29 June 2018

Industry survey - Big Data thematic review

Information about the organisation

Name of the reporting organisation:

Country:

Year in which the organisation was founded:

Total annual Gross Written Premiums (in million EUR) in 2017:

Is your organisation active in motor insurance and/or health insurance lines of business?

Does your organisation have an insurance undertaking and/or insurance intermediary license?

Introduction

Objective

On 15 March 2018 the Joint Committee of the European Supervisory Authorities (ESAs) published a report on the use of Big Data by financial institutions. The ESA's report identified a wide array of potential benefits arising from Big Data Analytics (BDA), both for the industry as well as for consumers. However, new regulatory and supervisory questions do also emerge requiring more in-depth analysis and supervisory oversight going forward.

The objective of this thematic review is therefore to find answers to some of these questions and to gather better understanding about the implications of the use of BDA in decision-making processes, business processes, emerging business models and the different stages of the insurance value chain.

Scope

The present thematic review covers the use of Big Data Analytics in motor and health insurance by (re-)insurance undertakings and intermediaries

Instructions on how to fill the survey

The survey uses deliberately a broad definition on BDA given the varied range of definitions and views about the topic. Indeed there is often not a common approach to clearly delineate the term "Big Data Analytics" from other expressions such as "data analytics", "data science", "artificial intelligence" or "machine learning". Some consider that you cannot separate one from the other. For this reason, the references to BDA in this survey should be understood in a broad sense.

The survey also includes questions on the level of digitalisation of some of your internal processes and procedures on the assumption that digitalisation of such process and procedures will have an impact on the use of BDA in your organisation.

If your organisation is only active on health or motor insurance and not in both, please disregard those questions that refer to the line of business where you are not active.

If your organisation is an insurance intermediary, please only respond to those questions relevant to your business models (e.g. if your organisation is not active across all the stages of the value chain, please only respond to those questions addressing the stages where you are active).

Please focus your responses on data from individual / retail customers, i.e. excluding date from corporate clients. If you cannot separate the data from retail customers and corporates clients, (e.g. regarding the quantitative figures requested in Q14 please use the aggregated figures from your retail and corporate clients).

Please respond to this survey based on your activities in 2018.

Glossary

Big Data Analytics (BDA)*[1]	Large volumes of data that can be generated, processed and increasingly used by digital tools and information systems for making predictive, descriptive and prescriptive analysis. This capability is driven by the increased availability of structured data, the ability to process unstructured data, increased data storage capabilities and advances in computing power
Predictive analysis	Making future predictions by studying recent and historical data
Descriptive analytics	The use of data aggregation and data mining to provide insights into the past and answer what has happened
Prescriptive analytics	The use of data aggregation and data mining to provide recommendations of one or more courses of action and showing the likely outcome of each decision
Price optimisation	Adjustments to the technical price to create the street price using factors which are unrelated to the risk of loss (including the add on of discretionary costs such as fees, charges and commissions)
Pricing or pricing practices	The method and setting of the price. This includes setting the technical price and making any optimisation adjustments including the add on of discretionary costs such as fees, charges and commissions to determine the street price
Rating factor	Any factor that is involved in the process of pricing of an insurance policy, and influences the premium paid by the consumer.
Technical price	Pricing using actuarial rating factors, such as expected claims costs, commissions, expenses, profit load and cost of capital.
Street price	The actual or ultimate price paid by the consumer.
Artificial intelligence*	IT systems that perform functions usually performed by human capabilities. AI can ask questions, discover and test hypotheses, and make decisions automatically based on advanced analytics operating on extensive data sets. Machine learning (see below) is one subcategory of AI.

[1] The terms with an * are based on the definitions used in the report Implications of fintech developments for banks and bank supervisors, BIS, February 2018, https://www.bis.org/bcbs/publ/d431.pdf

Machine learning	Machine learning (ML) is the ability of computers to learn from data through appropriate algorithms. This allows them to build a model of their world and better solve their intended tasks. Approaches of ML can be characterized by the dimensions of the task (differentiating fundamentally between classification, regression and clustering), the data types (special approaches exist for example for text, language and image data) and the algorithms (how is the problem solved technically)
Robo advisors	Phenomenon whereby advice is provided to consumers without, or with little, human intervention and providers rely instead on computer-based algorithms and/or decision trees.
Virtual assistant / Chatbot	A computer program that simulates human conversation through voice commands or text chats or both. Chatbots are typically embedded into messaging applications.
Internet of Thing (IoT)*	Is the networking of telematics devices, vehicles, buildings, and other items embedded with electronics, software, sensors, wearables actuators, and network connectivity that enable these objects to (a) collect and exchange data and (b) send, receive, and execute commands
IoT-based insurance products	Insurance products based on IoT sensor devices to measure consumer's behaviour and environment to perform risk assessments and price discount rewards. For instance, this would be the case of Pay-As-You-Drive (PAYD) and Pay-How-You-Drive (PHYD) products in motor insurance, or Pay-As-You-Live (PAYL) products in health insurance.
Health insurance	(29) Health insurance obligations where the underlying business is pursued on a similar technical basis to that of life insurance, other than annuities stemming from non-life insurance contracts and relating to health insurance obligations"[2]
Motor insurance	(4) Insurance obligations which cover all liabilities arising out of the use of motor vehicles operating on land (including carrier's liability) and insurance obligations which cover all damage to or loss of land vehicles (including railway rolling stock). [3]
Personal data	Personal data' means any information relating to an identified or identifiable natural person; an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person
Non-personal data	Any kind of data different that is not personal data

I. Data sources and BDA tools

The objective of this section is to gather a better understanding of the extent to which new technologies and increased connectivity is creating new data sources and tools that are being used by insurers throughout the insurance value chain in motor and health insurance

Data sources

1. Please select which types of data you use or you expect to use in the next 3 years in your BDA processes in motor and health insurance, and specify in which area of the insurance value chain you use or are going to use such data. Please also explain from what sources you collect such data.

[2] Commission Delegated Regulation (EU) 2015/35 of 10 October 2014 supplementing Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II), pages 227 and 228, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:012:FULL&from=EN

[3] Source see footnote 2

Type of data	Does your organisation use this type of data?	In which line of business do you use this data?	In which area of the insurance value chain do you use it or expect to use it?	From what sources you collect this data?	Explanation
Traditional sources of data					
Medical data (e.g. Medical history, medical condition, condition of family members)	*Drop down list with (i) Already using it; (ii) Expect to use it within the next 3 years; (iii) We have never used it and we don't expect to use within the next 3 years (iv) We have used it in the past but we expect to stop using within the next 3 years*	*Drop down list with (i) motor insurance; (ii) health insurance (iii) both motor and health insurance*	*Drop-down list with multiple choice option with the stages of the insurance value chain*	*Drop-down list with multiple choice option with (i) internal (i.e. your organisation's own data or data directly provided by the consumer to your organisation); and (ii) external (i.e. obtained from third parties) and (iii) both internal and external*	*Please explain how you obtain the internal data sources (e.g., the consumer provides it to you in the pre-contractual stage or you already have it from previous business relationships (in the latter case please specify which business relationships)).* *In the of case external data sources, please specify from which entities do you obtain or expect to obtain such data and what types of records and/or variables to you obtain from them*
Demographic Data (e.g. Age, gender, civil and family status, profession, address)					
Exposure data (e.g. Type of car, value of contents inside the car etc.)					
Behavioural data (except IoT data) (e.g. Smoking, drinking behaviour, distance driven in a year, etc.)					
Loss data (e.g. Claim reports from car accidents, liability Cases)					
Population data (e.g. Mortality rates, morbidity rates, car Accidents)					
Hazard data (e.g. Frequency and					

severity of natural Hazards)					
Other traditional Data (e.g. Credit reference, claim adjustment reports, information from the auto repair shops)					
New data sources enabled by digitalisation					
IoT sensor data (e.g. Driving behaviour (telematics), physical activity and medical condition (wearables).					
Online media data (e.g. Web searches, online purchases, social media activities, job career information)					
Insurers' own digital or digitalised data (e.g. Interaction with insurers (call centre data, users' digital account information, digital claim reports, online behaviour while logging in to insurers' websites or using insurers' app))					
Other digital Data (e.g. Selfie to estimate biological age of the consumer)					
Genetics data (e.g. Results of predictive analysis of a person's genes and chromosomes)					
Bank account / credit card data (e.g. Consumer's shopping habits, income and wealth data)					

Geocoding data (i.e. latitude and longitude coordinates of a physical address)					
Other					
If you have any additional comments on inputs to the table above, please include here.					

Big Data Analytics tools

Purpose of these questions is to understand the extent to which new IT and statistical techniques are being deployed that increasingly delegate decision making to machines in the different areas of the insurance value chain in motor and/or health insurance.

2. Please tell us of any new techniques and tools that you have or plan to put in place that are either designed to access previously inaccessible data (e.g. the use of Artificial Intelligence to analyse unstructured data) or machine learning algorithms (e.g. use of Artificial Neural Networks) in order to harness the benefits of Big Data. For each technique and tool, please tell us:

1) In which area of the value chain you use it
2) If you use it in motor or health insurance (or both)
3) If the tool was built in house, bought off-the-shelf or outsourced building the solution
4) The purpose and the output of each tool

3. Where applicable, please select the relevant box regarding the cloud computing services that you use or you plan to use in your organisation for BDA purposes in the next 3 years.

	We are already using it	We plan to use within the next 3 years	We don't expect using it in the near future
IaaS (Infrastructure as a Service)			
PaaS (Platform as a Service)			
SaaS (Software as a Service)			
Other			

4. Have you identified any obstacles that difficult the use of cloud computing services use by your organisation? In particular, please explain under which circumstances would you consider the outsourcing to a cloud computing service as outsourcing of critical or important operational functions or activities according to Art. 274 (3) of the Delegated Regulation (EU) 2015/35?

II. Use of BDA throughout the insurance value chain (except pricing and underwriting)

The following questions seek to obtain a better understanding about how BDA is used on the different stages of the insurance value chain (other than for pricing and underwriting in motor and/or health insurance). Some questions also aim to asses how digitalised some of your internal processes are and how this might impact your BDA processes

5. In which area of the insurance value chain BDA has had the biggest impact in your organisation to date, and which one do you expect to have a biggest impact in the next 3 years? *Please number the following areas from 1-5 (1=smallest impact, 5=biggest impact)*

	Biggest impact to date	Expected biggest impact in the next 3 years
Product development		
Pricing and underwriting		
Sales and distribution		
Post sales services and assistance		
Fraud and Claims management		
If you have any additional comments on inputs to the table above, please include here.		

Product Development

6. Please provide an overview of how you use or plan to use BDA for product development purposes in motor and/or health insurance and how are they expected to evolve in the next 3 years. Where applicable, please refer to any new types of insurance products and/or business models enabled by BDA (other than IoT-based insurance products).

7. In case you collect data through IoT devices, please specify what type of services you offer your customers through the IoT device, what types of data you collect through the IoT device, and for what purposes do you use such data.

	Type of IoT devices	Type of services offered	Type of data collected	Data usage (other than services specified in 1st column (e.g.

				pricing and underwriting))
In Motor insurance				
In Health insurance				
If you have any additional comments on inputs to the table above, please include here.				

8. Approximately what percentage of your total Gross Written Premiums (GWP) do IoT-based insurance products represent today and what do you expect them to represent in 3 years?

		0-10%	11-20%	21-30%	31-40%	41-50%	>50%
IoT-based motor insurance products	Currently						
	Expected (3 years)						
IoT-based health insurance products	Currently						
	Expected (3 years)						
If you have any additional comments on inputs to the table above, please include here.							

Sales and Distribution

9. Please provide an overview of how you use BDA in your marketing, sales and advice practices in motor and/or health insurance and how do you expect it to evolve in the next 3 years. Where relevant, please refer to new business models and processes enabled by BDA in this area of the insurance value chain.

10. Please select the relevant box indicating which of the following tools BDA has enabled you to use in the sale and distribution of motor and/or health insurance products (or for communication and engagement purposes). Please also explain the purpose and output of each tool.

	Does your organisation use these tools?	In which line of business do you use these tools?	How did you obtain this tool?	Explanation
Robo-advisors	*Drop-down list with (i) Already using it (ii) Expect to use it within*	*Drop down list with (i) motor insurance; (ii) health insurance*	*Drop down list with (i) built in-house; (ii) bought off-the-shelf*	*For those BDA tools that you are already using, please explain*

	the next 3 years (iii) Don't expect to use it within the next 3 years	*(iii) both motor and health insurance*	*from a third party provider; (iii) outsourced building the solution to a third party provider*	*the purpose and output of each tool*
Virtual assistants / Chatbots				
Other				
If you have any additional comments on inputs to the table above, please include here.				

Post-sale services and assistance

11. Please provide an overview of how you use BDA in your post-sales and assistance practices in motor and/or health insurance and how do you expect them to evolve in the next 3 years. Where applicable, please refer to new business models and processes enabled by BDA in this area of the insurance value chain.

12. If your organisation has one or more dedicated smartphone applications ("apps") to interact with the customers in motor and/or health insurance, please specify what type of services are offered through the app, what data is collected through the app, and for what purposes do you use such data.

Apps	Types of services offered	Types of data collected	Data usage (other than services specified in 1st column (e.g. pricing and underwriting))
Mobile phone application 1			
Mobile phone application 2			
Etc.			
If you have any additional comments on inputs to the table above, please include here.			

Claims management (including fraud prevention)

13. Please select the relevant box regarding how you use BDA in the different stages of the claims customer journey in motor and/or health insurance. Please also briefly explain the purpose and output of each tool.

	Do you already use this BDA tools and/or practices?	In which line of business do you use these BDA tools / and/or practices?	How did you obtain this tool?	Explanation
Claims prevention	*Drop-down list with (i) Already using it (ii) Expect to use it within the next 3 years (iii) Don't expect to use it within the next 3 years*	*Drop down list with (i) motor insurance; (ii) health insurance (iii) both motor and health insurance*	*Drop down list with (i) built in-house; (ii) bought off-the-shelf from a third party provider; (iii) outsourced building the solution to a third party provider*	*For those BDA tools and/or practices that you are already using, please explain the purpose and output of each of them*
– Safety warnings push notifications				
– Customer behaviour coaching				
First Notice of Loss (FNOL)				
– (Semi) automated FNOL (e.g. via telematics)				
– Prediction of claims event based on IoT sensor data				
– Biometric customer authentication				
– Chat-box based FNOL				
– Prediction of processing times				
Claims management				
– Prediction of claims characteristics				
– Segmentation of claims by type and complexity				
– Enhanced fraud analytics				*Please develop further in the next question*
Loss assessment and repair				
– (Semi) automated damage value estimation based on picture /video recognition				
– (Semi) automated damage value estimation based on IoT data				

– (Semi) automated damage value estimation based on invoice data				
Claims settlement				
– (semi) automated invoice verification				
– (semi) automated payment processes				
Other				

If you have any additional comments on inputs to the table above, please include here.

14. Please select the relevant box regarding how you use BDA in the prevention of fraud in motor and/or health insurance. Please also explain the purpose and output of each tool.

	Do you already use this BDA tools	In which line of business do you use these BDA tools?	How did you obtain this tool?	Explanation
Claims scoring	*Drop-down list with (i) Already using it (ii) Expect to use it within the next 3 years (iii) Don't expect to use it within the next 3 years*	*Drop down list with (i) motor insurance; (ii) health insurance (iii) both motor and health insurance*	*Drop down list with (i) built in-house; (ii) bought off-the-shelf from a third party provider; (iii) outsourced building the solution to a third party provider*	*For those BDA tools that you are already using, please explain the purpose and output of each tool*
Anomaly detection				
Social media analytics				
Social network analytics				
Behavioural modelling				
Other				

If you have any additional comments on inputs to the table above, please include here.

15. Do you use or expect to use BDA for claims optimisation purposes in order to calculate the value of the claims settlement offers in motor and/or health insurance? i.e. the claims settlement offer provided to the consumer is influenced by BDA tools and processes estimating the likelihood that the consumer will accept or reject the offer? Please explain your response.

III. Use of BDA for pricing and underwriting

Financial inclusion / exclusion

The following information is designed to assess whether pricing between policyholders is becoming more differentiated over time (both from an assessment of the underlying risk as well as the price paid by the consumer). We are aware that any possible trend visible in the figures below can be the result of a high variety of reasons and therefore we will interpret cautiously this information and in combination with other indicators / sources of information.

16. Please complete the following tables for your motor and/or health insurance products. Please enter into the table the situation on 31/12 for 2016 and 2017, and as of 30/06 for 2018.

(Retail) Personal Motor Insurance				
		2016	2017	2018
Policy count	New policies in period			
	End of period			
Average of the annualized premium (**technical price**)	New policies in period			
	End of period			
Standard deviation of the annualized premium (**technical price**)	New policies in period			
	End of period			
Average of the annualized premium (**street price**)	New policies in period			
	End of period			
Standard deviation of the annualized premium (**street price**)	New policies in period			
	End of period			

(Retail) Personal Health Insurance				
		2016	2017	2018
Policy count	New policies in period			
	End of period			
Average of the annualized premium (**technical price**)	New policies in period			
	End of period			
Standard deviation of the annualized premium (**technical price**)	New policies in period			
	End of period			
Average of the annualized premium (**street price**)	New policies in period			
	End of period			

Standard deviation of the annualized premium (**street price**)	New policies in period			
	End of period			

17. Please select the box that shows how the number of rejections of consumers in your organisation (i.e. customers seeking coverage in your organisation and not being offered one) has approximately changed compared to 3 years ago, and how do you expect them to evolve within the next 3 years:

	Motor insurance		Health insurance	
	Evolution in the last 3 years	Expected evolution in the next 3 years	Evolution in the last 3 years	Expected evolution in the next 3 years
- 0-25%				
- 25-50%				
- 50-75%				
- 75-100%				
No change				
+0-25%				
+25-50%				
+50-75%				
+75-100%				
+100%				
If you have any additional comments on inputs to the table above, please include here.				

18. Please select the box that shows how has the number of risk pools (i.e. homogeneous risks groups in the context of pricing and underwriting.) in your organisation has approximately changed compared to 3 years ago, and how they are expected to change in the next 3 years:

	Motor insurance		Health insurance	
	Evolution in the last 3 years	Expected evolution in the next 3 years	Evolution in the last 3 years	Expected evolution in the next 3 years
- 0-25%				
- 25-50%				
- 50-75%				
- 75-100%				
No change				
+0-25%				
+25-50%				
+50-75%				
+75-100%				
+100%				
If you have any additional comments on inputs to the table above, please include here.				

19. Please select how has the number of branches and other physical points of contact between consumers and your organisation has approximately changed compared to 3 years ago, and how do you expect them to evolve in the next 3 years.

	Motor insurance		Health insurance	
	Evolution in the last 3 years	Expected evolution in the next 3 years	Evolution in the last 3 years	Expected evolution in the next 3 years
- 0-25%				
- 25-50%				
- 50-75%				
- 75-100%				
No change				
+0-25%				
+25-50%				
+50-75%				
+75-100%				
+100%				
If you have any additional comments on inputs to the table above, please include here.				

20. Has BDA enabled or you expect that it will enable your organisation to offer insurance coverage to high-risk individuals to whom previously it was not possible to offer them such cover, and vice-versa? Please, explain your response and provide examples from your organisation.

Rating factors

The following information is designed to assess the extent to which various factors influence the premium paid by the consumer as well as how BDA have influenced your pricing and underwriting practices.

21. Please complete the tables below for all rating factors used in calculating the premium for motor and/or health insurance products. Please also explain the degree of influence each rating factor has on the price paid by the consumer and what kind of information do they provide.

Motor insurance products			
	Rating factor	Influence on price paid by consumer	Explanation

	Include all factors that influence the premium paid by the consumer for the insurance policy	*How much influence does this factor have on the final price paid by the consumer for the insurance policy? (low / high)*[4]	*Please briefly explain what kind of information you obtain from the rating factor*
1			
2			
3			
4			
5			
Etc.			
If you have any additional comments on inputs to the table above, please include here.			

Health insurance products			
	Rating factor	Influence on price paid by consumer	Explanation
	Include all factors that influence the premium paid by the consumer for the insurance policy	*How much influence does this factor have on the final price paid by the consumer for the insurance policy? (low / high)* [5]	*Please briefly explain what kind of information you obtain from the rating factor*
1			
2			
3			
4			
5			
Etc.			
If you have any additional comments on inputs to the table above, please include here.			

22. Please explain how the rating factors used by your BDA tools and processes for on boarding new customers differ from those used for renewal offers in motor and/or health insurance. Please list those rating factors exclusively used for calculating the renewal premium.

[4] *high = is approximately one of the 50% most influential factors that you use, low = is approximately one of the 50% less influential factors that you use.*
[5] *high = is approximately one of the 50% most influential factors that you use, low = is approximately one of the 50% less influential factors that you use.*

23. Please explain to what extent BDA enables your organisation to develop micro segmentation or even individual pricing and underwriting practices in motor and/or health insurance lines of business.

24. The increasingly availability of data (see Q1) and the development of more sophisticated IT tools may enable firms to develop new rating factors; please indicate how the number of rating factors used by your BDA tools and processes for pricing and underwriting purposes has approximately changed compared to 3 years ago and how do you expect them to evolve in the next 3 years:

	Motor insurance		Health insurance	
	Evolution in the last 3 years	Expected evolution in the next 3 years	Evolution in the last 3 years	Expected evolution in the next 3 years
- 0-25%				
- 25-50%				
- 50-75%				
- 75-100%				
No change				
+0-25%				
+25-50%				
+50-75%				
+75-100%				
+100%				
If you have any additional comments on inputs to the table above, please include here.				

25. Specific rating factors: Please tick the relevant box if you use the following rating factors to influence the price that consumers pay for their insurance cover in motor and/or health insurance:

	Motor Insurance	Health Insurance
Credit scoring		
Delays in instalments		
Level of education		
Income		

Wealth		
Shopping habits		
Diet		
Social media comments		
Social media network		
Consumer complaints		
Consumer inquiries		
Job stability		
Victim of domestic violence		
Facial recognition scoring		
Genetics data		
If you have any additional comments on inputs to the table above, please include here.		

IV. Consequences of the use of BDA

This section aims to understand what are the opportunities and challenges faced by insurance undertakings and intermediaries in the implementation of BDA. Some questions also aim to assess the actions undertaken by your organisation in order to address some of the key opportunities and challenges arising from BDA.

Opportunities

26. What are in your opinion the main potential benefits for your organisation arising from the use of Big Data in insurance. *For each row, please tick only one box. To suggest other opportunities, please use the space provided*

	Exceptionally important	Very important	Moderately important	Low importance
Enhanced risk assessments				
Risk mitigation and prevention				
Increased customer satisfaction and retention				
Increased customer engagement				
Increased personalisation of products and services				
Lower costs of operations				

Individual pricing				
Faster and real time processes				
Improved fraud analytics				
Regtech – use of BDA for regulatory compliance				
Other				

Other, please specify:

27. Please briefly explain how do you plan to harness the benefits arising from BDA; does your organisation have a BDA strategy approved at Board level? Are there any BDA projects in your strategic plan?

Challenges

28. How relevant are the following BDA-related challenges for your organisation? *For each row, please tick only one box. To suggest other big data challenges, please use the space provided*

	Exceptionally important	Very important	Moderately important	Low importance
Data accuracy issues				
Meeting regulatory requirements				
Fairness / Ethical considerations				
Access to data / data oligopolies				
Consumer trust				
Data portability issues				
Lack of facilities, infrastructure				
Lack of technology / legacy issues				
Shortage of talent/skills				
Reputational risks				
Project risk (e.g. misinterpretation of costumer needs)				
Cyber risks				
Corporate culture				
Fragmentation of the insurance value chain				
New competitors entering the market				
Other				

Other, please specify:

29. Data accuracy / data quality: please explain the governance arrangements that you have in place in your organisation and/or what challenges do you face in order to:
    1) Ensure the accuracy /quality of the data used in your BDA processes, including the data obtained from third parties; how do you ensure the accuracy/quality and lawfulness of the data purchased by third parties / data vendors?
    2) Ensure the robustness and accuracy of the BDA tools that you use per your response to Q2, in particular regarding artificial intelligence and machine learning tools. Please elaborate how you prevent the inference of discriminatory individual's characteristics (e.g. gender, ethnicity, sexual orientation etc.) from the design and data used by these tools.
    3) Please explain the role of your risk management, audit and/or compliance functions in ensuring the accuracy/quality of the data and design of your BDA processes.

30. Fairness / ethical considerations: Please explain what governance arrangements do you have in place and/or what challenges have you faced:
    1) Regarding the use of certain types of data and data sources in your BDA processes, which could potentially be particularly sensible from a fairness / ethical perspective.
    2) How do you prevent discrimination (e.g. based on gender, religion, ethnical origin etc.) in your BDA pricing and underwriting practices and how do you think the fairness of customer outcomes are considered in your BDA pricing and underwriting practices?
    3) How do you address the potential difficulties that some high-risk consumers could face to access affordable insurance because of BDA?
    4) To what extent do you explicitly consider in your BDA processes cross-subsidisation when setting market prices in motor and/or health insurance lines of business – for example, charging new customers less than existing customers?

31. Information and transparency: Please explain what governance arrangements do you have in place and/or what challenges have you faced in order to:
    1) Inform consumers about the types of data used in your BDA processes and for what purposes, in particular regarding the different types of rating factors specified in Q21 and Q26.
    2) Inform consumer how you process their data and the output of these processes, in particular about the outcome of decisions based on a complex BDA tools and processes.

32. Please briefly explain how does the General Data Protection Regulation (GDPR) enable your organisation to address the data quality/accuracy issues, fairness and ethical considerations as well as the information and transparency issues described in the three previous questions.

33. Please explain to which extent you see large Tech Firms using their global advantage and data capabilities to enter the insurance market in the next 3 years and how could this impact your BDA processes.