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September 29, 2023 *via Electronic Mail (WholesaleDataMarketStudy@fca.org.uk)*

Ms. Sarah Pritchard – Executive Director, Markets
Mr. Sheldon Mills – Executive Director, Consumers and Competition
Mr. Stephen Hanks – Manager, Markets Policy Division

Financial Conduct Authority
12 Endeavour Square, London E20 1JN

Re: Wholesale data market study – Update Report (MS23/1.4)[1]

Dear Director Pritchard, Director Mills, and Mr. Hanks,

On behalf of Data Boiler Technologies, I am pleased to provide the U.K. Financial Conduct Authority (FCA) with our comments on the MS23/1.4 Market Study concerning the emerging themes and issues with respect to (1) Benchmarks; (2) Credit rating data; and (3) Market Data Services.

We respect the FCA's provisional decision of *"not to refer any of the markets in scope of the study to the Competition and Markets Authority (CMA) at this stage"*, amid the FCA's believe *"there are reasonable grounds to suspect there are features of each of the relevant markets that prevent, restrict or distort competition in the UK"*. We think allowing market-wide diplomatic works to find the best possible solution to determine how the Consolidated Tape (CT) should be created and fund appropriately is substantially better than regulatory price control. Indeed, Market data, BestEx disclosure, access fee rebate, payment for order flow, and other market structure issues are all intertwined. The noumenon[2] of the Reg. NMS in the United States, or the so-called "venue-by-venue competition" around the world is indeed a brutal 'Warring States Period'[3].

The fixed income CT feed may be the low-hanging fruit to improve bond market functioning and liquidity, whereas, what constitutes as "real-time" for Equity is critical. We advocate using Time-Lock Encryption (TLE)[4] to make market data available securely in synchronized time. We think there are good lessons learnt from the success stories of different industries, such as the copyright licensing mechanism[5] in the music sector. It should serve as a base case to facilitate discussions. What Gets Paid and Who Gets What must be based on clear delineation of rights and obligations; it will help revitalize the industry value chain and grow the overall pie.

I traveled through Europe for two weeks in September meeting with various professionals. My meeting discussions centered around the CT/ market data reform. Thankfully, I have gained traction with several Buy-side trade associations, while getting the ear of some sell-side firms. The following are highlights of our key thoughts about wholesale data market reform:

1. The Exchanges and elites may persuade the industry to make compromises and turn to their favors in adopting a near real-time CT Provider "cloud" solution, when it is indeed unfair to latency disadvantaged market participants. It would not help to lower the cost of market data and connectivity. Everyone is and will continue to be

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[1] https://www.fca.org.uk/publication/market-studies/ms23-1-4.pdf
[2] https://www.databoiler.com/index_htm_files/DataBoiler%20Noumenon%20Equity%20Market%20Structure.pdf
[3] https://www.linkedin.com/pulse/warring-states-period-finding-new-equilibrium-kelvin-to/
[4] https://www.linkedin.com/pulse/market-data-available-securely-synchronized-time-kelvin-to/
[5] https://www.databoiler.com/index_htm_files/DataBoiler%20Copyright%20Licensing.pdf

subservient to those cloud and telecom infrastructure vendors.[6] Policy makers should reject such inequitable plans that further fragmenting the markets.

2. On the 1st of September, the US SEC issued an order to the SROs asking for improve Governance of Market Data Plans citing *"heightened the inherent conflicts of interest … maximizing the viability of the proprietary data products they sell."* [7] Research[8] has shown that Exchanges may optimally restrict access to price information by charging a high fee so that only a fraction of speculators buy their Proprietary Products.

   As long as the CT is NOT in competition with Proprietary Products, and/or the dominate Trading Venues and the Approved Publication Authorities (APAs) incur almost no incremental cost to become a CT Provider, they would not mind the CT acting as a "second line" product to generate additional profits for the Market Data Contributors under the revenue-sharing scheme.

3. Determining where the CT is going to locate is a significant issue. Requiring *"transmitting or releasing data no sooner than to a CT"* only describes one of the aspects of "fair and reasonable" and "not unreasonably discriminatory" principles of FRAND[9]. It omitted the fact that market data is highly valuable and requires proper SECURITY protection. Fortunately, aggregation distance/ location differential issues can be solved by TLE[4]. TLE is a method to encrypt data such that it can only be decrypted after a certain deadline has passed. The goal is to protect data from being decrypted prematurely. Rest assured that TLE is NOT another speedbump. Even online gaming industry is using TLE, it is a shame that our capital markets are behind.

4. The Exchanges' argument about "one side does not fit all and not everyone needs the fastest connectivity" is a half-truth. Although portfolio rebalancing and other non-high-frequency-trading activities may not use market data in millisecond/ nanosecond precision currently, latency arbitrage attributed to firms being "sniped" whenever they trade. Either they lose a few basis points each time, or they must rely on certain transaction cost analyzers (TCA), "liquidity sourcing", "outsource execution" services. These "bandages" are indeed added layers of cost to transact in the market.

5. How far should a more dynamic regime move away from a one-sized fit all approach without causing unnecessary complexities of the marketplace? Data driven to find the optimal break point is one thing, we are concerned about the practical implementation of such dynamic regime based on our experience in the US markets. Does that mean every broker-dealer would need an automated sweep like shopping for hotel/ air ticket at various travel sites to fulfill the BestEx responsibility? We are disappointed with the US SEC proposed market structure reform.[10] Some resourceful market participants can keep adding sophisticated market sweep or 'filters' to delineate sub and sub-sub market segments. However, it introduces latency when the sweep becomes more sophisticated. Smaller firms cannot bear such burdens, amid elites got super-tier rebates when others got nothing.

6. We at Data Boiler, and the industry collectively, should question what constitutes as a data licensing framework on a "reasonable commercial basis". Licensing frameworks "based on costs incurred to provide the data" only leads to endless arguments (see the different perspectives from IEX[11], NASDAQ[12], and others[13]). Market reform

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6 https://siliconangle.com/2019/07/28/hardware-still-matters-era-cloud-computing/
7 https://www.sec.gov/news/press-release/2023-166
8 https://www.bayes.city.ac.uk/__data/assets/pdf_file/0011/366599/sale-price-information-cass-knowledge.pdf
9 https://en.wikipedia.org/wiki/Reasonable_and_non-discriminatory_licensing
10 https://www.linkedin.com/pulse/analogies-taboo-secs-market-reform-kelvin-to/
11 http://www.iextrading.com/docs/The%20Cost%20of%20Exchange%20Services.pdf
12 http://www.nasdaq.com/docs/Market_Data_Policy_Statement_tcm5044-65695.pdf

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should be about the divergence between private and social costs[14]. Inequity cannot be measured by accounting costs.

7. Schwab's empirical evidence[15] proved that "Order routing revenue and price improvement are NOT zero-sum". The noumenon of rebate incentives serves as royalty payments for the use of others' copyrighted material. When one is not required to pay for the use of others' intellectual property, streamers would exploit the content creators with rent seeking behaviors and/or selectively paying rebates and other perks to the elites like George Orwell's 'Animal Farm'. We suggest learning from the Music industry's Copyright Licensing mechanism to address the question of 'who owns the data'.

8. Who owns the data? Should market participants be compensated, and how, when aggregators sell market data? While every market participant negotiates to be more equal for lower fees, higher rebates, more incentives, and other privileges, who dictates the outcome, how conflicts will be addressed, and what constitutes as unreasonable, unfair and/or discriminatory? When accessing the Values of Composing Trades to determine who gets what, has anyone forgotten that the traders and algorithm developers are indeed the composers deserving the most credit?

   We picture traders as performance artists, algorithm developers (including the risk control professionals) as musicians, composers, and sound engineers producing songs, and their respective financial institutions as record label companies. The music industry has gone through decades of reforms that helped them delineate copyright and royalty payments for fair use of musical works that benefit every constituent and grow the overall pie.[16]

9. Using the prevailing rates in the music industry as a hypothetical case study, and assuming algo developers and traders play the role of "featured artists" for their respective broker-dealers or "publishers", 50% of performance royalty is allocated to the "publishers", 45% is allocated to the "featured artists", and 5% is allocated to the non-featured supporting team.

   There are upsides for the Hunters type of firms (i.e., Performance Optimizers, Asset Gathering firms), if they can help reduce the number of unknown unknowns in the markets, creating better algorithms and more "hit songs" that deepen market liquidity. Equally, there will be opportunities for the Farmers type of firms (i.e., Asset Maximizers, Retails, Wealth Advisory) to grow their AUM and improve profitability (e.g., by off-loading some of the traders and algo developers' costs to be paid for by the royalty's system).

10. There will be upside for the traders and algo developers to earn more, if they are willing to do more than 12 to 20 "songs" a year and/or creating 1 or more "hit song(s)" that deepen market liquidity, identify trade irregularities, etc. (regardless of thinly traded securities or others). At the same time, entitlement of royalties must accompany the burden of potential liability if their trade activity is market manipulation and/or trading violations. Copyright Licensing mechanism provides excellent traceability (no more scapegoats) by aligning rights with obligations.

11. Agency trading, retail brokerage, order routers or other non-algorithm market participants to some extents are functioned like the "non-featured" musicians or "DJ mixing engineers", which they typically earn the 5% in the music industry, and the remaining 95% would be a "pass through" payment to the original "content" creators.

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[13] https://www.copenhageneconomics.com/dyn/resources/Publication/publicationPDF/6/466/1543587169/pricing-of-market-data.pdf
[14] https://iea.org.uk/wp-content/uploads/2016/07/THE%20MYTH%20OF%20SOCIAL%20COST.pdf
[15] https://content.schwab.com/web/retail/public/about-schwab/Schwab-2022-order-routing-whitepaper.pdf
[16] https://www.databoiler.com/index_htm_files/DataBoiler%20BIG%20OPP.pdf

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Unless the "derivative work" of a "DJ mixing engineer" is able to avert the original "song" or trade strategy into another new "song" (such as Exchange Traded Products, benchmarks and indices), their "remix" deems to be a "reproduction" or a "covered" song where they are compensated at 5% rather than the higher bracket of a "featured artist" at 45%.

A rule of thumb under this hypothetical model is: 5% performance royalty for each layer of data aggregation.

12. If we picture the 'index providers', benchmark or 'model portfolio providers', pricing services or Credit Rating Agency (CRA) as either 'Algo Publishing' (artists) or 'DJ Mixing Engineers' (aggregate and push upstream), it is not hard to see that their "derivative works" may or may not have significant difference from the original "songs" or trade strategies. So, the deterministic factor is whether these CRAs, Benchmark Indices firms are artistic enough to "create" original "contents" that uniquely different from the underlying securities and the rivalries.

    So, the setup would be like the SoundExchange as an administrator of performance rights royalties in the Music Industry, where YouTube, Spotify and other streaming platforms would run their system in the background to determine if the "content" being an original, a covered song, or a plagiarized counterfeit. The whole process of identifying potential infringement would run behind the scenes and NOT interfere the live streaming. A similar setup is recommended for our capital markets and this administrator can be a non-profit governed by the industry.

13. We argue that for-profit exchanges / integrated conglomerates are operating a "Jukebox model" to extract rent, hurting all, but mostly the smaller players. Policy makers should consider Market Makers (MM), Alternative Trading Systems (ATSs)/ Multilateral Trading Facilities (MTFs), single dealer platforms (SDPs), and Exchanges as different streaming platforms to have the right focus. Nevertheless, the Facebook case affirmed that data should be owned by "content creators" instead of the streaming platforms.

14. Think about what gives rise to arbitrage or pick off on price. Anyone would have done it if they did not have to bear the corresponding cost in using others' copyrighted materials. Bilateral or multilateral trading facilities have the upper hand in terms of nimbleness to maneuver around in crafting niches than public stock exchanges. So, the proper way to "harmonize" across market centers is:

    On-Exchange would be treated as non-interactive streaming platforms, versus off-Exchange will require to have 'catalog' to operate their interactive streaming platforms. By shining lights on the MTFs and systemic internalizers, it would be allowing a grant bargaining on which type of trading venues should have what capabilities in order to maximize overall reach and efficiency for the collective markets (just as music reaching a wider audience).

15. One may ask the question whether simple data (prices, rating, index values, reference data, etc.) would or would not be protected by copyright. Would fund companies need to assert their physical ownership of self-generated fund and trade data by restricting by contract the data vendor from reselling their own data before they send the data? *"Case at point would be fund data given today for free to Morningstar, except in Denmark where Morningstar is paying today the local industry owned Fund Connect platform for getting the DK fund data."* Again, per point 11, our hypothetical model suggests 5% performance royalty for each layer of data aggregation. Our suggested Copyright Licensing mechanism would work effectively to delineate the respective rights and obligations and harmonize jurisdiction differences based on an objective 4-part test[17], i.e., (1) willing seller willing buyer standard; (2) same parties' test; (3) "effective competition" test; and (4) same rights test.

[17] https://www.govinfo.gov/content/pkg/FR-2016-05-02/pdf/2016-09707.pdf

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16. It is noteworthy that those who play only a few single notes (e.g., 'do, 'ra', 'me') would not be entitled to copyright royalty. Those able to compose a full song (meaningful sequences of a series of notes) would be compensated. Music industry's rationale for not allowing anyone to claim copyright over a few single notes is that they do not want someone claiming exclusive right over, e.g., 'do, 'ra', 'me' and preclude the broader composers community to use these basic notes for creative works. Similar logic should apply to our capital markets. If someone is only able to play a few "music notes" (individual orders) rather than compose a complete "song" (trade algo), then it is our opinion that they deserve the appropriate investor protection. Regulators may then better draw the line in distinguishing between the "Professionals" versus the "non-Professionals" (retail, average investors).

    Professionals who are artistic enough to "create" original "contents" that uniquely different from the underlying securities and the rivalries should command our respect and justified their earning of 45% instead of the 5% copyright royalty under our hypothetic model. We will help democratize technologies, so more non-professionals can become professionals for a healthy mix of investors and sustainable development of the markets.

17. We believe algorithms have come to rule our world. Why not let Algo development to flourish by having a community 'sound library', where unused Algos would earn second profit while those who want to accelerate algo development can obtain licenses from others. Algos should not have a negative connotation as "speculative" (like options or indexes in the 70s). So, why not make this an essential tool for all market participants for price discovery, hedging risks, managing volatility, etc. Our suggested 'sound library' approach[18] would accelerate algo development lifecycle and foster creative discovery of unknown unknowns, which can be anybody's game. Shuffling with how the game is played presents new sources of economic opportunities and customer values.

18. Copyright Licensing Mechanism is NOT a drastic change. It simply asks trading platforms to pay a wider range of broker-dealers, featured traders, algo developers in royalties if they shall choose to carry a broader "catalog" of whose order flows be streamed on their platform. This levels the playing field or "harmonizes" different trading platforms without unnecessary government intervention. Royalty rate setting is market driven. Calibration to mimic payoff behaviors like today is possible, so there will be a seamless transition to a new equilibrium.

    By putting a value on quotes and trades composition, proper considerations will be given to eliminate conflict of interest, as well as ensuring efficiency in deployment of resources, rather than engaging in non-productive fights that destroy values.

19. Healthy markets need both farmers and hunters. Variety helps reach a wider audience, reduce unknowns, and drive new customer values. Give investors a fighting chance for new ways to do trade analytics with community library of trade patterns, it would encourage market participations. Pareto improvement is achieved when someone is better off without anybody worse off or win-win for all. What we need from the regulator are:

    - a no action letter in supporting the development of an industry-wide copyright licensing mechanism;
    - mandating the use of Time-Lock[4] and curb trading venues and APAs from circumventing security protection;
    - develop Pan-Europe and UK order protection rule, rather than the false hope of BestEx[19] or disclosure[20] rules;
    - consider (1) willing seller willing buyer standard; (2) same parties' test; (3) "effective competition" test; and (4) same rights test, i.e., the 4-part test[17] to promote FRAND and refrain from government price control.

[18] https://www.databoiler.com/index_htm_files/DataBoiler%20SoundLibrary.pdf
[19] https://www.sec.gov/rules/2022/12/regulation-best-execution#34-96496
[20] https://www.sec.gov/rules/2022/12/disclosure-order-execution-information#34-96493

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20. Beyond creating a CT, a little extra cost would enable the development of a de facto "Smart Order Router" for the UK and Europe as a public utility that we think it would yield even higher benefits. Also, we recommend the UK to visualize the opportunities of forming strategic alliance with the British Commonwealth Countries (Canada and Australia), as well as Singapore. In doing so, it enables a true 24 hours a day global trading experience. It would differentiate from the US and EU models, where a new equilibrium would emerge among the Western developed markets to counter the rise of China's capital markets.

We look forward to seeing the next FCA report by the 1st of March 2024. Meanwhile, feel free to contact us with any questions and please keep us posted where our expertise might be helpful.

Sincerely,

Kelvin To

Founder and President

Data Boiler Technologies, LLC

This letter is also available at: https://www.DataBoiler.com/index_htm_files/DataBoiler%20FCA%20202309%20Wholesale%20Data.pdf