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BBA / AFME joint response to the ESAs' Discussion Paper: use of Big Data by financial institutions

The Association for Financial Markets in Europe[1]and the British Bankers' Association[2] welcome this opportunity to comment on the discussion paper of the Joint Committees on the use of Big Data by financial institutions. Please find our response to the discussion paper questions annexed to this letter.

Please feel free to get in touch if you have any queries relating to this issue going forward.

Yours sincerely,

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[1] The Association for Financial Markets in Europe (AFME) represents a broad range of European and global participants in the wholesale financial markets. Its members comprise pan-EU and global banks as well as key regional banks and other financial institutions. AFME advocates stable, competitive and sustainable European financial markets, which support economic growth and benefit society. AFME is listed on the EU Transparency Register, under ID number 65110063986-76.

[2] The BBA is the leading trade association for the UK banking sector with 200 member banks headquartered in over 50 countries with operations in 180 jurisdictions worldwide. Eighty per cent of global systemically important banks are members of the BBA. As the representative of the world's largest international banking cluster the BBA is the voice of UK banking. The BBA is listed on the EU Transparency Register, under ID number 5897733662-75.

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Response to ESAs' Discussion Paper on the Use of Big Data by Financial Institutions

Overarching comments

The Discussion Paper ('the Paper') takes a thoughtful and comprehensive approach to analysing the 'Big Data phenomenon'. However, while the Paper rightly identifies associated risks, we feel that it would be beneficial if there was a greater focus on the enormous benefits that Big Data can provide both to customers/consumers and financial institutions alike.

Big Data is not a new phenomenon

Improvements in data collection and analytics which we have come to know as Big Data are a natural evolution of the data-driven processes that the financial industry has long used to improve its understanding of consumers/customers in order to better serve them.

Banks and other financial institutions have indeed long been custodians and users of data and have well established systems and protocols for using and protecting sensitive data on a large scale in compliance with the applicable legal and regulatory requirements. Improvements in technology, availability of data, and the increased ability to collect, store and process data are used by the industry to improve client experiences, to better inform decision-making for customers and businesses, and to improve the efficiency of banks' internal processes. This continually evolving data-driven approach can be applied to and improve many processes that might typically rely on intuition or limited or incomplete information. The use of Big Data by financial institutions should not therefore be viewed in isolation.

We believe that the risks arising from the use of Big Data are both foreseeable and manageable. Those risks should not diminish the ability of financial institutions to continue to use Big Data to benefit consumers/customers, through for example innovating and enhancing product offerings and cyber security and financial crime prevention. We also agree that the use of Big Data will continue to grow and will become a significant contributing factor towards competitiveness and the future performance of the financial sector.

We therefore encourage regulators to focus on providing the right conditions to enable financial institutions to continue to serve their customers in the best possible way by developing Big Data technologies.

We build on this overarching comment in our responses to the questions below.

1. **Do you agree with the above description of the Big Data phenomenon? If not, please explain why. Please also mention whether you consider that other characteristics are relevant to understanding the use of Big Data.**

Yes. The Paper describes the Big Data phenomenon well. We would however like to comment on three aspects as follows:

Banks use Big Data to augment decision-making that benefits consumers/customers and the business with a data-driven approach or to realise efficiencies in existing processes. These are the primary drivers for many of the use cases outlined in the Paper. Additionally, for reputational reasons, banks as trusted partners put a lot of emphasis on the fact that the majority of data processed by them is obtained from reliable sources, such as data provided in the course of customer relationships, transaction and account performance data or data from ratings agencies, amongst others.

It is worth noting that employing Big Data solutions requires a significant financial commitment. It is important to recognise, therefore, that firms need confidence in the regulatory environment so as to justify the investments necessary to deploy the technology.

Most importantly, Big Data is continually evolving and so there will not be a singular definition. Big Data is often described by reference to "the three 'V's". This is useful and goes some way towards describing the characteristics of the data used, such as size or magnitude. Nonetheless this is an incomplete description. More importantly, in our view the 'Big Data phenomenon' also encompasses the data management phase, such as cleaning and aggregating data and the analytics phase. The latter involves modelling, analysis, and interpretation of data, all of which are enabled by various new technologies. For the purposes of discussing the issues around Big Data, the broad definition provided is sufficient. If however this were to be used to develop

more concrete outputs such as regulatory or supervisory action it would be important for regulators to clearly specify areas of concern and provide a more precise definition in order to tailor remedies appropriately.

Nonetheless, it would be very challenging to neatly define Big Data. For example, what is the threshold that distinguishes Big Data from other data analytics and would it remain relevant over time? Are there risks that are sufficiently unique to Big Data that would necessitate defining Big Data, or should risks be managed in the context of data analytics more broadly? Presently it is not entirely clear whether the Paper is concerned with the technology, data analytics, data consumption, or some combination of these factors.

2. Which financial products/activities are (likely to be) the most impacted by the use of Big Data and which type of entities (e.g. large, small, traditional financial institutions, Fintechs, etc.) are making more use of Big Data technologies? In light of ESAs' objective to contribute to the stability and effectiveness of the financial system, to prevent regulatory arbitrage, do you consider that there is a level playing field between financial institutions using Big Data processes and those not using them (e.g. because they do not have access to data or the (IT) resources needed to implement Big Data processes) or between established financial institutions and potential new entrants (e.g. Fintechs) using Big Data processes? Please explain

Banking activities most likely to be impacted are those existing processes that can be made more efficient or accurate, for example: Know Your Customer (KYC)/Anti Money Laundering (AML) checking, marketing involving personalisation and behavioural tracking, fraud analysis and product design. There is also continuing exploration into the use of Big Data to increase consumer access to credit. While there is certainly a case that Big Data can help with advanced credit-worthiness checks to provide access to credit to those with thin or no credit files, it is important that banks consider safety and soundness foremost and that decisions made using Big Data align with obligations to lend fairly and responsibly. These important activities are most likely to be influenced by rules and regulations that banks are subject to, as well as by the need to engage in beneficial innovation while respecting the sensitivity of the trust placed in banks by their customers.

In terms of analysing the behaviour of customers/consumers and engaging with them further potential uses of deep analysis and Big Data are likely to include:

- Risk management (risk awareness, risk appetite definitions, a better audit trail which is clearly traceable, etc.);
- Client retention management (acting instead of reacting based on clients' behaviour);
- Marketing efforts (discerning client preferences towards a more specific / target-client oriented product / service offering);
- Acquisition efforts (towards a more target-client related prospects' handling);
- Supply and demand management (towards a more efficient and event driven approach); or
- Product catalogues (considering the business model and target audience).

In terms of new market entrants, we observe that these will not necessarily be small start-ups. Rather, there may also be large, well-established technology firms that enter the financial services market as well. This latter category of firm will often already have substantial amounts of data that they can leverage to gain market position. However, the playing field is potentially tilted in the favour of institutions that are providing products or services like those offered by regulated entities, but that are not subject to equivalent sectoral requirements.

Further to this, we note for example, that although PSD2 creates some registration requirements and regulatory controls for third party service providers, these fall well short of the obligations imposed on banks and other more traditional financial services firms, including in terms of minimum capital requirements. Furthermore, under the December guidance of the Article 29 Working Party, the data portability requirements set out under the GDPR will give third parties access to substantial personal data without any surrounding licensing framework (though the GDPR's general obligations will apply). Although this will not apply to *all* personal data, the current guidance does anticipate that much transactional data would be in scope as well as other data received directly from data subjects or indeed obtained by observing their activities. This could result in an environment in which institutions that are not constrained by requirements that are designed to protect consumers or markets use Big Data in ways such that the benefits do not outweigh the risks. The ESAs will need to be vigilant and work with data protection authorities to take a risk and activities-based approach to ensure that there is a level playing field between banks and new entrants and to ensure regulatory consistency.

3. **Do you offer/are you considering using Big Data tools as part of your business model? If so, please briefly describe: i) what type of entity you are, e.g., long established, start-up, a product provider, an intermediary; ii) the service you provide; iii) the nature of your clients; iv) your business model; v) whether the Big Data tools/strategy were developed by an external company or internally and whether you have related agreements with other entities (including non-financial entities)23; vi) what are the types of data used (personal, anonymised, user data, statistical data etc.) sources of data; and vii) the size of your Big Data related activity and/or forecast activity (e.g. to what extent are business decisions already taken on the basis of Big Data analysis; what other business actions could be based on Big Data in the future)?**

Not applicable. Individual members may choose to answer this question separately.

4. **If you are a consumer or a consumer organisation, do you witness any of the uses of Big Data? In what fields?**

Not applicable.

5. **Do you consider there are (non-regulatory) barriers preventing you (or which could prevent you in the future) from collecting and processing data? Are there barriers preventing you from offering/developing Big Data tools in the banking, insurance and securities sectors? If so, which barriers?**

There are some non-regulatory barriers that may impede the use of Big Data tools in the short term.

First, at a technical level we note that limited availability of technologies enabling low latency data capture and subsequent processing may limit firms from utilising Big Data tools as effectively as might be possible in theory. Other natural frictions that could delay or limit the adoption of Big Data could include the cost of new technology and human resources, legacy systems, or unproven business models. We also note that members experience gaps in availability of the digital skills needed to fully embrace the new opportunities offered by Big Data for the benefit of banks, and their customers. We refer not only to the skills of financial services firms' employees, but also the skills of regulators and even customers. With respect to this we believe there needs to be further push for financial education and digital literacy.

Second, banks must also ensure that sensitive data is secure wherever it exists. Concerns around the implementation and oversight of robust information security frameworks beyond just the regulated entities, such as third party solutions or cloud computing, could act as a barrier if it deters firms from collaborating with other entities or adopting new technologies.

Third, the Paper also highlights issues around reputational risks. We agree that these risks exist (for example, where a firm is perceived to use profiling too extensively), but would also add that there is a communications and consumer education component to this. Much of the public historic discourse on the use of Big Data has disproportionately focused on hypothetical harms that distract from the real issues and could discourage firms from developing beneficial tools. For example, there are stories in the media about the risks and dangers of Big Data, that do not necessarily provide a balanced view of the benefits to consumers and society that Big Data can provide. Although there is no need to explain the workings of specific Big Data analyses in detail, for the potential benefits of Big Data to be fully realised it will be important to reassure consumers that these technologies can be beneficial rather than threatening where they are well designed and subject to proper governance. Big Data's role beyond product development should also be communicated, particularly in the prevention of fraud and money laundering.

Lastly, we note that, given the significant investments required as outlined above, financial resources are an important factor. Where these are not sufficient for a sound and effective solution, there could be negative impacts on the firm and on industry more broadly.

6. **Do you agree with the above short, non-exhaustive, presentation of some of the main applicable requirements? If not, please explain why. Please also mention whether you consider that other legal requirements are essential and should be mentioned.**

Yes, we broadly agree with this summary. There are however several relevant regulatory areas that should be considered or expanded in the analysis.

First, although Directive 2002/58/EC (Directive on privacy and electronic communications) is mentioned, it is only covered very briefly. In particular, it does not refer to the limitations placed on cookies and tracking. However, such tracking ultimately provides the source material for many Big Data initiatives. Furthermore, we note that this Directive is currently in the process of being replaced, with more stringent rules around cookies and tracking proposed in the draft legislation.

Second, data localisation requirements that restrict cross-border data transfers or other obligations to store certain data in specific jurisdictions, both in the EU and abroad, can lead to conservatism in business activities and decision-making and can create challenges to Big Data innovation by limiting firms' ability to connect their datasets. Big Data, by its broad definition, provides value through insights obtained from the collection and combination of large data sets. If this phase cannot occur because the storage or processing of data is limited to a jurisdiction, then firms may have to rely on data that is incomplete or not fully representative. For example, banks with international operations or international customers may not be able to effectively enhance the services or insights provided to customers/consumers through the use of Big Data. It would be more concerning if localisation requirements create a barrier to firms trying to meet their regulatory obligations, such as AML requirements - see for example the European Commission on *Building a European Data Economy*, which examines some of these issues.

We also highlight the relevance of the recent CJEU judgement *Patrick Breyer v Bundesrepublik Deutschland.* Very briefly, this judgement expands the interpretation of 'personal data' to include dynamic IP addresses in certain circumstances, and potentially other indirect identifiers of natural persons where it is legally possible to fully identify these natural persons. Although the full implications of this judgement are yet to be seen, this is an expansion to the scope of what may be considered 'personal data'. Big Data techniques sometimes make use of 'anonymised' data but this could now be made more challenging if some of this data is considered to be 'personal data' and therefore subject to the EU's data protection laws/rules.

Financial supervisory regulation on outsourcing should also be noted. Many Big Data solutions are based on cloud technology but regulatory and supervisory authorities (with certain national differences) require prior notification and approval of outsourcing. This increases time to market and delays innovation, and it can pose challenges to the use of Big Data technologies by banking institutions. We note that this can put other types of firms that are less strictly regulated at an advantage.

Finally, we suggest that Directive (EU) 2016/943 on the protection of trade secrets could be relevant to the development of Big Data. This directive sets out rules against the unlawful acquisition, use and disclosure of undisclosed 'know-how' and business information, which could well be relevant to emerging uses of Big Data.

7. Do you consider any of these regulatory requirements as unjustified barriers preventing you from using Big Data technologies? If so, please explain why. Please also explain whether you consider that further regulation (including soft law/guidance, etc. and insofar as it falls within the scope/remit of the ESAs) should be introduced to facilitate the use of Big Data technologies

There are several regulatory challenges that are important to the development and growth of Big Data in financial services.

First, with regards to the GDPR a part of the value proposition to using Big Data is its ability to uncover unknown unknowns, that is, the discovery of innovations and applications or insights from data that were unexpected prior to analysing the data. The most fundamental regulatory challenge arises from the data protection requirement to have a clear processing purpose and to provide a notice setting out this purpose up front to the data subject (and potentially to obtain consent to the processing). These are set out in Article 5(1)(b), Article 13 and Article 14 of the GDPR. The notice provisions are complex and in the context of Big Data, sometimes impossible to comply with given that the potential uses of the data will not always be clear until it has been collected and analysed. It can therefore be difficult to provide notice effectively and compliantly, creating a 'chicken or egg' situation.

Similarly, the requirement to ensure the proportionality of data collection/processing to the purpose ('data minimisation' – Article 5(1)(c) of the GDPR) can also pose challenges for the same reasons.

Lastly with regards to the GDPR, we note that the tightening of rules around 'consent', particularly 'implied' or 'implicit' consent could inhibit the evolution and development of Big Data. Similarly, the new right to erasure (or

'right to be forgotten') could impact the quality of datasets by enabling consumers to have more of their data deleted.

The impact of the GDPR's new profiling restrictions on Big Data will also need to be explored and tested. While profiling could typically be perceived to include any kind of analysis of behaviours or patterns that could facilitate an assessment or prediction of a person that belongs to a group by virtue of shared characteristics, the definition of profiling in the GDPR clearly singles out the use of Big Data. It arguably begins with the assumption that automated processing is negative or harmful and distinguishes it from normal data use in a way that could inhibit the beneficial use of new technologies.

There are challenges stemming from outsourcing rules. In particular, changes to the allocation of liability for data protection breaches will change under the GDPR. Whereas the controller carried full legal liability under the Data Protection Directive for any processing in breach of data protection requirements, the GDPR creates a more complex framework under which the processor can also be liable, depending on its actions (particularly in relation to whether instructions of the controller or the new data processor legal obligations were followed). This change will create uncertainty, at least for a time, and will necessitate the revision of vendor contracts.

We note that there is an intersection of technology and regulatory uncertainty in that it is not clear at this time whether some of the emerging technologies will be fully GDPR-compliant. Examples include the effectiveness of anonymization tools (which, if fully effective, could move certain data or datasets beyond the scope of GDPR) and reversible encryption.

This is not necessarily to say that these regulatory requirements under the GDPR are 'unjustified barriers' as such, but there are trade-offs to be made, with prescriptive requirements potentially limiting useful innovation. The key is to ensure that the data protection principles of transparency, data minimisation, etc. are applied in a manner that fits the practicalities of Big Data use, facilitating the safe development of these technologies. One sensible approach could be to allow notice (and consent where applicable) only when processing is in the context of a specific individual / specific use case, rather than at the more general 'discovery' phase.

It will be important for there to be a practical and risk-based application of the GDPR to Big Data, avoiding assumptions that all automated processing poses a threat to privacy principles. The ESAs might wish to monitor and input into this process.

Secondly, restrictions on the free movement of data constrain firms' ability to innovate and draw together data sets from across their operations. These can stem from EU and non-EU data protection rules restricting cross-border data transfers and other regulatory obligations to store certain data in specific jurisdictions ('data localisation' rules). The recent European Commission paper on *Building a European Data Economy* undertakes to explore this challenge further.

There are a number of relevant requirements and standards to manage in this area, both restraining and encouraging cross border data transfers. These include the GDPR, the 4th Anti Money Laundering Directive and the International Security Services Association's *Financial Crime Compliance Principles*.

Developing an approach to data transfers that focuses on high levels of protection, rather than the physical location of servers, would help address this issue. Similarly, establishing an efficient framework for the transfer of data to third countries that is not subject to significant legal uncertainty, would assist firms in developing their Big Data capabilities. Such an approach would, of course, need to also ensure that regulatory authorities have appropriate access to firms and that data subjects are able to raise complaints efficiently.

8. Do you consider the potential benefits for consumers and respectively financial institutions to be accurately described? Have you observed any of them in practice? If so, please provide examples. If not, please explain whether you are aware of any barriers that may prevent the above potential benefits from materialising?

Yes, broadly the potential benefits are accurately described. We add though that:

- There are also several potential use cases that could benefit banks' wholesale customers and businesses, such as trade execution optimization, facilitation of relationship management, or risk management and scenario analysis.
- The benefits around improved customer experience and operational efficiency should be made more strongly.

- Consumers are also likely benefit from the detailed insight into their financial situation and are likely to be better protected from fraud.

We note however that some of these benefits are more *potential* than current. As such, whether they fully develop in the market is uncertain and will depend, in particular, on the implementation and interpretation of key regulatory requirements, as outlined above.

Potential barriers include those described above. For example, non-regulatory barriers include natural frictions of adopting new technologies (costs, business needs, availability of skilled staff) and reputational risks arising from a lack of consumer education or communication. Regulatory requirements, while not necessarily unjustified barriers, could pose challenges to the development and growth of Big Data in financial services. These challenges include equating the Big Data process with requirements to provide notice and/or obtain consent for the processing of personal information, data minimisation considerations, data localisation rules, and outsourcing rules/third party risks, among others.

9. Do you agree with the description of the risks identified for consumers and respectively financial institutions? Have you observed any of these risks (including other risks that you are aware of) causing detriment to consumers and respectively financial institutions? If so, in what way? If not, please explain why. Please also mention whether certain risks for consumers and financial institutions have not manifested yet but have the potential of developing in the future and hence need to be closely monitored by Supervisory Authorities.

Yes, the potential risks are well described. As noted above however, it is important to also give due weight to the potential benefits. For example, although it could be misused we would not consider targeted marketing to be a risk in and of itself, but rather a way to offer more tailored products.

One other risk we identify is that technological change could result in reduced individuals' data footprints. This could undermine firms' returns from investment in relevant technology.

That said, the existing regulatory and supervisory framework is appropriate for managing these risks. Where there is uncertainty, the industry could benefit from clarity on the applicability of existing requirements on Big Data processes.

10. Is the regulatory framework adequately addressing the risks mentioned above? Bearing in mind the constant evolution of technologies/IT developments and that some of the above mentioned regulatory requirements are not specific to the financial services sector (e.g. GDPR), do you think further regulation is needed to preserve the rights of consumers of financial services in a Big Data context? Please explain why.

As highlighted above under Question 7 we note that the practical application of some data protection principles to Big Data is not straight forward and clarification could helpfully be provided. Similarly, we can appreciate that customers may be concerned about how Big Data may affect them.

Nonetheless, the regulatory framework is appropriate overall and we do not foresee a need for any new sector-specific regulation with respect to financial services. In terms of wider conduct obligations, we see Big Data as neutral. Sophisticated analytics can substantially improve decision-making and the overarching requirements on firms to treat customers fairly, lend responsibly, assist customers in vulnerable circumstances, etc. remain appropriate and do not need to be specially amended or added to so as to accommodate Big Data. Rather, the challenge is on firms to ensure that their processes result in the fair treatment of customers, to test algorithms effectively, and to explain decisions to customers and give them the opportunity to have decisions reviewed manually, etc. Many of these safeguards are imposed under the GDPR.

Similarly, data accuracy is key to ensuring that firms' decisions regarding their customers are justified. Nonetheless, ensuring the accuracy of data is already a requirement of data protection law. Challenges for firms may arise where, for example, social media are used as a data source, but the regulatory framework is nonetheless appropriate (we note, though, that banks do not generally use such sources due to regulatory uncertainty and risks of data inaccuracy).

Clarifications regarding data protection are rightly the domain of data protection authorities and the EDPB (once established). Nonetheless, the ESAs might usefully engage on the development of guidance in order to ensure that the financial services industry is properly considered.

11. Do you agree that Big Data will have implications on the availability and affordability of financial products and services for some consumers? How could regulatory/supervisory authorities assist those consumers having difficulties to access financial services products?

See answer to Question 10.

12. Do you believe that Big Data processes may enable financial institutions to predict more accurately (and act accordingly) the behaviour of consumers (e.g. predicting which consumers are more likely to shop around, or to lodge a complaint or to accept claims settlement offers) and could therefore compromise the overarching obligations of financial institutions to treat their customers in a fair manner? Please explain your response.

See answer to Question 10.

13. Do you agree that Big Data increases the exposure of financial institutions to cyber risks? If yes, what type of measures has your institution adopted or is going to adopt to prevent such risks? What could supervisory/regulatory authorities do in this area?

Banks hold large amounts of personal and financial information and already have robust systems in place to manage cyber risks including cyber risk assessments, governance, etc. The GDPR will increase the regulatory structure around these measures from May 2018. Big Data will not increase the threat of cyberattack.

The main source of increased cyber risk that we perceive is the likely increased prominence of third parties, including vendors such as cloud providers or providers of analytics, and also aggregators and other fintechs that will gain access to bank data via PSD2. Again, however, this risk stems from increased use of third parties rather than from Big Data technology itself (see also comments under Question 2, above).

Regulatory authorities should monitor this risk, in particular around third parties sourcing data via PSD2, which will not have contracts with the bank providing the data, limiting the available controls. If these risks crystallise, the most direct way for regulators to intervene would be to increase the licensing requirements and supervision of such third-party providers. Regulatory authorities should also be alive to risks stemming from *contracted* third party technology vendors, but we note that many of these are based in third countries, and will not be within the competence of EU regulatory authorities.

It also should be acknowledged that for many consumers, convenience has taken a front seat to security. Consumers have to be adequately educated in how their behaviour online may be increasing the risks of their data being compromised.

14. Would you see merit in prohibiting the use of Big Data for certain types of financial products and or services, or certain types of customers, or in any other circumstances?

We do not think that prohibiting the use of Big Data for certain products, customers or services is appropriate.

We note that the direction of regulation is towards increased use of data rather than less extensive use. This includes use for the purposes of assessing affordability or the suitability of a product (MiFID rules require investment firms to collect and analyse large amounts of data in order to identify the best product for a customer) and for the prevention of fraud, money laundering and other financial crime. It would not be desirable for these benefits to be unavailable in respect of certain products, customers, etc.

We accept that there is a risk that use of Big Data could result in the development of more complex products and recommendations that could be difficult to explain to the customer or might lead to an erroneous recommendation where data is inaccurate. However, the response to this should be for the firm to assess the use of the particular Big Data technique in that context and determine whether it is fair on the customer and meets other overarching legal requirements. Where this would not be the case, that Big Data technique should not be used. Every firm has a responsibility to act correctly and protect the reputation of the industry.

This involves a use case by use case analysis, as should be done before launching any new product or service, rather than a blanket prohibition. In order to protect customers, the focus should be on the outcomes for the customer and the behaviours of firms rather than the specific technologies used. As with all products and services, firms should act to protect vulnerable customers.

Digital and financial education can also play a part in helping consumers engage better with Big Data and firms that employ such techniques.

15. Do you agree that Big Data may reduce the capacity of consumers to compare between financial products/services? Please explain your response.

There may be some degree of trade-off between personalisation of products and comparability, particularly where (theoretically) products adapt depending on the customer's behaviour.

The important point for firms to consider is that they must be transparent in how they use customer data, in the characteristics of their products and services, and be able to explain any advice and the reasons behind any personalisation of a product. We believe that the risks of reduced comparability are already addressed in legislation such as MiFID II and PRIIPs, which address cost transparency including the potential effects of costs on performance.

Furthermore, we are also witnessing the emergence of online comparison tools that assist customers to analyse products and choose the one for their particular situation. While at this stage they are more common in some EU jurisdictions than others, Price Comparison Websites (PCWs), with the right data inputs, can provide useful guidance to the customer. We note that PSD2 and data portability (GDPR) will increase customers' ability to share their data with third parties, including with PCWs, leading to more personalised comparisons of products. In the context of the UK we note the emergence of the 'midata' service for personal current accounts as an early example.

16. How do you believe that Big Data could impact the provision of advice to consumers of financial products? Please explain your response.

As noted above, in addition to enabling more powerful analysis by issuers of financial products, Big Data could also facilitate the development of third party analytical and advice tools, including PCWs.

Nonetheless, banking is still (and will mostly remain) centred on human interaction. Banks will continue to serve both the digital savvy and clients who wish for branch-based advice.

Digital developments can enhance the advice-giving process by:

- Reducing the time needed to produce product / offering advice, which helps advisors to better socialise products with customers;
- Reducing human errors, which helps customers, as well as the company by reducing complaints;
- Improving customer relationships - the customer is 'better known' by the firm and hence does not have to repeatedly explain their situation, for example when there is a change of client advisors / relationship manager; and
- Improving the audit trail of interactions with consumers via digital channels.

Nonetheless, it will be important for firms to still recognise customers as individuals with specific interests, needs and requirements that might not be so readily factored into a data-driven analysis. Similarly, firms need to ensure that customers still feel they are treated as individuals.

17. How do you believe Big Data tools will impact the implementation of product governance requirements? Please explain your response.

Big Data will likely have a significant impact on product governance. As products become more complex, governance arrangements will need to keep pace to ensure suitability, monitor product performance, check algorithms and confirm data protection compliance, for example.

18. How do you believe Big Data tools will impact know-your-customer processes? Please explain your response.

This is a key use case for Big Data technology. Firms will be able to better understand customers and their behaviour (individually and collectively), enabling for example more effective segmentation of customer groups. By combining data from various sources, firms will also be able to accommodate and analyse a wider range of factors such as interactions with business partners or a customer's ability to influence the market.

See also comments under Q16.

19. What are key success factors for a Big Data strategy (i.e. the adaptation of the business model/plan towards Big data driven technologies and methods)?

As with data strategies more broadly, the key will be to set up effective governance, monitoring and risk assessment procedures. Firms will also need to identify and address any unintended impacts quickly and to ensure they engage the specialised skills required. This is best achieved through an extensive testing and monitoring program. Efforts to develop and employ Big Data tools will need to be integrated with the firm's broader data strategy.

20. What are the greatest future challenges in the development and implementation of Big Data strategies?

There are several key challenges:

- Continuing to upgrade technological capabilities at a sufficient rate while maintaining agility;
- Ensuring data governance keeps pace with expanding processing and collection to ensure appropriate treatment of data sets and keeping pace with regulation;
- Communicating with consumers/customers and the public to ensure that they understand how their data is used and have confidence that it is treated appropriately (see also comments above);
- Integrating open source technology;
- Managing third party risks (see also comments above); and
- Attracting skilled employees.
- Establishing a two-way flow of information between banks and the regulators to help firms understand how authorities are making use of Big Data.

21. This Discussion paper refers to a number of measures and tools meant to ensure compliance with conduct and organisational regulatory requirements as well as data and consumer protection rules in the context of big data analytics. Are other measures and tools needed? If so, what are they and what they should cover?

See comments above on providing clarity as to application of data protection rules in Big Data context.

22. How do you see the development of artificial intelligence or blockchain technology in connection with Big Data processes?

We note that some AI technology, such as Machine Learning, can facilitate the processing of Big Data sets, and share many of the benefit and risk characteristics of Big Data.

Blockchain technology is distinct and not inherently linked to Big Data.

23. Are there any other comments you would like to convey on the topic of use of Big Data by financial institutions? In particular, are there other relevant issues that are not covered by this Discussion Paper?

There is a risk that technological capabilities will grow faster than regulatory powers / requirements. This paper is therefore a timely exploration of Big Data issues in the financial services sector.

Picking up on themes raised above, there are nonetheless several areas that could be further explored:

- How firms employing Big Data can interact constructively with customers;
- Engaging customers who prefer not to make use of digital technology and therefore lack a meaningful digital footprint. Such customers may not be easily provided for, where Big Data is a fundamental tool for the delivery of most services; and
- Cyber security issues and hacking.

The ESAs should also work to ensure that financial services institutions can make the best use possible of Big Data. This should include engaging with data protection authorities and the EDPS to ensure that the needs and peculiarities of the financial services sector are fully considered and accounted for in emerging guidance as the GDPR is implemented.

ENDS.