BNP Paribas Response to the
Joint Committee Discussion Paper on the Use of Big Data by Financial Institutions
17 March 2017

Description of the Phenomenon

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.

In broad terms we agree with the definition but would point out that Big Data is not such a new phenomenon in the financial industry, as large data sets and powerful IT tools have long been in use in the area of card payments, credit bureaus, and insurance, among others. To that extent, the term "big data" is difficult to define precisely and is likely to evolve in line with developments in technology, customer preference, and industry practices. In this context, we would caution against any premature additional financial regulation on the use big data *per se* at this stage before appropriate evidence-based assessments of its impacts can be conducted and the phenomenon is fully understood. From a regulatory standpoint however, the issue of cyber-security might have to be specifically considered and assigned.

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.

Big data is fundamentally changing the way businesses compete and operate with their data. Financial institutions make wide use of various data sources for marketing, risk scoring, insurance underwriting, investment services, recovery, and a host of other core business activities which often require heavy operations. In this regard, we think that the use of big data and artificial intelligence will have a transformative impact on back office and client servicing operations.

Fintechs are also starting to propose solutions based on the use of big data, with large and small banks becoming their clients and / or partners. Large players in other sectors such as cloud service providers and technology giants also loom. Given these conditions, it is crucial that the technological neutrality of the current financial sector regulation is maintained and its competitiveness not reduced by the introduction of further regulation putting it on unequal footing with other sectors. As an illustration, we would cite that firms providing investment services to clients should be subject to the same rules of investor protection whatever the technologies or algorithms used to provide those services, in particular when advice or portfolio management services are automated /robotized.

EU institutions need to take urgent action to accelerate the uptake of big data and digital platforms for the future competitiveness of Europe. Here we would underline that large investments are required to upgrade

Europe's physical, digital and security infrastructures to meet the demands of EU entities. The EU also needs to ensure a level playing field between established financial institutions and new entrants (for example, more information from these new operators as to how the algorithms they use function) and to foster research and innovation using big data. In this regard, we support a European framework for regulatory sandboxes. This approach can also ensure avoiding any potential negative impact on customers. Moreover, cybersecurity needs to be a top priority in the development of big data use by all players.

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); vi) what are the types of data used (personal, anonymized, 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)?

As a long-established global financial institution with a diversified business model, BNP Paribas uses big data tools as an integral part of its activities. Below we provide several illustrations of different uses:

In capital markets activities, in the electronic trading side, the use of Big Data is fundamental. The liquidity providing models adapt the liquidity posted on the market using machine learning techniques trained on Big Data sets, in order to reduce the adverse selection risks and the Market Impact effect.

In the French retail banking network, BNP Paribas has adopted a pragmatic approach of the "Big Data" as we consider it is a melting of old re-mastered ideas and real new options. Furthermore, the bank has always used data, which is in the DNA of our activity. We have been using data on a very large number of subjects: KYC legal obligations, risk and fraud management, tailor-made commercial offers taking into account the consumer's individual needs, creditworthiness assessment, marketing, reporting to supervisors…

Regarding the use of new techniques (e. g. machine learning) and new fields of data (e. g. external personal data) our pragmatic approach aims at avoiding theoretical concepts and detecting real development opportunities to generate more value to our customers and always with a perfect ethical behavior regarding our data usage. At this stage, this approach is mainly based on live tests of innovative projects or Proofs of Concept (POC).

As an example within the French Retail Banking, the aim of one of these POCs was to improve fraud detection in card transactions. The idea was to see if an algorithmic approach with innovative statistical methods gives better results than the current methodology, which is based on decision rules derived from customer profiles: either through better detection of fraud cases or by lowering "false positive" alerts. This POC was conducted with an external provider of an automated prediction platform with a specific machine learning algorithm. One of the things we learned is that when the number of fraudulent transactions is very low, the machine learning process is more difficult. However on a 3 months test, fraud detection was improved by 35% with machine learning, with a precision level increased by 3 times. We are convinced that the statistics methodology can improve the fraud detection but this technique must be combined with a decision-rules tool to be fully efficient. We decided to first change the decision tool before integrating statistical algorithms.

With regard to insurance activities, big data is essential for the development of our enterprise and of the industry as whole. We use all the data in our possession but also have profession-specific needs such as access to registry of deceased persons in order to facilitate the location of beneficiaries. Access to new data sources through open data enables us to have a deeper knowledge of insurable risks, in particular new types of risks such as cybercrime and those linked to medical advances. Big data also allows us to improve the underwriting and claim-settlement processes, which results in quicker reimbursements to clients.

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?

Non-regulatory obstacles include the large investments required to deliver integrated solutions and the intrinsic sensitivity of processing clients' personal data. Protecting data from security risks is a very considerable concern for financial entities and needs to be built into any Big Data projects, adding an additional layer of complexity. Data is distributed in each Bank legacy systems throughout the organization: these systems do not work easily with other systems. They were never designed to be integrated or to generate real-time insights. It requires time and investment to extract the data out of these "old systems" and put it in a useable form. It requires technological transformation.

Big data can be developed only to the extent that it does not compromise the confidence on which relies the relationship with our clients as well as the security when processing their personal information. Some clients are particularly sensitive with these aspects and reluctant to provide their personal data even for regulatory purposes (e.g., suitability). They require a high level of transparency, in particular on the use of their private data. Banks are rightly very careful in respecting clients' preferences with regard to how their personal data is used. They are also in the process of adapting their processes to ensure compliance with GDPR which will imply the implementation of new processes and additional investments for the use of personal data.

<u>**Regulatory framework applicable to Big Data**</u>

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.

We agree with the requirements put forth in the consultation. Existing European financial regulation is for the most part already appropriate to address the risks of Big Data in a technological neutral way: e.g. requirements to establish and operate sound internal control mechanisms and effective procedures for risk assessment under Solvency II, CRD IV, UCITS, MiFID and AIMFD or conduct of business principles under the GDPR, IDD and MiFID), and where supervisory authorities have the required competences. We would add, however, that Big data and digital platforms require a clear, supportive and common regulatory environment. Fragmentation

needs to be avoided. The new GDPR will help in this regard but companies will need further guidance to implement this regulation efficiently and without deviation. We would also highlight need for regulators to define rules for cloud-based banking activities and note that outsourcing is one of the ECB's priorities in 2017. In addition, as mentioned in our answer to Question #1, BNP Paribas believes that the issue of cybersecurity should be specifically considered from a regulatory standpoint, and this for all stages: data gathering, transmission, storage, processing …

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.

As stated previously, we are in favor of a European framework encouraging regulatory sandboxes (also including insurance activities) to foster research and innovation with big data while avoiding any potential negative impact on customers and any deviation on a level playing field. Incidentally, regarding this last point, there is a level playing field issue in Europe as the UK allows research without the prior consent of clients, something which is not allowed in France and other European countries.

Concerning market activities, we do not think that MIFID will be a barrier to the usage of Big Data technologies. However under MIFID 2, this regulation may impose to the industry a wrong usage of Big data, i.e., negative target markets that will oblige the industry by using big data to pre-determine clients that cannot invest in certain type of products.

In wealth management and retail banking, one concern is that the storage of public/unstructured data is restricted to 1 year in some countries.

<u>**Potential benefits and risks for consumers and financial institutions**</u>

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?

For the Financial Services Industry and its customers the opportunities of Big Data clearly outweigh the risks, as better knowledge about risk exposures leads to greater financial stability and better products and customer services (e.g. customized marketing and better targeting of services and products, extension of insurable risks, improved seed and effectiveness in KYC processes, new customer acquisition and other operational tasks, improved intelligence on cyber risks, and importantly greater financial inclusion and access to credit by allowing better knowledge of consumer behavior which then could facilitate access to credit).

Capital markets: The use of Big Data allows better risk modeling (the possibility to estimate the portfolio risks using data coming from different sources (fundamental data, price dynamic risk factors, micro-structure risk factors, market Impact risk…).

Consumer credit: Strengthened risk management due to better scoring is one of the benefits of big data as used through application scoring based on data sources like Open Data or web browsing (on our websites) on top of "traditional data" coming from the application form enable.

Combating fraud: Big data has brought with it novel fraud detection and prevention techniques such as behavioral analysis and real-time detection to give fraud fighting techniques a new perspective. For example, data analytics can allow banks to gain a deeper understanding of suspicious activities, derive patterns and locate unusual transactions that are helpful in preventing fraud. Data stored by the banks could be potentially helpful in identifying abnormal activities of their clients. For example, if several transactions by the same client take place from different devices during a day, the data generated is a possible justification for a bank to raise an alarm.

Insurance: As stated in our answer to question 3, big data allows better risk assessment and prevention, faster implementation of processes and better results in combating fraud, both of which can contribute to lower prices to consumers. Access to data enables better monitoring of health care evolutions (progress in the fight against cancer, for example). This allows us to better adapt our pricing to the evolution of risks and lets a greater number of individuals suffering from illnesses such as cancer, aids, asthma and others to have access to credit insurance as they can finally be covered.

Better targeting of products / services: Using customer data effectively means banks can deliver more targeted and cost-effective marketing campaigns, design products and offers that are specifically tailored to customer needs. Consumers are willing to share their data if there's value returned. One-way sharing will not fly anymore. As a bank, we are accountable to our clients particularly on how we protect and how we harness their data. Our aim is to be a partner with our clients rather than just a bank.

Rather than only asking how the banks can use data to better target customers, it is necessary to see how big data creates value for customers (shift from asking what big data can do for the bank, to what it can do for customers). Big data can help to augment appropriate products and services, and create entirely new ones that create value for customers by reducing their search and evaluation costs, leading to retention, loyalty and a higher customer lifetime value.

Big Data can help banks to retain customers, for example in maintaining a high quality service experience (idea to create a superior experience), spotting at-risk customers to identify the behavior patterns and paths that lead to customer churn and providing effective retention offers. The addition of data, such as call center, product and ATM logs, allows big data analytics to dig deeper into the service experience. Through the use of sophisticated analytics, companies can discover the details of service experience problems, uncover patterns that lead to churn and correlate offers with outcomes.

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.

We agree in general with the risks of big data described in the paper. However, in our view the consultation theoretically reflects on the well-known risks without examining whether (i) there is yet evidence on the manifestation of such risks in the market (which should be the prerequisite for any regulatory action) or (ii) to what extent potential risks arising from certain unlikely scenarios are already adequately covered by existing legislation (e.g. by the equal treatment directive or genome testing regulation in health).

Citing recent internal research we have conducted (end of 2016), the 1st edition of the BNP Paribas Digital Survey was carried out in conjunction with CSA Research which provides an overall picture of the practices and level of trust in France regarding digital usage.

Beyond the well-known increasing time spent online, this survey reveals several salient points notably that risk-awareness is not putting a stop to practices that expose users to risk. 73% of those polled believed that risk levels on the internet are higher than they were 10 years ago. However, 52% admit to having revealed personal data (contact details or bank account information) online, even though the majority believes that this is a risky thing to do. In fact, 61% of respondents think it is risky to type in their personal data and 50% that they are taking a risk when they enter their bank details in order to make a payment. This paradoxical attitude is also to be found among "digital natives", more of whom – despite being particularly familiar with the codes and practices of the digital era –do not bother to read the conditions of use (79% versus 68%), do not delete their browsing history (69% versus 59%), browse without checking that the site format is HTTPS (67% versus 47%) or use the same password for different accounts (62% versus 48%).

A majority of respondents expressed a desire for assistance in securing their bank data (61%) and their transactions (59%). On the whole, when it comes to protecting their data on the Internet, they place their greatest trust in banks. Fully 77% of the survey respondents mentioned the bank as their most trusted partner to help them protect their banking data and 63% said the same for their personal details in the wider sense. This trust and confidence is reflected in actual *behavior*: checking bank accounts online is the most frequent activity on the Internet, carried out by 77% of the respondents.

In insurance, concerning the risk of exclusion through over-segmentation arising from the use of big data, we would make the observation that Insurance is also based on a degree of randomness. For instance, even if genetic tests indicate a predisposition to a certain illness, there is in many cases no guarantee that it will indeed arise or if it does, when. There is therefore always a degree of mutualization among insurance policy holders while ensuring protection at a fair price. Here again, it should be noted that the best possible knowledge of the risk allows prevention. It is one of the key roles of insurance.

A good knowledge of clients facilitates for example undertaking education / pedagogical initiatives in the area of health: help smokers to quit and promoting regular exercise, for example. It is also possible to assist clients to better guard against thefts, etc. An illustration of these initiatives is the French Insurance Federation (FFA)'s web site ---www.assureurs-prevention.fr --- which aims to raise the public's awareness of the risks they can encounter in daily life. It includes a variety of resources such as videos, personal accounts, documentation on road safety tips, and Q&As on public health issues.

Also in this regard, the use of connected objects will amplify means for prevention by enabling more personalized advice.

Regarding segmentation, it is indeed possible to put in place systems that protect higher risk customers. This has been the case in France since 15 years ago, when big data did not exist. In order to facilitate access to credit insurance for people with increased health risks, the so-called "Belorgey Agreement" was signed in 2001 between banking and insurance professionals, patients' associations, consumer organizations and public authorities. The content of this agreement was improved several times up until 2006 when it was replaced by a new agreement called the "AERAS Convention" ("S'assurer et Emprunter avec un Risque Aggravé de Santé"), which, again, includes many improvements in terms of the previous undertaking. BNP Paribas Cardif, in the context of its Corporate Social Responsibility strategy, is a signatory to the AERAS convention. Since then, its asthmatic clients (among others) have access to mortgage insurance at the best possible rate, despite their

higher health risk. Cardif goes further in accompanying its more « at risk » clients by offering credit insurance to individuals suffering from tetraplegia and coronary pathologies.

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.

It is clear that digital technologies offer development opportunities within the financial services market, but they also give rise to new risks to which consumers are exposed. By definition, financial services imply the handling of consumers' personal confidential and sensitive data. And digital technologies, in particular internet-based technologies, show vulnerabilities. As a consequence, consumers are exposed to new risks such as fraud, abuse or misuse of personal data, privacy risk and cyber criminality. These new risks have to be anticipated and countered in order to develop consumer trust and a sound market.

To do so, a high level of security requirements and common standards should be imposed on all market players in order to ensure the legal and technical certainty of the transactions, and consumers' confidence in providers of financial services. It is for example the case through GDPR, NIS Directive or PSD2 Directive. Beyond that law makers and regulators have to find a balanced approach between maintaining a strong consumer protection and allowing the development of new opportunities. In this endeavor, they should abide by a simple principle: same activities, same rules regardless of distribution channels.

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?

Overall, we believe that big data will have positive impacts for customers in terms of availability and affordability of services and products.

Big data can be used to help industry to ensure that products will be sold to the relevant customers, but also to ensure that products are perfectly adapted to clients' needs. It can also improve consumer access to credit. Indeed, traditional data do not always allow the extension of credit to some more vulnerable sectors of the population. Big data allows having a better knowledge of consumer behavior which can help facilitate access to credit. Also, big data can help make services available to more people by lowering costs and barriers to access. In insurance, for example, the use of big data can allow to fine tune prices and to reduce them, to insure more people and specially to improve prevention in the first place.

Regarding regulation, we would underline that there are sufficient existing regulations already aimed at improving availability and affordability (i.e., PAD, consumer protection regulations…). We do not see the need for additional measures at this point - with a caveat regarding cybersecurity issues.

12. 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 settlement offers) and could therefore compromise the

overarching obligations of financial institutions to treat their customers in a fair manner? Please explain your response.

As stated above, we believe that big data can enable better prediction of consumer behavior, but we see this as a driver for better targeting of products and services, not as a risk of treating customers unfairly. Large banks are required to establish and operate sound and strong conduct and internal control mechanisms. They also must have in place effective procedures for consumer protection and risk assessment under numerous regulations implemented since the crisis. Also, supervisory authorities have the required competences to enforce regulations. Finally, we would underline that consumers have been entrusting banks with their personal data for a long time and expect them to make appropriate use of it. For these reasons we do not feel that there are significant risks for consumers arising from the use of big data by financial institutions.

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?

Cyber risks are a key concern for financial institutions and we are very vigilant in this area. Big data can be another vector that cybercriminals could exploit so banks will need to ensure that the introduction of new infrastructures and technologies is accompanied by appropriate security measures. Conversely, big data can enhance security by helping to improve customer identification and fraud detection as mentioned earlier.

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 there would be merit in prohibiting the use of big data at this stage. Rather the focus should be on effective implementation of existing directives and regulations (e.g., NIS, GDPR, PSD2, e-IDAS…) and on allowing for research in the development of new products and services through the use of big data. As mentioned earlier, regulatory sandboxes can provide the opportunity to do this. Once again, the issue of cybersecurity should be carefully assessed.

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

It should not, given the rules of conduct prevailing in EU (re MIFID & IDD) and the PRIIPs Regulation which was specifically designed to help clients compare products through a standardization of the information on the so-called "packaged products" which are also usually the most difficult to understand and compare.

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

Consumers need to feel confident that their data will be used in a fair, honest, and controlled manner. Big Data can help banks to improve the quality of their data. Banks have a lot of data, and sometimes they just were not using that data or were not paying as much attention to its quality as they now need to. With big data the banks can be sure that the data has the right permissible purpose to serve customers.

Big data can contribute to gaining specific insights through the multiple interactions with clients and better knowledge and anticipation of their needs. Therefore it increases the capacity to design a relevant offering for advisory services, taking into account for example the instruments/ sectors in which clients intend or would prefer to invest in. It can also contribute to capturing their feedback or frustrations and improving the follow up service including alerting on unusual or significant events. Big data also supports the development of automated advice (/ robo-advisors) which is developing in Europe using algorithms to provide different on-line services at competitive prices.

These rising capabilities should however not drive the service providers, whatever their status, away from the set of duties imposed by regulations as regards investor and personal data protection and to overlook the set of obligations regarding the requested personalization and suitability tests constituting advisory services.

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

As mentioned previously, big data can clearly help manufacturers to build products that better match client's needs. However regulators should not use big data to impose a ban on products for certain clients (negative target markets).

See also our response to question 16.

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

Providing that the data are accurate and up-to-date, the use of Big Data tools can help financial institutions to comply with their KYC obligations, in particular the obligation of vigilance in respect of customers and business relationships, and the obligation to report any suspicions to the Financial Intelligence Unit (FIU) in France and similar agencies in other Member States.

Due to the huge volume of banking transactions and customer information, an KYC/AML/FT policy is inconceivable and ineffective without the use of computer tools that allow the automatic filtering of transactions and countries under embargo, as well as the ability to profile and scan customer transactions against AML/CFT scenarios configured by each financial institution (in order to be able to detect suspicious behavior and finally and report AML/FT suspicions to FIU).

However, the performance of computer tools depends entirely on the reliability of the data they contain and their configuration. The development of Big Data technology can be used to collect, share and process a vast quantity of multi-structured data (for example: card payments, withdrawals from ATMs, account consultations via smartphone) and semi-structured data (mails and customer Internet site history), as well as unstructured data from call centers or tele-meetings with advisors. Big Data tools make it possible to analyze transactions very fast and to cross-check them, for example with geolocation data. A thorough predictive analysis of customer behavior can be used to anticipate customer behavior and to enrich the scenarios configured in the profiling AML/FT tools.

In addition, Big Data tools can increase the reliability of customer data analysis by using the technology to find absent data or data that has not been updated in customer records, in order to allow the financial institutions

to comply with their obligation to have an accurate knowledge of their customers and business relationships. The main benefits for the update of customer records through big data tools allow financial institutions to:

- improve their knowledge of their customers on a permanent and continuous basis as the update can be automatized
- decrease the administrative costs linked to such manual research of KYC data, or linked to requests to the customers to obtain the required updated KYC data
- improve the customer experience (no regular requests of information from the financial institution, which can be several times in a same year when the customer has multiple relationships in different business lines within a financial institution not having a common and shared KYC database).

The same benefits can be transposed at the time of the first acceptance of the customer, especially when the financial institutions business model is based on digital processes (Internet, phone…) or through commercial partners, where a short time-to-yes for acceptance is a key success factor in a more challenging and competitive framework.

We would also note that KYC legal obligations rely on official documents (e.g. ID, passport…), external documents (e.g. proof of residency, proof of incomes…), external databases (e.g. anti-money laundering…) and information provided by the customer (e. g. income and assets…). The efficiency of the process could be enhanced by the usage of digitalization allowing delivering a better user experience and combat fraud. Banks should be allowed to access some databases in order to assess the authenticity of information provided by the customer. This access should be granted under very strict conditions and mechanisms (e.g. positive / negative answer) to preserve the confidentiality of the data. Such schemes could also be used to keep KYC elements up-to-date. Digital identity, as defined in the framework of the e-IDAS regulation, will be a critical tool to improve the efficiency of KYC processes.

Possible evolution of the market

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)?

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

We can see several important challenges:

- Ensuring a level playing field among all actors including fintechs and Tech giants
- Providing maximum protection and prevention of cyber risks
- Ensuring an appropriate European data governance in a context of continuous technological evolution and expanding data sets
- Implementing GDPR, in particular, and ensuring that customers and the public understand how their data is used and have confidence that it is treated appropriately
- Integrating open source technologies

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?

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

These developments are critical for the financial industry and its adaptation to the new landscape. However, at this stage, these technologies are evolving under different streams most of the time. But in some cases, one technology is the support for another one: Big data is used as the source of artificial intelligence; blockchain can also be used to secure and automate mass processing of information with a high level of traceability.

Other comments

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?