BANKING STAKEHOLDER GROUP

JOINT COMMITTEE DISCUSION PAPER

JC 2016/86

On the Use of Big Data by Financial Institutions

Replies to Questions

BY THE EBA BANKING STAKEHOLDER GROUP

Foreword

The EBA Banking Stakeholder Group (BSG) welcomes the opportunity to comment on the Joint Committee Discussion Paper (JC 2016/86) on the Use of Big Data by Financial Institutions.
This response has been prepared on the basis of comments circulated and shared among the BSG members.

Replies to Questions

Description of the phenomenon

Question 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 understand the use of Big Data.

The big data phenomenon is captured well in the description.

As for the type of entities using big data, the ESAs mention traditional financial services firms, fintech startups and also big tech companies (i.e. GAFA, BATX). Nevertheless, there are entities from other sectors that should be taken into account when analyzing the big data phenomenon, entities that are starting to evidence interest in financial services, like the telecoms industry.

The big data description of the background document links big data to algorithms. Although true, from a technical point of view, it is more convenient to frame the matter in a broader Data Science context, rather than just algorithms. Indeed, algorithms can also be referred to small data or those data that do not exceed the traditional storing and processing capabilities.

Financial institutions are clearly increasing their use of consumer data and there are many potential impacts on the market. The evolution of the use of consumer data by financial institutions depends on various factors, most importantly the willingness of consumers to share their data. One should be cautious with the assumption made in point 7, suggesting that there is an active demand from consumer for new types of services incurring the use of big data in financial services. There might be a consumer demand for more user-friendly and digital financial services, but this is linked more to on-line access than anything else.

With PSD2 becoming effective, third party payment service providers are able to access consumers' payment data on their payment account on behalf of the account holder. This will inevitably increase the innovative use of transactional customer data for providing new services, which is the intention of the European Legislator. Thus, financial institutions are likely to increase their use of consumer data with different potential impacts on the market.

Related to this, there is an issue of tackling asymmetries of data sharing. The Big Data debate appears to rely primarily on new data being shared by consumers. However, there is little onus on banks and other financial institutions to offer commensurate exposure to their data on the quality, terms and conditions and costs of their products and services. There is a vast amount of 'hidden' information that consumers may find helpful in making informed choices about financial products. Because this information is not currently available it makes it very difficult for consumers to affect market power or take more responsibility in the market. Firms should be required to provide much more detailed information about their products in order to re-balance the asymmetry of power.

Some BSG members challenge the notion made in point 15 that "barriers" to data access for firms could lead to higher prices for consumers, poorer quality of products etc. This suggest a built-in bias towards the use of more data, while one could equally argue that those same "barriers" protect consumers from detriment such as price discrimination.

Question 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 to implement big data processes) or between financial institutions or potential new entrants (e.g. Fintechs) using big data processes? Please, explain.

Across sectors (banking, insurance & asset management) we expect increasing personalisation of offers, tailored marketing and the proliferation of new types of services (e.g. peer-to-peer lending, telematics insurance). In particular, we expect sweeping changes in underwriting and claims handling in the non-life insurance area, in creditworthiness assessments and in the payments landscape. Areas like risk management, marketing, fraud prevention or management, or regulatory compliance are highly impacted by the use of big data. Moreover, big data can enable innovation through the development of new products and services that otherwise would not be delivered to customers.

An important fact to bear in mind is that enterprises from other sectors are among those using big data in a more intensive way. Some of these players, like GAFAs, could play a role in financial services (they are already starting to do so in some niches) and regulations like PSD2 will help them to strengthen their role in the financial services field. Financial institutions face strong rules regarding privacy, confidentiality and security. Large financial entities and fintech companies will have an advantage over smaller entities in the initial use of big data processes, which could lead to issues of competition.

As regards the level playing field, if the business is the same, and so is the risk, rules should be the same. Supervisory authorities should follow a supervisory approach that establishes a level playing field for all agents involved, preserving financial stability. One way to ensure a level playing field is to apply the same overarching principles to all actors using Big Data in financial services: consumer data should first and foremost abide by very strict principles such as proportionality, accountability, transparency, lawfulness, loyalty, quality, consent,

privacy, integrity, confidentiality, impact on discrimination and social exclusion. Most of these principles, which can be summarized in the idea of data ethics, are already included in the General Data Protection Regulation (GDPR) recently adopted.

Question 3: Do you offer/are you considering using big data tools as part of your business models? 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); VI) what are the types of data used (personal, anonymised, used data, statistical data, etc; 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)?

Question 4: If you are a consumer or consumer organization, do you witness any of the uses of big data? In what fields?

Some BSG members are consumer organizations. This reply relies mostly on their comments.

Consumer data stemming from on-line behavior, geolocation tools, electronic payments and wearables is fuelling a 'gold rush', which is already impacting consumer's daily financial lives. A telling example is banks requesting access to data stored on a consumers' mobile phone (like contacts, pictures) to install a mobile banking app.

There are many other uses of Big Data by financial service providers:

- Creditworthiness assessment
- Insurance companies will be able to use Big Data for risk assessment in many different fields: health insurance (where consumer's behaviour is tracked and rewarded through wearable devices), car insurance ("Pay as you drive" (telematics)), home insurance,…
- Investment: via robo-investors
- Financial guidance/advice: budget management tools and robo-advisors.

Firms selling consumer data (e.g. banks selling payment data) is in the view of some BSG members another, questionable, practice we witness and a good reminder of how big data could be monetised without tangible consumer benefits. In the view of other members, data protection regulation (GDPR) provides sufficient reassurances against these practices.

Question 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 sector? If so, which barriers?

The traditional model of how business and IT work together no longer fits the field of big data. Integration of legacy systems with Big Data technology is still a big barrier to innovation. Legacy systems are very well oriented to ensure privacy, security and transactionality; regarding privacy and security, there's not a direct mapping when

information is loaded in data lakes or any other analytical storage, and these storages are oriented to make it easier apply machine learning techniques, but not to prevent unauthorized usage of information. Fragmented business processes and distributed data or data silos create challenges for big data, also. Many financial institutions hold large amounts of data in their legacy systems that do not work easily with, for instance, software frameworks used in big data like Hadoop ecosystem. To solve this issue, there are not standard security frameworks so data governance becomes a challenge.

Regulatory framework applicable to Big Data

Question 6: Do you agree with the above short description, 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.

The description is quite accurate. However, there is also another regulation that could be mentioned as an indirect barrier to big data. As big data is at the heart of many cloud services deployments, financial supervisors attitude towards outsourcing is essential. In some jurisdictions, under which banks must notify and obtain the supervisor's approval every time a cloud based project is launched, this process delays adoption of this critical technology. This financial outsourcing regulation is not completely harmonized at the EU level.

Some BSG members consider essential to add requirements which, although they do not directly target Big Data as such, have an indirect impact on Big Data use. These might include:

- Interest rate caps and other financial product pricing regulation: Setting a "maximum price" or some other forms of regulation would impact the "utility" of Big Data since pricing could only be adjusted to a limited extent (something these BSG members see as positive as individual risk-based pricing would lead to massive discrimination).
- Right to access basic financial services: the EU Commission has already passed the right to a "basic bank account". This means that any consumer, regardless of their "profile" have the right to access certain financial products, which are deemed essential for preventing social exclusion. So even if Big Data would suggest that certain metrics like "CLV" (consumer lifetime value) would indicate to the financial service provider that a certain consumer is "not worth" serving, they have no choice but to open a bank account for that consumer.
- Financial product ban: regulators do have, in theory, the power to ban certain financial products altogether. Thus banning a financial product could also mean banning the Big Data analytics underpinning that financial product (especially if it represents a core part of the financial product).
- Anti-discrimination and other broad human rights based regulation: it could be applicable to many future cases where Big Data is used.

The Unfair Commercial Practices Directive forbids unfair commercial practices which are likely to distort the behavior of consumers. In the view of some BSG members, Big Data in the form of targeted advertising, dynamic pricing/price optimization or simply due to its disciplinary power could fall under this provision and thereby nullifying such principles as acting in the "best interest of a consumer" or "understanding a consumer" since the consumer will have been manipulated. The major problem is that it will become very difficult

to identify such practices, especially if they are carried out by autonomous, self-learning algorithms which leave no trace of the ads or price fluctuations they have displayed.

Question 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.

The GDPR is one of the most demanding frameworks of data protection in the world and is designed to directly address many of the concerns rightly identified by the EBA in its Discussion Paper. The GDPR sets an appropriate regulatory framework for the use of consumers' personal data, and this should be relied on and leveraged as far as possible. The Article 29 Working Party (and in due course the European Data Protection Board) will be developing guidance on the GDPR; in the context of this WP29 there is a subgroup on financial matters, to which the EBA may provide guidance in the area of financial services and to assist these bodies to ensure that guidance is appropriate to risks and needs in banking services.

Some requirements introduced by the General Data Protection Regulation (GDPR) might be considered as barriers to big data. For instance, the prohibition of tacit consent, or the requirements related to the data controller obligation to inform subjects about the specific purposes of data processing. In many occasions, in the big data context, it is not possible to know all the future processing purposes from the very beginning. On the other hand, the GDPR is a cross-sector regulation and there is no need for additional specific regulation on the financial sector regarding privacy. Privacy regulations must be sector neutral. As for the GDPR issues that need further interpretation or need to be clarified, data protection authorities should be the ones to take the lead.

For the case that further regulation is introduced to enable the use of big data, it is very relevant to avoid overlapping and inconsistencies with existing regulation –financial and non-financial. On the other hand, the proportionality principle should be followed.

The EU free data flow initiative, which is meant to tackle data location restrictions and to solve emerging uncertainties in the data economy such as ownership, interoperability or standards in the context of non-personal data, should also be taken into account. This is an ongoing initiative under discussion but it should be followed, as it might derive into new legislation.

Cross-sectorial level playing field is also an important objective. It is essential not to establish sector specific guidelines that are only relevant for financial institutions falling within the remit of the EBA, as non-regulated market participants such as Fintechs, digital platforms or other market players with business models relying to a large extend on the use of data increasingly extend their value proposition to financial services. It must be guaranteed that these suppliers will not have competitive advantages regarding the innovative use of consumer data which would allow them to offer (integrated) financial products on more favourable conditions than regulated financial institutions. To this end, the EBA should work with the relevant authorities as suggested above to ensure that guidelines apply to all market participants.

Moreover, some members of the BSG see potential in the use of consumer data for improving consumer and investor protection by putting financial decisions on a more accurate and data-based ground. In this context, there should be the consideration to

facilitate the use of consumer data for regulated financial institutions so that they can improve consumer and investor protection. This would also contribute to the integrity of the financial system in general. The EBA work with Data Protection Authorities and the European Data Protection Board is to ensure that the GDPR is implemented in a way that mitigates the risks identified and meets data ethics considerations, while also ensuring that the potential benefits of consumer data use in financial services can be realised.

Potential benefits and risks for consumers:

Question 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 materializing?

Customer experience in the financial services industry can be significantly improved due to the use of big data. It can facilitate the development and offering of tailor-made products and services based on customer needs, behavioral patterns and preferences. Extracting value from data enables a wider knowledge about the customer that is translated into a personalized and agile service. On the other hand, the innovative uses of data and access to data from different sources and types of data, may have a positive impact on financial inclusion as, for instance, for customers with thin credit records, big data can take into account alternative data that otherwise will not be taken into consideration. Big data also has a positive impact on financial institutions' operational efficiency.

A more data-driven approach can create new opportunities for enhanced consumer and investor protection, e.g. by better assessing the consumer's individual risk appetite and product suitability concerning investment decisions, or for an earlier detection of financial difficulties helping to find viable solutions before problems start. A more data-based approach has the potential to put consumer and investor protection on a more effective basis in comparison with existing instruments. A better knowledge of the customer's situation could also have a positive impact on the credit institutions' overall risk management and thus have a positive effect on financial stability.

In the view of some members, the potential benefits identified in the paper deserve closer examination. This does not mean that the benefits listed by the ESA paper will not materialize, but rather that certain caveats are assorted to these benefits and help identify and understand potential risks. Broadly, the benefits identified by the ESA depend on the resolution of risks around data and algorithmic accuracy, inappropriate profiling and detrimental customer segmentation, and ensuring effective transparency for customers.

Additional caveats that – according to this view --should be highlighted around the benefits identified by ESA include:

35: Tailored/customized products based on consumer data may have a similar effect as the "filter bubble" following the use of consumer data by online service providers (for instance reinforcing an existing behaviour which may not always be in the interest of the consumer).

Granting access to your personal data may be a benefit in the very immediate/short term (for instance, access to a financial product you need) but it is advisable that customers adopt a longer terms perspective in this regard to avoid any detriment.

35-36: Using more data from a variety of sources increases in principle the accuracy of risk assessments. There is however a risk that, if some sources are not used appropriately and taking account of their limitations, they may increase the likelihood of mistakes, errors and inaccuracies. Social networking data, for instance, cannot be deemed as reliable as income statements, since the consumer can actively shape social networking content.

61-65: The degree to which increased cost-effectiveness is passed to consumers, investors, shareholders or an elite within the financial service provider depends, like in other similar cases, on structural characteristics of the financial services industry, in particular its degree of competition. Arguably, conditional to a genuine competitive market environment and market dynamics, part of the benefits would be passed on to consumers.

67: Selling data to third parties may not have only positive outcomes for banks. Certain retail banks have recently tried to change their terms of service to allow them to sell data to third parties and faced severe backlash from consumers, forcing them to backtrack. This shows that clients' trust is essential for financial services providers.

Question 9: Do you believe that big data processes may enable financial institutions to predict more accurately (and act accordingly) the behavior of consumers (e.g. predicting which consumers are more likely to shop around, or to lodge a complaint or to accept claims settlements offers) and 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.

Big data processes may enable financial institutions to predict more accurately the behavior of consumers, and therefore opens the possibility of differentiated pricing across different customers. Aggregators could potentially mitigate many of the highlighted risks and promote comparability of services and help to differentiate between marketing and financial advice. There is a risk for financial institutions derived from data governance frameworks not being fit for purpose and adapted to the era of big data.

Novel risk assessment methods may pose prudential issues in case they have not been thoroughly tested, although they will be subject to responsible lending requirements. National supervisors are responsible for overseeing this. EBA has published guidelines on creditworthiness and affordability. A lack of understanding of how algorithms and artificial intelligence (AI) work may reinforce this risk.

Data sharing may result in data about consumers being used against their interest by certain market players by taking advantage of their situation (for example, vulnerable consumers in debt targeted by predatory lenders). For example, payday lenders may use information taken from a consumer's bank account to facilitate aggressive debt collection practices which take repayments shortly after a consumer has been paid, meaning that they have little money left for essential expenditure. Rather than encouraging responsible lending, if big data facilitates these kind of aggressive techniques it can actually lead to irresponsible lending. If predatory lenders are confident that they can recover the money at low cost then it reduces the incentives placed on them to conduct proper affordability tests before extending credit.

Extending data analytics to information generated by users themselves may pose new moral hazard risks. Some consumers may seek to artificially improve their "scores" via either paying online reputation management companies or by tampering with data generated about them directly. This is a risk linked specifically to Fintechs since several startups have developed lending models based on analysis of social networking data.

If the choice of the type of data used or the way algorithms are configured is badly designed, they may result in exclusion of certain types of clients from access to certain financial services. Depending on the datasets used for assessing creditworthiness, the lack of availability of certain types of data could mean, therefore, de facto exclusion from access to certain financial services. Of course, financial institutions are the first interested in having accurate tools to assess creditworthiness, but it cannot be excluded that an inappropriate reliance on techniques based exclusively on big data may lead some institutions to these types of mistakes.

Question 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 for consumers of financial services in a Big Data context? Please, explain why.

At this time, due to a lack of research/evidence of clear detriment to consumers, there is no need for further regulation stemming strictly from Big Data, over and above those pieces of legislation on privacy already existing or under implementation. Cybersecurity risks are linked to IT systems and are not specific of big data. Financial institutions design a cybersecurity strategy and invest to mitigate these risks. There is already a EU Cybersecurity Directive (NIS Directive), a cross-sector regulation, already fit for purpose and there is no need for specific regulation on cybersecurity for the financial services industry.

On the other hand, the GDPR is already covering some of the risks mentioned, like for instance, customers having limited ability to challenge decisions in the big data context. As highlighted in GDPR, individual customers can not only challenge the decision made by automated means but also have a right to receive an explanation about the logic and consequences of algorithms used, and a right to ask for human intervention. The Data Protection authorities should clarify the extent of explanations and human intervention.Once again, there is no need for specific rules for the financial services industry.

However, as new research/evidences of the materialization of certain risks emerge, the ESAs and European Institutions should not exclude regulatory measures. In the US where the use of Big Data has advanced faster than in the EU, reports from the FTC, the Treasury Department and the Consumer Financial Protection Bureau have flagged certain risks that have materialized and highlighted either the need for new regulation or listed regulatory measures put in place at the federal or state level to mitigate these risks.

Question 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?

Big data could have implications on the affordability of some financial products for some consumers. There might be a need to do an exercise of analysis in order to identify which

products or services could be impacted and which category of customers. However, an important benefit of big data is that it may promote financial inclusion, as when analyzing the customer, it enables to take into account new sources of data. For instance, in the world of microfinance additional data to construct a credit history is very useful to facilitate access to credit.

Regulatory/supervisory authorities could assist consumers having difficulties in accessing financial services by promoting a creditworthiness methodology which promotes financial inclusion, fairness and anti-discrimination. One possibility is making use of an algorithm which can automatically test creditworthiness assessment techniques for certain biases and discriminatory practices.

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

Big data processes may enable financial companies to predict more accurately the behavior of consumers but it should not compromise the overarching obligations of financial institutions to treat customers in a fair manner. Pricing based on customer behavior has been a common practice for a long time. Different prices for different customers for the same product or service is not always a cause for concern. There is a need to analyze pricing practices on a case-by-case basis, as the product and market are relevant elements to take into account. In general terms, a natural consequence of innovative use of customer data is that prices reflect better information, and may be getting closer to perfect competition.

There is nevertheless always a risk that the decisions made do not reflect a consumers' situation due to either inaccurate data or even misleading/faulty correlations.

Big Data also raises, in the view of some members, philosophical questions as measuring risk based on data generated from consumer behavior implies that all decisions are made under the absolute "free will" of the consumer which thereby justify making the consumer "pay" extra for any perceived increased risk. It is postulating that the broader "context" in which the consumer lives, where he/she is exposed to aggressive advertising, consumerism, commercial pressures, play no role in his/her decisions. To give a clear example, a consumer who has an unhealthy eating habit may be offered a health insurance with a higher risk premium. However, there are more and more studies which make a clear link between exposure to advertising and unhealthy eating habits. Why should the consumer pay "extra"? Perhaps the company which promotes unhealthy eating behavior should pay to cover the "extra" risk.

Question 13: Do you agree that big data increases the exposure of financial institutions to cyber risk? 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?

As already mentioned above, it is not really big data, but technology itself, digitalization and IT systems what makes organizations to be exposed to cyber risk. Organizations need to innovate and invest in order to prevent this risk. As mentioned above there is no need for further and specific regulation on cybersecurity for financial services industry. However, as there is an EU-wide Cyber Security Directive, there is a need for coordination at an EU level among cross-sector cyber security supervisory authorities. On the other hand, if financial

institutions could share with their peers certain data (IP addresses, for instance in phishing campaigns) for reasons of fraud or cyber attack prevention, it will help to mitigate cyber risk. Over and above cyber risk, as long as part of big data comes from external sources, supervisory and regulatory authorities should pursue guarantees that entities appropriately monitor the veracity and inalterability of these external data sources.

Credit card details have been a frequent target for hackers. Moreover, theft of non-financial data has also been on the rise. It is not yet clear how data breaches may be monetized by hackers but there are several scenarios which can be envisaged: sale of the account details to third parties, sale of the data to third parties that may have an interest in the data set for data mining/analytics (advertising, predatory lending…), extortion (threatening victims to publicly release embarrassing data), impersonation (attempting to scam close friends and relatives). The UK consumer organisation Which? Recently conducted an undercover investigation into the trading of data, and found that very sensitive information (including financial data) was basically for grabs to firms with bad intentions.

Despite the fact that GDPR requires strong security measures which are complemented in the financial sector with other measures like tokenization (to avoid sharing sensitive information), cybersecurity is a concern that should be high on the priority list of general and financial regulators, as well as of course financial institutions.

Question 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 consumers, or any other circumstances?

Not at this stage. At the moment, a prohibition of this kind would be baseless or arbitrary, as there is no evidence in favor of doing so for certain types of products and/or services or certain types of consumers. However, prohibiting certain uses of big data for types of financial products and/or services should be grounded in well-established criteria such as human rights and anti-discrimination law (as in the case of the ban to use gender in calculating car insurance premiums) or a violation of provisions in upcoming pieces of regulation such as the GDPR.
Potential policy approaches include prohibiting the use of certain parameters in big data analytics which are highly prone to consumer detriment (e.g. certain parameters in health insurance, marital status in car insurance or credit assessments, parameters triggering price optimization).

In its response to the EBA consultation on the *Discussion paper on innovative uses of consumer data by financial institutions,* the BSG has listed a number of principles which could also be considered as criteria to assess the legality and ethical use of data: proportionality, accountability, transparency, lawfulness, loyalty, quality, consent, privacy, integrity, confidentiality, impact on discrimination and social exclusion. Looking at examples of banned big data uses in the US might also inform EU policy makers about applying similar measures, if relevant to the EU context.

Question 15: Do you agree that big data may reduce the capacity of consumers to compare between financial products/services? Please, explain your response.

Big data may lead to a more accurate comparability, particularly with the help of aggregators. Moreover, each financial institution might develop its own big data tools and, thus, the final outcome of a financial product based on big data, does not need to be the same and comparability of products and services would be preserved.

However, since customizing products will also dramatically increase product choice, it may make it harder for consumers to compare offers. Experience shows that in general comparison tools/aggregators develop rapidly to allow consumers to reap the benefits of more product choices, but of course this is conditional upon the emergence and availability of "new" comparison tools enabling consumers to compare customized offers. It is difficult to imagine how such aggregators would work if financial institutions develop their own Big Data solutions based on different algorithms and data sets since the end product will be unique and will not be comparable to any other product.

Question 16: How do you believe that big data could impact the provision of advice to consumers of financial products? Please, explain your response.

Big data can lead to an increase of the provision by automated means of advice to consumers of financial products. If properly designed and monitored, big data algorithms can help to make decisions not relying only on human biases. Natural language processing, which is part of Big Data, can help financial institutions to provide customers with a more homogeneous and consistent advice in many use cases. However, there is a thin line between targeted sales & marketing and providing real advice with the corresponding regulatory protections, which should be kept in mind. Increasing on-line distribution of financial services, assisted by big data analytics, could be further blurring this line.

There may be controversy regarding the liability of automated or semi-automated services (robo-advicesrs or robo-investors) making financial decisions based on data or providing advice based on data depending on how they are categorized. Ensuring the quality and supervisory oversight of the algorithms driving consumer's outcomes is crucial.

Question 17: How do you believe big data tools will impact the implementation of product governance requirements? Please explain your response.

Data Scientists and big data experts should take an increasing role both in product deployment, and especially in product governance.

Question 18: How do you believe big data tools will impact know-your-customer processes? Please, explain your response.

The digital onboarding process can be enriched with big data. Having access to alternative data, from different sources and different types of data and extracting value from it may have a positive impact on KYC processes, as it complements traditional data, although the use of external information sources could arise additional cybersecurity concerns.

As regards the EU anti-money laundering rules, there is a need to harmonise the provisions of the Anti-Money Laundering Directive (AMLD) to achieve its coherent application across Member States and better protect consumer personal data and privacy. The available evidence suggests that some financial service providers collect information from consumers for commercial purposes, using the AMLD requirements as an argument.

Possible evolution of the market

Question 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)?

An organizational alignment and culture that promotes digitalization and big data technologies and an effective coordination of all areas involved in implementing the big data strategy are key. Bearing in mind flexibility and that it is an ongoing process it is also fundamental. Integrating and coordinating "legacy world" with "Big Data world" will also be a challenge.

Question 20: What are the greatest future challenges in the development and implementation of big data strategies?

Big data technologies are tools to achieve solutions not the solution itself, so it is related to means and not final goals. Tools and means should be aligned with goals or solutions. The pace at which organizations adopt big data should be the right one. Moving too fast, especially within areas or units that have not internalized yet digitalization can lead to imbalances or mismatches. Model validation will also be a challenge for the regulator as models will be more and more complex and difficult to validate and they will include a big part of the financial institutions' know-how, whose confidentiality will need to be preserved.

Question 21: This Discussion Paper refers to a number of measures and tools meant to ensure compliance with conduct and organizational 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?

Question 22: How do you see the development of artificial intelligence or blockchain technology in connection with big data processes?

Big data and artificial intelligence need each other. AI can add an intelligence layer to big data to tackle complex analytical tasks. They will evolve together and there is room for convergence. Although blockchain is not directly linked to big data, it can help to enhance security and data quality.

Additional comments

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