

Institut des actuaires welcomes the opportunity to comment the European Supervisory Authorities (ESAs) public consultation about the potential benefits and risks of Big Data for consumers and financial firms

- Big Data and actuarial science do mutually reinforce each other. More data allow for a richer basis for actuarial mathematical analysis, Big Data leads to a dynamic risk management approach
- Not only do actuaries have the quantitative skills but their involvement in everything from pricing to financial reporting gives them the business knowledge to make sense of this. Actuaries benefit from ongoing training.
- Actuaries also developed deontological behaviour through codes of conduct and standards of Actuarial Practice

Also Big Data is important in the marketing area, we would like to point out that it has much to do with other phases of customer relationship: risk management, fraud detection, costs reducing, regulatory requirements etc.

### Questions:

**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.**

We agree to some extent with the description but if the collection of data has become an essential issue, it only makes sense with regard to a relevant exploitation of this data, made possible by so-called "machine learning" or "algorithms".

These algorithms offer the possibility to exploit this massive data that we have in order to extract all available information.

The algorithms have both an explanatory and a predictive role. They must indeed help in effective decision-making by decoding the important message hidden in the data. They also serve to anticipate, because they link one or more variables that one wishes to predict and the available data.

Concretely, algorithms (Neural Networks, Vector Support Machines, Random Forests, Linear Models, etc.) rely on complex mathematical methods to allow computers to perform tasks for which they are not explicitly programmed.

The principle is to separate the mass of data into two bases: a base on which the tested algorithm will "learn" and another on which the predictive quality of the algorithm is tested. The mathematical models underlying the algorithms make it possible to perform classification or regression as required. Classification (supervised or unsupervised) consists of grouping objects or individuals according to their characteristics. The regression consists in determining a mathematical function linking the variables to be explained to the different explanatory variables.

The interpretability and security of models is one of the challenges when manipulating algorithms. These limits stem from the very nature of the algorithms used (complexity of their structure with the capacity to process nonlinear phenomena) and current technical limitations. Great efforts are made to facilitate the exploitability of the results, notably through data visualization or other techniques of presentation of the most explanatory variables.

These algorithms have become the basis for the development of Artificial Intelligence, which is now able to compete with Man in many fields. This Artificial Intelligence is expressed in the creation of

robots to imitate or even replace the human in the financial fields, in particular to limit the risk of error and optimize the management processes.

**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?**

All products and activities will be impacted.

The use of Big Data will influence all activities of all insurance companies:

- Pre-sales: Searching for customers will be made by Big Data driven algorithms; products will be designed with Big Data driven methods and algorithms.
- Sales: Underwriting processes will be widely assisted by Big Data driven algorithms and AI.
- Big Data will and should be used in reserving techniques of insurers, i.e. in the process of calculating technical provisions and eventually solvency requirements.
- After-sales: Especially in the claims processes and in fraud detection, Big Data technologies and AI will be used more and more.

All products will be impacted by changes due to Big Data and Artificial Intelligence, but also possibly because of Blockchain : car insurance with connected cars, home insurance with home automation, agricultural risk with satellites and drones, parametric insurance development modifying the chain of treatment from subscription to compensation etc.

The changes can also come from a shift :

- from B2C to B2B (less ownership and more use, thus less individual and more fleets, with self-insurance in damage) resulting in a contraction of the insurable mass,
- even from B2C to C2C with the emergence of self-insured peer-to-peer communities, which could avoid insurance regulatory framework. This could be amplified by Blockchain.

New Players like Fintechs will participate in parts of the business, but also players in other fields like manufacturers of goods (cars, houses, ...), internet trade companies (Amazon, ...) and others (Facebook, ...).

There is a threat of a lack of a level playing field between established financial institutions and potential new entrants when financial institutions are treated under strong regulation and others might find ways to avoid regulation for (parts of) their business close to the business of the established financial institutions.

For example, in general insurance all kinds of “guarantees” and services around goods – today covered by insurance contracts like household insurance – could be “included” in goods connected with Internet of Things (IoT). Providers of those “inclusions” might avoid the strong regulation and have a big advantage against established insurance industry.

**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.**

The Privacy by design principle included in the General Data Protection Regulation (GDPR) structurally promotes new players. In addition, increasing demands on data regulation, which are sometimes

virtually impossible for insurers in place within the required timeframe (for example, the obligation to provide customers with all data held on them), could give advantage to new players.

New Players like Fintechs will participate in parts of the business, but also players in other fields like manufacturers of goods (cars, houses, ...), internet trade companies (Amazon, ...) and others (Facebook, ...) can offer “insurance-like” or “fragments of insurance” products and services especially in the field of property insurance.

We would like to remind that especially when talking of Big Data we are talking of a really global issue. EU alone could create rules that sound good but it could easily be rules in other countries that would make our European rules obsolete.

### **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)<sup>23</sup>;**
- 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)?**

We can only give general answers to vi) and vii):

vi) In their core business actuaries use anonymised, statistical data to create/ calculate tariffs and to calculate reserves. Gross industry statistics which are offered for example by insurance associations play an important role at least for the quality control.

vii) There is a trend to be seen in algorithms connected to all sorts of decisions: selection of what potential customers should be addressed in marketing campaigns, underwriting processes, claims handling processes and risk management of the companies. Big Data gives the opportunity to use more complex algorithms. A problem will be to understand the results of these complex algorithms – especially for the senior management.

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

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### **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?**

At this stage, we see only cost as a non-regulatory barrier.

### **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.

Insurance business is based on the confidence of customers in the industry. Most of the requirements support the confidence and the credibility of products and services of the industry.

In addition, Solvency 2 is designed to naturally accept this enhanced risk knowledge and provide more specific capital requirements to entities based on their unique risks. Big Data and Solvency 2 should work very well together.

**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.**

We see issues in :

- Differences between requirements towards the financial industry and ones towards other industries competing in the same or similar fields.
- Potential problems in regulatory arbitrage. It is important to think of a situation where Europe bans use of certain info but the USA does not. From a customer's perspective they can buy an insurance policy in the USA where the premium may be lower as the US insurer can use certain data not permissible in Europe to rate the individual. There is no additional risk from the European customer perspective as European regulator has deemed US regulations to be equivalent to Solvency II (and rating agencies will allow another way of comparing) and the policy can be bought over the internet. European IFAs and brokers may even recommend this approach.
- Finding the balance between innovation and safety : in the past, actuaries have by serendipity made contributions of some importance. The GDPR introduces a 'privacy by default' obligation. By default, businesses should only process personal data to the extent necessary for their intended purposes. This unable that kind of contributions. More specifically, regulators need to reconcile data protection and usage : the establishment of 'regulatory sandboxes' is interesting and would allow both regulators and regulated entities in building experience in this uncharted territory. For instance, insurers could play a role in preventing the risk if they were allowed to access and use personal data in a controlled environment.

**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?**

In general, we see very high advantages for the consumers if new models based on Big Data motivate customers to more claims prevention and claims reduction and this is shown credibly in the tariff structure.

Using Artificial Intelligence can also reduce insurance management charges and Improve reliability. Using open data can also enable insurers to improve their internal data through cross-checks

**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.**

It is one of the functions of private insurance to show and to calculate risks as precisely as possible. This creates risk prevention and risk reduction which is an important goal of the society.

We strongly believe that total individualisation of the risk is not viable as with too much segmentation, the risk of mistaking remains greater, and so more capital is needed.

For us, there will always be a minimal pooling size.

Our concern is more about consumer refusal of mutualisation when they consider themselves as “good risks” and don’t want to pay the average price.

**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.**

We see the threat that the regulatory framework – especially if it is exceeded – leads to a (partial) substitution of financial institutions by other non-regulated market participants especially in the field of property insurance. Today’s insurance cover potentially can be fragmented by Big Data techniques and integrated in goods and services of manufacturers, commercial enterprises and “community organizers” and then will not be under a proper regulatory framework

**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 potentially will lead to a reduction of risks in total because of better risk prevention and risk reduction, so that the insurance industry potentially will lose business volume (which of course is not bad!). To prevent a loss of business volume the insurance industry will exceed the possibility to insure all kinds of risks.

**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.**

By using Big Data insurers can obtain a better view of the riskiness of insured individuals or insured property etc. There is much work to do in this area. Models need to be created in predictive analytics to really understand for example the relationship between a person’s shopping basket and his/her health.

Big Data holds the promise to give insurers better tools in dividing insured persons and objects into ever more categories and price them accordingly. This should benefit the society. It should be remembered that we still talk of stochastic risks, i.e. even with all Big Data we still do not know whose house will burn and when. So there is still room for insurance even in the age of Big Data.

**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?**

We agree, that digitalization increases the exposure of financial institutions to cyber risks.

- Cyber (tangible and intangible) risk exposure is increased by storing, exchanging and processing data on ever larger.

- Generalization of data processing by machine gradually eliminates human intervention. The risk is transformed: the dangerousness of rare events increases while the occurrence of frequent human errors is reduced.

All finance institutions should integrate data protection requirements under the DICP criteria (availability, integrity, confidentiality, proof), make the necessary CNIL declarations and take technical measures (encryption type) for the subset of the most sensitive data. This orientation necessitates an important adaptation in terms of organization and implementation of the control processes.

With regard to data providers, one can envisage an equivalent of the SAS70 (Sarbanes Huxley process) which would place responsibility for the data acquisition and not the user. This "as if SAS 70" would take up the DICP topics, finality, non re-identification ....

**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?**

No.

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

We don't agree that Big Data may reduce the capacity of consumers to compare between financial products/ services. It is of course a challenge to insurers to communicate what they are doing to their customers. In the short run consumers can get confused with novel products and practices but we think this is a temporary problem. We believe also that the activities of supervisors, consumer protection organisations, press and others help customers in getting along.

A bigger question might be whether customers are able to correct information concerning themselves on which decisions on their insurability or their premiums are based. Therefore, customers should have the right to know what information concerning them is used and also to challenge that information in case they think it is flawed.

**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 and digitalization in general potentially lead to higher transparency of financial products.

This can also democratize the advice.

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

We believe that there will be an impact especially in the field of long-term products in life and health insurance. On the one hand there is the trend of differentiation via Big Data but on the other hand there is a big need of stabilisation of long-term products during their whole lifespan. This has to be covered by product governance requirements.

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

Know-your-customer processes aim to protect the customer from the provider trying sell products that are unsuitable for the customer. Providers need to be appropriately aware of the needs of their

customers and offer products that are suitable taking into consideration the needs, sophistication etc. of the customer. We think that Big Data will make it easier and cheaper for the provider to arrange its processes.

The processing of personal data must be carried out with the unambiguous consent of the data subject (or be necessary for the conclusion or performance of a contract binding on the data subject, or as a legal requirement, etc.).

We believe also that it will also help to build a long term relationship with the consumer.

**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 a professional organisation we can say that without acquiring good resources in predictive analytics it will be impossible for any firm to make use of Big Data. Our profession has long experience in this area and will continue to be essential not only in insurance but also in other sectors.

BigData projects are by nature transversal whereas organisations are generally structured in silos. It is paramount to organise transversal collaboration through multidisciplinary teams

Big Data will transform organisations and require them to form flexible operating models that can adapt to the insight provided by Big Data techniques.

A successful Big Data strategy requires this kind of flexibility paired with clear goals, adequate resources and cooperation among all business areas. A Data Science team living in a silo and with little communication with other teams will rarely provide useful insight to the company.

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

For institute des Actuaire, main challenge is educational : we believe actuaries have a central role to play in the strategy setting of insurers especially in the age of Big Data. They should be trained on data/algorithms, not only as initial background, but also frequently trained.

**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?**

In all sectors of our societies we see fragmentation of services and providers, made possible by digitalisation including Big Data techniques. Insurance is a heavily regulated sector. It could happen that new entrants could do parts of what has traditionally been done by regulated insurers. Regulators should define what areas of insurance constitute the core of regulated insurance activity. This core should be regulated on a similar manner irrespective of whether it is done by an insurer or by some other undertaking.

With Big Data there is an increasing threat of social exclusion. It is not easy to say how big or relevant this threat. It needs to be monitored so that appropriate measures can be taken if needed.

**22. How do you see the development of artificial intelligence or blockchain technology in**

connection with Big Data processes?

Artificial Intelligence will be used in all kinds of insurance processes in the future – we are only at the very beginning of this change.

Using Blockchain could lead to C2C insurance with the emergence of self-insured peer-to-peer communities.

**Additional 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?

No