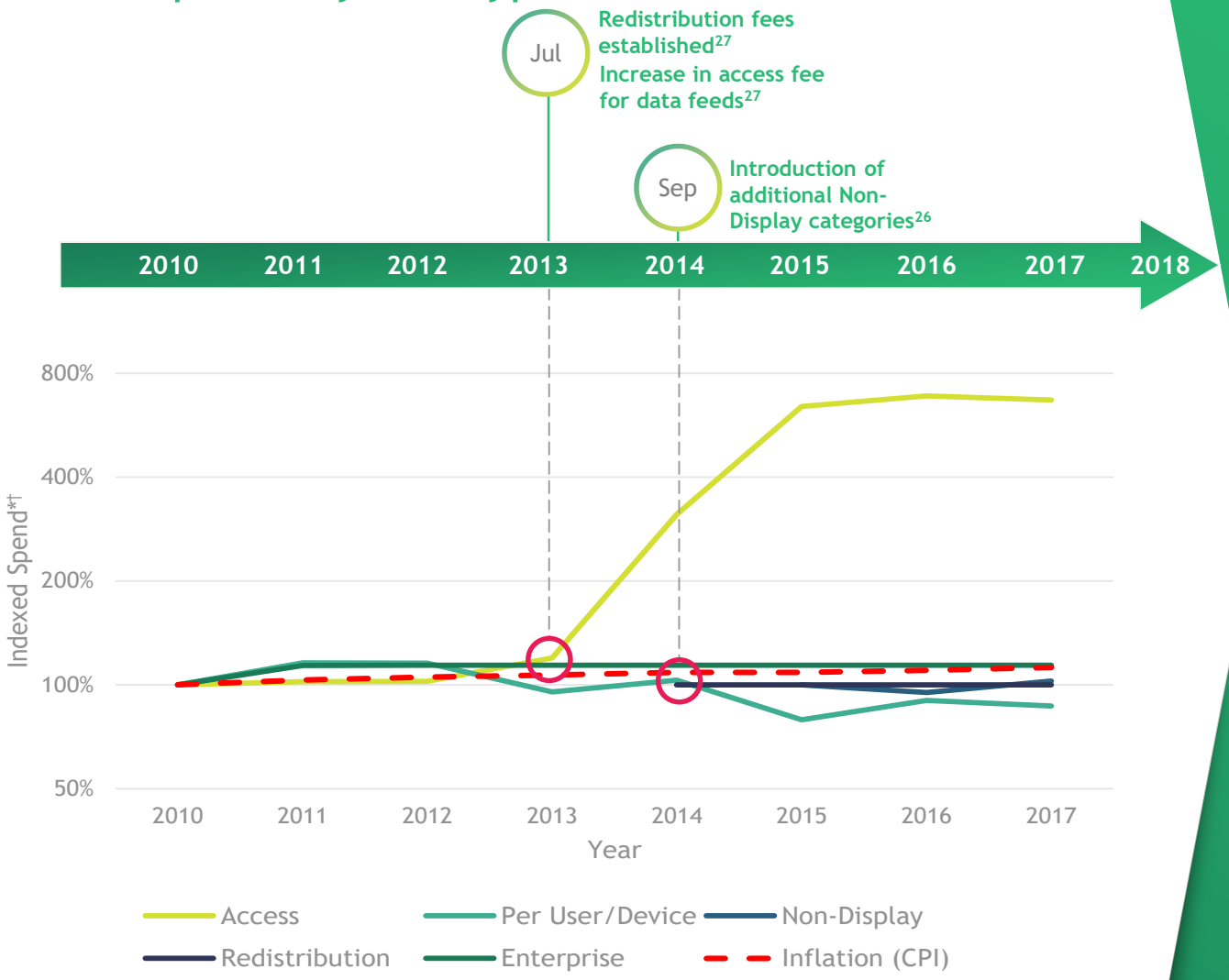


+210%
(2010 and 2017)

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)

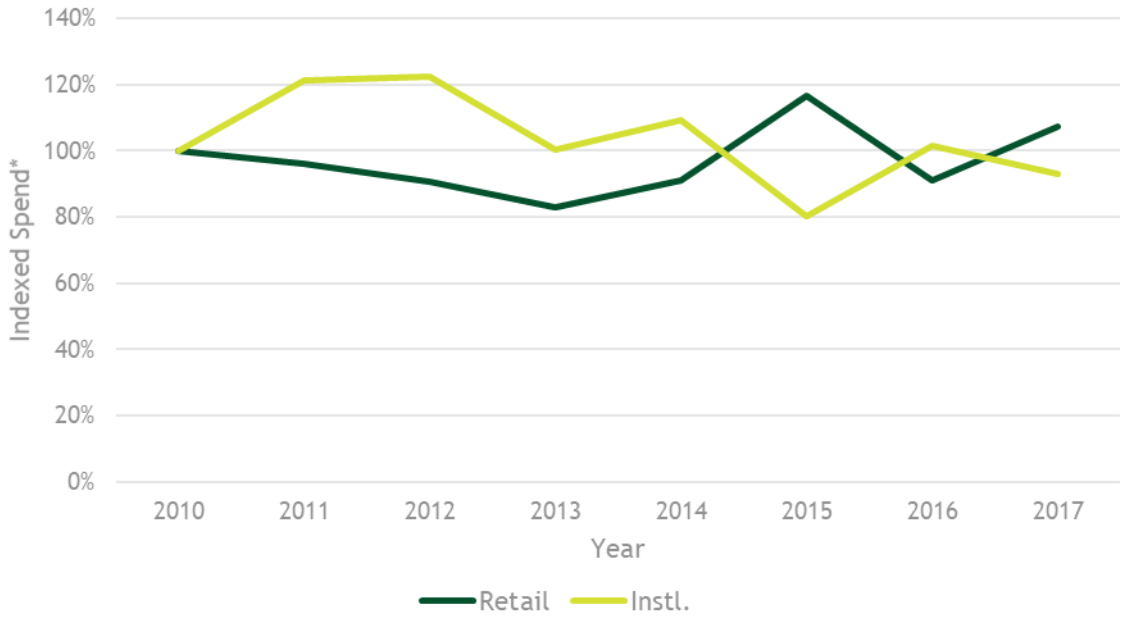
Enterprise
+14%
(2010 and 2017)

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)

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

Summary and Findings

Context

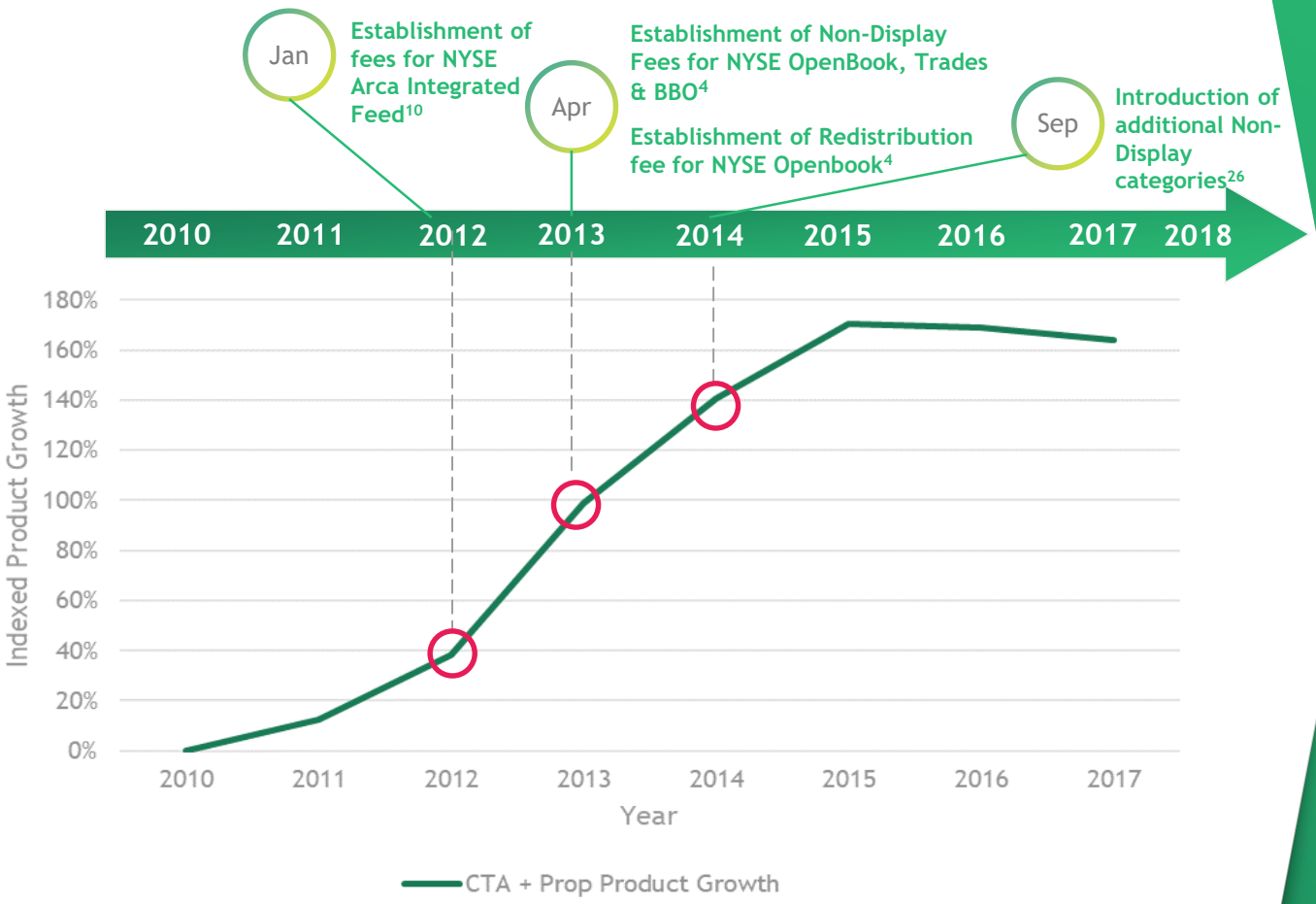
NYSE Proprietary Market Data Spend Analysis

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

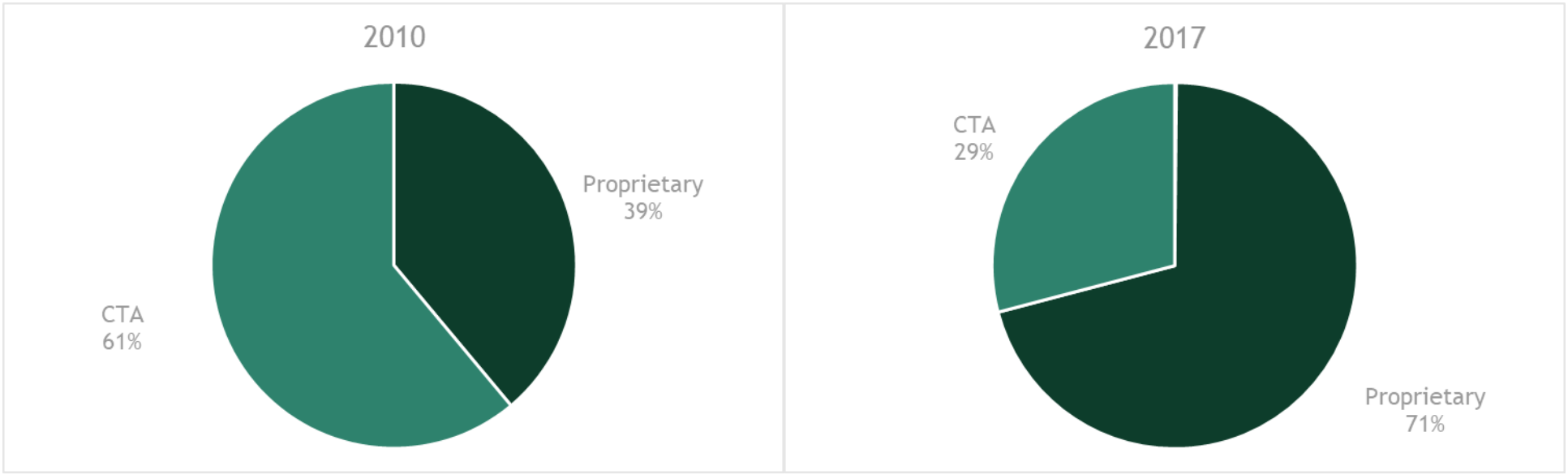


+164%
(2010 and 2017)

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

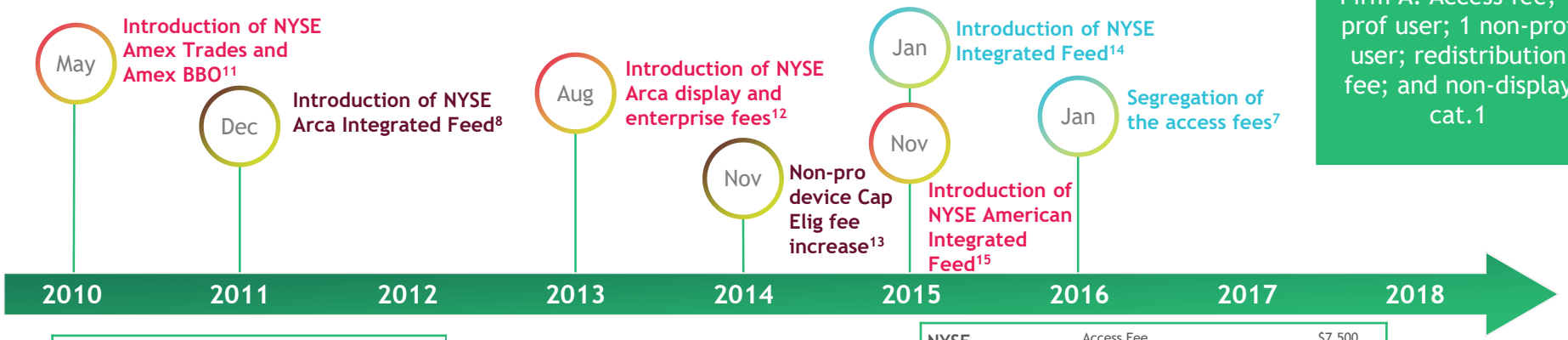
NYSE CTA Market Data Spend Analysis

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 Integrated[25]	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 Integrated[25]	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 Integrated[25]	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%

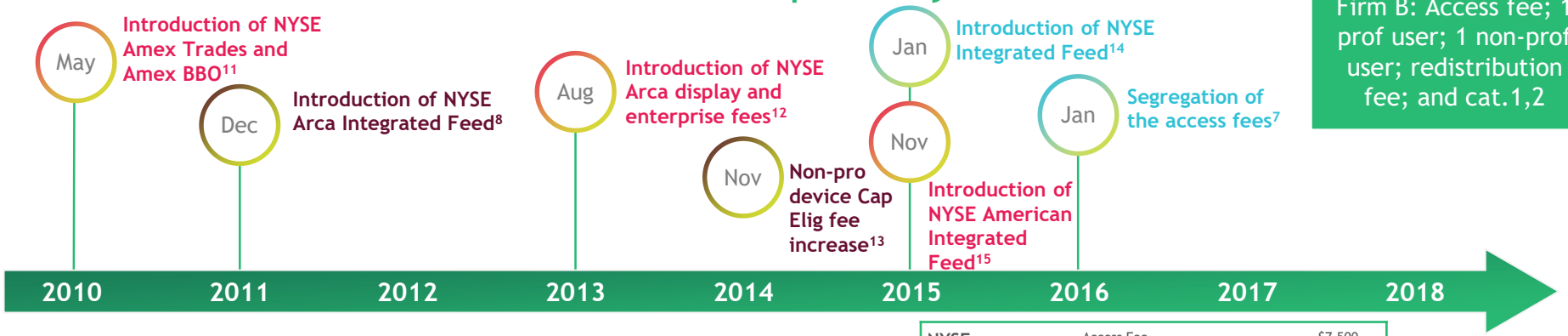
NYSE American Integrated +612%

†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 Arca Integrated equivalent (OpenBook, BBO, Trades & Order Imbalances)
Source: SIFMA, Expand Research analysis 2018

This compares the prices charged for NYSE Integrated Products from 2010 to 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‡

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 Integrated[25]	Access Fee	$7,500
	Professional User Fee	$70
	Non-Professional User Fee	$16
	Non-Display Fee (Category 1 & 2)	$40,000
	Redistribution Fee	$4,000
	Total	**$51,586**
NYSE Arca Integrated[25]	Access Fee	$3,000
	Professional User Fee	$60
	Non-Professional User Fee	$20
	Non-Display Fee (Category 1 & 2)	$21,000
	Redistribution Fee	$3,750
	Total	**$27,830**
NYSE American Integrated[25]	Access Fee	$2,500
	Professional User Fee	$10
	Non-Professional User Fee	$2
	Non-Display Fee (Category 1 & 2)	$10,000
	Redistribution Fee	$1,500
	Total	**$14,012**

NYSE Integrated +1,876%

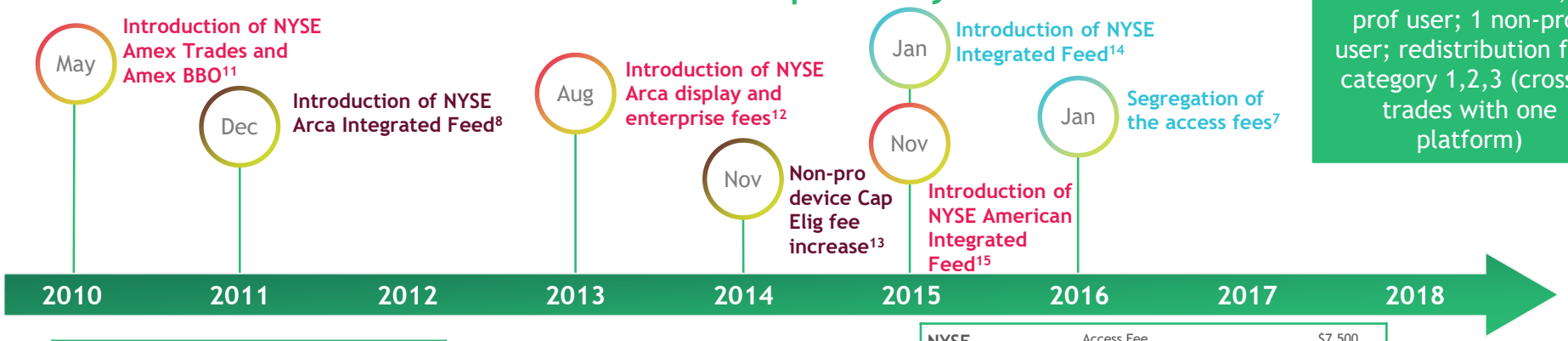
NYSE Arca Integrated +1,684%

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 Arca 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‡

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 Integrated[25]	Access Fee	$7,500
	Professional User Fee	$70
	Non-Professional User Fee	$16
	Non-Display Fee (Category 1 & 2 & 3)	$60,000
	Redistribution Fee	$4,000
	Total	**$71,586**
NYSE Arca Integrated[25]	Access Fee	$3,000
	Professional User Fee	$60
	Non-Professional User Fee	$20
	Non-Display Fee (Category 1 & 2 & 3)	$31,500
	Redistribution Fee	$3,750
	Total	**$38,330**
NYSE American Integrated[25]	Access Fee	$2,500
	Professional User Fee	$10
	Non-Professional User Fee	$2
	Non-Display Fee (Category 1 & 2 & 3)	$15,000
	Redistribution Fee	$1,500
	Total	**$19,012**

NYSE Integrated +2,643%

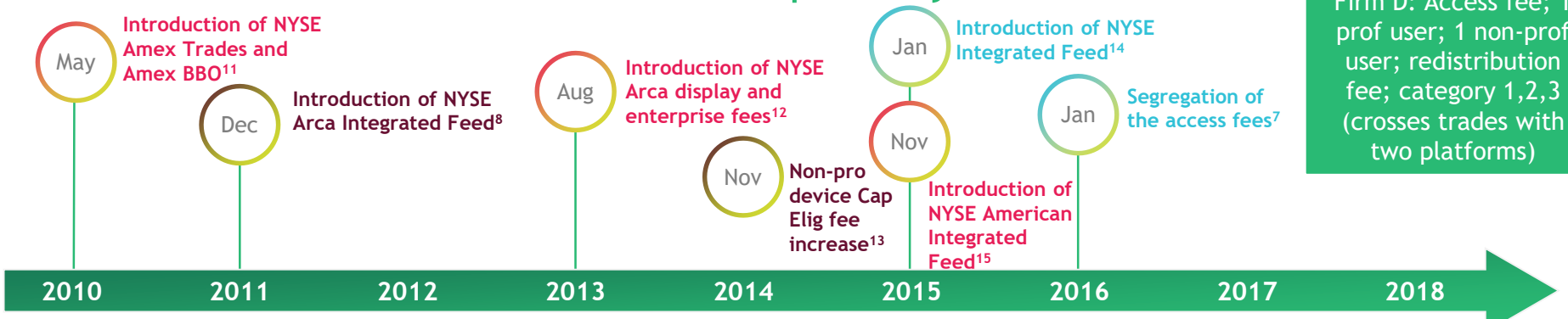
NYSE Arca Integrated +2,357%

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 Arca 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‡

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 Integrated[25]	Access Fee	$7,500
	Professional User Fee	$70
	Non-Professional User Fee	$16
	Non-Display Fee (Category 1,2,3 x2)	$80,000
	Redistribution Fee	$4,000
	Total	**$91,586**
NYSE Arca Integrated[25]	Access Fee	$3,000
	Professional User Fee	$60
	Non-Professional User Fee	$20
	Non-Display Fee (Category 1,2,3 x2)	$41,500
	Redistribution Fee	$3,750
	Total	**$48,330**
NYSE American Integrated[25]	Access Fee	$2,500
	Professional User Fee	$10
	Non-Professional User Fee	$2
	Non-Display Fee (Category 1,2,3 x2)	$20,000
	Redistribution Fee	$1,500
	Total	**$24,012**

NYSE Integrated +4,119%

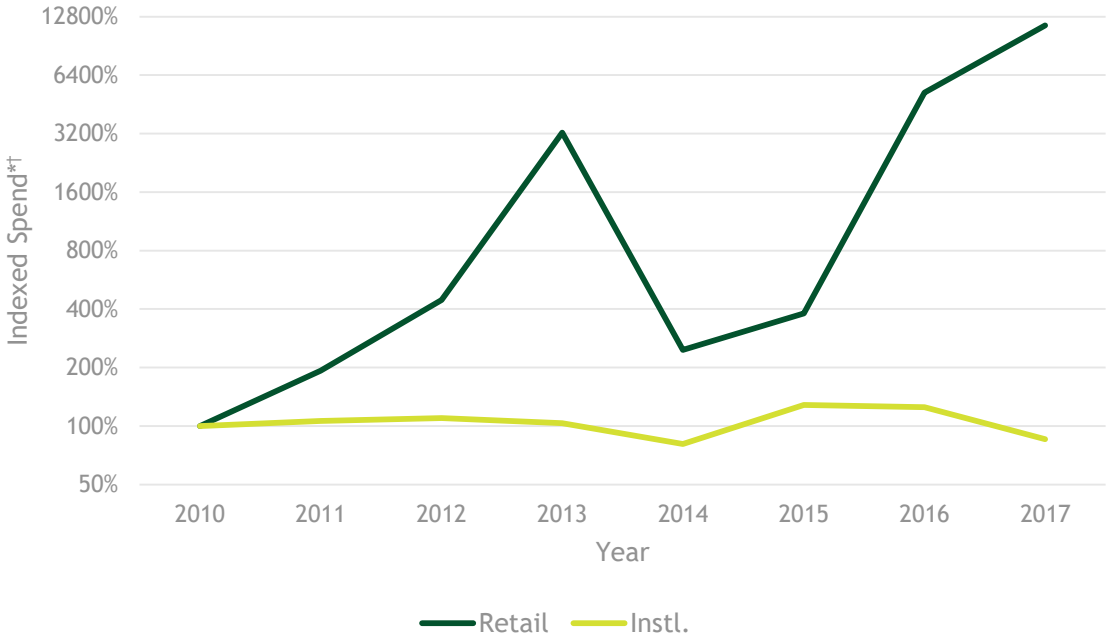
NYSE Arca Integrated +2,998%

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 Arca 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)

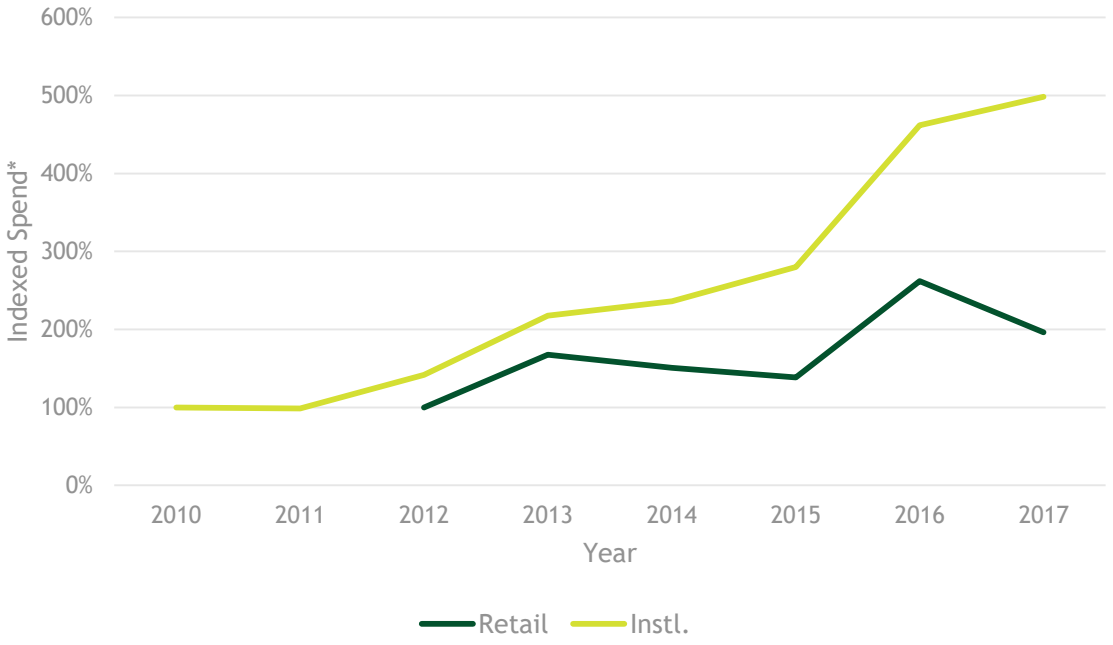
Institutional
-14%
(2010 and 2017)

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)

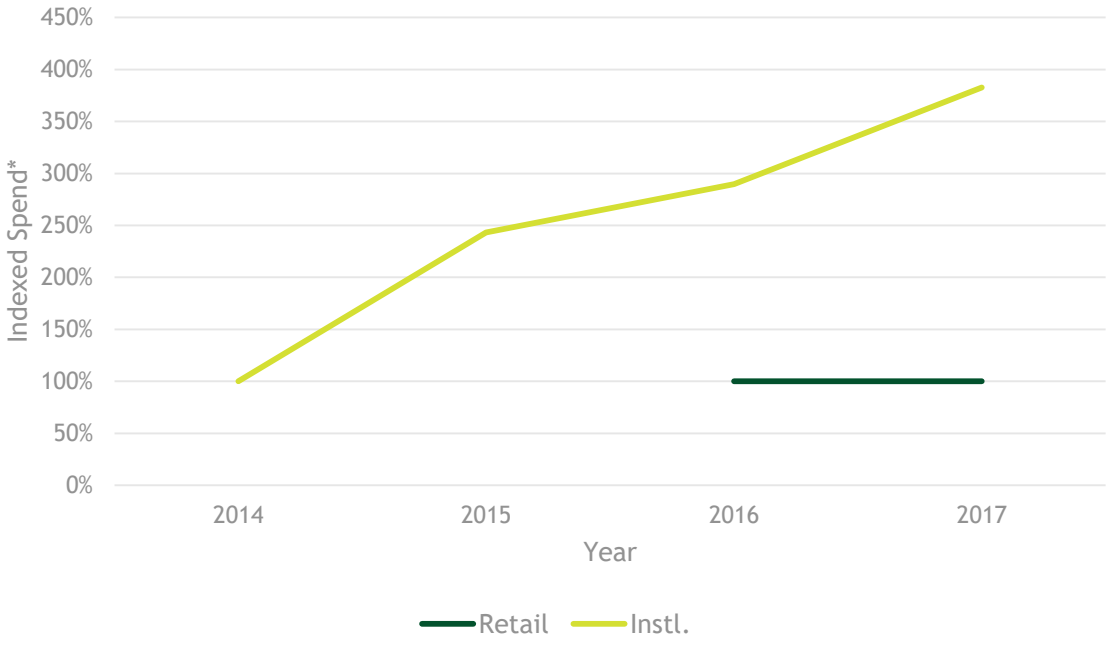
Institutional
+400%
(2010 and 2017)

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%

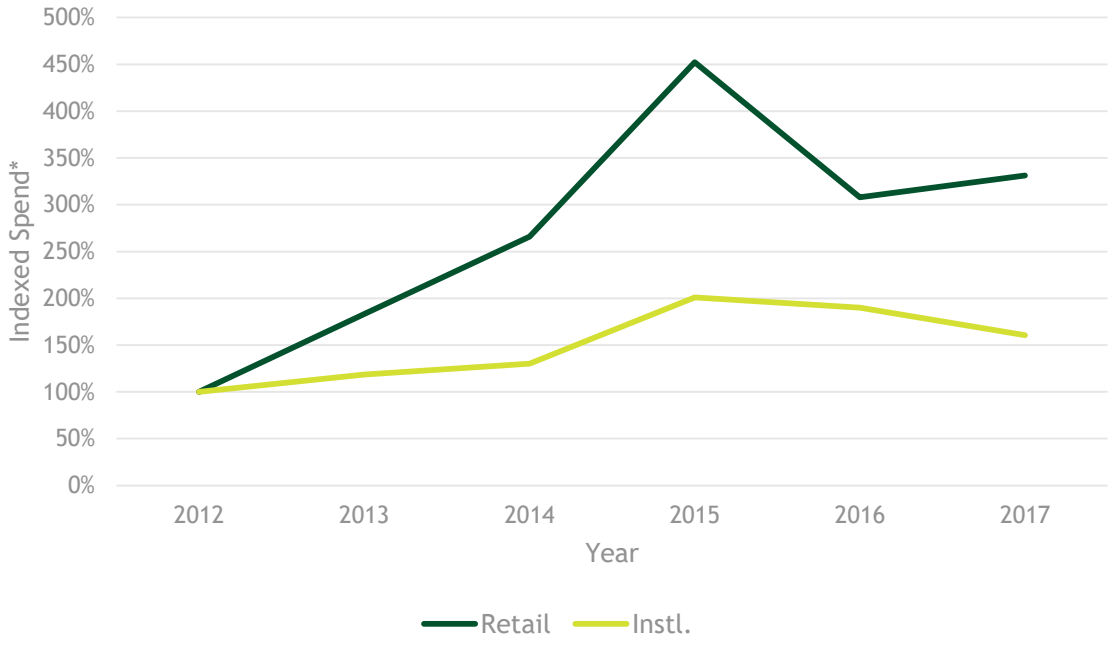
Institutional
+280%
(2014 and 2017)

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)

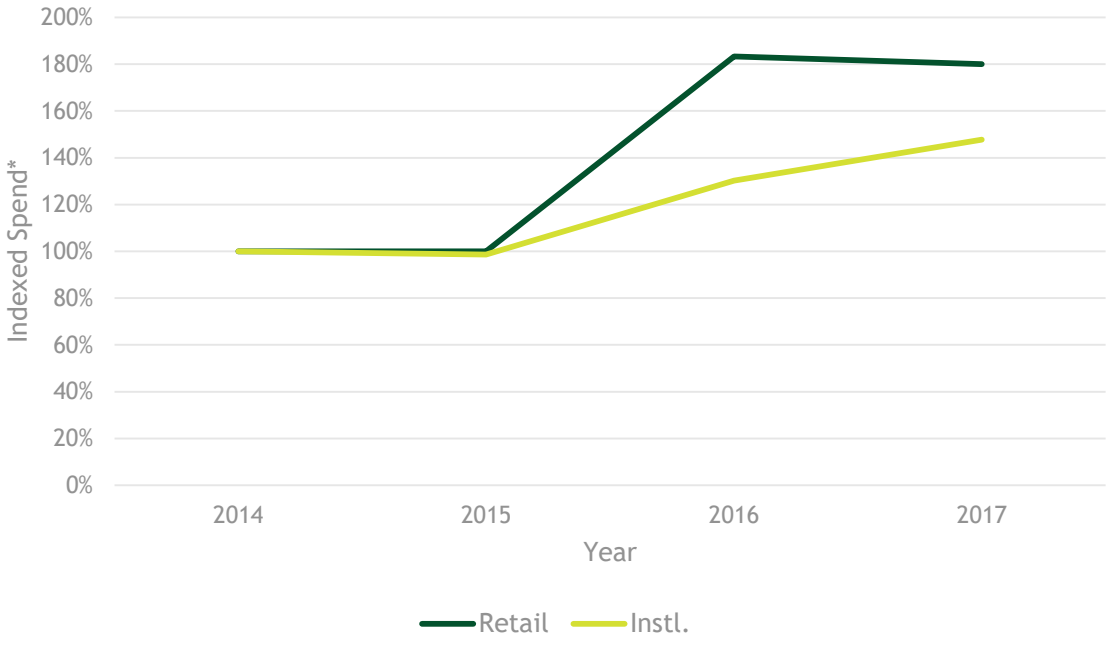
Institutional
+61%
(2012 and 2017)

Source: Expand Research / SIFMA Analysis 2018
* Indexed to 2012 Spend

a.: Products were categorized as enterprise fees when additional charges, and maximum rebates, were assessed on an entity.

Retail and Institutional NYSE Proprietary Spend

Redistribution[a]



Retail
+80%
(2014 and 2017)

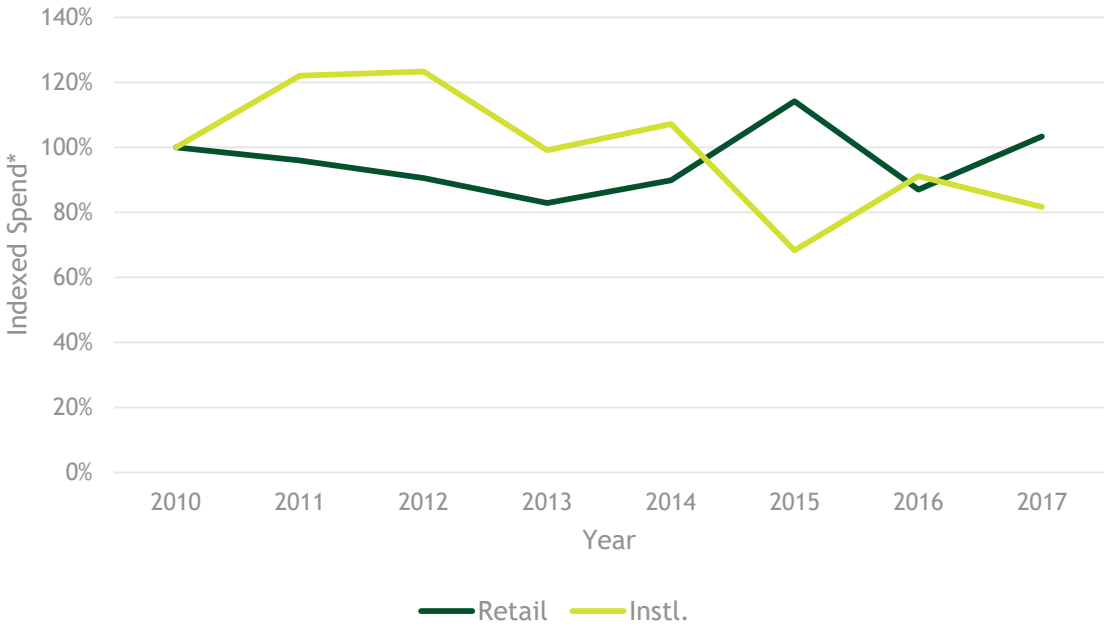
Institutional
+48%
(2014 and 2017)

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

a.: Products are designated as redistribution fees when the entities make last sale or quotation information available to any other entity or person other than its employees.

Retail and Institutional CTA Spend

Per User/Device[a]



Retail
+3%
(2010 and 2017)

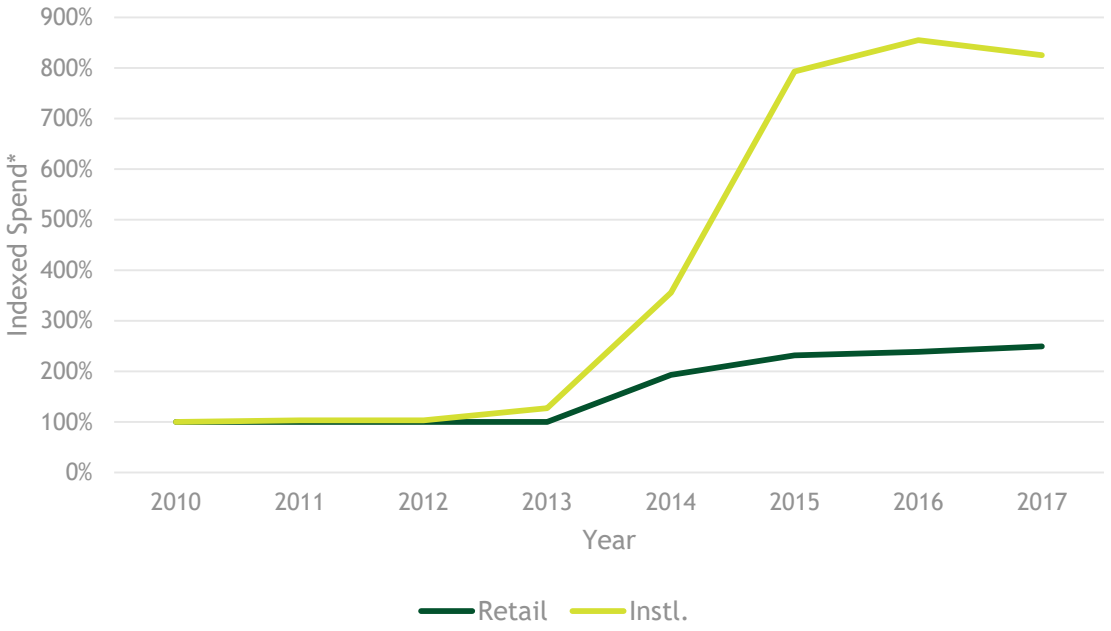
Institutional
-18%
(2010 and 2017)

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]



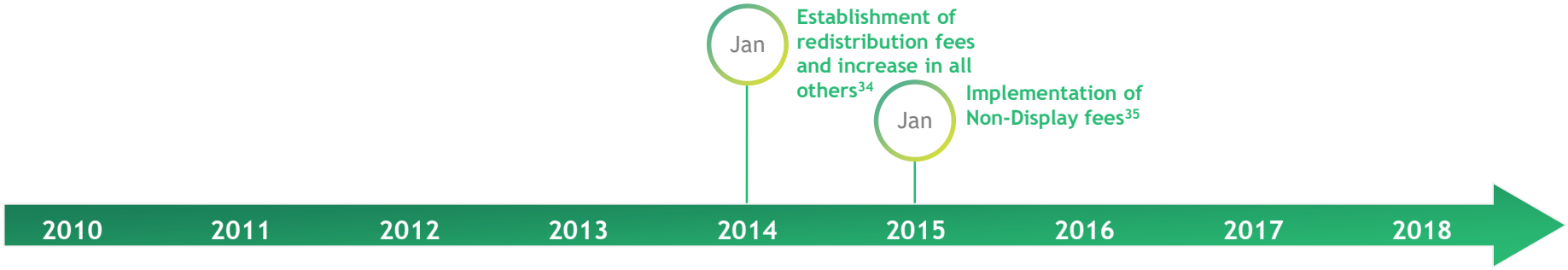
Retail
+149%
(2010 and 2017)

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‡**

UTP Plan +9.2%

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
10	https://www.nyse.com/publicdocs/nyse/markets/nyse-arca/rule-filings/sec-approvals/2011/(SR-NYSEArca-2011-96)%2034-66128.pdf
11	https://www.sec.gov/rules/sro/nyseamex/2010/34-62187.pdf
12	https://www.sec.gov/rules/sro/nysearca/2013/34-70213.pdf
13	https://www.nyse.com/publicdocs/nyse/markets/nyse-arca/rule-filings/sec-approvals/2014/NYSEArca-2014-72%20(34-72560).pdf
14	https://www.nyse.com/publicdocs/nyse/markets/nyse/rule-filings/sec-approvals/2015/(SR-NYSE-2015-03)%2034-74128.pdf
15	https://www.nyse.com/publicdocs/nyse/markets/nyse-american/rule-filings/sec-approvals/2015/(SR-NYSEMKT-2015-95)%2034-76525.pdf

Sources

Ref	Sources
16	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%20SECAppOrd%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
17	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%20SECAppOrd%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")
18	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%20SECAppOrd%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

Sources

Ref	Sources
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20	https://www.sec.gov/rules/sro/nysearca/2013/34-69315.pdf
21	https://www.sec.gov/rules/sro/nysearca/2013/34-69315.pdf
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")
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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

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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."**

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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?

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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.**

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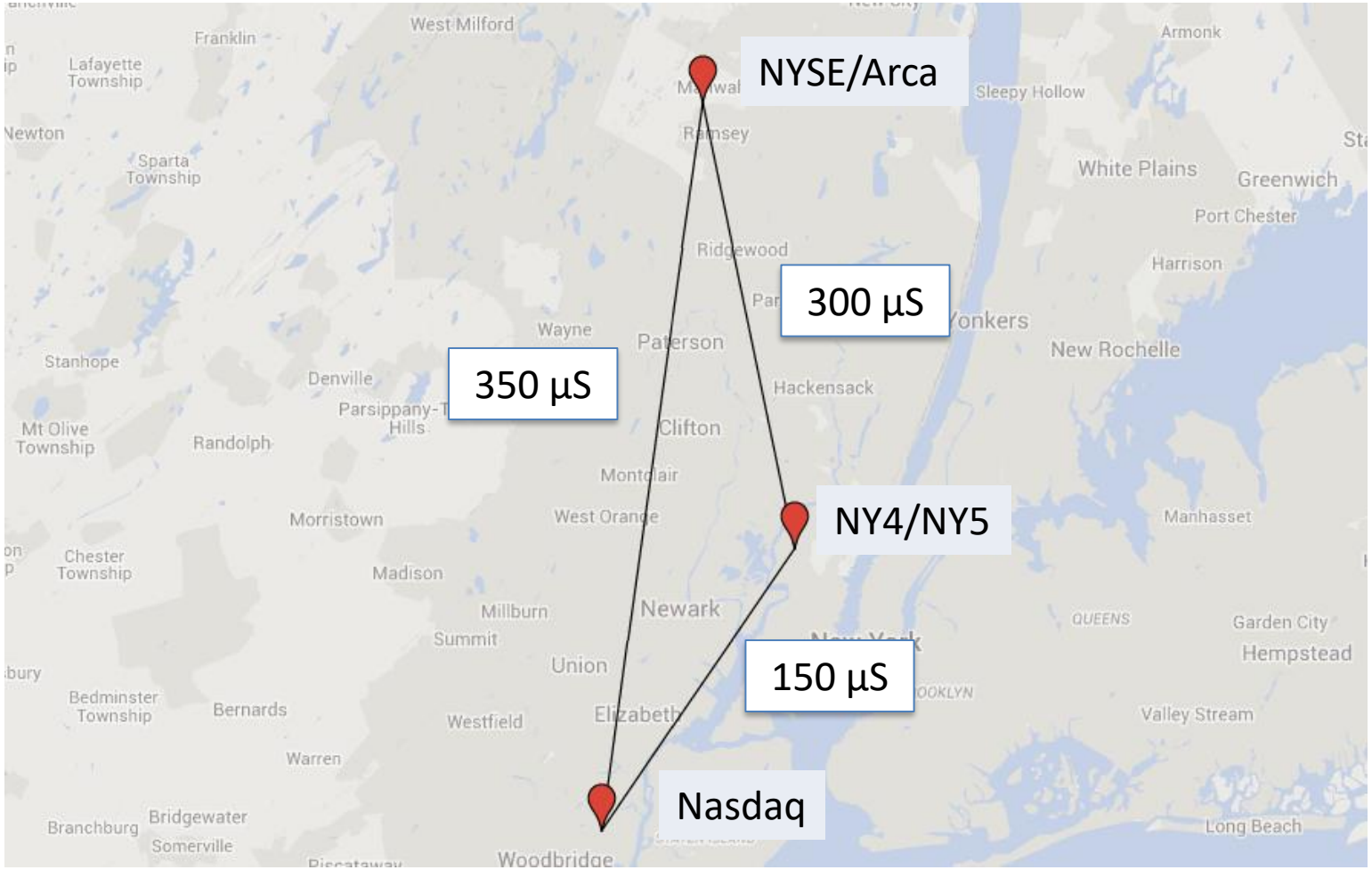
Latency map


NYSE/Arca
300 µS
350 µS
NY4/NY5
150 µS
Nasdaq
West Milford
Franklin
Lafayette Township
Newton
Sparta Township
Armonk
Sleepy Hollow
Ramsey
White Plains
Greenwich
Port Chester
Harrison
Ridgewood
Wayne
Paterson
Yonkers
New Rochelle
Stanhope
Denville
Hackensack
Parsippany-Troy Hills
Mt Olive Township
Randolph
Clifton
Montclair
West Orange
Manhasset
Morristown
Chester Township
Madison
Millburn
Newark
QUEENS
Garden City
Hempstead
Summit
Union
Bedminster Township
Bernards
Westfield
Elizabeth
Valley Stream
Warren
Bridgewater
Branchburg
Somerville
Woodbridge
Long Beach

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

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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 fasted 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 markets 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 Subscribership 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 Subscribership 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.

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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.

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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.

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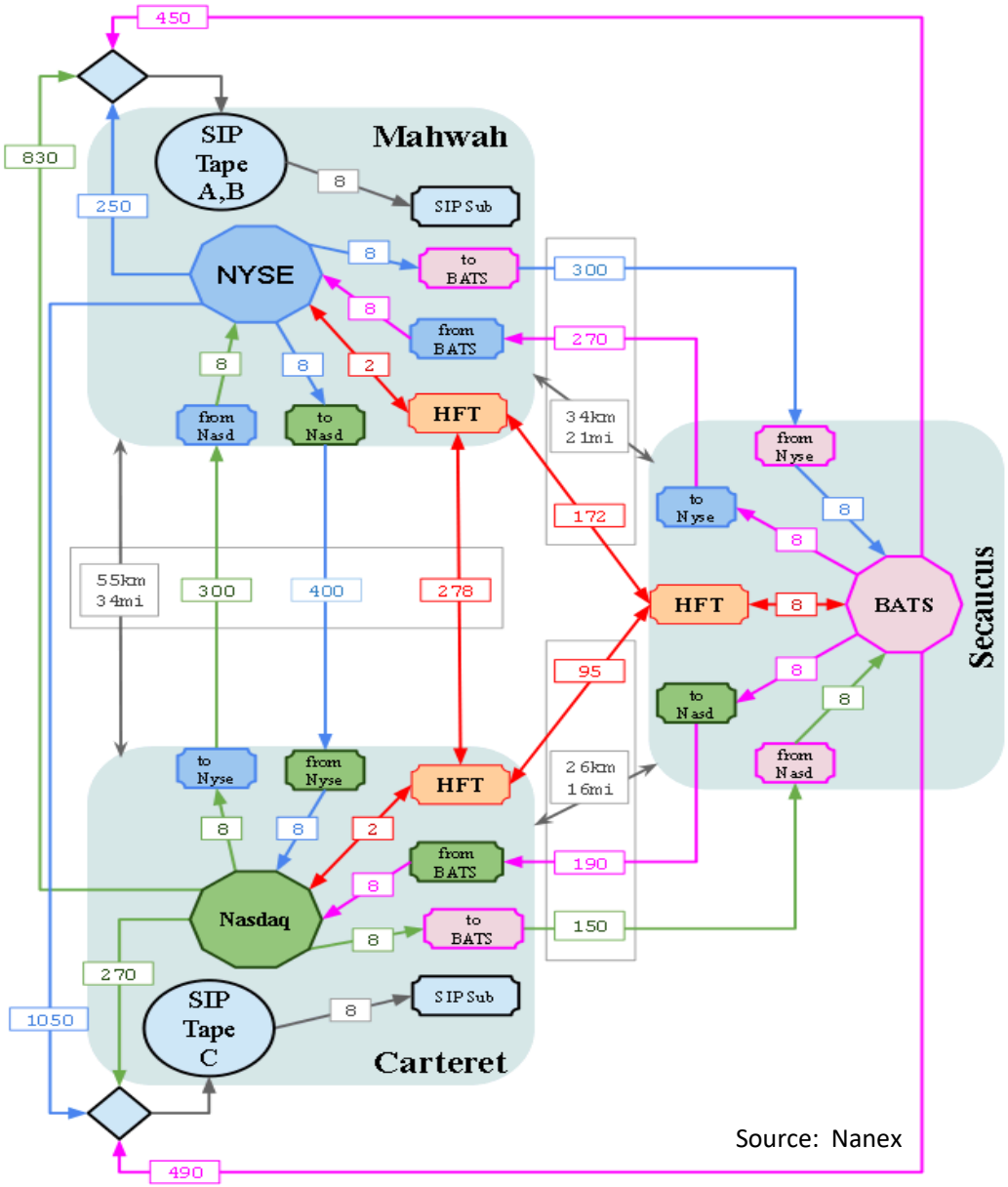
Not just a Broker-Dealer Issue…
Blackrock Comment Letter

- 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