

Accessing and using wholesale data – Call for Input

March 2020

How to respond

We are asking for comments on this report by 1 May 2020

You can send them to:

Accessing and using wholesale data
Call for Input
Competition Division
Financial Conduct Authority
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London E20 1JN

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1 Summary

Introduction

- 1.1** This Call for Input (CFI) looks at the use and value of data and advanced analytics in wholesale financial markets, both now and in the future.
- 1.2** New forms of data and analytical techniques are increasingly being used across wholesale financial markets. Access to data is needed to identify investment opportunities, trade, make investment decisions, to evaluate positions and to meet regulatory obligations. But as the demand for data increases, firms that generate data may be able to use or market their data in ways which create poor outcomes for users and ultimately end-consumers, in particular, data generators increasing charges or limiting the availability of data.
- 1.3** We are launching this CFI to better understand how data and advanced analytics are being accessed and used, the value offered to market participants and whether data are being competitively sold and priced. The CFI will allow us to determine whether we need to do further work to address any harm that we identify, as well as ensure our regulations do not hinder innovation.
- 1.4** We are asking for feedback on the questions set out in this CFI by **1 May 2020**.

Areas of focus

- 1.5** We are looking broadly at the supply and use of data and analytics in wholesale markets. There are 3 particular areas we are exploring in this CFI:
- trading data
 - benchmarks
 - market data vendor services
- 1.6** Trading data and benchmarks play a vital role in wholesale financial markets. They are used to trade, make investment decisions, to evaluate positions and to meet regulatory obligations. Trading venues and market data vendors also use them to provide other services, such as consolidated data feeds. We want to know whether users have concerns with the way trading data, benchmarks and vendor services are priced and sold.
- 1.7** Feedback from our [previous studies](#) suggested that trading venues and benchmark administrators may not face sufficient competitive pressures, allowing them to charge high prices to clients and competitors. We want to know whether this is the case, which users are affected and why. This will help us decide whether further work is necessary to address any harms we observe. We set out the questions we are exploring in Chapter 3.

- 1.8** We are also looking at the changing use of data and analytical techniques across all wholesale financial markets. We want to understand how innovations in data generation and use may change wholesale markets and what the implications are for how we should regulate. We also want to know if there are any blockers to using data in innovative ways, including current regulation. We set out the questions we are exploring in Chapter 4.
- 1.9** We plan to commission work which will look at the longer-term impact of the changing use and value of data and data analytics on wholesale financial markets.

Why we are publishing this CFI

- 1.10** Our CFIs are public invitations for views, evidence, examples and proposals from all interested stakeholders. They help us better understand current and emerging issues in a market. Rather than requesting specific information or data, we use CFIs as a less prescriptive method for gathering information.
- 1.11** We are opening our engagement with stakeholders by publishing this CFI. We are seeking views from stakeholders about our areas of focus above.
- 1.12** We will then publish a Feedback Statement setting out our findings and any next steps. If we find competition is not working as well, we have a range of tools available to address harm. This could be a market study to diagnose the sources of market failures in detail, or could be more targeted interventions like supervisory, policy action or competition law enforcement. Our findings from this CFI will also help us to inform international discussions about regulation of data.

Who this document is of interest to

- 1.13** We invite views from stakeholders across the wholesale sector, in particular:
- suppliers of data, and related products and services within wholesale financial markets
 - buyers of data, and related products and services within wholesale financial markets
 - users of data, and related products and services within wholesale financial markets
 - any other stakeholders who interact with wholesale market participants, may indirectly be affected by topics covered in this review and/or may have views on how competition is working in wholesale financial markets
- 1.14** We set out the scope of this CFI in Chapter 2. Chapters 3 and 4 set out the issues we want feedback on in more detail. Chapter 5 sets out the next steps including details of how stakeholders can respond to this CFI. Annex 1 provides a full list of the questions we are asking in Chapters 3 and 4.
- 1.15** We look forward to engaging widely with stakeholders during the course of this work through a range of engagement activities as discussed in Chapter 5. All feedback should be submitted by **1 May 2020**. In their responses, we encourage stakeholders to:
- provide evidence, where possible, to substantiate their responses; and
 - indicate clearly if there are any areas of particular concern

2 Scope of this CFI

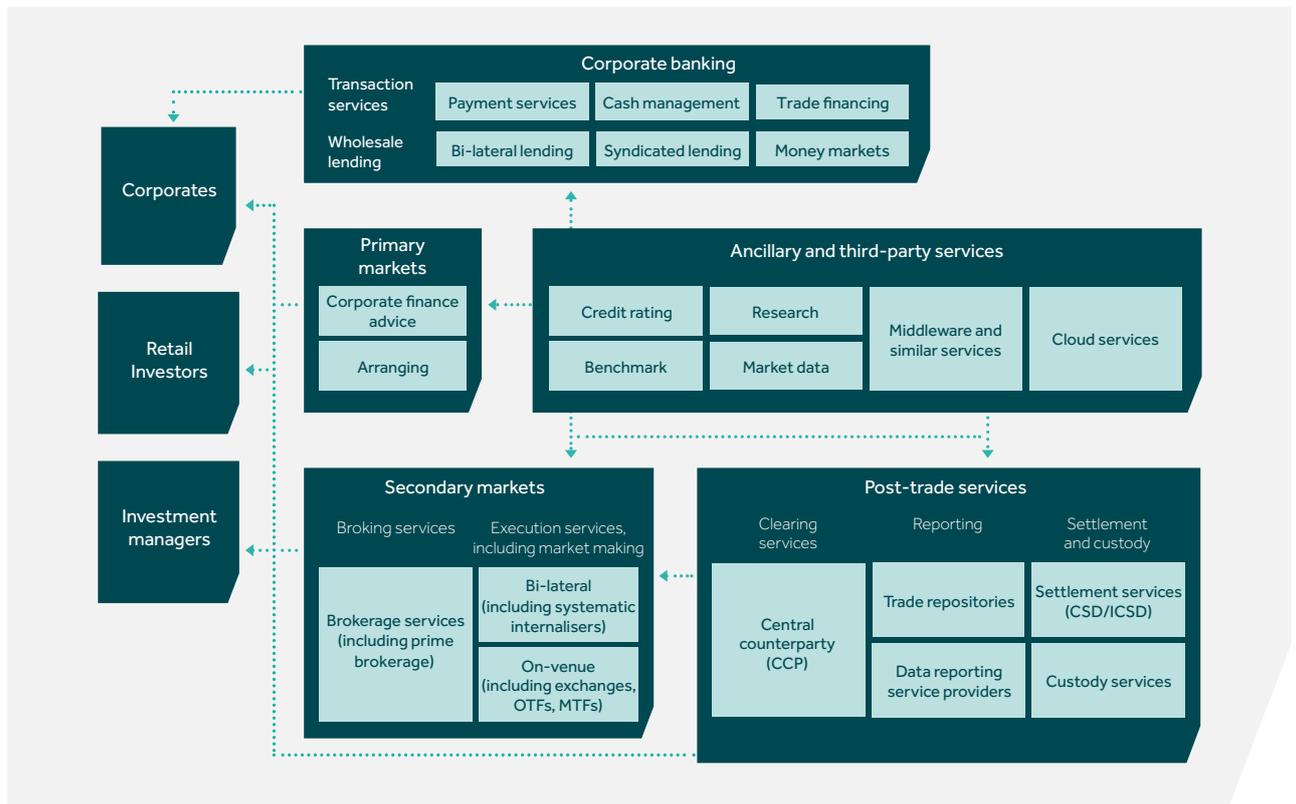
2.1 Our CFI focuses on access to and use of data and advanced analytics in wholesale financial markets through the whole supply chain for data (see Figure 1 below). The scope of this study is deliberately broad, as we recognise the inter-dependencies within wholesale financial markets and want to give stakeholders the opportunity to share concerns across the wholesale markets they operate in.

Activities in scope

2.2 Figure 1 below shows our scope, which includes both FCA regulated and closely connected non-FCA regulated activities and firms (when referring to “firms” in this document, this may therefore refer to regulated or non-regulated firms). This enables us to examine how non-regulated activities and firms may affect competition in markets we do regulate.

2.3 Our competition powers extend beyond our regulatory perimeter to broader financial services. Therefore, if we identify concerns in non-FCA-regulated markets we can use these powers to carry out market studies or to investigate and take action against potential breaches of competition law.

Figure 1: Overview of the wholesale financial markets sector



Geographic scope

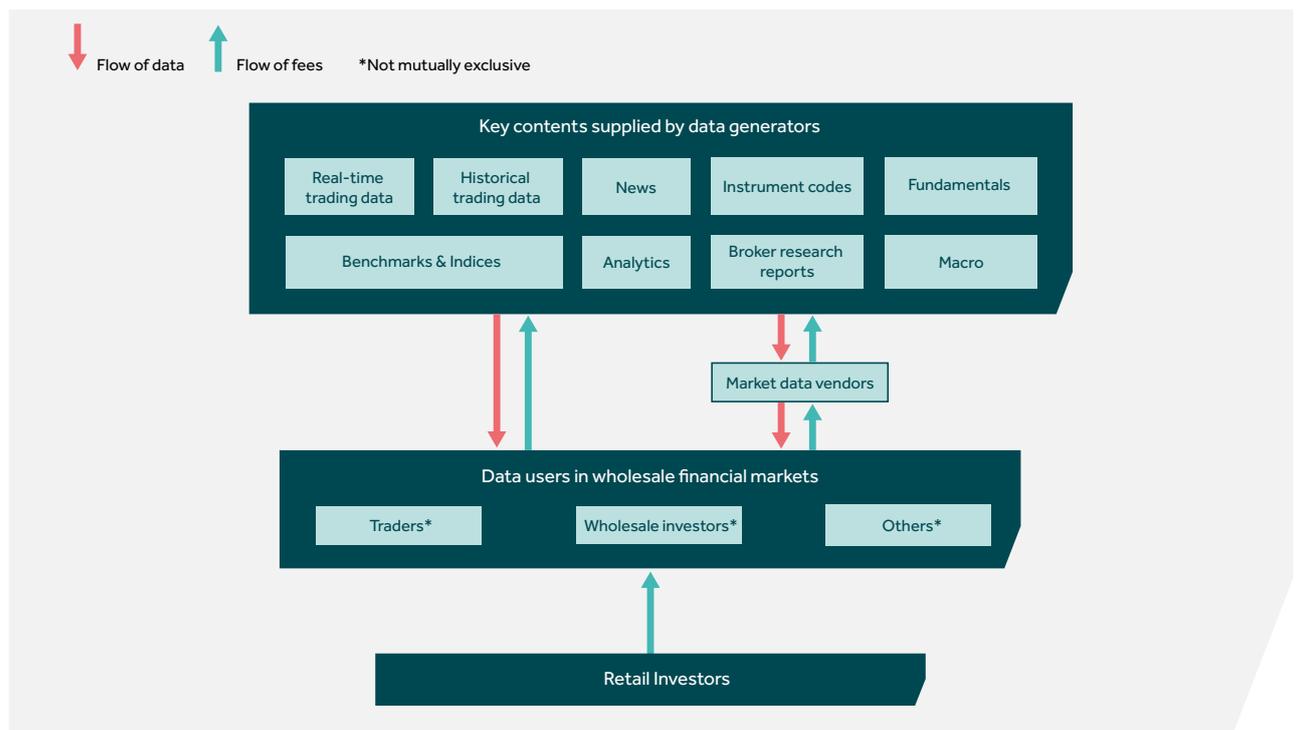
- 2.4** The markets for the supply of data used in wholesale financial markets are likely to be global in scope, or at the very least European, as customers tend to source relevant content on a global basis and distance between data providers and users is likely to have little if any impact on the cost of supply.
- 2.5** We are interested in all data that are made available from, or accessed in, the UK, regardless of where they have been generated or sourced.

3 Accessing and using market data

How different data are provided to users

- 3.1 We are using this CFI to gather more information about the access to and pricing of market data. We identified concerns in our previous Wholesale Sector Competition Review (WSCR) and Asset Management Market Study (AMMS), and we have heard further views and concerns since then. The feedback suggested that some trading venues and benchmark administrators may not face sufficient competitive pressure, allowing them to charge high prices to their clients and their competitors.
- 3.2 This CFI will help us better understand the relevant market dynamics and business models of data providers, including trading venues, benchmark administrators and market data vendors. It will also help us to understand the drivers for any issues and harm that may result, and consider whether and how they might be addressed.
- 3.3 Figure 2 shows how market data are provided to users. Trading data and benchmarks or indices can be sourced directly from data generators, or indirectly through market data vendors. Data can be sourced on a stand-alone basis or with other content as part of a bundle. Even though data charges are not itemised and explicitly passed through to consumers, they may ultimately be borne by investors such as pension scheme investors, retail investors or businesses seeking to raise capital.

Figure 2: Market data flow



3.4 The rest of this chapter covers the 3 areas where we are interested in hearing stakeholder views. These are:

- trading data
- benchmarks
- market data vendor services

3.5 We describe what each area covers and the issues we want to explore. We welcome stakeholder submissions with evidence about any other areas of concern.

A. Trading data

Overview

3.6 In this section, we explain what we mean by trading data and sub-categories of trading data. We explain the value chain for trading data, who provides data to whom and how these trading data are used.

What is trading data?

Trading data, often referred to as 'Market Data' includes information on prices, bid/ask quotes and volumes of all financial instruments available for trading on trading venues and over-the-counter systems (OTCs) such as Systematic Internalisers (SIs). Trading venues include Regulated Markets (RMs), Multilateral Trading Facilities (MTFs) and Organised Trading Facilities (OTFs).

How does trading data work?

3.7 Many trading venues receive orders from different participants offering to buy and sell specific volumes of financial instruments (in particular more liquid asset classes) at different prices (collectively these buy and sell indications are called 'order books') via their electronic trading system. The trading venue system then matches buy and sell orders and facilitates the execution of trades, with additional trading data being produced as a by-product of the participant interaction. Trading data may also be generated (mostly for less liquid asset classes) via non-order book formats such as requests for quotations (RFQs).

3.8 Trading venues provide trading data to other market participants and end users either directly via direct data feeds or indirectly through data vendors (providers of desktop solutions or others) or brokers who then supply the end users.

Types of data

3.9 Trading venues offer different types and depth of trading data packages to their clients. Licensing arrangements generally distinguish between:

- client type - redistributors versus users (or professional versus non-professional)
- use - display vs non-display, data used for pricing, algorithmic trading and to generate benchmarks and number of end users or websites where data are accessed
- content - raw or processed, level 1 or level 2 data (or different depths of order book data), single venue or consolidated feeds
- speed - real time, delayed or very low latency (the delay in receiving data)

- 3.10** Trading data can be used to trade, make investment decisions, and to evaluate positions. Importantly, trading data is also needed by some firms to fulfil their regulatory obligations. These data can also be used by other trading venues and data vendors to provide other products and services, including to supply consolidated data feeds or to provide information to support trading services.
- 3.11** Market participants, trading venues and data vendors need real-time trading data to be able to trade or to offer their services and might select data packages based on coverage, speed and depth rather than price. Other users may be able to use delayed data, primarily to monitor best execution. Some users, such as high frequency traders, are willing to pay a premium for low latency to implement their execution or trading strategies via algorithms. For example, high frequency traders and other users pay a premium for co-location of their servers (at the relevant trading venue) or for increased bandwidth.
- 3.12** In the rest of this section we briefly set out the current regulatory framework applicable to trading data, an overview of current trends and describe the types of issues we are interested in hearing views on.

The regulatory framework

- 3.13** MiFID II/MiFIR set out a number of pre-trade and post-trade transparency obligations for firms and trading venues.
- 3.14** Pre-trade transparency obligations require trading venues to make information about the trading opportunities publicly available. The level of transparency required depends on the execution protocol a trading venue operates. More liquid asset classes typically operate in the order book environment, where a venue publishes the current bid and offer prices advertised through their systems and the depth of the trading interests at those prices, on a continuous basis during normal trading hours.
- 3.15** Post-trade transparency obligations require trading venues to make the price, volume and time of the executed transactions publicly available, as close to real time as is technically possible. Transactions executed outside a trading venue (eg by an SI or over the counter by an investment firm) must be reported to an Approved Publication Arrangement (APA), an entity authorised to publish data feeds of executed trades. Trading venues and APAs should make market data publicly available free of charge 15 minutes after publication.
- 3.16** MiFID II sets out the framework for the establishment of a consolidated tape for equities. It envisages consolidated tape providers (CTPs) being authorised to collect post-trade reports from trading venues and APAs and consolidate them into a continuous electronic live data stream providing price and volume data per financial instrument. So far, no CTP has emerged, but the EU authorities are keen to explore this further.
- 3.17** Trading venues must publicly provide separate pre- and post-trading data on a reasonable commercial basis (RCB) and must ensure non-discriminatory access to the information.

3.18 The European Commission has clarified that trading data should be:

- offered on a non-discriminatory basis to all clients and charged according to the use made by the individual end-user
- available without being bundled with other services

And that the price of market data should be:

- based on the cost of producing and dissemination, and can include a reasonable margin
- the cost of producing and disseminating these data may include an appropriate share of joint costs for other services
- trading venues must disclose the price for providing market data along with the terms and conditions for providing the data in a way the public can easily access

Current trading data trends

3.19 Trading venues historically provided trading data to market participants free of charge, despite there being a cost involved. Trading data have more recently become a key growth driver and major source of revenue for a number of trading venues. Some market participants have suggested that this revenue growth has in part been driven by trading data prices increasing over time.

3.20 Some exchanges have recently introduced new fees, (often by moving to per-usage or per-type-of-data fee structures) which may make it difficult for some users to accurately forecast trading data costs.

3.21 In the US, the Securities and Exchange Commission (SEC) has recently intervened in cases related to market data pricing. In October 2018, it upheld the Securities Industry and Financial Markets Association's challenge to two trading venues' increase in trading data fees. In May 2019, it issued guidance for trading venues to assist them in ensuring that proposed or increased fees are consistent with the relevant requirements (that fees are reasonable, equitably allocated, not unfairly discriminatory, and not an undue burden on competition). In October 2019 the SEC proposed a new rule – subject to consultation - requiring trading venues to seek industry feedback about any proposed fee changes, before those fees could be charged. Finally, in February 2020 the SEC have proposed changes to the National Market System which provides consolidated US equity market data from trading venues. These proposals would expand the content of the data and introduce competitive forces into the market.

3.22 In the EU, in July 2019 the European Securities and Markets Authority (ESMA) launched a public consultation on the development in prices for pre and post-trade data and on the CTP for equity instruments. In December 2019 ESMA published its report. Its preliminary conclusion was that MiFID II has not so far delivered on its objectives to reduce the price of market data and in making data available free of charge 15 minutes after publication. We have recently conducted follow-up work with firms to encourage full compliance with the requirements to provide free delayed data.

3.23 The report also considered reasons for the lack of an equity CTP. This included limited commercial attractiveness, strict regulatory requirements, lack of sufficient data

quality for some transactions, and the possibility of competition from entities, such as data vendors, who may have a competitive advantage by being outside the regulations.

- 3.24** ESMA has recommended targeted changes to delegated legislation (to strengthen the concept that pricing should be linked to costs) and the improvement of the current ('transparency plus') approach with supervisory guidance. ESMA intends to work on supervisory guidance in 2020 and considers it should include standardised publication formats and key terminology and concepts (eg, per user fees) as well as a typology of costs to be included in the fee calculation.
- 3.25** ESMA also recommends including a requirement "to provide delayed market data, allowing for fast access and in easily accessible and usable formats", in Article 13 of MiFIR.
- 3.26** The European Commission published a consultation on MiFID in February 2020 which builds upon and is complementary to ESMA's report on these issues. It invites views on some technical aspects of the development of a single CTP for equities and the possibility of similar for non-equity instruments. It also details possible targeted changes to MiFID/MiFIR to strengthen the concept that market data should be charged based on the costs of producing and disseminating it.
- 3.27** We continue to support the objective of MiFID II for consolidated high quality market data to be available to market participants. Our CFI will help us to assess the appropriate regulatory actions we should take. We want to understand from stakeholders if there are any features or factors that makes market dynamics or accessing or using data in the UK different to the EU.

Issues we want to explore

- 3.28** We are using this CFI to explore if the current dynamics in markets for trading data are driving potential harm to users, and ultimately consumers in the UK. We seek feedback on all issues outlined below and have set out specific questions to stakeholders.

Market dynamics

- 3.29** Trading data users generally need data for their own trading or investments or, importantly, to meet regulatory requirements. For example, monitoring of suspicious transaction and order reporting as required by the EU Market Abuse Regulation requires the use of trade data. The MiFID II best execution rules also mean that dealers need to obtain trading data from venues in order to ensure their customers are receiving the best possible execution results on a consistent basis. Where there are no substitutable trading data available, firms may have no choice but to buy these data from the relevant providers. Where firms do have a choice, they may still face barriers to switch to alternative data providers.
- 3.30** MiFID reforms have also opened up trading venues to greater competition. Trading venues that see their margins squeezed on trading activities could exploit any market power they have in relation to the supply of trading data to increase data prices, reduce quality and innovation.

Pricing levels

- 3.31** These market conditions could provide the incentive and ability for data providers – such as trading venues and Over-the-Counter (OTC) trading facilities – to raise their prices. Data users may then pass the prices through higher costs to the end investors.
- 3.32** High prices could also limit access to trading data, particularly if users respond to high prices by reducing the amount of data they use. The impact of reduced use of trading data by traders and investors could result in less efficient pricing of securities, lower liquidity and higher volatility of financial markets.
- 3.33** ESMA recently looked at trading data prices across Europe for the period 2015 to 2018. They found that although the picture varied for individual venues and data packages, overall trading data prices had increased. They reported that prices included an element reflective of the value of data for users and so were not solely based on the costs for producing and disseminating these data. The largest increases were seen in data with highest demand (ie non-display data).
- 3.34** MiFID II's RCB requirement means that firms should price data based on the cost of producing and disseminating it (which may include an appropriate share of joint costs) and can include a reasonable margin. ESMA's report notes that so far, RCB provisions have not delivered on their objectives to reduce the price of trading data and that RCB information provided by trading venues, APAs and SIs does not enable users to understand trading data policies and how their prices are set.
- 3.35** We want to understand if similar views are held for the UK compared to the overall European experience reported by ESMA in relation to pricing levels. In doing so, we want to explore how trading venues set trading data prices and any constraints they face in doing so, whether from other trading venues, buyers, regulations or other factors.
- 3.36** ESMA has proposed targeted legislative changes to strengthen the concept that trading data should be charged based on the costs for producing and disseminating the information and to work on supervisory guidance to improve the comparability and usability of the information disclosed. Please see paragraphs 60 to 65 of the ESMA report for further details. We welcome views on the extent to which stakeholders consider ESMA's suggested improvements will be effective in lowering the price of trading data.

Quality and innovation

- 3.37** We are aware of some trading data users expressing concern regarding the quality of data provided, some firms reported difficulty getting the data in an accessible and cost-effective format. Firms may lack incentives to innovate, maintain or improve quality if they are unlikely to lose clients to their competitors. We want to hear about the quality and innovation in the provision of trading data.

Potential for discriminatory pricing

- 3.38** Trading venues are required to provide trading data on a non-discriminatory basis within the same category of use (for example redistributors, data users). But venues can define these categories themselves and so may be able to charge competitors more than other users.

- 3.39** Price discrimination is not necessarily harmful, but it can be. In particular (but not only) when firms with a dominant position practice price discrimination, this can distort competition and create harm to users. We therefore want to identify where discrimination may be occurring and to understand any rationale for firms' (potentially discriminatory) pricing practices.
- 3.40** US regulators have considered the potential for discriminatory trading data pricing to affect competition. As recently highlighted in the [SEC guidelines](#), if a US trading venue wants to apply a volume-based tiered trading data fee or tiered pricing covering multiple securities it will need to explain why it chose the specific tier levels, the rationale for distinguishing among them and why the structure is not unfairly discriminatory. We are interested in understanding whether stakeholders consider if this approach would be effective in constraining discriminatory prices in the UK.

Other potential issues related to trading data

- 3.41** Some trading data users have suggested that trading data pricing may be unnecessarily complex and that they struggle to understand licensing and pricing terms and accurately forecast their trading data spend or requirements. Other trading data users also pointed out that trading venues carry out audits of trading data usage which might result in an increase of compliance costs.
- 3.42** ESMA found that trading venues' market data policies could be made more accessible (not all venues publish all required information and for many it is difficult to find), shorter and less complex (an average full policy is 120 pages long) and more consistent (definitions are not identical across venues). We are interested in stakeholders' views on these findings.
- 3.43** MiFID II requires trading venues and APAs to publish 15-minute delayed trade data free of charge. We expect firms to meet ESMA guidance clarifying that trading venues and APAs may not impose fees on redistributors publishing or otherwise using delayed data, unless a redistributor charges fees for redistribution or added-value services created from such data. We have heard differing views on what constitutes an 'added-value service' and want to hear from trading venues and data users what these use cases are. The feedback will help us gain a better understanding of market practices and assess whether further action may be necessary.

Questions for stakeholders

- 3.44** The following questions are split between users of trading data and providers of trading data. Where your business operates as both a user and provider, please answer both sets of questions where relevant. Throughout all questions, where possible, please provide evidence to support your response and explain the impact that any issues have on your business, highlighting what you see as the biggest areas of concern.

Questions for users of trading data

- Q3.1: What type of trading data do you use/obtain directly from trading venues and APAs, and how do you use trading data?**

- Q3.2:** Are you content with the price, quality, provision, coverage, speed and depth of trading data (or other data sold by trading venues or APAs)? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.3:** Do you consider any trading venues or APAs set of trading data a 'must have' for your business purposes? If so, please explain why. For example, is it linked to a liquidity threshold in the relevant financial instrument and/or to best execution requirements considerations?
- Q3.4:** For each data set you use, how have the trading fees, trading data costs and quality evolved over the last 5 years? What impact has this had on your business and your clients?
- Q3.5:** How easy are trading data pricing/licensing terms to understand and comply with? What, if any, do you find to be complex or restrictive and what impact does this have on your business?
- Q3.6:** Are you aware of trading venues or APAs charging different amounts to different customers for similar services? Please give specific examples and explain how these practices affect your ability to compete in the markets you operate in.
- Q3.7:** Please explain when you are charged for the use of delayed data.
- Q3.8:** To what extent do you think ESMA's suggested improvements to the RCB requirement will adequately constrain trading data pricing (see 3.23)? Are there other ways to ensure trading data prices are competitive?

Questions for providers of trading data (including trading venues and APAs)

- Q3.9:** Please explain the trading data you offer and how you ensure that the quality, speed, coverage and depth of trading data provided meets the needs of your users.
- Q3.10:** For each trading venue you operate, how have overall trading fees and trading data price levels, pricing policies and your service offering evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.11:** Please describe your policy for charging for the use of delayed data, providing specific examples.

- Q3.12:** What factors do you take into account when setting your pricing policy? Do you face any constraints when doing so? Please provide reasons for changes in prices and detail how you ensure compliance with MiFID/MiFIR RCB requirements.
- Q3.13:** Please explain how you categorise types of user and the reasons for any price differentiation based on the categorisation of the user.

B. Benchmarks

Overview

- 3.45** The current regulatory framework defines benchmark as indices used to determine the amount payable under a financial instrument or contract or the value of it, or to measure investment performance.
- 3.46** Figure 3 below shows the participants and activities in the value chain for provision of benchmarks, from data providers who provide the input data through to the end customers.

Figure 3: Participants and activities in the provision of benchmarks value chain



- 3.47** The typical business model of benchmark administrators involves sourcing data from trading venues, market data vendors, other benchmark administrators or from publicly available sources. Using their own methodology, they then calculate and publish benchmarks or outsource this to other firms. They earn revenue from licensing benchmarks to professional users, either through annual fees based on usage or a flat fee, or use their benchmarks within the business to create financial products.
- 3.48** Benchmark administrators can be specialist benchmark providers, but they can also be exchanges, banks, asset managers, market data vendors, public bodies, or trade organisations. Some of them are vertically integrated firms that act as data generators, market data vendors and publication agents.
- 3.49** In the rest of this section we summarise the current regulatory framework and current trends. We then explain the types of issues we would like stakeholders' views on.

The current regulatory framework

- 3.50** The EU Benchmarks Regulation (BMR) came fully into force in January 2018, with a two-year transition period for EU administrators of non-critical benchmarks. It aims to ensure benchmarks are robust and reliable, and minimise conflicts of interest in benchmark-setting processes. It also requires the administrator of a Critical benchmark to ensure all users are provided access on a fair, reasonable, transparent and non-discriminatory basis.
- 3.51** The BMR defines an index as a figure that is publicly available and is regularly determined, either by applying a formula or other calculation or by making an assessment based on the value of one or more underlying assets/prices. Underlying assets and prices could include estimated prices, actual or estimated interest rates, quotes and committed quotes, or other values or surveys.
- 3.52** An index becomes a benchmark within the scope of the BMR where it is used to determine the amount payable under a financial instrument or contract or the value of it. An index also becomes a benchmark if it is used to measure the performance of an investment fund with the purpose of tracking the return, defining the asset allocation or computing of performance fees. We use this definition in this CFI but we are aware that other definitions exist.

Overview of current trends

- 3.53** The importance of certain benchmarks to investors appears to be growing. We have seen growth in passive investing and investors increasingly choosing passive index-tracked instruments, investment funds and exchange-traded funds (ETFs). This has increased revenues for equity benchmark administrators, especially the largest. We also see a rise in 'self-indexing' by issuers of index-linked products. These issuers have created their own proprietary benchmarks, allowing them to save on costs of accessing benchmarks provided by specialised administrators.

- 3.54** For some asset classes, there are only a small number of benchmark administrators. They typically have strong brand recognition and, as such, appear to have established themselves as the key providers for specific benchmarks.
- 3.55** New areas of investment such as environmental and social investing are also encouraging the creation of new benchmarks. And the desire to trade financial products on a wide set of non-financial underlying markets products, such as weather and cryptocurrencies, has led to new indices being created.

Issues we want to explore

- 3.56** Our findings in the WSCR (See section 4, pp.39-43) and the AMMS (See section 7, pp.44-46) suggest that competition may not be working well in the provision of indices and benchmarks, and we have heard similar views and concerns since then. In some cases, users reported high costs of switching between certain benchmarks, and a lack of suitable alternatives. This could create the incentives for benchmark administrators to charge unduly high prices or offer lower quality products.

Market dynamics

- 3.57** We want to explore how benchmark administrators operate and the dynamics of competition between them. For example, we are interested in understanding whether there are barriers to entry or expansion due to:
- demand-side preference for established benchmarks
 - switching costs for benchmark users
- 3.58** We want to understand the impact of end client preferences on competition in benchmarks. If end clients tend to prefer products that are referenced to well-established benchmarks and brand recognition is key to success, strong market positions may tend to reinforce themselves. These preferences may also limit new entrants to the market.
- 3.59** New benchmark administrators could also struggle to compete due to the cost of switching for benchmark users. Switching costs could be high, for example, because of the time and technical requirements involved in setting up a new relationship with a benchmark administrator, or the need to adapt business practices to different inputs. Some contractual arrangements could also create switching costs, for instance long notice periods or exit fees.
- 3.60** Switching costs can cause harm if they prevent benchmark users from switching to products that better suit their needs. We want to understand the impact that any switching costs have on the users of benchmarks and potential competitors.
- 3.61** We would also like to hear views on whether harm is being caused by complex licensing terms resulting in higher charges than users may expect. We discuss this further below.

Impact of concentrated markets

- 3.62** Demand-side preferences for established benchmarks and switching costs could lead to concentrated markets, increase the potential for suppliers to have market power and for competition to not work well.
- 3.63** We recognise that market concentration is not necessarily harmful, as the value of benchmarks may increase with the number of users (a so-called 'network effect'). Wide adoption of a given benchmark may improve market efficiency by reducing transaction costs and increasing liquidity. This is an important aspect we will take into account when considering whether market concentration is leading to potential harm.

Pricing for benchmarks

- 3.64** Concentrated market conditions could allow benchmark administrators to charge higher fees to clients. These higher fees could then be passed through to downstream markets for asset management, investment banking and other wholesale and retail sectors (and ultimately, may feed into retail investor or consumer prices). We want to hear stakeholders' views about benchmark pricing, what is driving them and how any price increases have affected their businesses.

Quality and innovation

- 3.65** High switching costs and lack of suitable alternative substitutes may weaken incentives for providers to innovate or improve the quality of their products. Challenger firms may also be dissuaded from investing in designing and marketing alternative benchmarks or from entering the market, if they believe clients will stick to the main brands.

Transparency and complexity of contract terms

- 3.66** Potential harm could arise if contracts are unnecessarily complex and conditions are not transparent, weakening users' ability to compare the quality, charges, or innovation offered by alternative services.
- 3.67** Complexity and lack of transparency could also hide switching costs, making it unexpectedly costly to exit contractual relationships if quality is lower/or charges are higher than expected. We want to find out more about how the transparency and complexity of contract terms are affecting users.

Vertical integration

- 3.68** Some benchmark administrators operate in different segments of the value chain in different roles, for example as trading venues generating and collecting trading data, market data vendors, or issuers of products.
- 3.69** Vertical integration can be beneficial to the end consumers as it improves efficiency through enabling synergies and reducing costs at the different stages across the value chain whereas non-integrated firms would apply profit margins at each stage of supply.
- 3.70** But there is the potential for harm when vertically integrated firms provide inputs to other firms which compete across the value chain. For example, a benchmark administrator holding trading data may increase prices or hinder data access to firms who could use them to design alternative benchmarks. This would create barriers to entry or expansion and reduce overall choice in the market.

- 3.71** We want to further explore what effect vertical integration is having on the competitive dynamics between benchmark providers, as well as on benchmark users and end consumers.

Questions for stakeholders

- 3.72** The following questions are split between users and providers of benchmarks. Where your business operates as both a user and provider, please answer all questions where relevant. Throughout all questions, where possible, please provide evidence to support your response and explain the impact that any issues have on your business, highlighting in particular what you see as the biggest areas of concern.

Questions for users of benchmarks

- Q3.14:** Which type of benchmarks do you use in your business? How many benchmarks do you use, and how many administrators have you had agreements with, over the last 5 years?
- Q3.15:** Are you content with the price and quality of the benchmarks you use? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.16:** Do you consider any benchmarks a 'must have' for your business purposes? What factors do you consider in this assessment?
- Q3.17:** How have prices and quality evolved over the last 5 years across the types of benchmarks you use? What impact has this had on your use of benchmarks, on your business and your clients?
- Q3.18:** Are benchmark administrators' pricing/licensing terms established by benchmark administrators easy to understand and comply with? What terms, if any, do you find to be overly complex or restrictive and what impact does this have on your business?
- Q3.19:** Are you aware of benchmark administrators charging different amounts or imposing different contract terms, to different customers for similar services? Please give specific examples and explain the impact on your ability to compete in the markets you operate in.
- Q3.20:** How easy is it to compare and switch between benchmark providers? Please provide details on the benchmarks considered when choosing and possible hurdles affecting your ability to compare, choose and switch.

Questions for benchmark administrators

- Q3.21:** Please explain the benchmarks you offer and how you ensure that they meet the needs of your clients.
- Q3.22:** How have your prices and charging structures, volume and value of sales of services and innovation in your offerings evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.23:** For your main benchmarks/indices, who are your key competitors, and to what extent are their products reasonably good substitutes for yours? How have competitive pressures affecting your business evolved over the last 5 years, including entry/exit of competitors?
- Q3.24:** What are the main barriers to attracting users away from your competitors? Please provide specific examples in your response.
- Q3.25:** Are you aware of input data providers charging different amounts or imposing different contract terms to different benchmark administrators for similar services? Please provide specific examples where possible.
- Q3.26:** Are there markets downstream from benchmark administration where you compete with customers of the benchmark(s) you supply?
- Q3.27:** What, if any, barriers to accessing input data put you at a competitive disadvantage in the design and provision of benchmarks? Please provide specific examples where this happens or may happen.

C. Market data vendors

Overview

3.73 Market data vendors (data vendors) play a key role in the distribution of trading data and other sources of market data. Data vendors generally provide desktop or web-based products with sets of content such as trading data from multiple exchanges, research, analysis, GDP and statistical data and news. Data vendors may be able to get some of the content from third parties, while other content is developed or owned by the data vendor. Data vendors provide access to these trading data via a standardised stream and offer processed data alongside functions like valuation tools and chat functionality.

3.74 The activity of formatting, aggregating and distributing trading data to end users by market data vendors is not regulated (to the extent they do not fall within the scope of the regulated activity of operating an APA, ARM or CTP). MiFID II pricing-related

requirements do not apply to market data distributed by data vendors. But many users of market data vendors' services use those services to inform their decisions in relation to regulated activities. Distortions or weakness in competition for data vendor services could impact other services that are within the regulatory perimeter set out in FSMA.

- 3.75** We will use evidence we obtain through this CFI to assess whether we need to act to improve competition between data vendors. Our competition powers extend beyond our regulatory perimeter to broader financial services. Therefore, if we identify concerns in non-FCA-regulated markets we could use these powers to carry out market studies or to investigate and take enforcement action against potential breaches of competition law.

Issues we want to explore

Market dynamics

- 3.76** Given the role data vendors have in supplying market data to a range of market participants engaged in regulated activities, we want to understand the impact data vendors have on whether participants can get value for money for these services.
- 3.77** There are a small number of firms offering market data to a range of market participants engaged in regulated activities. Data vendors might therefore be able to use their scale in the market to negotiate on behalf of their users to ensure market data prices are competitive. We want to understand the extent to which this happens and what may prevent this.
- 3.78** We also want to understand whether concentration could indicate the market is not working well. If data vendors do not face sufficient competitive pressure, they may be able to charge higher prices and face little incentive to provide quality services and products. Innovation and competition may also be hampered if data vendors' market power or pricing strategies create barriers to entry. Concentration may also create risk for users if they are dependent on a single provider. In such cases, an outage or technical problem for that particular provider may lead to market integrity or orderly trading issues.

How data vendor products and services are sold

- 3.79** Data vendors typically sell different bundles of content alongside certain functionalities and analytics in a packaged format. Bundling could have benefits for users if it creates efficiencies such as lower overall cost, or savings from dealing with a single provider. In turn, the practice could give the data vendor a competitive advantage.
- 3.80** But bundling could also make it difficult for buyers to negotiate effectively with vendors. For example, some respondents to the WSCR told us that instant messaging services, an essential part of OTC trading, are bundled with data services. Selling messaging services as part of a bundle could make it difficult for competitors to compete for the products or services included within the bundle if individual prices are unclear. We are interested in understanding the extent of and effects of bundling on users and competing providers.

- 3.81** Similarly, we want to understand the impact data vendors have on overall trade data prices. In the WSCR, some respondents told us a large proportion of trading data costs were at the data vendor level. We want to understand how users purchase these data (whether this is part of a package or on a stand-alone basis), how they are charged for these data and how these prices may have changed over time.
- 3.82** As noted in the WSCR, bundling of data products and services may reduce price transparency of individual elements, making it harder for clients to accurately assess whether they are getting value for money and may also serve to foreclose entry from competitors (where the firm bundles data or services over which it has market power with services on which it competes). And clients may have to pay higher prices or pay for products or services they do not need.

Impact of vertical integration

- 3.83** Data vendors also sell data products and services in markets downstream from their core products. This vertical integration is common for data vendors who operate across the value chain as data generators (eg trading venues and instrument code providers), data aggregators, index administrators and desktop solution providers.
- 3.84** We want to explore whether this vertical integration is causing competitive distortions at different points of the supply chain, for example, if vertically integrated data vendors are charging different prices to data users who compete with them, or are not offering them access to input data that would enable them to compete.

Questions for stakeholders

- 3.85** The following questions are split between users and providers of data vendor services. Where your business operates as both a user and provider, please answer all questions where relevant. Throughout all questions, where possible, please provide evidence to support your response and explain the impact that any issues have on your business, highlighting what you see as the biggest areas of concern.

Questions for users of market data vendor services

- Q3.28:** Which market data vendor services do you use in your business and how has this evolved over the last 5 years?
- Q3.29:** Are you satisfied with the price, quality and level of innovation of market data vendors' offerings? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.30:** How have prices and quality evolved over the last 5 years across the types of market data vendor services you use? What impact has this had on your use of data, on your business and your clients?
- Q3.31:** Are you aware of market data vendors charging different amounts or imposing different contract terms on different customers for similar services? As a user are you, or have you been, at a competitive disadvantage as a result?

- Q3.32:** Are there any products and/or services that you needed/ tried to purchase from market data vendors on a standalone basis, but were not able to? What impact does purchasing a bundle have on your business?
- Q3.33:** How do you choose market data vendors? Do you use more than one, and if so why? How easy is it to compare the content and price of alternative packages before choosing which data package to use? How easy is it to switch providers?

Questions for market data vendors

- Q3.34:** Please explain the market data services you offer and how you ensure that they meet the needs of your clients.
- Q3.35:** How would you characterise the market data related market(s) in which you are active and what approximate share do you believe you hold in each market?
- Q3.36:** How have your prices and service offering for data packages, trading data and other data/analytical services evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.37:** Who are your key competitors, and to what extent are their products reasonably good substitutes for yours? How have competitive pressures affecting your business evolved over the last 5 years, including entry/exit of competitors?
- Q3.38:** What is your contractual relationship and ability to negotiate with trading venues in relation to the pricing and provision of trading data?
- Q3.39:** To what extent is your firm vertically integrated? How does vertical integration affect your pricing and sales practices? Are there instances in which you are at a competitive disadvantage when you compete with providers offering bundled products or that are operating in different parts of the value chain. For example, a market data vendor running also an MTF or administering a benchmark?

4 Accessing and using data and advanced analytics

Introduction

- 4.1 Our second area of focus is other areas within wholesale markets where the changing use and value of data and analytical techniques are, whether now or in the future, transforming business models, competitive dynamics and how financial markets function. We want to understand what opportunities and risks are being created.
- 4.2 Wholesale market participants are increasingly using new data sources and have advanced their ability to extract insights from data. This includes firms using technology such as machine learning (ML) to make autonomous decisions, with minimal human input.
- 4.3 We want to see the benefits of new technology, innovation and competition realised in the interests of market participants and ultimately end consumers. We also want to understand the emerging business models and the implications for existing ones to ensure we have an appropriate regulatory environment in place that does not stifle beneficial innovation.

Use of data and advanced analytics in wholesale markets

- 4.4 Wholesale market participants can increasingly use data from non-traditional sources and new techniques to carry out innovative and advanced forms of analysis. These can help generate insights and intelligence to improve investment strategies, or to act faster than their competitors on forthcoming market developments through forms of high frequency trading (HFT).
- 4.5 Investors may benefit if firms use data to find more cost-efficient ways of managing investment portfolios and pass these savings on to investors through lower management fees. Investors may also benefit from higher returns, as firms find new ways to outperform the market.
- 4.6 The range and depth of data sets that firms operating in wholesale markets can access is vast and rapidly increasing. Firms might already hold these new forms of data themselves, having collected them through their business activities, but are now able to exploit them more than in the past. Alternatively, firms might buy these data from third-party sources.
- 4.7 We want to understand how wholesale market participants use and envisage using alternative sources of data. Some examples include:
 - **Satellite imagery:** firms can use satellite imagery to gain insight into economic or other activity at specific geographical locations. For example, they can use

images of changes in the use of retail car parks to predict economic activity, predict manufacturing activity through monitoring store warehouses, or use oil storage container images to inform their views on future changes in commodities valuations. These insights might then be used to inform valuations of certain listed companies.

- **Client data:** firms can use data and advanced forms of analytics to generate a better understanding of their clients' needs and preferences, improving the quality of products offered to clients, as well as their sales and marketing efforts.
- **Trading data:** some firms may have access to vast amounts of wholesale data, from their business activities. For example, some firms may hold or buy data on current or historic trades and positions of asset managers or data relating to clients trading requirements. Using forms of advanced analytics, they may be able to analyse it to optimise future trade orders or to more easily identify behaviours such as traders taking excessive risks or committing market abuse. Firms may also be able to use this information to predict when orders are going to arrive at different trading venues, enabling trading in advance of others.
- **Social media:** firms can use data mined from social media sites to gain insight into markets. For example, they can use techniques such as sentiment analysis, which determine patterns relating to consumer views and preferences regarding specific products or events, to judge whether consumers are dissatisfied with particular products. This may help firms make better predictions of future sales, which could influence the valuation of certain companies.
- **Account-level data:** it may be possible to use data from account aggregators, which have access to consumer accounts across multiple banking providers, to monitor transaction and savings data and use these when making predictions relating to economic growth. Similarly, banks offering retail banking services will have access to large amounts of customer data and might be able to use this to gain an investment edge over competitors who do not have this access.
- **Location data:** it is possible to use location data to understand and track visits to certain specific retailers, and generate predictions relating to retail sales data. This might enable firms to predict financial performance or alter their valuations of particular companies.

4.8 These are just some of the potential types and uses of emerging data or uses of data in wholesale markets. What many of them have in common is that they may need new analytical approaches to fully realise their benefits. For example, to generate meaningful insights from unstructured data from social media sites, advanced forms of analytics are needed to translate these data into summarised consumer views and preferences, given the vast amount of data that are required to generate reliable patterns.

4.9 Given this, firms are increasingly making use of advanced analytics, such as artificial intelligence (AI) and machine learning (ML) to collect and analyse these expanded data sets. Algorithms are now used more frequently to make both execution and investment decisions. Algorithms can also have the capacity to operate entirely autonomously, creating the potential for automated decision making, with very little input from human decision makers. Firms who want to make use of these new analytical techniques can either build up in-house capability to do so or buy expertise in through third-party providers.

- 4.10** We have previously explored issues relating to the use of data and advanced analytics. For example, we conducted work which focused on algorithmic trading compliance in wholesale markets. In our report, we summarise our findings on development and testing processes which identify potential concerns relating to risk controls, governance and oversight issues, and market conduct issues.
- 4.11** The academic and regulatory community is also assessing the impact of the increased use of data and advanced analytics:
- In December 2019, the ICO and The Alan Turing Institute launched a consultation 'Explaining decisions made with AI'. Published in response to the commitment in the Government's AI Sector Deal, this guidance aims to give organisations practical advice to help the processes, service and decisions delivered or assisted by AI.
 - In February 2020, the ICO also launched a consultation on its draft guidance on the AI auditing framework. The guidance contains advice on how to understand data protection law in relation to artificial intelligence (AI) and recommendations for organisational and technical measures to mitigate the risks AI poses to individuals.
 - In 2019 the CMA launched its digital markets strategy setting out how it will continue to protect consumers in rapidly developing digital markets, while fostering innovation.
 - At an international level, the International Organization of Securities Commissions is exploring issues around trust and ethics and what a framework for financial services might look like. As part of this we are leading a workstream relating to ML and AI.
 - In January 2020, the European Banking Authority published a report on Big Data and Advanced Analytics (BD&AA) in the banking sector. The report identifies four key pillars for the development, implementation and adoption of BD&AA. These are: data management; technological infrastructure; organisation and governance; and analytics methodology.
- 4.12** In 2019 we also conducted a joint survey with the Bank of England to better understand the current use of ML in UK financial services. This report, published in October 2019, was a first step towards deepening our understanding of this area. The survey was sent to firms across both retail and wholesale markets and asked about the way that ML is being deployed, the business areas where it is used and the maturity of applications.
- 4.13** We found that ML is increasingly used in financial services (including in wholesale markets). For example, ML is used for a range of processes and often plays a supporting role within asset management such as portfolio decision-making or trade execution. The survey also found that overall, ML development is entering more advanced stages of deployment and that currently, larger firms may possibly be more advanced in their ML deployment due to benefits of scale, access to data, ability to attract ML talent, or greater resource.
- 4.14** More recently, we published an insight article on our collaboration with the Alan Turing Institute on AI transparency. The article presents an initial framework for thinking about transparency needs in relation to machine learning in financial markets.
- 4.15** In summary, when we refer to the access to and use of data and advanced analytics, in this CFI we mean:
- using new or expanded datasets, (often referred to as 'big data') including data from alternative or new sources such as social media

- adopting the technologies required to generate, collect and store these new forms of data
- using advanced data processing technologies
- using sophisticated analytical techniques such as machine learning or predictive analytics
- using this data in business decisions and activities in a way which might change business models and data strategies

4.16 The rest of this chapter describes the types of issues we would like stakeholders' views on.

Issues we want to explore

4.17 There are many potential benefits of using data and advanced analytics in wholesale markets. For example, as firms increase the volume of data that is incorporated into investment decision models, they may be able to create more refined modelling scenarios, which can improve returns for investors. Advanced analytics can analyse more data from a wider range of sources quicker, creating potential to increase execution speed and reduce costs. As wholesale market participants use new sources of data more effectively, this could lead to better price discovery and reduced trading costs.

4.18 However, the use of data and advanced analytics by firms operating in wholesale markets also may affect competition and pose new risks, for example, relating to market integrity as set out in the areas we are exploring below. Additionally, as data becomes an increasingly important component in wholesale markets, market participants may recognise the value of the data that they hold. We want to understand whether this is likely to lead to changes in market dynamics and how firms compete.

4.19 Therefore, we want to better understand how the use of data could lead to new harms we need to address.

4.20 Below are some examples of areas we would like feedback on. This is not a complete list and we welcome views on any other issues respondents think may be relevant.

Access to data and advanced analytics

4.21 In some instances, data may only be available to one market participant or group of market participants where there is no method by which those data could be obtained or replicated. This may be because of a variety of reasons including:

- some firms secure exclusive access to particular data through contractual arrangements with data providers
- firms cannot secure sufficient financing to purchase these data
- firms with differing business models are able to generate and distil their own data (for example credit card or other transactional data from retail banking offerings)

4.22 These data may be used to generate insights into the business of issuers with traded securities that would not be available through traditional sources.

- 4.23** As we highlighted in our recently published [insight article](#), the concept of taking input data, analysing it to determine an insight that others do not have, and then profiting from that insight, is not a new one. However, new forms of data or technology may be restricted or very expensive, which means they are not publicly available or even available to all financial services firms.
- 4.24** Therefore, we want to explore whether there are barriers to firms accessing data, or to techniques for analysing data, either of which could act as a driver of harm.
- 4.25** We also want to understand whether this dynamic may create information advantages where firms with exclusive access to data or technology can use these to potentially identify market movements ahead of their competitors who do not have such access. This could lead to:
- potential barriers to competition working well in wholesale markets. For example, if firms are not able to access particular data, this could result in barriers to current or future entry or expansion into wholesale markets and may increase costs in the value chain which could ultimately increase prices for consumers.
 - potential harm to market integrity, where such data not available to others could lead to information asymmetries and therefore forms of unfair advantages for the holder of the information, to the detriment of third parties who are unaware of such information.
- 4.26** We welcome any views on whether these potential effects may materialise as a result of restricted access to data or technology.

Impact of concentrated markets

- 4.27** Wholesale market participants might increasingly rely on buying new forms of data from particular third-party providers. We want to explore whether there is potentially high concentration in the supply of data or data and technology services. If this is the case, we want to understand whether such concentration could be a symptom or indicator of weak competition and have the potential to lead to harm to consumers.
- 4.28** For example, if only a limited number of firms sell certain types of data sets, they might not face sufficient competitive pressure to constrain their pricing, and so charge higher prices for them. Firms buying these data could then pass these higher prices on to investors. A lack of competition amongst data providers could also lead to lower service levels, or a lower quality of data supplied to wholesale firms.
- 4.29** We want to explore whether existing or future market power has the potential to lead to these types of harms.

Changing and emerging business models

- 4.30** New kinds of data and uses for data are emerging, and market participants are recognising their potential value. For example, as outlined above, some firms will hold data relating to current or historic trades and positions or data relating to client trading requirements. They may be able to analyse these data to gain a competitive advantage.
- 4.31** We want to understand whether this is likely to lead to changes in market dynamics, for example as suppliers' business models change to monetise the data they own.

This may lead to firms focusing more on the supply of data, rather than traditional wholesale financial services.

4.32 We already have evidence of this happening. For example, we have seen business models expanding with a greater focus on monetising data – this could lead to them charging data users higher prices. Conversely, this could lead to lower prices for other services as firms use revenues from data to cross-subsidise the costs of other activities.

4.33 We want to explore the ways in which business models may change as a result of the emerging types and uses of data, and whether this could have implications for the fundamental dynamics and structures of wholesale markets and the broader workings of competition.

Information sharing, collusion and biases

4.34 As wholesale market participants apply new and more sophisticated analytical techniques to extract insights from data, this can lead to new efficiencies and more effective price discovery. This may also introduce new types of risks or harms. For example, the wider adoption of algorithms by firms with the capability to produce investment recommendations or trade with minimal human input could give rise to new types of market abuse or collusive behaviour.

4.35 This use of ML could also give rise to increased risks of collusive outcomes, without the individuals that have programmed or are operating the machines being aware this is happening. Using algorithms may also make the process of collusion easier for individuals who intentionally want to collude.

4.36 Separately, there may be a risk that ML based on historic data could lead to unintended biases towards incumbents. For example, firms that use ML to assess where historical liquidity and pricing has been best in the past, may only use these brokers or venues in future, in a way which excludes new entrants. This could create new types of barriers to entry.

4.37 Overall, we want to explore the extent to which these risks are occurring, or may occur in wholesale markets, how they would arise and whether they pose threats to competition and the integrity of financial markets. If such risks in wholesale markets exist, we want to understand whether firms have controls in place to manage them, including in the development process of algorithmic solutions and whether senior management have sufficient understanding in how these analytical tools work.

Data governance, controls and ethics

4.38 Data that wholesale firms use can include personal data, or be based on aggregated forms of personal data, for example if they choose to mine data from social media channels. By using ML techniques, these firms might be able to determine consumer views and preferences which can help to inform investment strategies

4.39 As firms increasingly access these data through third party sources, they need to have suitable controls in place to monitor their data vendors. This includes making sure that these data, whether sourced in-house or from third parties, have not been sourced unethically or in ways which do not comply with the General Data Protection Regulation

(GDPR). We would like to know whether there are any governance and control issues as a result of the increasing and changing use of data.

- 4.40** Moreover, wholesale market participants may use client data (for example historical trading data) to inform the development, sale or distribution of products, or their own proprietary trading positions. Such uses could give rise to conflicts of interest, questions around client consent or knowledge, or novel ethical issues around the fair treatment of clients. We want to understand whether there are potential ethical implications as a result of the use of new forms of data and advanced analytics in wholesale markets.

Market stability

- 4.41** As firms increasingly use technology in their portfolio management processes, such as algorithms provided by third parties or risk management tools, there are potential risks of herding-like behaviours. This means that portfolios are managed in a similar manner, meaning large groups of clients are exposed to identical risks.
- 4.42** We know there are a range of elements in current portfolio design that would make identical investment decisions unlikely at present (for example portfolio strategies, modelling factors, asset universes etc.), even while using similar portfolio management technology. But we want to explore whether, as technology evolves further, there may be a greater risk of herding behaviour materialising in the future, and what impact this would have on markets and investors.
- 4.43** If many firms rely on technology for a wide variety of tasks which are central to the management of client portfolios, this could present risks to market stability. For example, if a tool became unavailable, this might affect firms' ability to manage client portfolios. This could potentially lead to firms being unable to trade and therefore have a negative impact for their clients.
- 4.44** Firms' increasing use of algorithms which, for example, make investment recommendations, also creates potential risks. For example, without sufficient controls, oversight or ability to explain the rationale behind certain recommendations or decisions, firms may make investment decisions which take excessive or unintended risks. In turn, this could threaten market stability.
- 4.45** We have already carried out some work in this area. However, we welcome any views on whether potential harm might materialise because of increasing adoption of technology, such as portfolio management tools, in the future, and whether this might present problems for market stability.

The role of regulation

- 4.46** The use of data and advanced analytics in wholesale markets can create new opportunities and efficiencies for market participants.
- 4.47** Regulation plays an important role in ensuring that markets function properly and that we achieve our operational objectives, including promoting competition in the interests of consumers. But we know that regulation can also have a dampening effect on competition and innovation. For instance, a sector's regulatory framework often sets the conditions for firms being able to enter a market, the kind of products they offer, and how they conduct their business. The impact of our regulation on outcomes

in the market, and the ability of firms to innovate in the interests of clients and the market as whole, is of key interest to us.

- 4.48** We would like to hear views on any specific rules within our regulatory regime that unduly affect the way firms can use data and advanced analytics. We are particularly interested in whether any of our rules unduly limit the benefits of data to firms or consumers, and whether our rules may become less effective in a world where data or advanced analytics are more commonly used or decisions more automated.

Questions for stakeholders

- 4.49** Throughout all questions, where possible, please provide evidence to support your response and explain the impact that any issues have on your business, highlighting in particular what you see as the biggest areas of concern. We also invite stakeholders to submit any other concerns they may have about areas relating to access to and use of data which are not already covered in the questions.

Business models and opportunities

- Q4.1:** How are firms operating in wholesale markets using alternative data and advanced analytics, and for which particular activities or markets? How might this change in the future?
- Q4.2:** How much has your firm allocated to investments in data and advanced analytics over the next three years?
- Q4.3:** What are the potential benefits for firms and investors of the development of data and advanced analytics, now and in the future, and for which particular activities or markets? Please provide examples and where possible explain how the benefits are passed on to investors. How do you assess these benefits against the potential risks associated with the use of data and advanced analytics?
- Q4.4:** How have business models changed in light of developments in the use and value of data, and how might they change in the future? What affect might this in turn have on different financial markets?

Access to data and advanced analytics

- Q4.5:** What barriers make it difficult for firms to access data or access the technology necessary for analysing data, and how might this change in the future?
- Q4.6:** With reference to paragraph 4.25, do you agree there are situations where the use of data could lead to unfair advantages in wholesale markets which could:
- pose potential barriers to competition well; or
 - harm market integrity.

Q4.7: What factors do you consider are relevant in assessing whether the use of data may create unfair advantages in wholesale markets? For example, if the data are only available to one or a handful of firms or if some market participants are not able to secure sufficient financing to access data.

Impact of concentrated markets

Q4.8: How concentrated is the supply of data, or technology required to analyse data, to wholesale market participants? Please explain how this differs by data type and technology type and the impact on your business.

Information sharing, collusion and biases

Q4.9: Do you consider that the wider use of algorithmic solutions in wholesale markets could give risk to new types of market abuse or collusive behaviour? If you currently use these solutions, do you have any processes in place to manage these potential risks?

Data governance, controls and ethics

Q4.10: Are there any potential control or governance issues associated with these data that you currently use or think will be used in the future? Please provide examples and explain your reasoning.

Q4.11: For wholesale market participants that make use of advanced analytics, how does senior management ensure that it has sufficient understanding of how these algorithms, as an example of one tool, work in order to ensure that they are complying with their regulatory and competition law obligations?

In relation to ethical considerations:

Q4.12a: Are there any potential ethical implications as a result of the use of new forms of data and advanced analytics in wholesale markets? Please give specific examples.

Q4.12b: What steps do you take to make sure that the data you use have been sourced legally and ethically?

Market stability

Q4.13: What challenges or risks (for example, in relation to market stability) are associated with the increased use of technology by wholesale market participants? For example, could this lead to the increased risk of herding like behaviours or excessive risk taking?

The role of regulation

Q4.14: What specific aspects of the regulatory regime unduly limit the way firms can use data and advanced analytics? How do these limit the benefits of data being realised by firms or consumers?

5 Next Steps

- 5.1** We are keen to hear from all market participants about their experiences. We are seeking evidence, views and answers to the questions we have asked throughout this CFI from all market participants and other interested stakeholders by **1 May 2020**. We would also like to hear about any other issues relating to the access to and use of data in wholesale markets not covered in this CFI but which you think we should also consider. To hear views, we will host a number of roundtables. Please see the FCA's website here for more details and to register your interest. In addition, we are also open to meeting with stakeholders on a 1-2-1 basis. We look forward to engaging with industry throughout the course of this work.
- 5.2** Please submit any responses via the online form, send responses via email to WholesaleDataCFI@fca.org.uk, or via post to the address set out on page 2 by **1 May 2020**. When providing feedback please include as much detail as possible and provide evidence for your responses where possible to do so.
- 5.3** We plan to publish a Feedback Statement setting out our analysis, findings and any next steps in **Autumn 2020**. The information and evidence we collect as part of this CFI will inform any next steps we need to take, which may include a market study, take other regulatory action, or to take no further action.

Annex 1

Feedback questions

Trading data

Questions for users of trading data

- Q3.1:** What type of trading data do you use/obtain directly from trading venues and APAs, and how do you use trading data?
- Q3.2:** Are you content with the price, quality, provision, coverage, speed and depth of trading data (or other data sold by trading venues or APAs)? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.3:** Do you consider any trading venues or APAs set of trading data a 'must have' for your business purposes? If so, please explain why. For example, is it linked to a liquidity threshold in the relevant financial instrument and/or to best execution requirements considerations?
- Q3.4:** For each data set you use, how have the trading fees, trading data costs and quality evolved over the last 5 years? What impact has this had on your business and your clients?
- Q3.5:** How easy are trading data pricing/licensing terms to understand and comply with? What, if any, do you find to be complex or restrictive and what impact does this have on your business?
- Q3.6:** Are you aware of trading venues or APAs charging different amounts to different customers for similar services? Please give specific examples and explain how these practices affect your ability to compete in the markets you operate in.
- Q3.7:** Please explain when you are charged for the use of delayed data.
- Q3.8:** To what extent do you think ESMA's suggested improvements to the RCB requirement will adequately constrain trading data pricing (see 3.23)? Are there other ways to ensure trading data prices are competitive?

Questions for providers of trading data (including trading venues and APAs)

- Q3.9:** Please explain the trading data you offer and how you ensure that the quality, speed, coverage and depth of trading data provided meets the needs of your users.
- Q3.10:** For each trading venue you operate, how have overall trading fees and trading data price levels, pricing policies and your service offering evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.11:** Please describe your policy for charging for the use of delayed data, providing specific examples.
- Q3.12:** What factors do you take into account when setting your pricing policy? Do you face any constraints when doing so? Please provide reasons for changes in prices and detail how you ensure compliance with MiFID/MiFIR RCB requirements.
- Q3.13:** Please explain how you categorise types of user and the reasons for any price differentiation based on the categorisation of the user.

Benchmarks

Questions for users of benchmarks

- Q3.14:** Which type of benchmarks do you use in your business? How many benchmarks do you use, and how many administrators have you had agreements with, over the last 5 years?
- Q3.15:** Are you content with the price and quality of the benchmarks you use? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.16:** Do you consider any benchmarks a 'must have' for your business purposes? What factors do you consider in this assessment?
- Q3.17:** How have prices and quality evolved over the last 5 years across the types of benchmarks you use? What impact has this had on your use of benchmarks, on your business and your clients?

- Q3.18:** Are benchmark administrators' pricing/licensing terms established by benchmark administrators easy to understand and comply with? What terms, if any, do you find to be overly complex or restrictive and what impact does this have on your business?
- Q3.19:** Are you aware of benchmark administrators charging different amounts or imposing different contract terms, to different customers for similar services? Please give specific examples and explain the impact on your ability to compete in the markets you operate in.
- Q3.20:** How easy is it to compare and switch between benchmark providers? Please provide details on the benchmarks considered when choosing and possible hurdles affecting your ability to compare, choose and switch.

Questions for benchmark administrators

- Q3.21:** Please explain the benchmarks you offer and how you ensure that they meet the needs of your clients.
- Q3.22:** How have your prices and charging structures, volume and value of sales of services and innovation in your offerings evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.23:** For your main benchmarks/indices, who are your key competitors, and to what extent are their products reasonably good substitutes for yours? How have competitive pressures affecting your business evolved over the last 5 years, including entry/exit of competitors?
- Q3.24:** What are the main barriers to attracting users away from your competitors? Please provide specific examples in your response.
- Q3.25:** Are you aware of input data providers charging different amounts or imposing different contract terms to different benchmark administrators for similar services? Please provide specific examples where possible.
- Q3.26:** Are there markets downstream from benchmark administration where you compete with customers of the benchmark(s) you supply?
- Q3.27:** What, if any, barriers to accessing input data put you at a competitive disadvantage in the design and provision of benchmarks? Please provide specific examples where this happens or may happen.

Market data vendor services

Questions for users of market data vendor services

- Q3.28:** Which market data vendor services do you use in your business and how has this evolved over the last 5 years?
- Q3.29:** Are you satisfied with the price, quality and level of innovation of market data vendors' offerings? If you are not satisfied with any of these elements, please explain why not and the impact this has on your business.
- Q3.30:** How have prices and quality evolved over the last 5 years across the types of market data vendor services you use? What impact has this had on your use of data, on your business and your clients?
- Q3.31:** Are you aware of market data vendors charging different amounts or imposing different contract terms on different customers for similar services? As a user are you, or have you been, at a competitive disadvantage as a result?
- Q3.32:** Are there any products and/or services that you needed/ tried to purchase from market data vendors on a standalone basis, but were not able to? What impact does purchasing a bundle have on your business?
- Q3.33:** How do you choose market data vendors? Do you use more than one, and if so why? How easy is it to compare the content and price of alternative packages before choosing which data package to use? How easy is it to switch providers?

Questions for market data vendors

- Q3.34:** Please explain the market data services you offer and how you ensure that they meet the needs of your clients.
- Q3.35:** How would you characterise the market data related market(s) in which you are active and what approximate share do you believe you hold in each market?
- Q3.36:** How have your prices and service offering for data packages, trading data and other data/analytical services evolved over the last 5 years? Please explain reasons for changes in prices and other relevant dimensions.
- Q3.37:** Who are your key competitors, and to what extent are their products reasonably good substitutes for yours? How have competitive pressures affecting your business evolved over the last 5 years, including entry/exit of competitors?

- Q3.38:** What is your contractual relationship and ability to negotiate with trading venues in relation to the pricing and provision of trading data?
- Q3.39:** To what extent is your firm vertically integrated? How does vertical integration affect your pricing and sales practices? Are there instances in which you are at a competitive disadvantage when you compete with providers offering bundled products or that are operating in different parts of the value chain. For example, a market data vendor running also an MTF or administering a benchmark?

Wider uses of data and advanced analytics in wholesale markets

Business models and opportunities

- Q4.1:** How are firms operating in wholesale markets using alternative data and advanced analytics, and for which particular activities or markets? How might this change in the future?
- Q4.2:** How much has your firm allocated to investments in data and advanced analytics over the next three years?
- Q4.3:** What are the potential benefits for firms and investors of the development of data and advanced analytics, now and in the future, and for which particular activities or markets? Please provide examples and where possible explain how the benefits are passed on to investors. How do you assess these benefits against the potential risks associated with the use of data and advanced analytics?
- Q4.4:** How have business models changed in light of developments in the use and value of data, and how might they change in the future? What affect might this in turn have on different financial markets?

Access to data and advanced analytics

- Q4.5:** What barriers make it difficult for firms to access data or access the technology necessary for analysing data, and how might this change in the future?
- Q4.6:** With reference to paragraph 4.25, do you agree there are situations where the use of data could lead to unfair advantages in wholesale markets which could:
- pose potential barriers to competition well; or
 - harm market integrity.

- Q4.7:** What factors do you consider are relevant in assessing whether the use of data may create unfair advantages in wholesale markets? For example, if the data are only available to one or a handful of firms or if some market participants are not able to secure sufficient financing to access data.

Impact of concentrated markets

- Q4.8:** How concentrated is the supply of data, or technology required to analyse data, to wholesale market participants? Please explain how this differs by data type and technology type and the impact on your business.

Information sharing, collusion and biases

- Q4.9:** Do you consider that the wider use of algorithmic solutions in wholesale markets could give risk to new types of market abuse or collusive behaviour? If you currently use these solutions, do you have any processes in place to manage these potential risks?

Data governance, controls and ethics

- Q4.10:** Are there any potential control or governance issues associated with these data that you currently use or think will be used in the future? Please provide examples and explain your reasoning.
- Q4.11:** For wholesale market participants that make use of advanced analytics, how does senior management ensure that it has sufficient understanding of how these algorithms, as an example of one tool, work in order to ensure that they are complying with their regulatory and competition law obligations?

In relation to ethical considerations:

- Q4.12a:** Are there any potential ethical implications as a result of the use of new forms of data and advanced analytics in wholesale markets? Please give specific examples.
- Q4.12b:** What steps do you take to make sure that the data you use have been sourced legally and ethically?

Market stability

Q4.13: What challenges or risks (for example, in relation to market stability) are associated with the increased use of technology by wholesale market participants? For example, could this lead to the increased risk of herding like behaviours or excessive risk taking?

The role of regulation

Q4.14: What specific aspects of the regulatory regime unduly limit the way firms can use data and advanced analytics? How do these limit the benefits of data being realised by firms or consumers?

Annex 2

Abbreviations used in this paper

AI	Artificial Intelligence
AMMS	Asset Management Market Study
APA	Approved Publication Arrangement
BMR	Benchmarks Regulation
CCP	Central Counterparty
CMA	Competition and Markets Authority
CTP	Consolidated Tape Provider
EBA	European Banking Authority
ESMA	European Securities and Markets Authority
ETF	Exchange-Traded Funds
EU	European Union
FESE	The Federation of European Securities Exchanges
FS	Feedback statement
FSMA	Financial Services and Markets Act
GDPR	General Data Protection Regulation
ICO	Information Commissioner’s Office
IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Numbers
MAR	Market Abuse Regulation
MiFIR	Markets in Financial Instruments Regulation
MiFID	Markets in Financial Instruments Directive
MF	Mutual Funds

ML	Machine Learning
MTF	Multilateral Trading Facility
NNA	National Numbering Agencies
OTC	Over the Counter
OTF	Organised Trading Facility
RCB	Reasonable Commercial Basis
SEC	Securities and Exchange Commission
SIP	Securities Information Processors
SIs	Systematic Internalisers
WSCR	Wholesale Sector Competition Review



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