

Global Memo

Market Data Costs



MARCH 2020

CONTRIBUTORS



EFAMA is the voice of the European investment management industry, representing 28 member associations, 59 corporate members and 22 associate members. At end 2018, total net assets of European investment funds reached EUR 15.2 trillion. These assets were managed by almost 62,000 investment funds, of which more than 33,000 were UCITS (Undertakings for Collective Investments in Transferable Securities) funds, with the remaining funds composed of AIFs (Alternative Investment Funds).



ICSA is the global organization of securities industry associations representing securities firms operating in domestic and cross-border markets across the globe, including East and West Asia, Latin America, North America, and Europe.

ICSA advocates appropriate regulatory policies and regulations, policy approaches and techniques across jurisdictions, and public policy initiatives to promote efficient and well-functioning securities markets, and the efficient flow of cross-border capital in global capital markets. Appropriate regulatory initiatives should assist in leading to increased confidence and efficiency in the markets. These initiatives should also assist in increased economic growth, benefitting markets participants and the general health of global capital markets.

ICSA provides a forum for member associations to understand market and industry developments across indigenous and cross-border markets, exchange views on the conduct of regulatory and public policy in domestic markets, and collaborate for more efficient capital markets. ICSA assists regulators and government authorities in understanding the global, consolidated and non-biased position of industry as it relates to proposed policy and regulatory reform initiatives in global capital markets.



Managed Funds Association (MFA) represents the global alternative investment industry and its investors by advocating for sound industry practices and public policies that foster efficient, transparent, and fair capital markets. MFA, based in Washington, DC, is an advocacy, education, and communications organization established to enable hedge fund and managed futures firms in the alternative investment industry to participate in public policy discourse, share best practices and learn from peers, and communicate the industry's contributions to the global economy. MFA members help pension plans, university endowments, charitable organizations, qualified individuals and other institutional investors to diversify their investments, manage risk, and generate attractive returns over time. MFA has cultivated a global membership and actively engages with regulators and policymakers in Asia, Europe, the Americas, Australia and all other regions where MFA members are market

Background and Global Principles for Market Data Costs

Executive Summary and recommendations

A key function of the financial system is to allocate capital and risk in a manner that supports economic development and growth, including through the provision of financing, investment and hedging products. The allocative function of the financial system is dependent on financial prices being set through an effective price discovery process, especially in the financial markets. This is in turn dependent, amongst other things, on the cost and quality of information that is available to financial market participants, including investors and securities issuers, who interact through the market process. Government, regulators, standard setters, and industry firms and their associations all share a common purpose in promoting the policy and business conditions under which financial markets can serve this purpose in the economy.

This paper identifies a material challenge arising from higher data costs to the effective functioning of markets that is growing in its harmful effect and proposes initiatives by authorities to address this problem that is consistent with their purpose and role in promoting sound securities markets regulation.

Exchanges are essential for economic growth, prosperity and risk mitigation as they form the core financial infrastructure in modern economies, bringing together issuers and investors¹, and allowing commercial entities to relay and hedge risk.

The fundamental function of exchanges is to match buyers and sellers of securities at a price that balances supply and demand through transparent rules and processes. The sale of market data is a related but separate by-product of that primary function.

Over the last few decades exchanges have greatly evolved in response to market forces and technological and regulatory developments. The privatization² of exchanges and market participants' implementation of best execution or fiduciary duty obligations has given exchanges significant market power with respect to market data unique to their trading venue. Globally, exchanges utilize their market power with the consequence of limiting market data access, data distribution and competition. The negative effects of increased market data costs is widely recognized, including by supervisory authorities.³

The consequences of the increasing market data costs force many data consumers to scale back their data purchase to a minimum and sometimes, economically suboptimal level, deselecting certain investments or markets – especially smaller companies and smaller, foreign markets. This results in reduced transparency, decreased levels of cross-border competition and lower market integration. The consequences of these outcomes are less informed markets, weaker competition, and higher costs for investors and potential higher cost of capital for, in particular, smaller companies.

Despite some attempts to solve the problems, market data costs have continued to increase.

¹ It is important to stress that an exchange/a regulated market in its essence is defined as a multilateral system bringing together multiple third-party buyers and sellers in financial instruments in a way that result in a contract in accordance with the rules (e.g. MiFIDII, art. 4. Securities and Exchange Act. § 3)

² In some countries/regions it is more correct to use the phrase "demutualization" rather than "privatization" as governments did not own the exchanges. However, in this memo, the term "privatization" is used generally for simplicity reasons.

³See ESMA report from 5 December 2019 in response to the market data consultation https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf, see actions taken by SEC: <https://www.sec.gov/news/public-statement/statement-chairman-clayton-2018-10-16>). And in Canada the authorities are following SEC: <https://insurance-journal.ca/article/rising-market-data-costs-raising-operating-costs/>

It is important to note that the discussions and data in relation to the market data problems are mostly based on the experiences in the equities markets as this is where we have data for the longest period of time. However, as the problem is generic to exchange and trading venue-based execution, it is therefore relevant for all asset classes, the proposed principles below are instrument neutral⁴.

Given the importance of these consequences to the general health of the capital markets, **we recommend** that governments, regulators, central banks, and standard setters establish core principles to address the problem.⁵

As a starting point, authorities should recognize that exchanges hold disproportionate market power on market data generated from orders and trades conducted on their venues. As such, market data costs (the market data pricing, licensing practices, definitions, audit procedures and connectivity fees) must be subject to regulatory oversight. Rigorous supervision of the entire market data business (as well as contiguous markets and products where the search for revenue could shift once there is increased scrutiny of market data sales) is crucial in order to maximize the economic benefits of financial marketplaces.

Authorities should consider developing a cost benchmark for producing and distributing market data, such as recommended in the Copenhagen Economics reports from 2013, 2014, 2018 and 2019 and the IEX report (January 2019).⁶

The Core principles should entail

1. **The price of market data and connectivity must be based on the efficient costs of producing and distributing the market data (as opposed to the value market participants derive from market data) with a reasonable mark-up. The cost should be measured against a recognised cost benchmark.**
 - a) Regulators should require trading venues to submit detailed cost and revenue data in order to understand the amount of mark-up exchanges impose.
 - b) As market data should be based on cost with a reasonable mark-up, exchanges should simplify contract terms and eliminate "non-display" categories. Instead, exchanges should consider simply differentiating between professional and non-professional users.

⁴The problem with market data costs is at present most significant for exchange traded products (e.g. equities, ETD, ETFs, and Commodity Derivatives). Bond trading is still conducted primarily Over-The-Counter and through Systematic Internalisers (liquidity, size, immediacy, balance sheets being key reasons). However, "on venue" bond trading is increasing and likely to do so over time. Therefore, rising market data costs are of concern to bond markets as well.

⁵ This would be consistent with IOSCO's objective: https://www.iosco.org/about/?subsection=about_iosco: "...to cooperate in developing, implementing and promoting adherence to internationally recognized and consistent standards of regulation, oversight and enforcement in order to protect investors, maintain fair, efficient and transparent markets, and seek to address systemic risks.." This is also consistent with the IOSCO/BIS paper *Principles for financial market infrastructures* (April 2012), which observed "Where competition may be difficult to maintain because of economies of scale or scope, and an FMI therefore enjoys some form of market power over the service it provides, relevant authorities may have a responsibility to review the costs imposed on the FMI's participants and the markets it serves.."

⁶ The IEX report is the first exchange report that released detailed information on the cost of exchange services in the US. IEX published its report in response to the growing concerns around market data and connectivity fees and requests for transparency by US regulators and other market participants. In its report, IEX sets out details of the review it has conducted of its own costs to provide market data and connectivity compared with the fees NYSE, Nasdaq and Cboe charge for these products and services. Because of the regulatory requirements related to market data, there should be a regulatory interest in ensuring that market data fees and licensing practices are fair and reasonable and not a burden on competition.

Please see the IEX¹ cost study⁷ and Copenhagen Economics guideline to a cost benchmark⁸ for inspiration in addressing principle one in more detail.

2. Trading venues of a single market system should standardize key market data contract definitions, terms and interpretations. Contract definitions, terms and policies should be specific and avoid overly broad or general terms.

- a) Market data licensing contracts should avoid “derived data” terms, which are lopsided and unfair and standardized agreements should be subject to regulatory review.

3. Market data licensing contracts should be simplified to ease administration and so that audits are not necessary.

Please see Appendix B and C for inspiration on principle two and three.

⁷ <https://iextrading.com/insights/cost-transparency-whitepaper/>

⁸ <https://www.copenhageneconomics.com/publications/publication/a-guideline-to-a-cost-benchmark-of-market-data-how-to-obtain-reasonable-prices-of-market-data>

1. Barriers to Market Access are Harming Economic Productivity

Exchanges are essential for economic growth, prosperity and risk mitigation as they form the core financial infrastructure in modern economies, bringing together issuers and investors⁹, and allowing commercial entities to relay and hedge risk.¹⁰

Over the last few decades exchanges have greatly evolved in response to market forces and technological and regulatory developments. The privatization of exchanges and market participants' adoption by legal authorities of best execution or fiduciary duty obligations for market intermediaries has given exchanges a significant market power with respect to market data unique to their trading venue. Globally, exchanges utilize their market power, which has resulted in limiting market access, distribution and competition. The problem with increasing market data costs¹¹ is widely recognized, including by supervisory authorities.¹²

Given the prominent role exchanges play in the economy, there has been a delicate balance in establishing the appropriate level of oversight to allow for innovation and efficiency while maximizing societal benefit. To enhance competition in securities trading and innovation in general, many jurisdictions introduced regulations opening the exchange business to competitive forces. While the creation of a more competitive trading environment lowered costs in that area, it has had the opposite effect with respect to market data: Since the markets have been privatized, exchanges have implemented steep increases in market data licensing fees—the cost to purchase raw pre- or post-trade data (i.e., bid-ask, trade, price and volume data). In addition to these increases in direct market data fees, market participants face increased connectivity fees, increased administrative costs due to unclear definitions, new products, bundling, complex market data policies and unreasonable audit procedures etc. All of these factors are components of market data costs.

The increase in the cost to market participants of this essential component of the exchange service offering represents a new barrier to exchange access. When the cost of accessing the public market becomes prohibitive for issuers, essential intermediaries or investors, economic opportunities for all market participants are diminished, ultimately harming the larger economy decreased competition and innovation.

Exchanges' control of the raw market data generated on their platforms allow them to charge market participants ever greater rents with little consequence¹³ Even when there are multiple exchanges competing for order flow, market participants purchase market data from the major trading venues, if not all venues, in order to satisfy best execution, order protection, and fiduciary duty obligations. In recent years, increasing costs have compelled many investors, banks, brokers and dealers (data users) to scale back their market access (where regulation allows) and products to ensure their business model remains feasible given the growing impact of market data costs to their bottom line.

The structural changes in the exchange framework and regulations that effectively require data users to subscribe to their data has created an imbalance in market power that must be addressed through

⁹ It is important to stress that an exchange/a regulated market in its essence is defined as a multilateral system bringing together multiple third-party buyers and sellers in financial instruments in a way that result in a contract in accordance with the rules (e.g. MiFIDII, art. 4. Securities and Exchange Act. § 3)

¹⁰ Fleckner, Andreas M. Stock Exchanges at the Crossroads: Competitive challenges – reorganization – Regulatory concerns, Harvard Law School, Discussion Paper No. 6. (2005)

¹¹ Market data costs are at least but not limited direct market data fees, fees in relation to reporting and distribution licences, connectivity fees, cost in relation to administration, compliance and audits of the market data agreements.

¹² See ESMA report from 5 December 2019 in response to the market data consultation

https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf, see actions taken by SEC: <https://www.sec.gov/news/public-statement/statement-chairman-clayton-2018-10-16>). And in Canada the authorities are following SEC; <https://insurance-journal.ca/article/rising-market-data-costs-raising-operating-costs/>

¹³ See e.g. Copenhagen Economics reports and guideline on market data: [Copenhagen Economics reports and guideline](#)

more rigorous regulatory oversight. Given the change to exchanges' ownership and business interests, it is important for policymakers to review the regulatory construct for exchange market data fees to ensure that they do not unreasonably restrict market access or burden competition.

As IOSCO noted in its 2010 discussion paper on Stock Exchange Demutualization, “[t]here are a number of financial issues that may become of greater concern in a for-profit exchange”.

Market participants globally believe that the day for greater concern has arrived.

A significant step forward would be the establishment of global core principles to address the challenge. A proposal for such principles is included in section 7.

2. Privatization; when it happened and why

As a central part of the modern financial infrastructure and a public good with critical impact on the overall economy¹⁴, exchanges were traditionally organized as government controlled, member owned and/or “not-for-profit” organizations¹⁵ – as was often the case other infrastructure utilities with significant market power in the economy¹⁶. This ensured that their core functions and positions were less likely to be abused for private gain.

However, over the last 20-30 years, there has been a global trend towards privatization of government controlled or member owned organizations. Beginning in the early 1990s in Scandinavia and spreading first to Australia, and then rest of Europe, US, Canada and Asia (cf. appendix A) exchanges were re-structured to become publicly traded “for-profit” companies – a process referred to as “demutualization” or “privatization”.

Privatization typically occurred in response to deregulation and globalization with the goal of leveraging technological developments to enhance international market integration and competition, and to provide more competitively priced exchange services. Please see Appendix A for further information.

3. Evolution of the Exchange Business and Unintended Consequences of Privatization

While privatization has increased competition in trading and provided increased investor choice, it has also allowed for the development of harmful anticompetitive behavior. In many countries exchange privatization was followed by the adoption of a single market system allowing trading to become fragmented across multiple venues.¹⁷ Under this new framework, market participants were and are subject to order protection, best execution and/or fiduciary duty requirements. As such, they have an obligation to price compare among markets, and to do so they need market data from each (relevant) market/exchange.

¹⁴ Fleckner, Andreas M. Stock Exchanges at the Crossroads: Competitive challenges – reorganization – Regulatory concerns, Harvard Law School, Discussion Paper No. 6. (2005)

¹⁵ Many exchanges were founded by brokers and dealers, who managed “their” exchange like an exclusive club, with high barriers for new entrants and a regional or even national monopoly.

¹⁶ See e.g. ECA (Economic Consulting Associates, Methodologies and parameters used to determine the allowed revenue of gas transmission system operators (TSOs), 2018) and EY (Mapping Power and utilities regulation in Europe, 2013), COMMISSION RECOMMENDATION on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC), ERPG (2014) ERPG Report on the outcome of the ERGP public consultation on the evolution of the Universal Service Obligation

¹⁷ The Markets in Financial Instruments Directive (2007) was introduced in the EU, and the Regulation National Market System was introduced in 2005 in the US. In 2000, Canada introduced the Marketplace Operation Rule. Prior to these legislative and regulatory changes, a stock could only be traded on the exchange on which it was listed. Today, stocks can be traded on all exchanges, regardless of where the company is listed.

These developments led to a shift in the business strategies of exchanges as they realized that market participants' need for market data was relatively inelastic due to the uniqueness of the data per venue and their regulatory obligations to seek best execution for their clients and investors, as well as the commercial imperative of trading firms to have access to the same level of price information that is available to the competitors. Instead of continuing to derive most or all of their revenue from their listing or trading business, market data that was once given away freely¹⁸ or priced at minimal cost, became a major revenue source for exchanges.

As documented in several reports¹⁹ and discussed further below, trading venues increasingly have utilized their significant market power to charge excessively high fees and exercise unreasonable terms in their sale of market data generated with respect to their platform.²⁰ Trading venues have increased market data fees in a number of ways, including by changing the terms of licensing agreements, creating new categories of fees, redefining and re-categorizing fees, and forcing licensees to agree that the exchange has a licensing right in any work product derived from exchange data (so-called "derived data" terms).

The high and increasing market data costs are one of the unintended consequences and run contrary to the stated objectives of privatization. The increased market data costs have also led to other significant negative consequences. For investors, the price of obtaining and using data constitutes a fixed cost of participating in a market – a fixed entry cost. When these costs increase, investors scale back their data purchase to a minimum and sometimes, substandard level, deselecting certain investments or markets – especially smaller companies and smaller, foreign markets. As a result, smaller investors may exit the markets due to a lack of information, and only few new investors enter to replace them.

Similarly, for broker-dealers and investment firms, market data is a fixed entry cost. As the costs outpace the margin for providing execution services, more firms exit the business. The result is decreased competition in execution services and a concentration in risk, which may exacerbate market conditions particularly, in times of market stress or sudden spikes in market volatility.

A recent survey by IPUG and Cossiom based on 63 European buy and sell-side firms found that 40-50 % of all data users scaled back their data purchase across regions, and 80 % knew of cases where financial institutions eliminated or curtailed investments, all in response to excessive market data costs. This is unfortunate as the core function of an exchange is to connect buyers and sellers and to serve as a market for capital formation and/or risk mitigation.

As investors scale back their investments and investment firms exit certain business lines, transparency declines and companies lose access to necessary capital hampering their growth and development. Excessively high market data costs decrease international market integration, reduce economic productivity and threaten diversity and stability of markets.

4. Impact of Imbalance of Market Power between exchanges and Market Participants

Market data from exchanges are indispensable for market participants to carry out their core business as exemplified in figure 1. Frequently, exchanges have the dominant market share for stock listed with them. However, regardless of where a stock is listed, all exchanges are in the unique position of being the only entity in a position to provide top of book stock information for their market with the least

¹⁸ A few exchanges still do this. For example, Shanghai Stock Exchange as an incumbent exchange and IEX, which in addition was the first exchange in the world to put forward the cost of producing and disseminating market data.

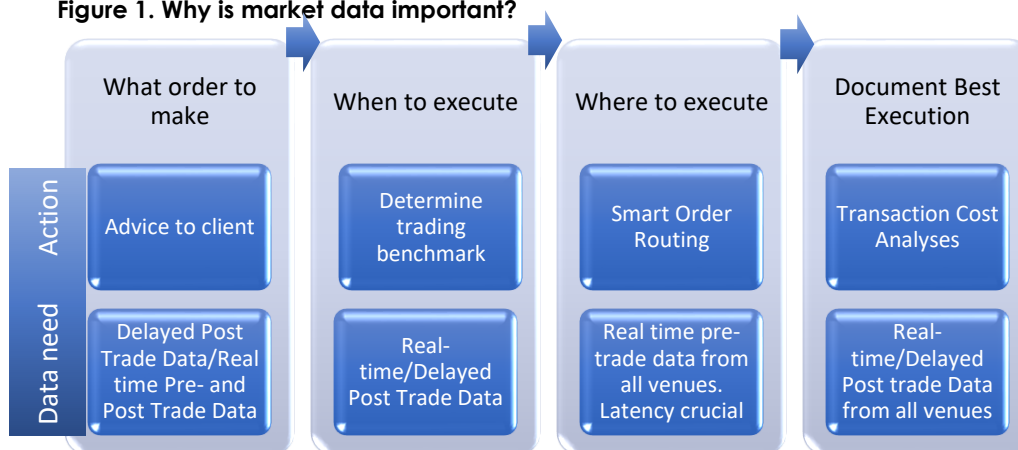
¹⁹ See e.g. Copenhagen Economics (2013, 2014, 2018, 2019), Expand (2019), Cossiom and IPUG (2019)

²⁰ Running a stock exchange is one of the best examples of Economies of Scale. Once the trading venue has set up the trading facilities, rules, governance and so forth, there are almost no further costs, regardless of the number of transactions performed.

amount of data latency. Given that market participants have best execution and/or fiduciary obligations to their clients, they are latency-sensitive and must obtain quotes and prices from exchanges, irrespective of cost if they want to stay in business, compliant with legal and regulatory requirements, and/or implement certain investment strategies.²¹ Data is used both to determine what order to make, when to execute, where to execute and to confirm and document best execution. This need for market data by market participants provide exchanges with the power to behave to an appreciable extent independently of other exchanges and of their clients.

Trading firms without specific best execution obligations also are compelled to obtain low-latency proprietary exchange data in order to stay competitive. Where trading profits are won and lost in milliseconds or microseconds and depend on detailed order-by-order market data, the only realistic choice is to pay for the data or exit the business.

Figure 1. Why is market data important?



Note: Market data is 1) generated as a unique by-product of the activities taking place in relation to trading,²² 2) contains fundamental information indispensable for agents' ability to participate in trading (for example the current market price of a security, and the current orders for a certain security), and 3) is necessary to satisfy regulatory requirements, such as best execution, order protection and/or fiduciary duty obligations as illustrated in figure 1. Source: Copenhagen Economics (2013) + own additions.

Market participants are concerned that exchanges are charging excessive fees and imposing unfair licensing terms. First, exchanges have increased market data and related fees (i.e. connectivity fees) significantly over a relatively short span of time without sufficient justification.²³ Second, market data fees have continued to increase year after year while global computing and storage costs continue to decline. Third, estimates on the cost to aggregate and produce market data indicate that exchanges

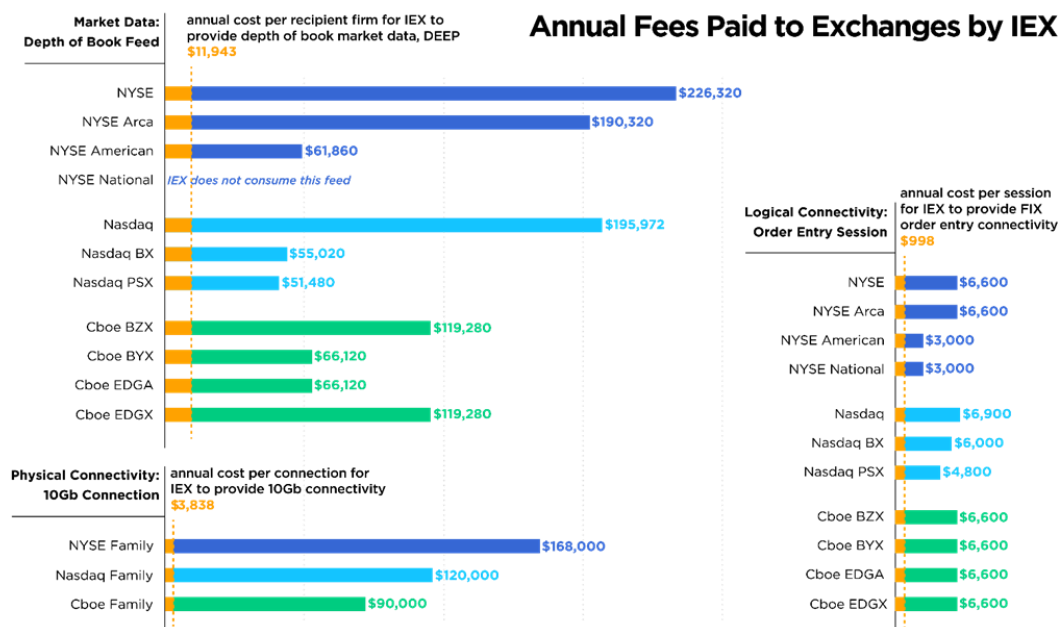
²¹ Regulations, such as the US order protection rule prohibiting trades at prices worse than a protected quotation. In EU, US and Canada, best execution requirements and investment management fiduciary duty obligations, have created a framework where market participants—whether broker-dealers/investment firms or investors—are compelled to purchase exchange data to meet legal, regulatory, and competitive standards

²² Exchanges argue that market data and trading are joint products. They are not. The fundamental function of exchanges is to match buyers and sellers of securities at a price that balances supply and demand price through transparent rules and processes. The sale of market data is a related but separate by-product of that primary function.

²³ <https://www.sifma.org/wp-content/uploads/2019/01/Expand-and-SIFMA-An-Analysis-of-Market-Data-Fees-08-2018.pdf>; <https://www.thetradenews.com/market-data-justifying-the-cost/>; <https://www.wsj.com/articles/sec-to-rule-nyse-nasdaq-didnt-justify-market-data-fee-increases-1539721232>; <https://www.ft.com/content/3d176bd4-d0be-11e9-b018-ca4456540ea6>; <https://www.bestexecution.net/data-management-market-data-heather-mckenzie/>; <https://www.sec.gov/news/public-statement/statement-chairman-clayton-2018-10-16>; [Copenhagen Economics reports and guideline, https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf](https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf)

are charging fees several hundred times above the cost. Figure 2 below shows an estimate of the annual cost per recipient for U.S.-based Investors Exchange (IEX) to provide depth of book market data compared with what other U.S. exchanges charge for such data.

Figure 2. Annual Fees Paid to Exchanges by IEX



Note: The short orange bar on the left reflects IEX's estimate of its per user annual cost to produce its depth of book data feed, a basic data product of the type that all exchanges sell. IEX estimated the per user cost for 2018 was about \$12,000. The long bars on the right show, for each large U.S. exchange group, how much IEX pays for similar depth-of-book feeds from other markets.

Source: IEX (2019).

The strong position of exchanges in the economy is similar to companies in sectors operating essential economic infrastructure, e.g. power and telecommunication grids, airports and railways. When essential economic infrastructure is privatized, regulatory requirements are normally imposed to ensure their market power is not abused. Counterbalancing regulation has been partially implemented for exchanges. However, over time it has become more and more challenging for exchange supervisors to clearly ascertain the cost and profit from producing and disseminating market data given competitive and profit incentives for exchanges to unbundle and increase the complexity of product offerings and to group (for public and regulatory reporting purposes) profit and loss for multiple exchange functions such as trading, surveillance and other technology based services. As such the regulatory requirements and/or the enforcement has not been effective in controlling costs.²⁴

In addition to exploitative prices, exchanges engage in predatory practices by imposing unfair and unreasonable terms of use on market participants/licensees. As firms need exchange market data, they have little choice but to sign the exchange market data licensing contracts. These contracts typically include: overly broad terms and definitions; "derived data" provisions, stipulating that the exchange has a licensing right in any work product derived from exchange data and may charge a separate derived data fee;²⁵ as well as "non-display" provisions, charging users for each separate software/machine-use

²⁴ See e.g. ESMA report from 5 December 2019 in response to the market data consultation https://www.esma.europa.eu/sites/default/files/library/mifid_ii_mifir_review_report_no_1_on_prices_for_market_data_and_the_equity_ct.pdf

²⁵ As a consequence, exchanges use the derived data provisions to subject users to intrusive audits, potentially exposing trade secrets and other intellectual property.

of data. Under these provisions, oftentimes market participants pay multiple licenses for usage of the same data. Further, licensees are subject to intrusive and burdensome audits, with no recourse for unfair findings and punitive fees as they risk exchanges disconnecting market data feeds which would jeopardize the licensee's business. This is especially problematic as exchanges use ambiguous and vague definitions in their market data licensing contracts, which allow auditors to easily cite unauthorized data usage and charge backpay and interest. Such predatory practices involving audits to extract greater market data revenue from market participants emerged with excessive pricing.

5. Empiric

The empirical data supports evidence of potential dominant behavior. As discussed, exchange market data revenue began an upward ascension shortly after the introduction of a single market system. For example, as illustrated in **figure 3**, the market data revenue for Deutsche Börse and London Stock Exchange begins to steadily increase after the introduction of MiFiD I in 2007; and significantly increases after 2013.

One indication of potential dominant behavior is the rapid rate of revenue growth. It supports academic studies showing that exchanges have clear incentives for cross-product subsidization -- overcharging on price inelastic product offerings (excessive pricing) and undercharging on price elastic product offerings (predatory pricing). In these respects, exchanges have increased market data fees as customers are limited in their ability to opt out, and decreased trade execution and listings fees—services with more price elasticity.²⁶

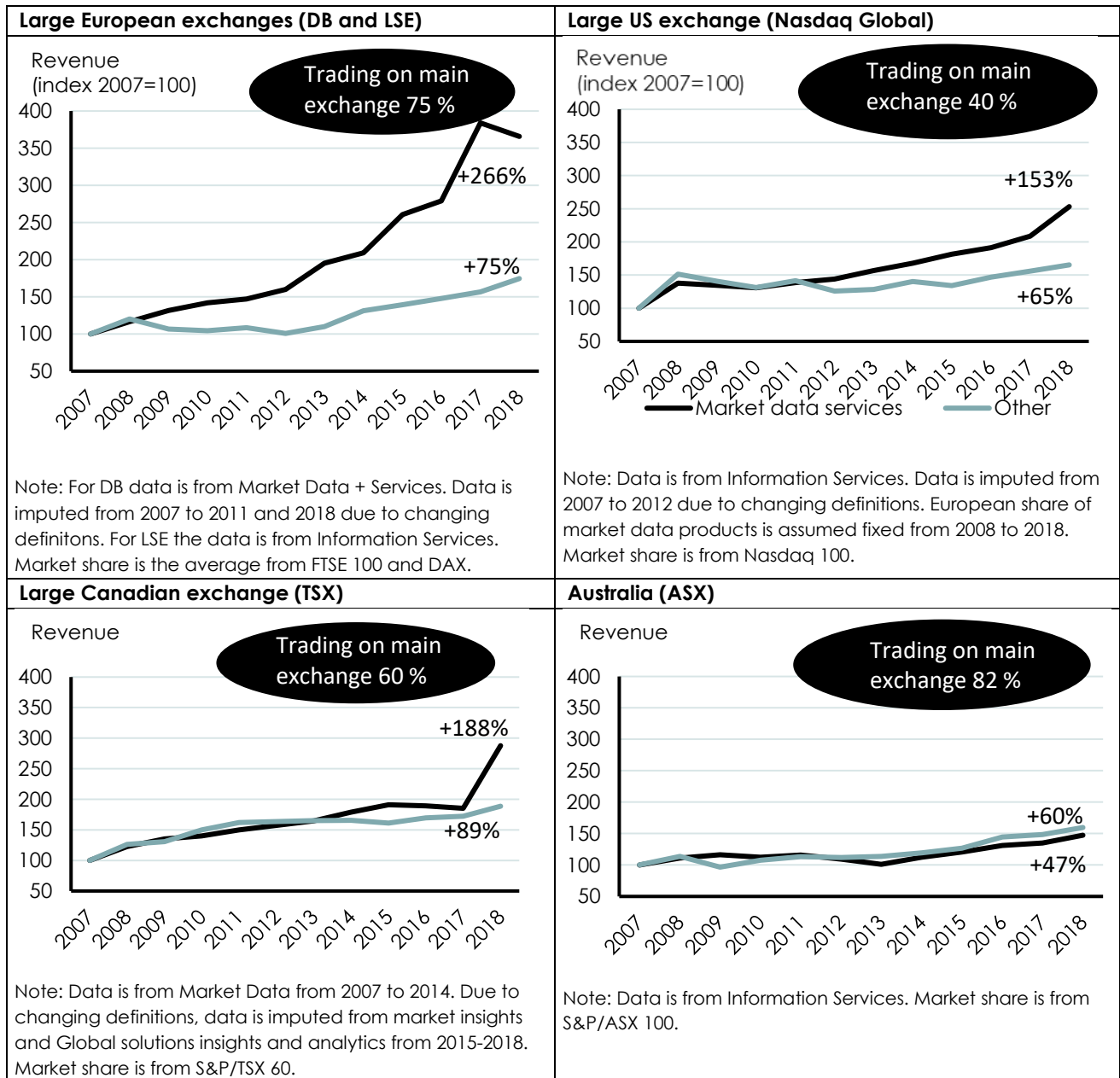
A high trading volume is of most importance to exchanges, allowing them to keep their unique market position. It increases the user value of listings, trade execution and market data, as, e.g., emphasized by Oxera (2019) p. 83 "... a higher volume of trading on a stock exchanges makes its market data more attractive to buyers, for example."^{27 28} By lowering the trading fee to an artificially low level, exchanges gain market share in trading and increase overall revenue high market data revenue. This practice is not only harmful to the capital markets in general, but also for smaller exchanges/trading venues, which do not have similar market data revenue stream to be able to follow the same cross subsidization path as larger exchanges. In short, it increases entry barriers for new entrants and harms smaller exchanges.

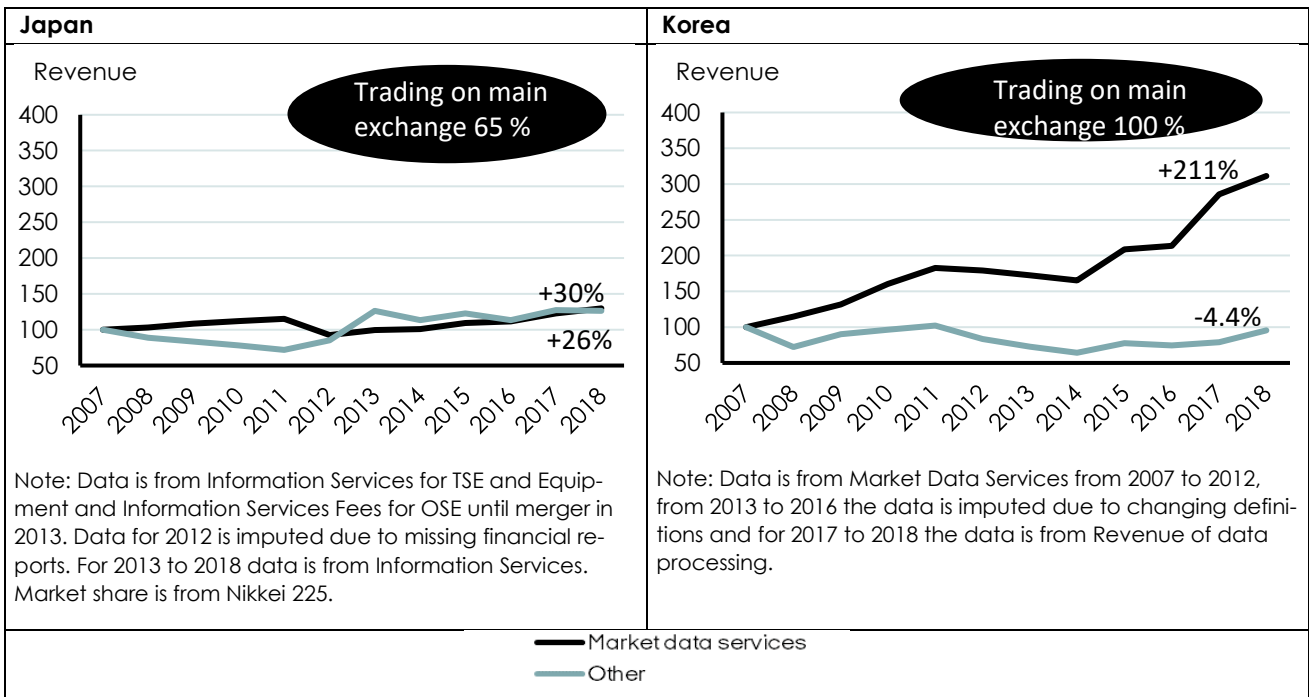
²⁶ A higher price on market data may even increase the willingness to pay for trade execution for certain high frequency traders – that is the traders who fortunes on a more uneven distribution of information, inefficiency and higher illiquidity in the markets. See Cespa and Foucault (2013).

²⁷ Here Oxera (2018) p.18 also try to emphasize the opposite causal relation (a vice versa relation), namely that the more data an exchange has, the more attractive is trading on that exchange, which is difficult to follow. This is probably also why they only exemplify the first causality relation.

²⁸ See also Business Insider Nordic (2016) exhibit 7, which shows how Nasdaq's, BATS' and NYSE's revenue from market data has increased by 62 % from 2010-15, while their transaction revenues at the same time have increase by 5.1 %.

Figure 3. Privatizations, fragmented trading and order protection rules have allowed exchanges to enjoy significant positions with respect to market data



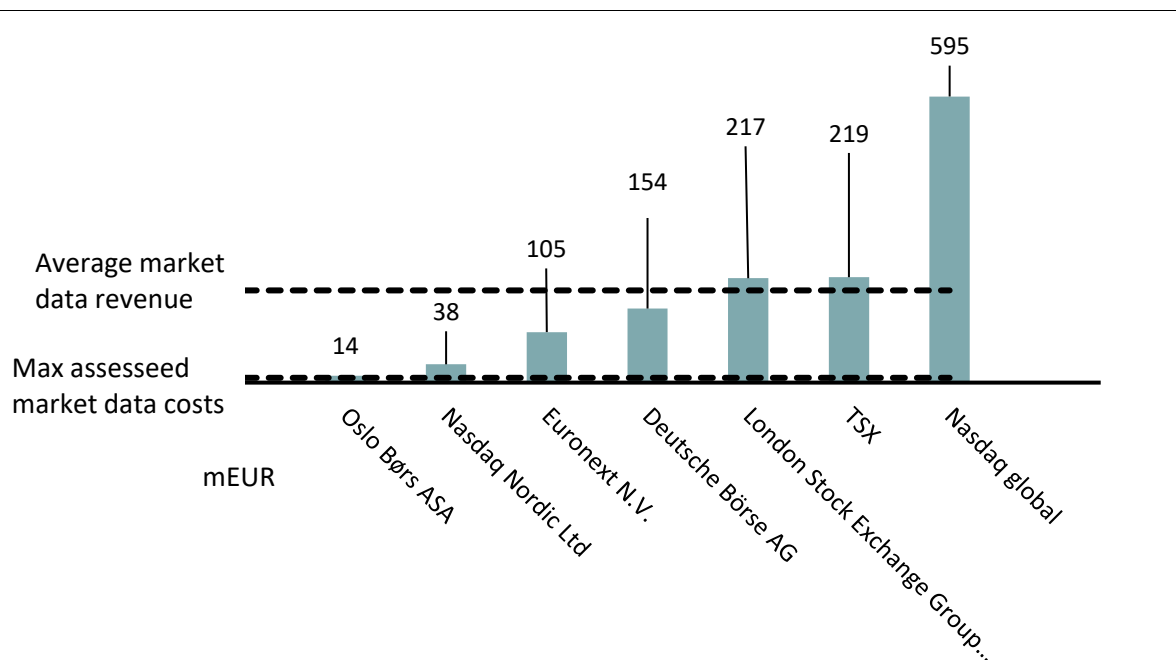


Note: Please beware that the percentage of "Trading on main exchange" is indicative as it is dynamic and vary across various sources.

Source: Annual reports from various exchanges and Fidessa Fragmentation Index and input from ICOSA members.

A second indication of dominant practices in market data pricing is when fees are unrelated to the cost of production. The empirical evidence shows a huge disparity between production costs and fees. Figure 2 shows that the cost of producing market data ranges from 1,5 and 10 million EUR per exchange, while the average market data revenue by large US, European and Canadian exchanges are far above 100 million EUR per exchange,²⁹ see **figure 4**. With profit margins of 10-100 times that of production costs, the empirical evidence shows that fees for market data have a low linkage to market data production costs. See also figure 2 and discussion in section 4.

Figure 4. Market data revenues and cost of production at large global venues



Note: The figure shows data for 2017. For London Stock Exchange Group plc., market data revenue includes 'real-time data' and 'other information' but excludes 'FTSE Russell Indexes' as defined in their annual report. For Deutsche Börse AG, market data consists of 'data services' and excludes 'Infrastructure services' and 'index services'. We would like to have NYSE included too, but it is unfortunately not doable to disentangle the data services revenue for NYSE from the ICE consolidated annual report

Source: Copenhagen Economics (2018) + own additions. Calculated based on annual reports from the venues.

A third indication of pricing power is when a firm is able to use its dominance to set one-sided or unfair contractual terms and conditions. Research and investor surveys show that exchanges have typically increased market data revenues through a combination of two price strategies, with particular focus on the latter:

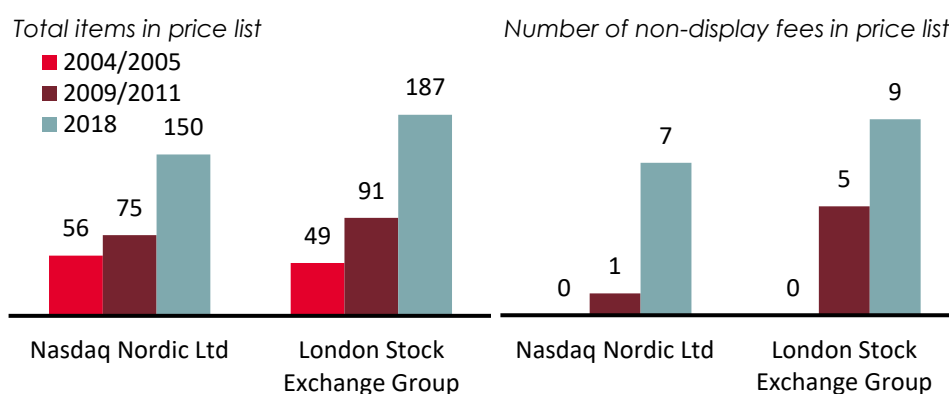
- i. increasing prices on individual data products, and
- ii. introducing new and complex licensing terms, price structures, data products, fees, auditing requirements and documentation requirements.³⁰

²⁹ See IEX (2019), and Copenhagen Economics (2018).

³⁰ See Copenhagen Economics (2018) p. 20-28.

Despite the use by market participants of two basic raw data products – pre- and post-trade market data – exchanges, such as the London Stock Exchanges and Nasdaq Nordic have tripled the number of data products since 2007, see **figure 5**. The new “non-display” fee categorization has been particularly burdensome for security dealers, since non-display data is used in all stages of the value chain, from research to trading, middle- and back office applications, see also discussion in Copenhagen Economics (2019). The administrative burdens are also described in Appendix B.

Figure 5. Number of different fees in the fee schedule



Note: Notice the different starting year. London Stock Exchange Group Plc. has different fees for different customer groups. The number of non-display fees show the number of fees for Tier 1 customers. Data was not available for all trading venues
Source: Copenhagen Economics (2018) based on prices lists from trading venues

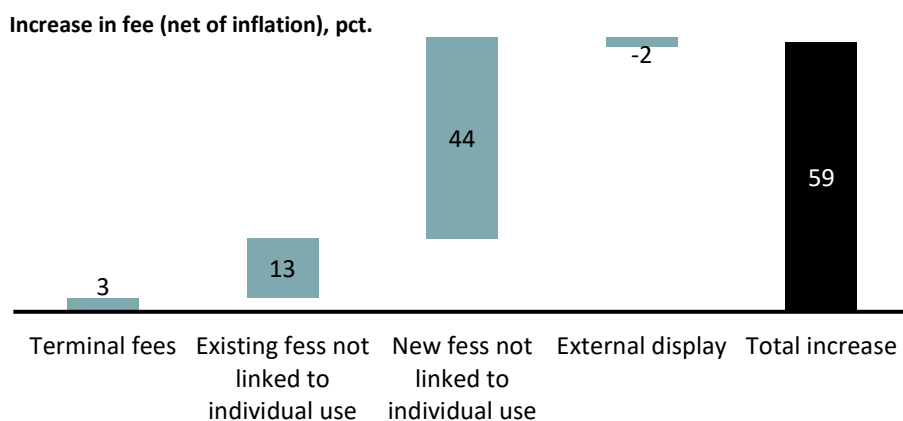
The re-categorization of data into new products and extension of fees to additional uses are also significant reasons for the large discrepancy between exchanges' claims that market data revenue have only increased by 1% a year since 2012 (see Oxera (2019)) while market participants claim that market data fees have increased by 59% from 2008 to 2018. When exchanges calculate increases in market data costs, they generally only take into consideration the increase from pre-existing products, notwithstanding that these fee increases constitute a smaller fraction of the total cost increase observed by market participants

Figure 6 show the cost increase in the case of a typical small Nordic investment bank. From 2008 to 2018 the bank's market data cost increased by 59 % net of inflation, while only 13 % of this was related to price increases of pre-existing products.

Studies from the US³¹ reveal an even stronger development, e.g. 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.

³¹ <https://www.sifma.org/wp-content/uploads/2019/01/Expand-and-SIFMA-An-Analysis-of-Market-Data-Fees-08-2018.pdf>

Figure 6. Increase in market data costs for a small Nordic investment bank from 2008-2018



Note: The figure shows the increase in fees for a typical small Nordic investment bank, see Copenhagen Economics (2018) box 6 for details. End-user fees are fees for accessing the market data in a terminal, i.e. individual use. On top, venues charge a range of other license fees, non-display license fee etc. External display is the costs of allowing a customer of the security dealer to access market data. All fees are outlined in Copenhagen Economics (2018) appendix B. Numbers are rounded.
Source: Copenhagen Economics (2018) based on prices lists from Nasdaq Nordic Ltd

Finally, excessive market data fees significantly impact the competitive landscape among security dealers, vendors, index providers and credit rating agencies³², both regionally and across borders, favoring large scale firms. Regionally, the increasing price and complexity of buying market data constitute high fixed costs and barriers in the markets for security dealers and data vendors. For data users, market data has in general moved from being the 15th highest cost component in 2007 to the 3rd largest cost component today – only surpassed by staff costs and IT³³. This means that only the largest players can afford the high fixed cost – no new players will enter, and the small players may leave the market as the cost increase. In essence, excessive market data fees serve as a denial of access to essential facilities for all but the largest market participants.

For instance, in Canada 108 IROC dealer members exited from the industry between 2009 and 2018. While the departures cannot be directly attributed to excessive market data costs, such costs are certainly likely to have played a role in many cases. We also see a limited number of market participants in the global vendor markets, where Bloomberg and Thomson Reuters make up almost 40 % of the total revenues in 2017³⁴.

6. Was the problem with market data costs to be foreseen?

The issues with high and increasing market data costs have also – to a certain extent - been addressed in previous academic literature, research and discussion paper. For example, IOSCO stated in their discussion paper on Stock Exchange Demutualization from 2000 (page 10):

“There are a number of financial issues that may become of greater concern in a for-profit exchange, such as: Cross-subsidization between regulatory and commercial activities. Service and other fees set at a level for commercial purposes, such as to build market share, are unduly depleting resources of the exchange etc.”

³² Although vendors, credit rating agencies and index providers are not the focus in this memo, there are also significant challenges with the market power of these entities and how this is used to require excessive fees from data users. As some of the problems is expected to be solved when the problems with the exchanges' market data fees are solved, it should be considered to investigate the problems with these data providers more in depth.

³³ According to input from member firms

³⁴ Oxera (2019) p. 66.

Exchanges have expanded the products and services that they provide, such as data processing, the distribution of information etc. The profit-seeking actions can give rise to increased conflict of interests and IOSCO concluded that:

“Given the importance of an exchange in the financial and economic system of a country and the additional complexities posed where an exchange becomes a for-profit entity actively competing for business, these issues will continue to demand regulatory attention”³⁵

Some academic papers show how for-profit, unregulated exchanges, competing in the markets for trading, have incentives to charge abnormal high prices on market data but overall market efficiency and liquidity are higher when market data is provided at a lower price.³⁶ Furthermore, several older papers on stock market demutualization address the issue of market data – although many did not foresee this problem at the time.³⁷ (E.g. Andreas M. Fleckner (page 11) mentions briefly that: “(6) stock Exchanges can, and to an increasing extent do, sell market data...”)

This illustrates the problem well: It was unforeseen at that time the degree to which market data would be utilized and valued as trading fragment regulatory requirements would increase, and technologies would evolve.

However, this is not an excuse for inaction. Instead, it represents an opportunity to act and handle the problem to the benefit of both investors, companies and capital markets in general.

7. Potential solutions

The business model for exchanges has changed and so should regulatory oversight. As IOSCO noted in its 2010 discussion paper on Stock Exchange Demutualization, “[t]here are a number of financial issues that may become of greater concern in a for-profit exchange”. Market participants globally believe that the day for greater concern has arrived.

Given that market participants are struggling globally from the burden of excessively high market data fees and unfair licensing provisions, governments, regulators, central banks, and standard setters should establish core principles to address the problem.

As a starting point, authorities should recognize that exchanges hold disproportionate market power on market data generated from orders and trades with respect to their venues. As such, market data costs (the market data pricing, licensing practices, definitions, audit procedures and connectivity fees) must be subject to supervisory scrutiny. Rigorous supervision of the whole market data business (as well as contiguous markets and products where the search for revenue could shift once there is increased scrutiny of market data sales) is crucial in order to maximize the economic benefits of financial market-places.

Authorities should consider developing a cost benchmark for producing and distributing market data, such as Copenhagen Economics reports from 2013, 2014, 2018 and 2019³⁸ and the IEX report (January 2019).³⁹ The IEX report is the first exchange report that released detailed information on the cost of exchange services in the US. IEX published its report in response to the growing concerns around market data and connectivity fees and requests for transparency by US regulators and other market participants. In its report, IEX sets out details of the review it has conducted of its own costs to provide market data and connectivity compared with the fees NYSE, Nasdaq and Cboe charge for these products and services. Because of the regulatory requirements related to market data, there should be a regulatory

³⁵ <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD112.pdf>, page 12.

³⁶ See e.g. Easley, et al. (2016).

³⁷ First literature on stock market demutualization – from 2011 and before – mostly focused on competition in respect of trading and listing.

³⁸ <http://financedenmark.dk/the-danish-securities-dealers-association/publications/>

³⁹ <https://iextrading.com/insights/cost-transparency-whitepaper/>

interest in ensuring that market data fees and licensing practices are fair and reasonable and not a burden on competition.

The Core principles should entail

- 1. The price of market data and connectivity must be based on the costs of producing and distributing the market data (as opposed to the value market participants derive from market data) with a reasonable mark-up. The cost should be measured against a recognised cost benchmark.**
 - a. Regulators should require trading venues to submit detailed cost and revenue data in order to understand the amount of mark-up exchanges impose.
 - b. As market data should be based on cost with a reasonable mark-up, exchanges should simplify contract terms and eliminate “non-display” categories. Instead, exchanges should consider simply differentiating between professional and non-professional users.

Please see IEX¹ cost study⁴⁰ and Copenhagen Economics guideline to a cost benchmark⁴¹ for inspiration in addressing principle one in more detail.

- 2. Trading venues of a single market system should standardize key market data contract definitions, terms and interpretations. Contract definitions, terms and policies should be specific and avoid overly broad or general terms.**
 - a. Market data licensing contracts should avoid “derived data” terms, which are lopsided and unfair, and standardized agreements should be subject to regulatory review.
- 3. Market data licensing contracts should be simplified to ease administration and so that audits are not necessary.**

Please see Appendix B and C for additional inspiration in respect of principle two and three

⁴⁰ <https://iextrading.com/insights/cost-transparency-whitepaper/>

⁴¹ <https://www.copenhageneconomics.com/publications/publication/a-guideline-to-a-cost-benchmark-of-market-data-how-to-obtain-reasonable-prices-of-market-data>

8. References

- Baker, M., J.C. Stein, and J. Wurgler (2003) When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms, *The Quarterly Journal of Economics*, 2003, 118 (3), 969-1005.
- Biais B., T. Foucault, S. Moinas (2015) Equilibrium fast trading, *Journal of Financial Economics* Volume 116, Issue 2, May 2015, Pages 292-313
- Bond P., A. Edmans and I. Goldstein (2012) The real effects of financial markets, *Annual Review of Financial Economics*, Annual Reviews, vol. 4(1), pages 339-360
- Business Insider Nordic (2016) There's a new 'hot-button' issue on Wall Street, and battle lines are being drawn, Nov. 2016, Mark Turner
- Cespa, Giovanni and Foucault, Thierry (2013), Sale of Price Information by Exchanges: Does it Promote Price Discovery? *Management Science* Vol. 60, No. 1. 2013
- Chen, Q., I. Goldstein and W. Jiang (2007) Price Informativeness and Investment Sensitivity to Stock Price, *Review of Financial Studies*, 2007, 20 (3), 619-650.
- Copenhagen Economics (2019) A Guideline to a cost benchmark of market data. Prepared for the Danish Securities Dealers Association
- Copenhagen Economics (2019): Response of Copenhagen Economics to the Report: "The Design of equity trading markets in Europe". Prepared for the Danish Securities Dealers Association.
- Copenhagen Economics (2018) Pricing of market data. Prepared for The Danish and Swedish security dealers associations, 28 November 2018
- Copenhagen Economics (2014): How to ensure reasonable prices of financial market data. Prepared for The Danish and Swedish security dealers associations.
- Copenhagen Economics (2013): Regulating access to and pricing of equity market data. Prepared for The Danish and Swedish security dealers associations.
- Cossum, IPUG (2019: European IPUG/Cossum Market Data Survey on Exchange fees 2019
- Davis R., D. Maslar and B. Roseman (2017) Secondary Market Trading and the Cost of New Debt Issuance (March 15, 2018). Available at SSRN: <https://ssrn.com/abstract=2954857> or <http://dx.doi.org/10.2139/ssrn.2954857>
- Ding S., J. Hanna and T. Hendershott (2014) How Slow Is the NBBO? A Comparison with Direct Exchange Feeds, *The Financial Review* 49 (2014) 313-332
- ECA (Economic Consulting Associates, 2018) Methodologies and parameters used to determine the allowed revenue of gas transmission system operators (TSOs)
- EY (2013) Mapping Power and utilities regulation in Europe
- Easley, D., O'Hara, M., & Yang, L. (2016). Differential Access to Price Information in Financial Markets. *Journal of Financial and Quantitative Analysis*, 51 (4), 1071-1110. doi:10.1017/S0022109016000491
- Ellul A. and M. Pagano (2006) IPO underpricing and after-market liquidity, *Review of Financial Studies* 19, 381-421.
- Estelle C., P.L Yin (2010) Competition between exchanges: A research agenda, *International Journal of Industrial Organization* Volume 29, Issue 3, May 2011, Pages 329-336

European Commission (2009) Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC)

European Commission (2014) Markets in Financial Instrument Directive II and Market In Financial Instrument Regulation (including delegated acts)

Expand (2018): An Analysis of Market Data Fees. Prepared for SIFMA.

Foucault T., O. Dessaint, L. Frésard, and A. Matray. Noisy Stock Prices and Corporate Investment, The Review of Financial Studies, 20 November 2018

Fleckner, Andreas M. (2005). Stock Exchanges at the crossroads: Competitive challenges - reorganization – regulatory concerns, Harvard Law School, Discussion Paper No. 6 (2005),

Gider, Jasmin, S.N. M. Schmickler, and C. Westheide (2019). High-Frequency Trading and Price Informativeness. SSRN Electronic Journal. 10.2139/ssrn.3349653.

IEX (2019): The Cost of Exchange Services; Disclosing the Cost of Offering Market Data and Connectivity as a National Securities Exchange

IOSCO (2000) Discussion Paper on Stock Exchange Demutualization

Jung, Nu Ri (2011): A Study on Demutualization of Stock Exchanges – focusing of the Case of Korea Exchange

Lee, C.M.C. and E. Watts (2018) Tick Size Tolls: Can a Trading Slowdown Improve Earnings News Discovery? Stanford University Graduate School of Business Research Paper No. 19-1. Available at SSRN: <https://ssrn.com/abstract=3263778> or <http://dx.doi.org/10.2139/ssrn.3263778>

OECD Business and Finance Outlook (2016), Changing Business Models of Stock Exchanges and Stock Market Fragmentation

Oxera (2019) The design of equity trading markets in Europe. Prepared for Federation of European Securities Exchanges, March 2019

SEC (1934) Securities and Exchange Act

SEC (2019) Public statements and Comments on Roundtable on Market Data and Market Access

Weller, Brian. (2018). Does Algorithmic Trading Reduce Information Acquisition? Review of Financial Studies. 31. 2184-2226. 10.1093

Appendix A

Privatisation of Exchanges

Box 1. Privatization of global Exchanges	Liberalization of trading, requirements in relation to best execution/order protection
US, Canada and Mexico	
<p>US: In 2000, the Pacific Exchange (PCX) became the first US Stock Exchange to demutualize part of its business. PCX finalized an agreement with "Arca" and the new exchange was called ARCX. ARCX merged with NYSE in 2006 and became NYSE Arca.</p> <p>New York Stock Exchange (NYSE) demutualized in 2006 and went public in 2006. Attempts were made for years up to the event. The Chicago Mercantile Exchange (CME) was the first financial exchange to demutualize in 2000. CME and CBOT merged in 2007 and in 2008 the CME group acquired NYMEX.</p> <p>Nasdaq was demutualized in 2001 and went public in 2002 and acquired OMX in 2008.</p> <p>Significant problems with markets data costs is observed, cf. recent studies from Expand and SIFMA and the SEC actions</p> <p>Canada: In 2000 the Toronto Stock Exchange (TSE) became a for-profit-company, owned by shareholders instead of members. Several other marketplaces emerged and dealers were compelled to purchase market data from all of them. At present Canada has 6 Exchanges and 4 ATSS. However, the main market TMX has 63% market share.</p> <p>Significant problems with market data costs according to report from 2012 and recent information from market participants.</p> <p>Mexico: In Mexico it two stock exchanges (Bolsa Mexicana de Valores (BMV) and Bolsa Institucional de Valores, where BMV has 90% market share. Market data clients can only redistribute the information with 20 minutes delay and when paying the correspondent fee for each user.</p> <p>Whether problems market data costs has started to emerge in Mexico needs to be investigated further</p>	<p>Trading was liberalized in US in 2005 via "Reg NMS (National Market System)—rules designed to foster competition. Chief among these was Rule 611, the "order-protection rule", which requires brokers to route trades to the exchange that displays the best price.</p> <p>Trading was liberalized in Canada in 2001, Canada has an Order Protection Rule which is National Instrument 23-101 Trading Rules, enacted by the Provincial Regulators and also a Best Execution Rule enacted by the Industry Regulator (IIROC) Rule 3300 Best Execution of Client Orders.</p> <p>Those rules require dealers to obtain the best price and execution available on all protected marketplaces (those with market share above 2.5%). However, firms are required to periodically check non protected marketplaces to determine if they should be executing on those marketplaces if the securities trade significantly there.</p> <p>Mexico has Best Execution requirements based on best price available, volume available and the probability for executing the order.</p>

<p>Europe</p> <p>London Stock Exchange was demutualized in 2000 and is listed on itself in 2001. London Stock Exchange merged with Borsa Italiana in 2007 and became London Stock Exchange group (LSEG). In 2009 LSEG acquired the majority in Turquoise, in 2011 LSEG acquired 100% of FTSE in 2013 LSEG acquired the majority of LCH Clearnet</p> <p>The Nordics: The Stockholm Stock Exchange was demutualized in 1993 and became the first for-profit exchange in the world. Helsinki followed in 1995 and Copenhagen Stock Exchange in 1996. In 1998 another Swedish Stock Exchange OM acquired Stockholm Stock Exchange. OM acquires Helsinki Stock Exchange in 2003 and was re-named to OMX. In 2005 OMX acquired Copenhagen Stock Exchange and OMX acquired Iceland Stock exchange in 2006. In 2008, Nasdaq acquired OMX.</p> <p>Deutsche Börse was demutualized in 2000 and went public in 2001.</p> <p>The exchanges in Amsterdam, Brussels and Paris demutualized and merged into EuroNext in 2000. EuroNext became publicly listed in 2001. In 2007 NYSE acquired EuroNext and became NYSE EuroNext.</p> <p>Borsa Italiana was demutualized in 1997 went public in connection with the the LSE takeover of Borsa Italiana in 2007.</p> <p>BME Spanish Exchanges was demutualized in 2001, not listed.</p> <p>Significant problems with market data costs are observed. See e.g. Copenhagen Economics Reports, IPUG and Cossiom study, feedback from ESMA consultation on market data costs (https://www.esma.europa.eu/press-news/esma-news/esma-publishes-responses-its-consultation-cost-market-data-and-consolidated)</p>	<p>Trading was liberalized in 2007 in Europe via MiFID I meaning that e.g. stock could be traded on various venues without the consent of the issuer. This change resulted in significant competition between new and "old" trading venues to attract trading flow. However, this also created the need for market participants to buy market data from the various trading venues e.g. due to the requirement of providing clients best execution.</p> <p>The Best Execution requirements in EU can be found in MiFIDII, art. 27 (detailed rules can be found in Delegated Acts), where it is required for investment firms to take all sufficient steps to obtain, when executing orders, the best possible result for their clients taking into account price, costs, speed, likelihood of execution and settlement, size, nature of any other considerations relevant to the execution of the order. There is a "rule of thumb" that when a trading venue gets close to 5% market share, firms needs to include that venue in its order execution policy.</p>
<p>Australia and New Zealand</p>	
<p>Australia: The Australian Stock Exchange (ASX) was formed in 1987 through incorporation under legislation of the Australian Parliament enabling the amalgamation of six independent stock exchanges that formally operated in the State capital cities. Each of those stock exchanges had a history of share trading dating back to the last century. In 1998, ASX demutualized and became a listed company on its own market. Around 2000, member firms that were allocated shares at the demutualization have held onto their shares.</p>	<p>Trading in Australia was liberalized in 1996.</p> <p>Best Execution requirements can be found in Regulatory Guide 265, section G. It is stated that market participants must take reasonable steps when handling and executing an order in relevant products to obtain the best outcome for its client. For retail clients this may be interpreted as "best price", taking into account the client's instructions. For wholesale clients other outcomes may be relevant, including speed, likelihood of execution and any other relevant considerations (or any combination of these outcomes)</p>

<p>Competition for trading cash equities is not restricted in Australia. ASX has around 80% market share (and Chi-X accounts for the rest). Hence, fragmentation is minimal.</p> <p>Recent fee increases for market data has been observed on ASX. Whether market data costs have started to be considered as an increasing problem, needs to be investigated further.</p> <p>New Zealand: New Zealand Stock Exchange demutualized in 2003 and went public in 2003</p>	<p><i>Best Execution requirements are quite similar to the Australian.</i></p>
<p>Asia</p>	
<p>Tokyo Stock Exchange demutualized in 2001, not listed Except e.g. Tokyo Stock Exchange (TSE) which is not publicly-traded. TSE is organized as a joint stock corporation, whose shares are closely held by member firms like banks and brokerages</p> <p>Osaka Securities Exchange demutualized in 2001 and listed in 2004</p> <p>Taiwan Stock Exchange Corp. was originally organized in company form 1961 so demutualization has not been completed, not listed.</p> <p>Korea Stock Exchange demutualized in 2005 and listed in 2011</p> <p>Hong Kong: In 1999, the securities and futures markets was subject to the demutualization and merger of Hong Kong's Exchanges and Clearing Houses under a new holding company, Hong Kong Exchanges and Clearing Limited (HKEx). The changes took effect in March 2000 and in June 2000, HKEC was listed on the wholly owned subsidiary, The Stock Exchange of Hong Kong I 2000. The prudential regulator shall also prevent monopolistic abuses as HKEx at the time was offered on a de facto monopolistic basis, the SFC was approval authority over the fees, charged by HKEx.</p> <p>Singapore: The Stock Exchange of Singapore (SES) was demutualized and merged in 1999 and listed in 2000</p>	<p><i>In Japan, Best Execution requirements can be found in Financial Instruments and Exchange Act has also long employed the phrase "under the best terms and conditions" in reference to best execution.</i></p> <p><i>In Korea, Best Execution requirements can be found in The Financial Investment Services and Capital Markets. Art. 68. Among other things, this includes the price of the instrument, the cost associated with a trade and other matters such as likelihood of execution.</i></p> <p><i>In Hong Kong, the SFC expects firms to take sufficient steps to obtain the best available terms when executing client orders, considering price, cost, speed of execution, likelihood of execution, speed of settlement, likelihood of settlement, size and nature of the order, and any other relevant considerations. The relative importance of each best execution factor may vary from case to case, and best execution of certain types of transactions should be assessed against multiple factors. The SFC highlighted that a good practice would be for firms to establish a policy outlining specific best execution factors relevant to their businesses, prioritizing different factors under different circumstances.</i></p> <p><i>On the factors to be taken into account for best execution in Singapore, the MAS expects Capital Markets Intermediaries to consider different factors such as price, costs, speed, likelihood of execution and settlement, and size and nature of the customer's order, if appropriate, to achieve the best available terms for their customers. The relative importance of the different factors should take into account the characteristics of the order and type of capital markets product, as well as customer categorization. On the scope</i></p>

<p>India has 3 operational stock exchanges, NSE, BSE (demutualized in 2005) and MSEI. BSE was established in 1875, NSE I 1994 and MSEI in 2012. NSE has a significant market share around 93% in the equity market and 100% in the equity derivatives market.</p>	<p><i>of the best execution requirement, the MAS noted that the best execution policies and procedures should cover all customers' orders, regardless of the capacity in which a Capital Markets Intermediary is acting (i.e., whether as agent or principal</i></p> <p><i>Best Execution applies to broker dealers who offer Smart Order Routing to their clients (which almost no one offers)</i></p> <p>Trading in India went electronic in 1995. Smart Order Routing (SOR) has been permitted in India vide Securities and Exchange Board of India (SEBI) Circular No. CIR/MRD/DP/26/2010. The Sebi circular includes the following factors that need to be considered by a broker member offering SOR: price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order.</p> <p>However, SOR is optional for stock brokers in India.</p>
--	--

Source: IOSCO Discussion Paper on Stock Exchange Demutualization (2000), Andreas M. Fleckner, Stock Exchanges at the Crossroads: Competitive Challenges – reorganization – Regulatory concerns, Discussion Paper No. 6, Harvard Law School (2005), Hung, Nu Ri, A study on Demutualization of Stock Exchanges (2011), own data

Appendix B

Examples of unreasonable market data policies, definitions and procedures

The different and vague definitions or interpretations of definitions, differences in usage policies across the trading venues in combination with unreasonable audit procedures, together, make market data licensing contracts burdensome and administratively complex to manage. When signing the market data contracts, "Confidentiality Clauses" apply which restrict/prohibit disclosure of information. This limits transparency considerably and harms the possibility for the trading venues' members to negotiate their terms. In practice this means that the trading venues have the absolute bargaining power when negotiating and interpreting the agreements with their members. Members must accept the trading venues' terms and conditions, pricelist etc. in order to become a member. This "one-way-bargaining-power" increases the entry barriers for other potential entrants (other trading venues) and harms the terms of the trading venues members.

Examples of complex market data policies:

1) Administration of accesses:

An Investment Firm (IF) is required to get approval from most trading venues before any data can be permitted by the data distributor/vendor on the IF feed. For example, each time the IF changes the location of its data centers or its headquarters address, the IF is required to get a new approval, complete order forms and sign the License agreement all over again.

An IF would be required to pay additional fees if it was decided to move part of a department to a new location (new city or country), in case the trading venue licenses its market data on a per site level.

An IF could have an application consuming market data from different trading venues, where for one trading venue this application is licensed under a specific category/purpose whereas for another trading venue this same application would be perceived to belong under another type of category or several categories at the same time. This scenario makes it very cumbersome to ensure that the IF can technically control that the IF is properly licensed and have the right level of information to prove it during a future audit.

The IF receives several data change notifications from each data distributor/vendor every day regarding alterations to the way data is packaged, priced as well as policy amendments. Each notification needs to be investigated to estimate the impact on the IF's users and applications, as well as if the IF should expect additional market data costs, signing a new License agreement.

When a new application requires access to market data, the IF is asking to answer a long list of questions to determine if the data will be displayed or not, controlled, stored, used to calculate new data, distributed to downstream application or externally to customers, in which format, at which frequency, etc. This thorough investigation is necessary to ensure that the IF subscribes to the right license for each trading venue.

The IF needs to regularly check that the correct number of users/departments have access to applications, to avoid paying fees for a service that is not being used – as the IF has employees going on maternity/paternity leave, changing positions internally or job descriptions, etc.

Each market data cost needs to be allocated at the employee level in the IF's market data inventory, so the IF can provide a cost report to management. The IF is also using this inventory to reconcile invoices from trading venues and data distributors/vendors before they are paid. Each time a trading venue updates its fees, the IF will need to update its market data inventory.

Definitions and policies are deliberately vague, which creates uncertainties and unclear license situations.

2) Audits:

The auditor requires the IF to complete a questionnaire for each internal and external application having potential access to their market data.

The IF needs to provide an audit trail (3-5 years back in time – sometimes up to 10 years) of all users permitted to their data, which will be matched to the numbers the IF has reported to the trading venue or reported by the data distributor/vendor on the IF's behalf.

The IF will need to demonstrate how the market data is controlled (entitlement system) and displayed in each application, or explain what kind of calculations are being done by the application, for what purpose, if the calculated data is distributed within the organization or externally, etc.

If the IF is not able to provide the auditor with a proper audit log of all end-users permitted to a specific application, they will ask the IF to pay for all potential employees having access to the application itself. In some cases, it could be the IF's entire staff! The burden of proof is turned on the IF who therefore is "guilty until proven otherwise"!

It is very difficult to administer the policy terms from the market data License agreements since they do not match the reality of how the current technology allows the IF to use the market data. It is therefore very cumbersome to find the "right" (non-display) license which will fit the IF's usage per application – especially when the definition of those terms is not clear in the License agreement. The IF must always ask its account manager at the trading venue to confirm how they would categorize the IF's application use. The IF does see in some cases a significant lack of understanding from the trading venue of the IF business. The account manager would therefore very often ask its audit team for confirmation, in order to avoid heated discussions during a future audit, as the IF will keep a record of the email confirmation in order to prove to the auditor that the IF ensured compliance with their License agreement, by asking for a formal confirmation.

Most trading venues only publish the latest valid version of their market data agreement and fee schedule as well as policy documents on their website. This lack of transparency makes it impossible for the IF to know what terms applied in the past (for the duration of the audit period). Therefore, it should be noted that the IF sees auditors choose to use current license terms and apply those back in time.

Beware, there is a limit on how far back in time the IFs are entitled to be compensated for overpaid market data fees (usually 60-90 days from the time of the audit/today), whereas trading venues can go back several years if the IFs underreported. IFs' also see trading venues allowing IF to amend past reports (up to a year from today's date), but it chooses only to "reimburse" over reporting for 60-90 days from today's date.

Appendix C

Inspiration for simplifying and standardization of pricing policies and audits

Notwithstanding our recommendations that market data licensing agreements should be simplified and exclude 'non-display' and 'derived data' terms and the need for audits, we provide some suggestions for simplifying these terms in a standardized manner.

Contents

Fundamental Pricelist Terms

- Non-pro vs. Pro User
- Display vs. Non-Display Usage
- Real-time, Delayed, EOD and Historical Data
- Derived Data

Audit Terms

- Obligation to present contractual foundation
- General audit principals, Reasonable commercial basis and conflict of interest
- Right to postpone audit
- Right to first refusal

Fundamental Pricelist Terms

1. Non-Pro vs. Pro User

Purpose:

The Trading venues do not hold the same user definition which in return causes a lot of unnecessary administration of market data access rights to these.

This is one clear and simple definition to the user types across the Trading Venues.

Proposed wording:

A "Non-Pro" is a user who does not hold a license to act as financial institution, hereunder but not limited to: investment firms, credit institutions, insurance companies, investment management companies and management companies, and pension funds and their management companies and who is not a representative of a financial institution;

A "Pro" shall mean a user who does not qualify as a Non-Pro.

Legal reference:

This is an alignment of the Trading Venue User definitions to be aligned with the Retail versus Eligible Counter Party definition found in Directive 2004/39/EF

2. Display vs. Non – Display Usage**Purpose:**

Over the past decade, we have seen an inexplicable increase in Trading Venue market data licenses based on the use of market data outside the Display to end user format. This type of usage is commonly referred to as "Non-Display", however sometimes quite confusing as also labelled as "Other application use" or similar by the Trading Venues.

This is one clear and simple definition to market data usage categorized as either Display or Non-Display usage to be implemented across the Trading Venues.

Proposed wording:

"Display Usage" is usage of market data made by one or more physical persons who benefits from having (at minimum) visual usage access to the data.

Display Usage of data is applicable to both snap-shot and streaming market data.

"Non-Display Usage" is defined as any type of data which is not Display Usage.

Non-Display Usage of data is only applicable to real time streaming data. Non-Display Fees can only be charged as an enterprise-wide license, and not on a per use case purpose.

3. Real-time, Delayed, EOD and Historical Data**Purpose:**

In order to ensure that there is a clear definition of what market data is in use, it is important to have clear cut definitions to the difference between Real-time data, Delayed data, End of Day (EOD) data and Historical data.

Proposed Wording:

"Delayed data" is streaming market data delivered with a delay of minimum 15 minutes at the official publication.

"Real-time data" is streaming market data delivered in real-time or with a delay of less than 15 minutes.

"End of Day (EOD) data" is the official closing prices of the current trading day.

"Historical data" is all market data generated prior to the End of Day of the previous trading day. The Trading Venues waive all claims and right to the Historical data.

4. Derived Data

Purpose:

The situation where a market data set is used in whole or in part to make other data values is quite common across not only the financial industry, but also the research community and society in general.

Therefore, it is a problem not to have an industry wide definition applied across all Trading Venues.

Another problem to address is the ownership of the derived data regarding when the Trading Venue can claim some right or entitlement as opposed to when the deriving party is creating its own new original work. Ownership of markets data is also analyzed in legal opinion from Danowsky and Partners (2018). An IF should hold the IP rights to the derived data and original work, allowing them to distribute/display those as they please without any licensing from trading venues.

Proposed wording:

“Derived Data” is market data derived from the Trading Venue most commonly achieved using mathematical, logical, or other type of transformation, hereunder arithmetic formula, composition, aggregation.

“Original Work” is unique Derived Data created in a way where it cannot be reverse engineered back to the Trading Venue market data used in the production process and do not materially replace the Trading Venue market data.

Audit Terms

1. Audit Term

Purpose:

The term of the Trading Venue audit should never have such historical length that (in itself) carries a burden to document for year back in time. Therefore, a clearly defined upper limit is necessary.

Proposal:

The “Audit Term” is the period which the audit will cover.

The Audit Term can be no longer than the shorter of the time from the closure of the latest audit or three (3) years, calculated from the time of the audit notice reception.

2. Obligation to present contractual foundation

Purpose:

The historical nature of the audit imposes a problem for either side in documenting what terms and conditions of the Trading Venue policies were applicable in relation the relevant time of the audit period. As the party drafting the terms and controlling changes there must be a clearly defined obligation for the Trading Venues to present the complete contractual foundation with updates and changes as imposed from start to end of the audit term.

Proposal:

"Prior to the commencement of any audit it shall be the obligation of the Trading Venue to facilitate to the auditee any and all applicable versions of contracts, terms and policy for the audit term."

3. General audit principals, Reasonable commercial basis and Conflict of Interest

Purpose:

It important that the audit is carried out in an adequate and reasonable manner. In order to ensure this, these general principals should be established.

Proposal:

These "General Principals" must be applied in the performance of any market data audit:

- a) Objective
- b) Competent
- c) Performed with Due Care, and
- d) Respect Confidentiality.

The audit shall happen in a "Reasonable Commercial Manner", therefore either party (or representative thereof) to a contract is under the obligation to act in good faith and commercial reasonable manner.

Any "Conflict of Interest" with the auditor shall be disclosed to the audited party. Including but not limited to; employment status and/or compensations based on audit claim size.

It must be transparent to regulators and/or the public about how audit topics firms to be audited are selected, in order to avoid discriminatory or selective (anti-competitive) enforcement

4. Right to postpone audit

Purpose:

In order to cope with the requirements, the audited party is consistently required to focus its resources entirely on the burdensome audit process. Therefore, it should be possible for the audited party to request for the audit to be postponed ensuring a well-executed and mutually satisfactory audit process.

Proposal:

The audited party shall have the "Right to Postpone" twice for three months after having received the Trading Venue's proposal of an audit start date.

5. Right of first refusal

Purpose:

From practice it has been observed that the audit process can be quite conflicted based on the behavior of the parties involved or flaws to the audit scheme. With the aim of preventing reoccurrences of such incidents, the audited party must have a right of first refusal to one of more audit participants or scheme elements that are conflicted.

Proposal:

The audited party shall have a "Right of First Refusal" to the audit process in whole or in part as proposed by the Trading Venue, if the audited party in a reasonable manner can identify elements to the audit or concerning the audit that are conflicted or needs a separate resolution prior to the commencement of an audit.