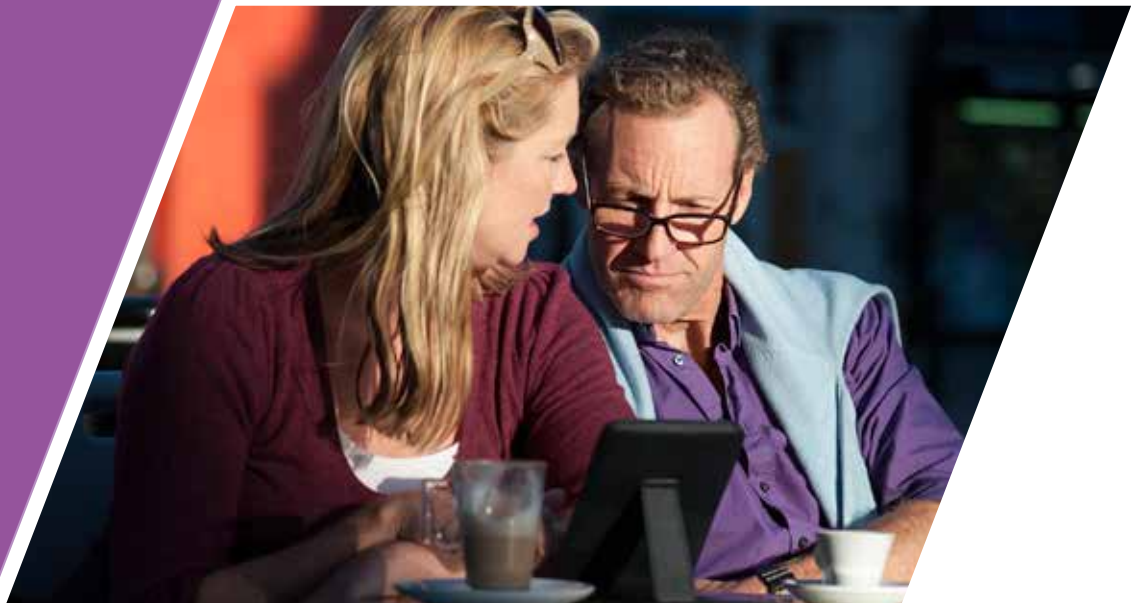


Feedback Statement

FS16/5

Call for Inputs on Big Data in retail general insurance



September 2016

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In this Feedback Statement we report on the main issues arising from the Call for Inputs: Big Data in retail general insurance, published in November 2015.

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Abbreviations used in this paper

BIBA	British Insurance Brokers' Association
Cfi	Call for Inputs
CUE	Claims and Underwriting Exchange
DVLA	Driver and Vehicle Licensing Agency
GDPR	General Data Protection Regulation
GI	General insurance
GLM	Generalised linear model
ICO	Information Commissioner's Office
PCW	Price comparison website

1. Executive Summary

Overview

- 1.1** Insurance firms have always tried to predict and assess risk using information that is available to them. In recent years they have been able to draw on increasingly sophisticated datasets and techniques for predicting risk, including advanced flood mapping data and consumers' shopping data from retail loyalty card schemes, as well as developing their own more detailed databases.
- 1.2** The growth of computing power and computer science means the industry has the ability to manipulate and analyse more complex sets of data than previously possible or economically viable. New developments in technology such as telematics, connected home and the internet of things are in their infancy, but offer the potential to radically expand the data available about customers. These are examples of what we refer to as Big Data, which includes:
- using new or expanded datasets and data, including from unconventional sources such as social media
 - adopting the technologies required to generate, collect and store these new forms of data
 - using advanced data processing techniques
 - sophisticated analytical techniques such as predictive analytics and
 - applying this data knowledge in business decisions and activities.
- 1.3** Big Data raises issues that range from moral and ethical, to how the market may develop or be constrained and how consumer outcomes may be affected. Many of these issues are not new in insurance, but can be accelerated and magnified by Big Data. In theory, some of the outcomes for consumers from better prediction and segmentation could be positive in terms of service and price. However, taken to the other extreme, it could lead to some consumers facing difficulties in obtaining affordable insurance or even undermine the key concept of pooling risk.
- 1.4** In light of these developing issues, we wanted to better understand how the use of data by firms has developed in recent years and how this might change in the next five years. We focused specifically on three areas:
- does the use of Big Data affect consumer outcomes?
 - does the use of Big Data foster or constrain competition?
 - does the FCA's regulatory framework affect developments in Big Data in retail GI?

- 1.5** Our general approach to new technology can be seen through Project Innovate. We want to see the benefits of new technology, innovation and competition realised in the interests of consumers. We want to be sufficiently close to new innovation to understand it and create an appropriate regulatory environment, while not stifling innovation or attempting to define winning technologies. Specifically in relation to Big Data, we want to understand the risks and opportunities it presents. Given the complexity of the environment, we are prepared to play a leading role to ensure regulatory barriers to innovation are managed appropriately.
- 1.6** In November 2015 we published a Call for Inputs (Cfi) on Big Data in retail general insurance (GI), focused on private motor and home (buildings and contents) insurance to gain a better understanding of these issues.
- 1.7** We wanted to use the findings from the Cfi to take stock of the developments in Big Data in GI and then decide whether a market study or another approach is needed, or if no further work is required.
- 1.8** We received 27 responses to the Cfi and held many meetings with a variety of stakeholders. We also analysed data from two price comparison websites (PCWs) to find out whether there have been any changes to price dispersion (the variation in prices for insurance between consumers) and coverage in the last five years, and surveyed brokers specialising in consumers with non-standard risk.
- 1.9** This paper sets out our findings, our response to what we found and our next steps.

Who does this affect?

- 1.10** Although our Cfi focussed on retail GI, we know that financial services firms in other sectors are increasing their use of data. Given this, our findings may be relevant to other sectors of retail financial services where firms are using large amounts of data and analytics to interact with their consumers.

Is this of interest to consumers?

- 1.11** The Cfi considered how firms used consumers' data and how that might impact on retail GI. This will therefore be of interest to any consumers who want a better understanding of how GI firms are using their data.

Our findings

- 1.12** We launched our Cfi on Big Data because we recognised its potential to transform practices and products across the retail GI market. We wanted to understand the current use of Big Data and associated benefits and risks, and how they may evolve in the future. We focused our attention on private motor insurance and home and contents insurance.
- 1.13** We found that Big Data produces a range of benefits for consumers in motor and home insurance. For example, the increased use of data by retail GI firms has encouraged innovation in products and services. In addition, Big Data from telematics has the potential to allow

consumers to change their behaviour in order to reduce their risk and the cost to firms of providing the relevant insurance (known as 'cost to serve'). For example, consumers using motor telematics devices can obtain benefits and lower costs through safer driving.

- 1.14** While our findings were largely positive, we did find concerns about some aspects of the impact of Big Data. While we do not consider that these concerns require us to launch a full-scale market study, we did note there was a lack of clarity among stakeholders as to who should address these concerns. We are not the only interested party, with the Information Commissioner's Office (ICO) and government also having an important role to play. We set out our findings below, including key consumer benefits, key areas of concern and how these will be addressed.
- 1.15 Use of data** – Big Data is being used across the product lifecycle, in pricing, product design, marketing, distribution and sales, claims handling and fraud detection. While firms' underlying pricing models have not changed fundamentally, they are increasingly using additional internal and external data to supplement the information they receive from consumers. This is improving firms' ability to predict the likelihood of an insured event occurring and a consumer's propensity to claim. The most developed example of Big Data in retail GI is car-based telematics devices, but retail GI firms are also exploring using telematics in other areas such as in the home.
- 1.16 Consumer outcomes** – Big Data is bringing a range of benefits to consumers, reducing form-filling, streamlining sales and claims processes, and allowing firms to develop more personalised products to serve customers' needs. In addition, telematics products can provide feedback to consumers to help them manage their risk, lowering insurance costs. We discuss these and other benefits in Chapter 3.
- 1.17** Our work identified two areas where increased use of Big Data has the potential for mixed outcomes with cause for concern that some consumers may be worse off. The first of these relates to how firms assess and categorise the risk of a consumer making a claim (i.e. the likelihood of a claim and the firm's appetite to take that particular risk on). Specifically, the concern is the potential consequences of increased '**risk segmentation**' as a result of Big Data. Risk segmentation has always been a key part of the insurance business. Increased risk segmentation may result in improved outcomes for some consumers, but we are concerned that it could also result in categories of consumers with higher risks that are no longer able to obtain or afford insurance for the risk they represent.
- 1.18** The second concern is about '**pricing practices**' which do not reflect a consumer's risks or the cost to serve. Big Data may improve firms' ability to identify opportunities to charge more to certain types of customer, for example looking at their ability and willingness to pay more i.e. not risk or cost based. This is referred to as 'price discrimination' or 'price optimisation'. It is a common feature in many industries, but can lead to poor consumer outcomes in some circumstances.
- 1.19** This paper discusses risk segmentation and pricing practices separately, given that the effects of Big Data are different in each case and may affect different groups of consumers. In practice, insurance pricing is complex, and brings together a wide range of information to determine the premium. The models used to determine prices will not clearly label which factors relate to risk, which have no relation to risk, and which have some relation but not to the extent factored into the pricing model.¹

¹ For example, data concerning a consumer's income and credit rating may help to predict both risk and sensitivity to price.

- 1.20 Risk segmentation** – Many stakeholders thought that Big Data has the potential to increase risk segmentation, because it can be used to model a consumer’s risk profile more accurately, in order to calculate a more accurate premium. A wide range of different stakeholders thought that increased segmentation could lead to consumers with higher risks being unable to obtain insurance or being unable to afford insurance.
- 1.21** On the other hand, risk segmentation can have positive consequences. Some consumer groups thought more granular risk modelling might benefit some members of groups that are currently perceived to be higher risk, e.g. older or disabled consumers, who can demonstrate that their risk is lower than simpler risk models may assume.
- 1.22** Given the volume of concerns about the effect of increased risk segmentation on consumers’ ability to obtain and afford insurance expressed in response to our Cfl, we undertook some additional analysis to explore what is happening in the market using information from PCWs and brokers.
- 1.23** In the parts of the GI sector we reviewed, our broker survey and PCW data analysis indicated that these concerns are not yet materialising. We recognise that our analysis does not look at particular providers, nor other parts of the GI sector that are not in the scope of our work. As the use of Big Data and sophisticated data analysis becomes more common across retail GI providers, we may see more consumers deemed higher risk who are unable to obtain or afford insurance through more accurate risk modelling, recognising that other consumers may benefit from greater accuracy.
- 1.24** It is inevitable that risk segmentation will not always operate in favour of all consumers. For example, more detailed data and increased segmentation in home insurance meant some consumers living in properties with a high risk of flooding faced difficulties in finding affordable cover. In response, government put in place a scheme – Flood Re – to ensure affordable insurance is available to these consumers. However, we may begin to see other groups of consumers emerge that face similar difficulties in obtaining insurance in the future. Big Data’s enhanced identification of those risks may make this issue more prevalent and, as segmentation becomes more granular, it may become more difficult to detect the groups of consumers affected and find a suitable solution.
- 1.25** In these situations, there is a tension between what may be desirable from a social policy perspective and of the public good, and the commercial reality that firms will not wish to offer insurance that is not economic to supply. In other words, the balance of when to require that customers be offered insurance should most appropriately be decided by government in consultation with regulators and other stakeholders. We will remain alert to the potential exclusion of higher-risk customers, and will engage with government if we become aware of these concerns developing because of Big Data. We discuss the topic further in the risk segmentation section in Chapter 3.
- 1.26 Pricing practices** – We also asked about pricing decisions that are based on reasons other than risk or cost in our Cfl – for example, whether prices increase or decrease if the consumer is predicted to be unlikely to shop around.
- 1.27** Alongside this feedback statement, we are publishing Occasional Paper 22 on price discrimination and cross-subsidy in financial services, which sets out in more detail the economic analysis of the topic. Charging different prices to different consumers for reasons other than risk or cost is a practice that is common in many markets. Price discrimination is not necessarily problematic, but in some circumstances it can lead to concerns about the outcomes for consumers.

- 1.28** Some stakeholders have raised concerns about this practice in retail GI. We also came across issues relating to such pricing practices in separate FCA work on insurance renewals, where evidence suggests that the length of time a customer has had a policy may be the key factor in persistent high prices, rather than the underlying risk or cost.
- 1.29** In the course of this Cfl, we received limited responses from GI firms about their use of Big Data in pricing practices for reasons other than risk or cost. To assess whether there is a risk to our objectives from this type of use of data, particularly our consumer protection and competition objectives, we need to understand more fully what pricing practices are commonly used and how Big Data will change the pricing models.
- 1.30** To build our understanding of how these developments are affecting the market, we will start a piece of work later this year to look at the pricing practices of a limited number of firms in retail GI. At this stage this work is discovery, and we would only intervene if we identify one or more market issues where we think a regulatory intervention would improve outcomes. We discuss this in the pricing practices section of Chapter 3.
- 1.31** **Competition** – We did not find that the growing use of data currently limits effective competition in motor and home insurance. However, pricing practices not related to risk or cost can be a symptom of underlying competition issues – for example, firms may be able to price in this way because some consumers are finding it difficult to search for and/or act on a better deal. In addition, we did not identify that Big Data currently raises barriers to entry for firms, such as creating difficulties in accessing complex datasets. We also did not find evidence that consumers using telematics currently experience difficulties in switching providers nor complaints from firms relating to the lack of portability of telematics data. However, we recognise this has the potential to occur in the future.
- 1.32** We set out our full competition findings and highlight emerging issues that have the potential to restrict competition in the future in Chapter 4.
- 1.33** **Regulatory framework** – Stakeholders did not think any changes to our regulatory framework were needed, and noted that the FCA supports innovation in the market. However, some stakeholders expressed concerns about data protection rules and the use of data. Available research suggests that consumers are cautious about sharing their data and have some concerns about their use. Some firms told us that they choose not to use some consumer data in pricing because of these concerns. We discuss this further in Chapter 5.
- 1.34** We recognise the importance of data protection and the ICO's leading role in this area. We will therefore co-host a roundtable with the ICO to discuss with relevant stakeholders the use of data in retail GI and how data protection rules are applied.

Next steps

- 1.35** Having considered the responses and information we examined in our Cfl, we have decided not to launch a full market study at the present time. We consider the increasing use of Big Data is broadly having a positive impact on consumer outcomes, by transforming how consumers deal with retail GI firms, streamlining processes and encouraging more innovation in products and services. However we have decided to take forward two key actions to further engage with industry on the issues we have identified. We will:

- Jointly host a roundtable with the ICO for stakeholders from the retail GI industry including consumer groups with the aim of discussing the increased use of data sources and what data protection risks arise as a result, and
- To better understand developments in the market, we will start a piece of discovery work to look at pricing practices in a limited number of retail GI firms later this year. We will select a range of firms to engage with across the retail GI sector. We will contact these firms in due course. We will also engage with trade bodies and other relevant stakeholders during our work. At this stage this is a discovery piece of work, and we would only intervene further if we identify one or more market issues where we think a regulatory intervention would improve outcomes.

1.36 We will also stay up to date with innovations and developments in the market through our usual supervisory and intelligence activities, and keep the questions around risk segmentation under review.

1.37 We are not proposing any changes to our regulatory framework as a result of the feedback we received.

2. Sources of Big Data

- 2.1** In this section we set out what we mean by Big Data. We also outline the types and sources of new data being used across the value chain in retail GI, focusing on motor and home insurance. We categorise these new data sources into four main groups – proprietary data, data acquired from third parties, social media data and data from connected devices. We also highlight a number of analytical methods that are being utilised by retail GI firms.
- 2.2** This chapter summarises what we were told about data sources and analytical methods. The next chapter discusses the impact of Big Data on consumer outcomes.

What do we mean by Big Data?

- 2.3** Our Cfi focused on the use of Big Data in retail GI. We decided to focus on retail GI because of the extensive use of data within the sector, particularly in pricing. In our Cfi we explained that when we refer to the use of Big Data we mean:
- using new or expanded datasets and data, including from unconventional sources such as social media
 - adopting the technologies required to generate, collect and store these new forms of data
 - using advanced data processing techniques
 - sophisticated analytical techniques such as predictive analytics and
 - applying this data knowledge in business decisions and activities.
- 2.4** During our engagement with stakeholders, we found they did not have a common view of what is meant by Big Data. For instance, some stakeholders consider the phrase Big Data to mean the increasing use and application of existing and new analytical *techniques*. However, others focused more on non-traditional data *sources* such as social media when discussing Big Data.
- 2.5** Given the broad range of definitions and views, we have taken a broad approach to considering issues rather than set criteria to determine when a type, use or application of data constitutes Big Data. Further, in our stakeholder meetings we found it more helpful to discuss the issue of data more generally including data sources, uses and analytical methods.
- 2.6** We outline below the range of data sources that are being utilised across different parts of the product life cycle.

Data sources and analyses

2.7 Consumers are familiar with the concept of providing personal data to insurers to get a quote. Responses to our Cfl showed that insurers are supplementing this information with an increasing variety of additional data from other sources. New sources of data being used by insurers include:

- proprietary data, e.g. data from connected companies
- data acquired from third parties, e.g. aggregated search engine data
- social media data, e.g. consumer-specific data taken from Facebook or Twitter and
- connected devices data, e.g. telematics devices

2.8 We group the data sources in this way as it reflects the comments we received. However, we are aware that some stakeholders thought about data in different ways, for example distinguishing between structured and unstructured data².

2.9 We outline the data sources, the evolution of telematics products and new types of analyses in more detail below.

Proprietary data

2.10 Some insurance providers have access to personal data about consumers which they or connected group companies have collected outside the sale of the insurance product. They may include information about other products held by a consumer from a firm or companies connected to the firm (which may operate outside of the financial services sector).

2.11 They may also include lifestyle data from other sources. By 'lifestyle data', we simply mean data that are generated by an individual in their everyday life. For example, data can be collected from an individual through the purchases they make under a retail loyalty card scheme.

Data acquired from third parties

2.12 Firms have been using data from external third party sources for some time. For example, insurance providers routinely carry out credit checks using external agencies before finalising the sale of an insurance product. However, we found that the range of acquired data sources has increased extensively in the last decade.

2.13 Some examples of additional data sources that respondents told us about include:

- more detailed flood mapping data
- MyLicence database – licence details directly from the DVLA
- Claims and Underwriting Exchange (CUE) – previous claims records for motor, home and personal injury
- No Claims Discount database
- price comparison website quote and transaction data and

² We consider structured data to be highly organised, for example in a data table or in defined fields. We consider unstructured data to be typically not organised in a pre-defined manner and often to be text-heavy, for example social media postings. Unstructured data may not be readily searchable by simple search algorithms or other search tools when compared with structured databases.

- aggregated search engine data on online search trends.

Social media data

- 2.14** Social media platforms such as Twitter and Facebook have the potential to be a useful source of data to retail GI firms. These data can be publicly available, although this will depend on individual privacy settings.
- 2.15** Using social media data presents several challenges. Finding, categorising and analysing such data can be costly due to the unstructured nature of the data, as opposed to traditional structured databases. Secondly, a lack of confidence in the accuracy of this information may limit its use and suitability for certain applications. Thirdly, firms need to ensure that customers have provided consent in line with data protection law, and also consider whether consumers are comfortable and expect firms to be using social media data (as per ICO guidance discussed further in Chapter 5).
- 2.16** The use of social media data is discussed further from paragraph 5.10.

Connected devices data

- 2.17** Connected devices allow a range of data to be collected and transmitted to insurers directly. Examples include:
- *motor telematics* – devices in vehicles can record GPS location data as well as information from a vehicle's engine management system to monitor all aspects of driving style
 - *home telematics* – can monitor the use and supply of a range of utilities as well as the security of a home and
 - *health monitors* – fitness monitors can record location, movement and other health information.
- 2.18** We look at the growth of telematics in these products below.

Evolution of telematics

Motor telematics

The most developed forms of connected devices are in motor telematics. A small number of insurers started testing 'black-box' devices in the mid-1990s and most insurers were offering a telematics proposition by the 2000s. There have been large increases in the number of telematics policies in the last few years, with a 40% increase between 2014 and 2015 and 455,000 live motor telematics policies in December 2015.³ This represents around 2% of all live motor policies.⁴

³ www.biba.org.uk/latest-news/40-increase-in-telematics-motor-policies-in-a-year/

⁴ Calculated using statistic from ABI – approx. 26.5m live personal comprehensive motor policies in 2015.

Telematic devices range from boxes connected to car engine management systems and fitted by insurers, to mobile apps downloaded by consumers. Telematics devices and mobile apps enable insurers to collect information about the insured risk in real time using the Global Positioning System (GPS) to track the vehicle's movements. In some cases, a box is fitted to the car by the insurer in the first few weeks of the insurance policy. While it differs among devices, the box generally records location, journey duration, and acceleration, braking and driving speed. This information is typically generated at very short intervals creating large datasets.

Motor telematics offer a range of new possibilities to insurers and consumers, and it is expected that the use of such devices will grow. Insurers typically provide consumers with feedback on their driving, often distilled into a driving score. This enables consumers to improve their score, helping to lower risk, potentially the cost of their insurance and possibly reduce accidents. Telematics boxes can also detect an accident, enabling emergency services to be alerted.

Car manufacturers also have the ability to install telematics devices directly into the vehicle. We have seen commercial relationships developing between car manufacturers and insurance firms.

Motor telematics have gained popularity in other countries, particularly the US and Italy (although the reasons for this are very different to those for the UK). In the US, insurance providers offer similar behaviour-based products as in the UK. However, there is also a focus on usage-based insurance where consumers are able to either pay per mile or receive a low-mileage discount at renewal. Italy is commonly considered a leader in the adoption of telematics-based insurance. The increased use of telematics-based insurance in Italy was encouraged both by industry and regulatory bodies to solve some of the issues that have characterised the Italian market in the past (e.g. expensive premiums compared to other European markets and high frequency and costs of claims to insurers, potentially connected to high levels of fraud).

Home telematics

Home telematics – 'smart home' products – are likely to develop further over the next five years. There are already smart home products in the market – for example, Hive and Nest products allow consumers to monitor their heating from their smartphones. Other such products include water leak detectors, smart locks on doors and windows, smart plugs and smart lighting. However, such devices are not yet linked to insurance products in the UK.

Smart home products are gaining popularity in the US. By mid-2015, an estimated 6% of US homes were already connected and 40% of insurers were reported to have invested in some kind of program with a connected device manufacturer in 2015.⁵ Some insurers will offer discounts for homes with qualifying monitoring systems. Some of these monitoring systems are 'smart' products, e.g. connected security devices, and some are just standard security products (such as alarm systems).

⁵ www.fortune.com/2015/12/09/smart-home-insurance/

In Germany, Deutsche Telekom has launched a smart home platform that allows home appliances to be controlled and monitored remotely.⁶ Using this smart platform, Deutsche Telekom has partnered up with Allianz to offer a combination of home monitoring, insurance and emergency assist services when things go wrong. For example, if a water pipe bursts, the consumer's smartphone and Allianz's emergency hotline are notified. Allianz would then organise repairs and pay the bills directly if needed.⁷ Deutsche Telekom has started to offer its smart home platform as a white label product in other European countries, including the Netherlands.⁸

Life/health insurance

Although strictly speaking outside the scope of this work, telematics devices have the potential to make a significant impact on the life insurance sector. Wearable devices collect a range of lifestyle data, e.g. exercise information, GPS and heart rate, and it is likely they will become more popular over the next five years. Insurers could use the data produced by wearables to create more personalised products and to calculate premiums more accurately. Consumers could benefit by being encouraged to adopt healthier habits and subsequently through paying lower premiums. However, this brings new issues for firms to consider, including keeping up to date with technology.

Another development in life insurance is the increase in consumers having DNA screening. Consumers can undergo diagnostic or predictive genetic testing to rule out certain conditions. The Government and the ABI believe the relationship between medical data and insurance underwriting should be proportionate and based on sound evidence. This was highlighted in the Government and ABI's Concordat and Moratorium on genetic testing⁹, which puts in place a framework for insurers' use of predictive genetic test results.

Analysing data to assess and price risk

- 2.20** Most of the firms we met during the Cfi still primarily rely on traditional generalised linear models (GLMs) to assess and price risk. This is a statistical technique used to estimate relationships between the probability of making a claim and different risk factors.¹⁰ We understand this has been the industry standard for around two decades.
- 2.21** However, a small number of firms have told us they use other analytical techniques as well as GLM, for example, to create the inputs to GLM. One insurer told us they use techniques such as decision tree analytics, which is a method of segmenting data based on a series of attributes and values that form a 'decision tree'. Other firms mentioned using non-linear techniques, e.g. machine learning techniques (which involves developing computer algorithms that can grow and change with new data).

⁶ See, for example, Financial Times coverage of this product www.next.ft.com/content/b4ad7ff6-851b-11e4-ab4e-00144feabdc0

⁷ See, for example, Allianz's press release on this www.allianz.com/en/press/news/financials/stakes_investments/news_2014-06-06.html/

⁸ www.telekom.com/media/enterprise-solutions/307274

⁹ www.abi.org.uk/Insurance-and-savings/Topics-and-issues/Genetics/Genetic-testing

¹⁰ It is a generalisation of ordinary linear regression.

3.

The use of data and impact on consumers

- 3.1** In our CfI, we wanted to better understand how the use of Big Data affects consumer outcomes. In this section, we outline how Big Data is being used and how the different uses can affect consumer outcomes.
- 3.2** Consumer impact varies across the different parts of the product lifecycle. We look at each part of the lifecycle in turn. Our key findings are set out below:
- **Product design:** firms are increasingly using data to develop new products and pricing models
 - **Underwriting and pricing:**
 - insurers are using new data sources and new analytical methods, but their underlying pricing models have not changed
 - stakeholders suggested an increase in risk segmentation from new data sources may cause poor consumer outcomes and
 - the increase in data and analytics could make it easier for firms to charge different prices to different consumers for reasons other than the cost to supply
 - **Marketing:** firms' marketing strategies are using data to target customers with suitable products more effectively
 - **Distribution and sales:** external data sources can verify consumers' details at point of sale, and consumers can benefit from easier application processes
 - **Claims handling and complaints:** processes are becoming more digital – for example, claims are being verified using third party data.
- 3.3** We discuss our key findings for each section below.

Product design

- 3.4** Big Data is allowing new products to be offered, although many are still in the early stages of development. Telematics has already enabled insurers to introduce a range of new pricing models. We are well aware of the standard telematics proposition, where insurers use the consumer's driving score to adjust pricing or offer a reward for good driving, such as a discount or other benefit (e.g. retail vouchers), or even cancel a policy due to poor driving. These products have a mileage limit and come with an option to purchase additional miles at a set price. However there are also usage-based 'pay as you drive' schemes, where consumers will be

charged for insurance on a per-mile basis. There are various such products available in the US where consumers are able to either pay per mile or receive a low-mileage discount at renewal, and, we have recently seen the development of pay per hour insurance in the UK market.

- 3.5** Telematics devices and mobile apps tend to record location, speed and information on driving style, e.g. braking and acceleration. Some providers collect more sophisticated data than others. We were informed that, with more analysis, insurers could build up a picture of precisely where and when accidents are more likely to occur, e.g. by analysing sharp braking trends of particular stretches of road at particular times. Insurance policies could then be adjusted to reflect the specific risk a driver represented, depending on when and where they drove.
- 3.6** We note that a number of firms and other stakeholders commented that motor telematics data may not be easily transferrable. This is because different providers use different devices, which could potentially add cost and inconvenience if a consumer has to have one device uninstalled and another reinstalled each time they switch providers. Two firms told us that consumers own much of the driving data and could request it from their provider. However, there is not a common standard for recording driving data. Additionally, as one firm explained to us, another insurer may not be able to use the data because it is difficult to condense meaningfully (many insurers record driving data on a per second basis) and each insurer will interpret driving behaviour differently.
- 3.7** Some stakeholders mentioned that EU eCall legislation may resolve the issue of telematics standardisation. The Directive requires eCall technology to be installed in every new car from April 2018. This technology will automatically communicate a car's exact location and direction of travel to emergency services in the event of a serious accident¹¹. However, the European Commission has pointed out that eCall is not a black box and does not constantly record the position of the vehicle¹², so cannot be used in the context of standardising telematics data.
- 3.8** For home insurance, home telematics devices are not yet having an impact on insurance pricing, but firms are starting to explore how they might link smart home data to insurance premiums in the future. Home telematics offer the potential to detect potential issues, such as leaking or freezing pipes or open doors/windows, which may help to reduce risk.

Our response:

Motor telematics is the most prominent example of Big Data affecting product design that we found in this exercise, albeit home telematics may soon follow.

Innovation can often benefit consumers. However, it also has the potential to adversely impact consumers' ability to assess and/or switch products.

Impact on ability to assess products

Consumers may find it hard to understand and compare information on products and price. For example, in motor telematics, consumers can purchase additional bundles of miles if they exceed their policy limit. As such, it is important that consumers can compare the cost of purchasing additional miles, so they understand the implications of going above the policy limit. It is also

¹¹ The European Parliament has approved the implementation of the eCall technology on every car from April 2018. This system will be installed for emergency purposes. The 'Ecall' regulation defines this system as an 'interoperable, standardised, secure and open-access platform for possible future in-vehicle applications or services'.

See www.ec.europa.eu/digital-single-market/en/news/ecall-all-new-cars-april-2018

¹² www.ec.europa.eu/transport/themes/its/road/action_plan/ecall_en.htm

important that consumers understand that their driving ability will affect their insurance premium.

We remind firms that they are under an obligation to ensure consumers are given appropriate information about a policy in good time and in a comprehensible form so that customers can make informed decisions about the product proposed¹³. Information which may better enable consumers to make an informed decision includes whether poor driving could lead to a price change or to the policy being cancelled.

Impact on switching – telematics

Several respondents noted that consumers of telematics products (particularly lower risk drivers) may possibly face higher premiums if their telematics data – or the information about their risk contained in it – cannot be transferred between insurers. Compared with the consumer's existing provider, other insurers have less information and therefore may offer a higher initial premium, at least until they can collect their own telematics data on the consumer. A consumer who tries to switch insurers could incur higher initial premiums compared with their current telematics policy, deterring them from switching. There may be new products in the future that raise similar concerns, such as home telematics insurance.

We have not received any evidence that consumers using telematics currently experience difficulties in switching providers nor complaints from firms relating to the lack of portability of telematics data. However, we recognise this has the potential to occur in the future if telematics increase in popularity.

We are aware that there have been industry discussions about standardisation, which we note has not yet found an appropriate solution. We would strongly encourage the industry to consider further how best to address this issue, as ownership of data should not become a barrier to effective competition. Should ownership of telematics data become a barrier to switching in the future, this is an area where we would consider use of our competition powers.

Underwriting and pricing

- 3.9** This subsection looks at the impact of Big Data on underwriting and pricing practices. We specifically consider the issues of risk segmentation and pricing practices.
- 3.10** In this Feedback Statement, we consider that on a simple conceptual basis, it is possible to consider two broad types of insurance pricing, where firms charge different prices to different consumers because of:
- Each consumer's risk (i.e. the likelihood of a claim and a firm's appetite to take that particular risk on) and their cost to serve. We refer to this as 'risk-based pricing'. Through this CfI, we received feedback on how Big Data may affect consumer outcomes through increased risk segmentation in risk-based pricing.

¹³ ICOBS 6.1.5R

- Reasons other than risk and cost, typically in addition to assessing a consumer's risk. For example, even if two consumers had the same risk profile, firms may vary the prices to each consumer based on estimating their price sensitivity and/or propensity to switch. This is also commonly referred to as 'price discrimination' or 'price optimisation'.

3.11 We are aware that in practice it may be difficult to separate out these two types of pricing, since they may use the same information as inputs¹⁴ and be calculated in the same models. However, we have considered them separately in this Feedback Statement because the effect of Big Data on each gives rise to different potential concerns and would therefore be addressed differently.

3.12 In particular, we found:

- an increasing amount of data from a wider range of sources being used in risk pricing
- stakeholders raised concerns about increasing segmentation causing poor outcomes
- these concerns do not seem to be realised yet, as indicated by our analysis of price dispersion and access to insurance based on data from two PCWs and
- the increasing use of data and sophisticated analytical tools may increase the practice of using factors other than risk or cost in pricing for reasons other than risk and cost.

Increased use of data sources

3.13 Most of the retail GI firms we engaged with during the CFI mentioned that a much wider range of third party data sources is being used in underwriting and pricing compared to five years ago. They noted that this is improving the accuracy of models, both in predicting an insurance event occurring and a claim being made, and therefore enhancing pricing accuracy. As we noted above, insurers are using an increasing variety of acquired and proprietary data. For example, third party flood mapping data offers home insurance providers much more comprehensive information on the likelihood of a flood occurring than was previously available. We also came across several firms who are utilising lifestyle data to understand consumers' likelihood of making a claim more accurately. One firm told us it predicts a consumer's likelihood of claiming more accurately from their retail purchase data.

3.14 We heard speculation that the use of social media data will become prevalent in underwriting. Despite this, we did not encounter examples of firms using social media data in underwriting or pricing and most firms said they had no plans to do so in the next five years. There appears to be an additional consideration among firms that this use of data would lead to reputational damage because of consumer disquiet. However, as set out below, social media data are being used in claims handling.

3.15 While firms are using more data sources, their risk pricing models do not appear to have substantially changed. The firms we spoke to are still using traditional pricing models, namely generalised linear models. However, they also described how they are feeding more data and risk factors into their models, and using more sophisticated analytical tools to analyse and process data so it can be fed into their pricing models.

3.16 Some firms outsource parts of their data analysis to other companies, for example to analyse telematics data. Any outsourced analytical research used in underwriting can create risks

¹⁴ For example, income may help to predict both the consumer's risk and their sensitivity to price.

around security and use of data, and we remind firms that they remain responsible for the actions of the company to whom they outsource.

Our response

Using an increased amount of data to more accurately underwrite a customer does not in itself cause us concern, provided collection and use of such data are in line with the ICO guidelines and the Data Protection Act 1998 – in particular that firms processing data must obtain the individual's consent to their personal data being collected and used in the manner and for the purposes in question. Beyond those guidelines, it is for firms to assess whether their use of particular data sources is in line with FCA Principles¹⁵, including treating customers fairly and communicating information to them in a way which is clear, fair and not misleading.

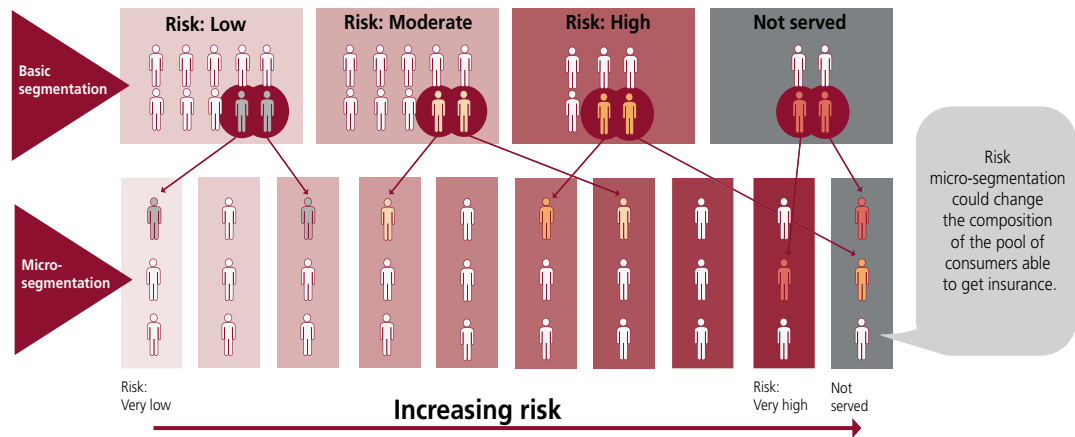
However, the increasing use of data does raise some issues about risk segmentation and pricing practices, which we discuss further below.

Risk segmentation

- 3.17** In our Cfl, we set out our interest in understanding how Big Data might affect risk segmentation practices, and what the impact on consumers of any increased risk segmentation might be.
- 3.18** Some respondents expressed concerns that the increase in Big Data would lead to greater risk segmentation, and that this could result in undesirable outcomes for some consumers.
- 3.19** As background, risk pricing in retail GI is based on grouping together consumers with similar risk profiles (i.e. likelihood of a claim and a firm's appetite to take that particular risk on) and setting premiums based on the risk across the pool. Pools of consumers deemed to be lower risk pay lower premiums, and those in higher risk pools pay more. However, consumers who are deemed particularly high risk may end up facing very high premiums or have difficulty getting insurance.
- 3.20** Risk segmentation is the process by which consumers are subdivided into these 'risk pools' or groups. The more risk-rating factors that insurers take into account in their models, the greater the number of potential risk pools those consumers can be grouped into and so potentially the more granularly risk is assessed. This could include changes in premiums for different consumers.
- 3.21** As a simplified example, consumers who were previously in the same risk segment may be split into smaller risk segments, see Figure 1 below. Those in a lower risk segment could benefit from lower premiums due to the lower average risk of their risk pool. Conversely, those in a higher risk segment could face higher premiums due to the higher average risk of their segment. Assessing risk more granularly could also result in changes in which consumers are offered insurance. Some insurers may decide to serve some consumers who were not previously offered coverage, for example because they were previously considered to have non-standard risk, but insurers may also decide to no longer serve others, particularly those deemed to be the highest risk.

¹⁵ www.handbook.fca.org.uk/handbook/PRIN/2/1.html

Figure 1: Simplified illustration of risk segmentation by an insurance firm



- 3.22** A number of firms stated that Big Data will lead to further risk segmentation. Others commented that further risk segmentation is likely to be based on actual behaviour, for example using telematics-generated data, rather than being estimated by risk factors as is currently the case.
- 3.23** A number of firms have told us that they have increased the number of risk-rating factors they use to price risk over time. For example, one firm said that the number of factors used in its pricing model has increased from approximately 15 factors in the 1990s to over 100 today. In contrast, another firm commented that they did not use many more factors compared with five years ago, but were likely to be obtaining more insight from these factors.
- 3.24** A few stakeholders made comments about increasingly personalised risk pricing, with some firms mentioning that more personalised products might be offered in the future. One data provider commented that there may be 'mass customisation' in the near future, where every individual will be offered an insurance solution designed to meet their needs, taking into account their unique assets and behaviours.
- 3.25** Two stakeholders thought that, at least in motor insurance, there may now be more segments than there are customers, so that each premium is practically priced individually. One firm told us that for motor insurance, models now produce billions of prices for millions of consumers. Some firms also commented that there may be limits to the number of factors that can be considered for risk pricing. One firm stated that more complex pricing models increase the probability that things could go wrong, and instead of *more* data firms may seek *more accurate* data or get greater insight into each risk segment. Despite differing views on risk segmentation, a common theme from the input we received is that increased data and newer analytical techniques should make risk assessment more accurate for each consumer.
- 3.26** Some firms commented that there are likely to be winners and losers from more accurate risk assessments. Two firms noted that there may be increased dispersion in prices to different consumers, i.e. greater variation in prices between consumer groups.
- 3.27** In terms of consumers who may benefit, some firms and consumer groups thought that Big Data could allow insurers to differentiate between individual consumers with non-standard risks, rather than grouping them all together and treating them the same. Insurers may then decide to underwrite some of these consumers rather than not and/or offer them lower prices. This could benefit a wide range of consumers with non-standard risk. Examples given include:

- telematics, which should allow insurers to identify better drivers among young drivers, first-time drivers and those with driving convictions
- for consumers with previous criminal convictions trying to buy home insurance, we were told that two specialist brokers carry out additional risk assessment (e.g. using credit scoring and electoral role data, or using Google searches on publicly available data on a consumer's previous offence) to understand the individual consumer's risk better
- disabled consumers can either struggle to find affordable insurance or gain access to the insurance market as a result of their impairment(s) or condition(s). If used appropriately, Big Data has the potential to improve the outcome for these consumers

3.28 However, in terms of consumers who may lose out, views were mixed on whether some consumers may be unable to get insurance at all. A few stakeholders thought that Big Data may create uninsurable pools of risk. On the other hand, two firms commented that high risk consumers should still be able to get insurance quotes, although the price may be particularly high. Some firms and consumer groups were concerned that at an extreme, individualised risk pricing due to risk micro-segmentation could undermine the pooling of risks that underpins insurance. We discuss our views on potential and future impact below.

3.29 In our Cfl, we highlighted our commitment to the Extra Costs Commission¹⁶ to consider disabled consumers in our work and we are grateful for the continued engagement of Scope throughout the Cfl process. Since publishing the Cfl we have also published Occasional Paper 8¹⁷ on Consumer Vulnerability and Occasional Paper 17¹⁸ on Access to Financial Services (see our response below for more on OP17). Consequently we are particularly interested in the impact of data on increasing risk segmentation and/or more accurate risk pricing on consumers with non-standard risk. Examples include disabled consumers, consumers with unspent criminal convictions and older consumers.

3.30 To gain some high level insight into these groups, we carried out a survey of brokers and analysed data from two price comparison websites. Our findings are set out below.

Survey of brokers who specialise in consumers with non-standard risk

We were interested in identifying trends in the market in terms of coverage and risk segmentation for consumers with non-standard risk. By this, we mean those consumers who may not be able to access mainstream insurance products. As part of our investigation, we carried out a survey of all brokers on BIBA's *Find a Broker* website who are listed as serving the following three groups of consumers: consumers with unspent criminal convictions, disabled consumers and consumers over the age of 85 (151 brokers are listed as serving at least one of these groups). Our survey asked a number of questions about brokers' experience in providing home and motor insurance to these groups of consumers. See Annex 2 for full methodology and findings.

¹⁶ The Extra Costs Commission was established in July 2014 to explore the additional costs incurred by disabled people and families with disabled children in England and Wales. The Commission issued its final report *Driving Down the Extra Costs Disabled People Face* in June 2015 – www.extracosts.org/index.html

¹⁷ www.fca.org.uk/publication/occasional-papers/occasional-paper-8.pdf

¹⁸ www.fca.org.uk/publications/occasional-papers/occasional-paper-no-17-access-financial-services-uk

In our survey, we asked about coverage across these three groups of consumers. We were particularly interested in seeing if the growing use of data has led to changes in the provision of insurance for these consumer groups. We received a response rate of 25%¹⁹, so the results should be interpreted with some caution. The responses suggest that coverage has broadly stayed the same over the past five years across these three consumer groups. We also asked the brokers whether the number of risk factors from underwriters has increased over the past five years. The findings of our survey do not show that brokers are seeing an increase in risk factors. This suggests that an increase in risk segmentation is not yet apparent to brokers. However, as discussed in Chapter 3, we have been informed by various insurers that the number of risk factors they use has increased over the last five years.

We also found some inconsistencies in which brokers cater for these three groups of customers. Based on our survey, some firms do not cater for the groups of consumers that they are listed as doing on the BIBA website. BIBA has agreed to work with its members to ensure the database is up to date (as they rely on their members to advise them). It is important for brokers to ensure their services are accurately represented on the database to help consumers find a broker who is able to serve them.

Price comparison website data analysis

To better understand the impact of Big Data on consumer outcomes, we gathered consumer-level anonymised quote data from two large PCWs to see if some of the concerns about the use of Big Data can be seen over time – see Annex 3 for more information.

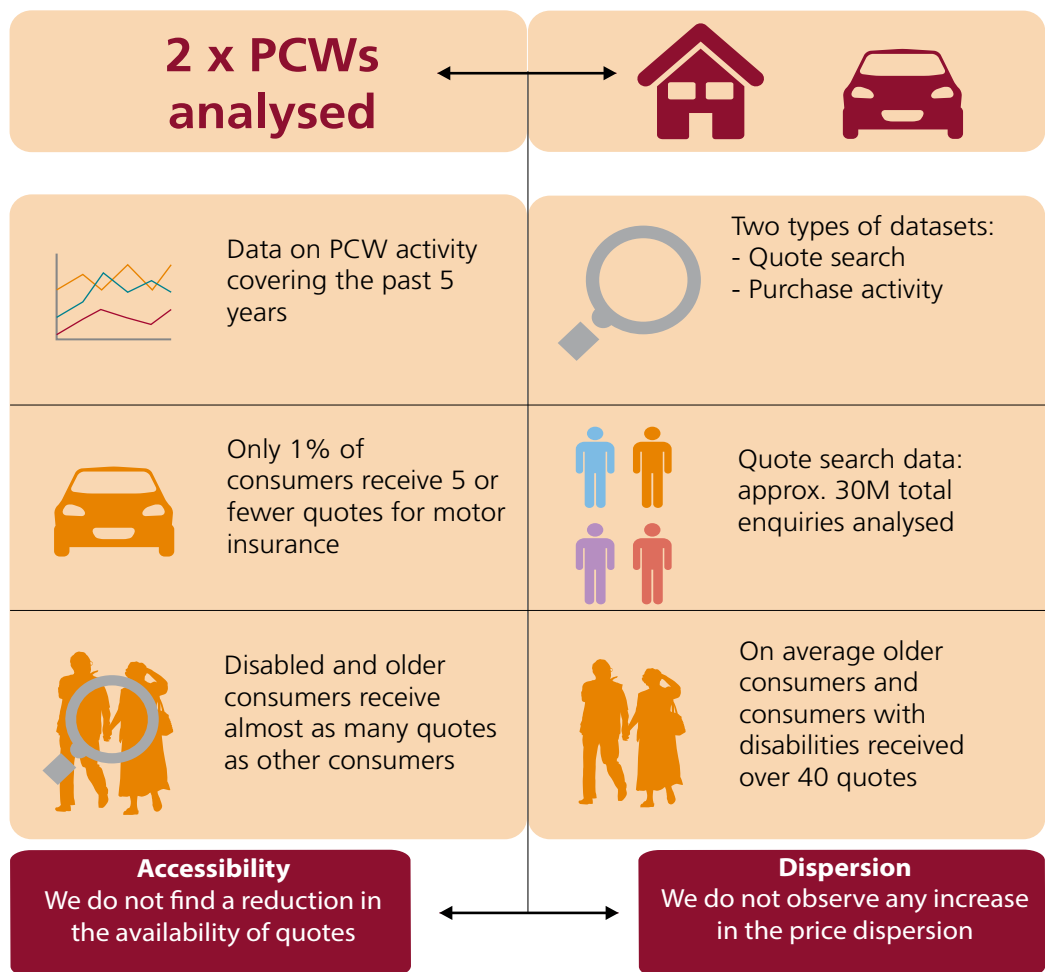
While these two PCWs only represent a portion of the market, we believed they could give us a broad indication of general trends in the market. We looked for evidence that increased risk micro-segmentation led to greater dispersion in prices and decreased the availability of insurance for some types of consumers.

We did not see any increase in price dispersion for both motor and home insurance, based on the portion of the market we looked at. It should not be assumed that there has been no increase in risk micro-segmentation, as firms have told us that they are using additional and more granular data in their risk models. Rather, the effect on prices is either not materially changing the distribution of prices, or there are some other factors that might offset the effect. For example, increasing the amount of data used might allow firms to assess risk with more certainty. This might in turn lead to lower prices, since firms can reduce the amount they priced in for potential errors. However, while the position may change in the future, there do not seem to be significant numbers or particular groups of consumers currently facing large price increases as a result of more accurate risk pricing in the portion of the market covered by our analysis.

¹⁹ 151 firms surveyed; 38 responses received.

We also found that, in general across the sample, the vast majority of consumers received a significant number of quotes for both motor and home insurance. Some consumers got few quotes, and a tiny minority received no quotes at all. We saw that less than 2% of enquiries resulted in fewer than 5 quotes being provided for motor insurance at both price comparison websites.

We also compared the experience of older and disabled consumers. On average these consumers still receive a relatively high number of quotes, 80% of the number of quotes received by other consumers. We also compared quote data with sales data to see if each group could buy insurance at the price of the minimum quotes offered, since we are aware of some concerns that the quotes offered in a PCW may change after entering additional data in an insurer’s website. We found that prices paid for insurance for disabled, older and other consumers were all very similar to the quotes received.



Our response

More accurate risk assessments should reduce underwriters' uncertainty about each consumer's risk.²⁰ This could increase the likelihood of firms being willing to offer insurance to some groups, and may also reduce insurers' overall costs (which, in a competitive market, would reduce overall premiums for consumers).

Improved risk assessments will also lead to consumers buying insurance at a price that more correctly reflects their individual risk or cost, where those who pay less relative to their risk profile are effectively funded by those who pay a higher premium. Therefore, more accurate risk pricing is likely to result in some consumers' premiums going down and some going up.

We recognise that commercial firms will seek to recover the costs of providing goods and services, and consider it reasonable for insurers to try to assess such costs more accurately and seek to recover those costs. Nonetheless, to the extent that this leads to some consumers being unable to obtain insurance or facing very high premiums, we are aware that social policy interventions may be required to address any socially undesirable outcomes.²¹

As described above, we carried out some further analysis to examine whether risk segmentation is increasing. We recognise that our analysis does not cover the full retail GI market, as it only covered one distribution channel and one small group of brokers. However, the information we obtained and analysed gave us some insight into how parts of the market are operating.

Through our broker survey and PCW analysis we did not see any indication that price dispersion is materially increasing. This could suggest that the increasing use of Big Data is not yet resulting in significant price dispersion, as was suggested in the responses to our Cfl.

Our analysis also did not look specifically particular providers. For example, it may be that, even if a consumer cannot obtain insurance with one provider, they still have a number of alternative providers to fall back on. As Big Data and the use of sophisticated analytical tools become more widespread across the retail GI market over time, we may see these issues materialising through certain groups of customers facing difficulties in obtaining insurance at an affordable price, or obtaining insurance at all.

This would then require an assessment of whether the outcomes which arise are socially acceptable, e.g. forming a view on whether consumers who have been deemed very high risk should be guaranteed access to insurance even where that cannot be provided on a commercial basis. This may require cross-subsidies, e.g. where one group of consumers are served at a loss, funded by other consumers who are charged more.²² The answer may differ depending upon which consumers are affected. For instance, is it desirable to cross-

²⁰ In other words, better risk assessments would reduce adverse selection, which is explained further in Chapter 4.

²¹ We consider that these comments refer to the socially undesirable outcomes discussed here. We do not consider separately whether risk segmentation undermines the pooling of risks that underpins insurance. Technically, where insurance is offered, it will continue to rely on pooling risk across many consumers and over time. Consumers who make a substantial claim will continue to be partially funded by others who do not, even where all consumers pay a premium that reflects their individual risk. For example, if a consumer writes off their car, their claim will not be entirely covered by their premium for the year.

²² See our OP22 for further thinking on cross-subsidies.

subsidise insurance for risks that are inherent and which a consumer has no control over (the use of genetics in health insurance) or from unforeseeable changes over which an individual has no control (the impact of climate change on property), as compared to the approach taken to poor driving which the consumer has more control over?

If it is considered desirable to provide cross-subsidised insurance to some consumers, there will also need to be a decision about how any cross subsidy will be made and who will fund it.

One example of where similar questions have been considered is Flood Re, a flood reinsurance scheme set up by government and industry to ensure that consumers living in a flood risk area will still be offered affordable home insurance. As in the case of Flood Re, the approach towards these policy issues, with an element of the public good at stake, is more appropriately decided by government in consultation with us and other stakeholders.

We also note that some stakeholders thought more granular modelling could help reduce the insurance costs for some groups of consumers with non-standard risk, by more accurately assessing their risks which may be lower than insurers currently recognise. We are aware that some specialist consumer groups have formed relationships with insurers to enable this to happen, and we encourage more firms and consumer groups to collaborate in this way.

The broker survey we carried out focused on consumers with non-standard risk, and it did not indicate that Big Data adversely affects consumers of motor and home insurance with non-standard risk as yet. The PCW analysis we carried out also suggested that the number of quotes received by older and disabled consumers had not fallen relative to all other consumers, suggesting that these consumers are not finding it more difficult to access insurance (within the limitations of this analysis). Recognising that practices in this area are still evolving, we will continue to monitor the market through our normal supervisory and intelligence activities for any notable increase in risk segmentation for different groups, although we recognise that it is not always easy to detect groups of consumers who face difficulties getting insurance. If we do identify particular concerns with consumers struggling to obtain insurance, we will highlight this to government as we consider that the balance of when to require that customers be offered insurance, even where commercially that would not be economic, should most appropriately be decided by government in consultation with regulators and other stakeholders.

The issue of access and financial inclusion was discussed in our recent Occasional Paper on Access to Financial Services. This aims to stimulate ideas and foster a culture of access and inclusion throughout retail financial services embracing firms, regulators, the government and consumer organisations. Financial inclusion is a vast topic and one where the actions of the regulator alone cannot address all of the potential issues. Following the launch of the paper we are working to ensure this debate continues internally and externally – including on the issue of access to insurance. This includes continuing dialogue with consumer groups on the extra costs faced by disabled people.

The comments above are based on consumers' premiums reflecting their risk or cost – we discuss how firms may set premiums based on reasons other than risk or cost below.

Pricing practices

3.31 In our CfI, we explained that we were particularly interested in how Big Data might affect pricing practices, particularly where firms charge different prices to different consumers for reasons other than risk and cost. In this subsection, we outline the responses we received and our findings.

Overview of pricing practices

3.32 Firms sometimes charge different prices to different, but similar, consumers for reasons other than risk and cost. In such instances, two consumers with the same risk profile (or, more accurately, the same total cost to supply) could potentially buy the same insurance product²³ at different prices, based on drivers including their sensitivity to price or likelihood of renewal. The consumer will often not be aware of this difference as they only see their own price quote. This pricing practice is sometimes referred to as ‘price discrimination’ or ‘price optimisation’.

3.33 In insurance products, this practice can be implemented at the start of a policy as well as at renewal. There is a wide range of information that firms could use to try to determine a consumer’s sensitivity to price²⁴. Such pricing practices can exist even in markets with many firms, or where firms compete on price for some consumers. Firms may still be able to carry out these pricing practices, for instance, because of brand loyalty or because some consumers find it harder to switch than others.

3.34 Charging different prices to different consumers for reasons other than risk or cost is a practice that is common in many markets and does not necessarily create problems. In some cases, some consumers may not have purchased the product but for the lower prices offered to them under such pricing practices. Whether consumers as a whole benefit from such pricing practices would depend on the specific facts of each case – some consumers may be better off and others worse off as compared with pricing based solely on costs.

3.35 However, there may be instances where such pricing practices raise concerns. For example, we may have consumer protection concerns, if those who face higher prices tend to be vulnerable or older consumers. There may also be competition concerns, for example if pricing for reasons other than cost and risk creates barriers to entry or (at an extreme) forces other firms to exit the market.

3.36 Alongside this Feedback Statement we are publishing an Occasional Paper on price discrimination and cross-subsidy, which provides more detail on the topic across financial services.

3.37 Furthermore, in previous work on renewals in GI, we came across examples of pricing practices where the evidence suggested that the length of time a customer has a policy may be a key factor in persistent high prices, rather than the underlying risk or cost. This may amount to a form of price discrimination.

3.38 In Policy Statement PS16/21, we confirmed new rules and guidance on the steps firms should take when renewing general insurance policies.²⁵ This includes the requirement that firms disclose the previous year’s premium at renewal, alongside the new premium. These changes are intended to prompt consumers to engage, shop around, and make better-informed decisions. The measures will also increase firms’ focus on renewal practices, and, as a result, improve consumer outcomes.

²³ Defining “the same insurance product” can be complex. A simple way to think about this is an insurance product with the same coverage, exclusions and excess.

²⁴ Some information, like income, may help to predict both the consumer’s risk and their sensitivity to price.

²⁵ www.fca.org.uk/news/ps16-21-increasing-transparency-engagement-at-renewal-in-general-insurance-markets

3.39 We previously reminded firms that they need to be able to demonstrate how their renewal pricing in general, and their treatment of long-standing customers in particular, delivers fair outcomes to consumers. We stated that firms needed to consider this as part of their obligations under Principle 6 to treat customers fairly.²⁶

Stakeholders' comments on pricing practices

3.40 During the Cfl, we asked firms how Big Data could impact on pricing decisions based on reasons other than risk or cost (such as likelihood of renewal or price sensitivity). In general, this appeared to be a controversial topic. For example, one intermediary informed us that they were uncomfortable with such practices in insurance pricing. Firms provided little detail to us on this topic in the Cfl process.

3.41 A number of firms told us that Big Data has limited or no impact on such pricing practices (or that they were not aware of any impact). One firm commented that they were currently constrained by existing legacy systems in their ability to use more advanced analytic techniques to model price sensitivity, but they would like to explore this further once they finish upgrading their IT platform.

3.42 We found one instance where a firm carries out analysis more frequently on its pricing practices that are based on reasons other than risk or cost. The firm carried out its analysis on such pricing practices daily, whilst it reviews its risk-based pricing model monthly. For example, this firm reviews its conversion rate (the number of policies sold in relation to the number of quotes provided) and changes the prices in order to influence conversions in particular consumer segments.

3.43 A number of firms commented on the potential to use Big Data to model consumer behaviour, including retention, although one firm believed that this was at very early stages of development compared to the use of Big Data in risk pricing.

3.44 Some other industry stakeholders (but not firms) have also expressed concerns about what they perceive to be the increasing use of pricing practices based on reasons other than risk or cost when policies are renewed.

3.45 Some stakeholders raised the US approach to such pricing practices as a relevant international development (although we note that the US insurance market differs in some respects to the UK). There are State based laws applying to all States (except Illinois) that mandate "*rates (premiums) shall not be inadequate, excessive or unfairly discriminatory*"²⁷. Each State has taken a slightly different approach to implementing the law in regards to pricing, but some have specifically regulated a ban on firms using price elasticity and consumers' propensity to shop for insurance as risk factors in pricing.

3.46 The National Association of Insurance Commissioners (NAIC) – a US regulator created and governed by insurance regulators from all 50 states – has also taken an interest in this topic. In its 2015 paper on the subject, the NAIC recommended that consideration of the following factors are inconsistent with the statutory requirements that rates shall not be unfairly discriminatory: price elasticity of demand, propensity to shop for insurance, retention adjustment at an individual level, and a policyholder's propensity to ask questions or file complaints²⁸.

²⁶ www.fca.org.uk/your-fca/documents/consultation-papers/cp-15-41

²⁷ Explained further in NAIC paper – www.naic.org/documents/committees_c_catf_related_price_optimization_white_paper.pdf

²⁸ www.naic.org/documents/committees_c_catf_related_price_optimization_white_paper.pdf – page 16

Our response

We recognise that Big Data does not specifically cause firms to charge different prices to different consumers for reasons other than risk and cost. However, Big Data could make it easier for firms to do so, by generating more information and providing the means to analyse information better. Our expectation is that the increasing availability of data – including behavioural data – coupled with the increasing sophistication of analytical tools will enable firms to more effectively develop these pricing practices in the future.

The effects of pricing practices that are based on reasons other than cost or risk can be complex and are discussed further in the Occasional Paper on price discrimination. In some cases, pricing practices for reasons other than risk or cost could create concerns for us, particularly if the consumer could be considered vulnerable. We would need to assess in each case whether there is a risk to our objectives, particularly our consumer protection and competition objectives.

In CP 15/41²⁹ on increasing transparency and engagement at renewal markets, we said we expect that firms consider how they are meeting their obligations to treat customers fairly, under principle 6 of our Principles for Businesses. Specifically, we expect firms to consider how their approach to renewal pricing in general, and their treatment of long-standing customers in particular, delivers fair outcomes to consumers. We remind firms about their obligations to consider how their pricing practices impact on their ability to deliver fair consumer outcomes. In order to do this we consider that firms will understand how the tools they use in pricing are impacting on the outcome received by the consumer.

Responses to this CfI have demonstrated contrasting views more generally on the practice of charging different prices to different consumers for reasons other than risk or cost. We want to better understand how such pricing practices operate in the retail GI market, not limited to the impact of Big Data or at renewal.

Therefore, we will start a piece of discovery work later this year looking at pricing practices in retail GI. We will engage with a small number of firms of different sizes across the sector, and will be in touch with relevant stakeholders shortly. At this stage this work serves a discovery purpose, and does not mean we will find that further work is needed. We will consider further intervention if we identify one or more market issues. For example, if consumers do not have sufficient information, firms may exploit behavioural biases as described by our work on behavioural economics.³⁰

²⁹ www.fca.org.uk/publication/consultation/cp15-41.pdf

³⁰ See, for example, our Occasional Paper No 1 www.fca.org.uk/static/documents/occasional-papers/occasional-paper-1.pdf

Marketing

- 3.47** Respondents informed us that Big Data is being used to target customers more effectively using a range of datasets and tools.
- 3.48** We found that:
- firms' marketing strategies are utilising aggregated consumer data and
 - marketing departments are increasingly using data to target customers with suitable products.
- 3.49** Insurance providers told us that they use search engine optimisation as part of their marketing strategies, which is now very common across all sectors. Search engine optimisation is the process of improving the visibility of a website or a web page in a search engine's results, and is an example of the processing and analysis of large datasets. Firms look to ensure their website is highly ranked in search engine results to attract more potential customers.
- 3.50** In addition, a number of firms highlighted that they use aggregated search engine data to analyse potential groups of consumers who may have specific insurance needs. By looking at what consumers are searching for, firms can better understand their requirements and meet their needs. This allows insurers to design and offer products to customers who tend to be under-served by the mass market.
- 3.51** Insurers' marketing departments are also using a wider variety of new analytical tools to target specific consumer groups. For example, one analytics firm described to us how they can enable call centre personnel to sell add-on products more effectively by using systems that analyse client data and highlight customers who are likely to be interested in additional products. Consumer profiles can be analysed mid-call to evaluate a client's likely interest for various add-ons products, automatically informing call centre personnel which products to offer. We were told this ensures that customers are offered products which the firms feel will be of interest to them.
- 3.52** Another insurer explained to us how analytics can be used to help tailor communications and marketing materials. One insurer gave the example that they like to show home insurance offerings on their website to existing motor insurance consumers, but they would like to use analytics to ensure they do not show such products to consumers who are not eligible to buy them. Additionally, firms are now able to record how a customer engages with the information they are presented with, e.g. how long they spend on a given webpage. They can also use customer data to produce personalised marketing and advertising, e.g. using a consumer's first name on their website to make it seem more personal.
- 3.53** A significant proportion of insurers and brokers believe future innovation in data usage will lead to further developments in marketing. Some respondents expected to see more offering of additional products during the sales process and increased tailoring of products for customers.

Our response

We note that an increased ability to market and cross-sell could bring benefits to consumers, for example by increasing the amount of relevant information available to them. However, depending on the circumstances, these practices may also give rise to consumer harm by leading consumers to purchase products that are not necessarily what they need or are poor value.

For example, Big Data is being used to enhance cross-selling at the point of sale, when the consumer is less likely to shop around. Where firms are planning on using Big Data in marketing to present additional or add-on products during the sales process, there is a greater risk that consumers may not shop around and/or may be less price-aware than they would be when choosing a standalone product. This can mean consumers end up spending more, or buying a product that does not suit their needs. Firms should be clear about their target market and design products that meet the needs of end customers in that target market. We also expect firms to take account of the final rules and guidance set out in the General Insurance Add-Ons Market Study Policy Statement PS15/22.³¹

The Market Study³² identified that competition was not working well for consumers in retail GI add-on markets, which led to consumers paying too much for their add-on products. To address our concerns, we proposed publishing a value measure to incentivise firms to improve product value and will shortly be piloting a scorecard of information to increase transparency.

Distribution and sales

- 3.54** An increase in data use across the industry has had an impact on sales processes in retail GI:
- the increasing popularity of price comparison websites has changed how a lot of consumers search for insurance
 - firms are increasingly using external data sources to verify consumer information and
 - consumers can benefit from an easier application process as external data sources are increasingly used to pre-fill application forms.
- 3.55** PCWs have been around for over a decade, but they are a clear example of how increased use of data can affect consumers. PCWs can interrogate a wide range of internal and third party databases to produce a vast number of quotes in a matter of seconds, reducing search costs for consumers by providing multiple quotes quickly and in one place.
- 3.56** Firms are also using data during the sales process in other ways. Insurance providers are now able to use a variety of data sources to verify consumer information during the sales process. For example, the MyLicence database can be used to verify licence details and check for any penalty points or disqualifications using data directly from the DVLA. Additionally, firms can

³¹ www.fca.org.uk/static/fca/documents/policy-statements/policy-statement-15-22-general-insurance-add-ons.pdf

³² www.fca.org.uk/news/general-insurance-add-ons-market-study

search on the Claims and Underwriting Exchange for previous motor, home or personal injury claims. The Motor Insurance Bureau, who manages CUE and other industry databases, has also developed a No Claims Discount database that replaces the need for motor insurers and policyholders to manually exchange information.

- 3.57** A significant number of firms have commented that, in the near future, Big Data should make it even easier for consumers to obtain quotes. These firms think that automation should reduce the amount of information consumers have to provide to get a quote, particularly for consumers who search for quotes online. For example, data fields could be pre-populated from data sourced automatically and reliably from other databases holding information about a consumer, their car or their house.

Our response

Generally, we find that PCWs have made searching for and purchasing motor and home insurance more convenient for consumers³³. More innovations to reduce the amount of time and effort required from consumers to obtain an insurance quote should make it even easier for consumers to access price and product information.

However, we are aware of PCWs' limitations. Based on our 2014 thematic review,³⁴ we found that some PCWs were falling short of our expectations and that consumers were focused on the headline price when using PCWs, as opposed to the extent and quality of cover. We are exploring issues related to PCWs more widely in a piece of work we are leading on for the UK Regulators Network, and we plan to feed into the CMA's analysis of PCWs.³⁵

It is positive that the industry is implementing solutions to ensure that consumers' details are recorded accurately. These developments have the potential to save consumers time and effort when purchasing insurance, as long as the data sources are reliable and accurate. However, detriment to the customer may be high where firms do not accurately record data, as this could result in high premiums which do not reflect the underlying risk/cost or the consumer not being offered insurance due to a piece of false information. If the consumer is unaware that false information is being used, the consumer will be unable to take steps to address the false information held.

If communicating to consumers why decisions have been made, for example if insurance is not offered, firms should be mindful of Principle 7 and the requirement to be fair, clear and not misleading in these communications.

Claims handling and complaints

- 3.58** Firms are using a wider variety of data sources to assist in claims handling and fraud prevention:

³³ The CMA private motor insurance market investigation (2014) found that between 55 and 65% of new business comes through PCWs (final report, paragraph 53).

³⁴ www.fca.org.uk/news/tr14-11-price-comparison-websites-in-the-general-insurance-sector

³⁵ www.gov.uk/government/news/cma-welcomes-competition-plan

- the roll-out of connected devices will assist with claims verification
- claims processes are likely to improve through increased digitisation coupled with the use of connected and other online devices and
- consumers are likely to benefit from more streamlined claims processes.

3.59 *Verification* – Firms have told us that using Big Data can improve claims verification, particularly through the use of connected devices and social media.

3.60 Several respondents explained to us how connected devices can provide more detailed evidence about a claim and even indicate where fault may lie. This has the potential to reduce fraudulent claims. For example, motor telematics devices can record location, speed, braking, acceleration and whether airbags were deployed (although this varies across devices). Connected home devices have the ability to confirm details about heating, plumbing and security or possibly whether a house was occupied at the time an incident occurred.

3.61 We were also informed that some firms use social media to verify claims and detect fraudulent claimants. We were told that social media posts can be used in verifying claims details, and that social connections can be analysed to identify suspected fraud rings. One firm also commented that they carry out manual searches via Google to check for additional information that may assist in verifying a claim.

3.62 Firms will benefit from reducing the costs of settling claims and preventing fraudulent claims being paid. However, consumers will also benefit if an overall reduction in claims costs leads to firms reducing their premiums.

3.63 *Claims processes* – The information generated by telematics devices can also reduce the burden on the consumer in presenting their claim. One respondent highlighted that reports from telematics devices are likely to make form-filling a thing of the past, saving time and money for both customers and firms. Some stakeholders commented on other potential future developments in claims handling. Examples include using mobile apps to submit claims, online claims portals and more digitised claims processes. Firms generally believe these initiatives will make the claims process more efficient for consumers.

3.64 *Complaints handling* – We received limited feedback on how Big Data can affect complaints handling. However, we were notified that one firm had been reviewing a consumer's social media feed for any negative comments about the firm in order to help determine whether they were likely to stay with the firm, before deciding the outcome of their complaint.

Our response

We welcome firms' innovation and improvements in claims handling processes if they improve efficiency and reduce the consumer's burden in submitting their claim. We consider that the use of telematics based data can positively impact the wider consumer journey by saving time and reducing the burden on consumers at the point of claim. The data extracted from telematics devices also has the potential to help corroborate driver and witness statements. We recognise that social media can be a useful tool in identifying and preventing fraudulent claims. These uses are likely to be beneficial to consumers as they can help speed up the claims process and help prevent fraudulent claims.

Firms are under an obligation to deal with complaints fairly and impartially.³⁶ All firms should ensure they consider complaints on the basis of their validity, rather than wider circumstances (such as a consumer's likelihood of staying with the firm) that may be irrelevant to the outcome of the complaint.

Consumers who do not generate or share data

- 3.65** In our Cfi, we recognised that some consumers may not be willing or able to share their data. For example, they may not use certain types of media that produce data or may want to remain 'off-grid'. We asked respondents to consider how Big Data affects these consumers and received mixed opinions. Some considered the impact would be limited, some noted underwriters already have to allow for missing data in their algorithms, irrespective of the types or sources of data, and two respondents felt the impact would be broadly neutral. Three insurers disagreed and considered these consumers may not receive the best possible price in comparison to those who share and/or generate data.

Our response

We received mixed comments on the impact on these consumers and we do not have quantitative evidence to establish this impact. However, as insurers take into account more data, it is important that retail GI firms are clear and fair in any communications with consumers on the effects of sharing data to allow the consumer to make an informed decision. This may include setting out both the benefits and other aspects or features that some consumers may not consider beneficial, for example, the likely impact on the consumer of not sharing the data. The consumer is likely to be better able to make an informed decision about the benefits of sharing their data with the firm if the firm explains any assumptions it used because of the consumer not sharing the data.

³⁶ DISP 1.4.1 (1) and (2)

4.

The impact of data on competition

4.1 In our Cfl we set out our interest in understanding how Big Data could affect competition in motor and home insurance. When competition in markets is effective consumers will be offered variety and choice, with firms striving to win custom on the basis of service, quality, price and innovation. To assess whether competition is affected, we considered the following issues:

- **Demand-side factors:** whether Big Data changes consumers' ability to access, assess and act on the available information to choose the product that best meets their needs. From what we have observed, PCWs have made accessing information about motor and home insurance easier for many consumers (although this can mean an undue focus on headline price), and telematics products have the potential to bring benefits to some consumers. Additionally, the feedback we received suggests that, in the future, Big Data could:
 - Make information easier to access, but the increased ability to market and cross-sell could – depending on the circumstances – bring potential harm to consumers as well as benefits
 - Have a more mixed effect on consumers' ability to assess information. While there are obvious consumer benefits from new products that are more flexible and individually customised, any complex features and pricing structures could make these harder to compare, and
 - Affect how easy it is for consumers to act on information. Big Data could expand consumers' choice, but consumers using telematics may find it harder to switch insurers if their data cannot be transferred between firms.

We discussed these findings throughout Chapter 3.

- **Supply-side factors:** how Big Data affects the behaviour of firms and the products they offer. In summary, our findings on this are:
 - Big Data does not appear to raise or create barriers to entry for insurance firms, including underwriters
 - in particular, there does not currently appear to be any one type of data recently adopted by firms that cannot be easily accessed or substituted and
 - firms have also commented that Big Data is likely to be a driver of innovation and efficiencies

4.2 We set out some context and then discuss our supply-side findings in more detail below.

Context to supply-side factors

- 4.3** A number of firms and stakeholders pointed out that Big Data is not a new or separate phenomenon in retail GI, but continues an ongoing trend of insurers competing to assess risks more accurately through finding and analysing data. Some firms discussed in some detail why they compete on this, particularly in relation to 'adverse selection' and 'winner's curse'. We summarise these concepts and the main points of discussion here.
- **'Adverse selection'** is an issue that arises in the insurance industry where insurers know less about a consumer's risk than the consumer, and so may unintentionally attract consumers with higher-than-expected risk, causing the insurer to make losses.
 - Another phenomenon that insurance firms may experience, particularly with the growth of PCWs, is **'winner's curse'**, where they win business based on being the lowest-priced firm but are less informed about consumers' risks, also resulting in losses. One firm told us that 95% of PCW sales come from the top three firms listed by lowest price, and two firms commented that a 1% change in pricing could have around 10% effect on sales, so there is significant potential to incur losses through under-pricing or otherwise assessing risk incorrectly ('things can go wrong very quickly').
- 4.4** To avoid adverse selection and winner's curse, insurers compete to obtain and analyse additional data to assess consumers' risks more accurately. A number of firms made this point, with a couple of firms using the term 'arms race' to describe this process.
- 4.5** However, some firms thought there may be decreasing benefits to collecting more and more data. This is because analytical techniques may become more valuable in the future rather than the actual quantity of data. The focus might shift to obtaining more insight from existing data rather than trying to collect increasing amounts of data.
- 4.6** A number of firms also mentioned the role of PCWs in standardising the data that need to be collected from consumers. They commented on the potential trade-off between reducing search costs for consumers versus innovation in the types of data that insurers use to price risk. One firm told us they were increasingly looking for external data sources that could explain risk. These do not involve asking consumers for more data and avoids revealing intellectual property to competitors who may otherwise be able to add that new factor or data source to their pricing models.

Effect on barriers to entry

- 4.7** In our Cfl, we asked whether Big Data might change how easily firms can enter or expand in motor and home insurance. Firms can enter at different points at the supply chain – for example, into underwriting motor and home insurance, distributing these products, or carrying out analytics that feed into underwriting and pricing models.
- 4.8** The feedback we received can be grouped into general comments on Big Data's effect on ease of entry, and then more specific comments on the costs of investments in Big Data and whether firms could access and substitute different types of data. As a brief summary:
- **Big Data's effect on ease of entry in general:** we did not receive any comments that Big Data currently raises or creates barriers to entry, with one new telematics entrant stating that it might make entry easier

- **costs of investments in Big Data:** we received mixed comments on whether the costs of investing in Big Data are significant, overall the comments do suggest that these costs are not necessarily prohibitive for now
- **access to and ability to substitute different types of data:** we discuss this from paragraph 4.17 onwards.

4.9 A few stakeholders made more general comments about barriers to entry, e.g. that capital requirements are likely to have a bigger impact than Big Data on entry. For this work we are interested in the effect of Big Data, rather than barriers to entry more generally (or comparing the relative impact of different barriers).

Big Data's effect on ease of entry in general

4.10 While we did not receive any comments that Big Data currently raises barriers to entry, we received some mixed comments about whether Big Data has made entry easier, and its future potential impact on barriers to entry:

- In relation to underwriting, a new telematics entrant thought that Big Data made it easier to enter without any established backers. This entrant told us that access to customers is the biggest barrier for a new entrant, but PCWs have made this much easier with access to large numbers of customers for little cost. Another insurance provider said that they have seen a host of new market entrants as a result of telematics.
- However, one trade body did not think Big Data made it easier to enter, although it may support the development of peer-to-peer insurance in the future.
- Another stakeholder thought that costs to entering underwriting will undoubtedly increase due to the need to invest in finding and accessing the data. However, this may be counterbalanced by reducing reliance on historic claims data that existing insurers hold. (Historic claims data as a barrier to entry is discussed further from paragraph 4.17 below).
- We also received comments from several firms about the potential entry (as distributors or even underwriters) of companies with new data sources and/or strong analytical capabilities, particularly Google. We note that Google shut down its Google Compare service³⁷ in February 2016, but some other firms do appear to have entered the motor and home insurance sectors making use of consumer data collected from other parts of their business, which we discuss further below.
- The use of connected devices by insurers may enable them to enter new markets. For example, by detecting the state of various home services (pipes, heating, locks), insurers may be able to offer maintenance and repair services.
- More generally, Big Data is also enabling new business models – for example, peer-to-peer insurance has started to emerge in other countries (such as Friendsurance in Germany). It has also led to innovations within existing business models. One example is Bought By Many – this firm is a broker, but enables consumers to group when insuring similar risks.

Costs of investments in Big Data

4.11 We also asked firms about the costs of investing in Big Data. As set out in the CfI, we wanted to understand whether these are so significant they may act as a barrier to entry and expansion in different stages of the supply chain. We also wanted to understand whether large established

³⁷ This was Google's comparison-shopping site for motor insurance, credit cards and mortgages.

insurers have a cost advantage when investing in Big Data, including whether there are any significant economies of scale³⁸ effects.

- 4.12** In general for underwriting, firms did not consider any particular item of investment to be specific to Big Data, but rather as incremental to more general IT investments and systems upgrades. The only exceptions to this were three insurers that gave us cost estimates for their investments in Big Data, which varied considerably.
- 4.13** Firms also varied in their general comments on how expensive investments in Big Data might be. One firm reported that costs are high, with data storage and fast access being expensive. However, other firms have stated that the overall cost is relatively modest or not prohibitive. One insurer thought that Big Data tools and technology are less costly than traditional database systems, and there are likely to be cost efficiencies moving from traditional systems to cloud or 'data lake' solutions. This insurer also thought that a lot of Big Data analytical software is free to use.
- 4.14** In relation to potential cost advantages to large established insurers, we received a number of responses (including from smaller firms) that – if anything – large insurers may have a cost disadvantage in implementing Big Data. This is because they would need to invest significantly in upgrading their existing IT systems, whereas a newer entrant may have fewer legacy IT issues.
- 4.15** Economies of scale do not seem to be significant in data analytics i.e. smaller firms appear to be able to enter and compete effectively. We met with a few newer firms that provide data analytics services to insurers for use in their underwriting and pricing models (e.g. on telematics). One of these firms told us that there were few upfront setup costs, with most equipment and staff being scalable (including through using cloud computing), and that their business was profitable by its second year.

Our response

We have not seen any significant competition issues requiring us to act based on the comments we received about Big Data's potential effect on barriers to entry.

The mixed comments on the costs of investing in Big Data suggest that the magnitude and nature of these investments are likely to vary based on the business model and investment decision of each insurer. We have not received any evidence that there are material minimum investments in Big Data that are required for firms to enter or expand in home and motor insurance, and which would consequently make it more difficult for them to do so. However, it remains to be seen whether different sources of data in future may make it harder for new firms to either enter the market, or for existing firms to be able to compete effectively. We will continue to look for such issues through our usual supervisory and intelligence activities.

³⁸ This is where firms gain cost savings on each unit produced by producing more of the good or service.

Access to and ability to substitute different types of data

4.16 In our Cfl, we were interested in understanding whether the inability to access or control any particular type of data might restrict competition in the motor and home insurance sectors (since such control could create market power). The comments we received mostly relate to:

- **Historic claims data** – we received comments that accessing such claims data continues to be critical to enter as an underwriter. We understand this is a longstanding issue that pre-dates Big Data, but some firms did comment that other data sources could potentially reduce the importance of historic claims data.
- **Third party data** – firms do not currently seem to have any issues accessing third party data, but we are aware that who ends up owning and/or controlling data may still potentially create competition issues in the future.
- **Proprietary consumer data from another part of the firm’s business.** This does not currently appear to create competition issues, since it seems to be possible to achieve similar or greater accuracy in risk pricing using other sources of data. One distributor told us that they would not have entered the motor and home insurance sectors had it not been for their ability to use this type of data to price risk, suggesting such uses of proprietary data could help new kinds of firms to enter. However, we are aware that this may change in the future.
- **Data generated from consumers** over the course of their insurance policy, in particular in relation to telematics data – if there are difficulties in transferring these data between firms, consumers may find it more difficult to switch insurers if they wished to do so.

Historic claims data

4.17 A number of firms commented that historic claims data continues to be critical to enter as an underwriter. These are data on past claims experience, which significantly helps insurers predict and price risk more accurately, particularly if gathered over a large number of consumers.

4.18 Some firms did comment that Big Data could potentially lessen the importance of these data. For example, Big Data could allow new entrants to follow competitors’ prices through PCWs, use third party data sources such as MarketIQ (which provides for bi-weekly customer quote data) or price using other bases such as telematics or peer-to-peer insurance.

Our response

We understand that the significance of historic claims data for entering as an underwriter is a longstanding issue that pre-dates Big Data. Large existing insurers have gathered these data from their operations over time.

To the extent that Big Data may affect the significance of historic claim data, we did receive some comments that Big Data may create substitutes that lessen its importance. We did not receive any evidence from this Cfl that we need to act further on this issue, but note that the importance of historic claims data will continue to evolve.

Third party data

4.19 As set out in Chapter 3, firms use a wide range of data that are not collected directly from consumers in order to set prices. Based on the feedback we have received, firms are purchasing

much of these data from third party providers. A number of insurance providers have told us that it is relatively easy to gain access to data sourced from third parties. Our understanding is that these are generally available on a non-exclusive basis and some firms commented on the range of firms competing to sell data in recent years.

- 4.20** One firm explained that the competitive advantage of using third party data sources lies in accessing data before competitors do, rather than accessing data exclusively (this firm gave an example of a data source that it started using before its competitors did). The cost of purchasing data from these third parties does not appear to be an issue. Another firm commented that the main costs of data relate to detecting useful data sources and developing the ability to use them, rather than in the cost of purchasing the data itself.

Our response

Based on the comments received, there do not appear to be any material current competition issues in firms' access of third party data sources. However, one firm told us that there may be a risk of data being monopolised in the medium term, although this risk is currently limited. Other firms have pointed out that monopolisation could mean that data become expensive or that exclusive arrangements could create issues.

We are aware that competition issues of data ownership and control may still arise in the future. We will look out for such issues through our usual supervisory and intelligence activities.

Proprietary consumer data from another part of a firm's business

- 4.21** Based on responses and firm engagement, we understand that a small number of firms use consumer data collected from another part of their business to help price risk more accurately. They have told us that these data do have significant power in explaining risk. This was described further in the previous chapter. These firms do not currently sell these data to other insurance firms, so firms that do not have considerable operations outside of motor and home insurance may not have easy access to this type of data.
- 4.22** One insurer thought that some firms may be unable to access behavioural data collected by others, for example through websites, which may be a potential barrier to entry and expansion. However, we have been told by insurers – including those without access to these data – that it is not currently critical to entering or expanding in underwriting, as it may be possible to achieve greater accuracy in risk pricing through other sources of data or analytical techniques.
- 4.23** One of the firms that use such data told us they would not have entered the insurance sector if they could not use such data. Several other firms have commented that access to such data may have allowed different types of firms to enter and provide insurance.
- 4.24** One insurer told us that in the future, change is likely to be in distribution where third parties own the customer relationship and associated data (for example banks, retailers, search engines and mobile phone operators). This may result in business models where insurers partner with these third parties to gain access to these data before underwriting an insurance policy, or even where these third parties could invite insurers to bid for underwriting business based on the information held by the third party.

Our response

Based on this input, the use of proprietary consumer data from another part of a firm's business does not currently appear to create competition issues.

Moreover, the use of such data may have allowed different types of firms to enter the motor and home insurance sectors, which could create more competition.

However, we are aware that this may change in the future, as more advanced analytical techniques become more widespread and such datasets become more valuable. There may be competition concerns if firms were able to increase or create market power³⁹ through their use of data, and we remain vigilant to this risk.

We also note the comment we received on changes in distribution. While we see no evidence that this is currently happening on a significant scale, we note the potential for disruption in the motor and home insurance sectors in the future.

Data generated from consumers over the course of their insurance policy

- 4.25** We also received a number of comments on data generated from consumers over the course of their insurance policy, particularly data generated from telematics boxes. Some stakeholders have commented that such information may be difficult to transfer between insurers, which may make it more difficult for consumers using telematics to switch between providers if they wished to do so. We discuss this further in Chapter 3.

Innovation and efficiencies

- 4.26** A number of firms commented that Big Data should enable innovation in a number of areas in motor and home insurance. This includes tailoring insurance products to consumers and offering new services to manage risk as well as insure it (for example, alerting a homeowner to a leaking water pipe). These are discussed in previous chapters.
- 4.27** A number of firms also commented that advances in Big Data can create cost savings, such as through better fraud detection and marketing. One firm also thought that the ability to predict risk better lowers uncertainty and therefore reduces the cost of capital (although they have not measured this).

Our response

We believe innovation in the interests of consumers is a good consumer outcome – providing wider choice, lower prices and/or better products, as well as driving competition.

We discuss the risks and implications of an increased ability to market and cross-sell to consumers in Chapter 3.

³⁹ Market power can be defined as the ability of a firm to raise prices above (or lower quality below) the level that would be expected when firms compete effectively, and to do so in a profitable way.

5. Regulatory framework

5.1 In the Cfl, we asked respondents whether the FCA's current regulatory framework constrains or fosters innovation in the use of Big Data and what changes, if any, would be necessary to this framework to promote innovation in the interests of consumers. We also asked whether there have been any relevant international regulatory developments. In this section, we outline the responses we received and the steps we intend to take. In summary:

- **Respondents did not consider that our regulatory framework constrains innovation in the use of data.** They considered it to be satisfactory or considered it too early to tell whether regulatory change is necessary.
- We received a number of suggestions for action we can take on issues regarding data use. Data use regulation is primarily the responsibility of the ICO and so **we will co-host a roundtable with the ICO to discuss with stakeholders how data are used in retail GI and the application of the current legislation.**
- **We will support European regulatory bodies** and contribute to the further work they are currently undertaking into Big Data and the use of data.

Current FCA regulatory framework

5.2 As set out in the Cfl, we were keen to understand whether our regulatory framework constrains or fosters innovation in the interests of consumers in retail GI.

5.3 A significant proportion of stakeholders consider that it is too early to tell whether the FCA regulatory regime is having a positive or negative impact on innovation in Big Data. One trade body noted that the development of Big Data is in its infancy – as innovation progresses, certain elements of the framework may be identified as boosting or hindering innovation.

5.4 Several respondents set out their view that the regulatory framework fosters innovation, commenting that we are supportive of firms' innovation within the market. Stakeholders highlighted the positive impact of FCA initiatives such as Project Innovate. As part of Project Innovate⁴⁰, the Innovation Hub has supported a range of firms in bringing innovative financial products and services to the market, including in retail GI. This has included helping these businesses better understand the regulatory framework and providing additional support throughout the authorisations application process.

5.5 Stakeholders did ask that we stay up to date with innovations in the use of Big Data to avoid regulation falling behind technological developments. One insurer suggested we engage and consult with the market to monitor developments and remain receptive to industry efforts to self-regulate where possible. Another provider highlighted that regulation will need to adapt to recognise the significantly greater use of technology by both firms and consumers. We

⁴⁰ For more information, see www.fca.org.uk/firms/project-innovate-innovation-hub

recognise the importance of keeping our knowledge up to date and will continue to observe market developments through our usual supervisory and wider intelligence activities.

Stakeholder requests of possible FCA actions

- 5.6** We also asked stakeholders what changes may be necessary to our regulatory framework to promote the use of Big Data to foster innovation in the interests of consumers.
- 5.7** While the majority of respondents felt the framework was broadly satisfactory, some felt that further guidelines and/or regulatory intervention were required. Some felt that we should:
- review whether firms are complying with data protection legislation
 - introduce guidelines on the ethical use of data and
 - issue insurance-specific guidance on the General Data Protection Regulation (GDPR).

We consider each of these suggestions below and set out our response to each.

Should the FCA review whether firms are complying with data protection legislation?

- 5.8** One consumer group suggested that we investigate whether insurers are applying data protection law correctly and consistently. Their view was that developments in the use of data could have an adverse impact on consumers' ability to access general insurance products.
- 5.9** A number of respondents also asked us to collaborate with the ICO as innovations in Big Data develop. For example, one insurer highlighted the importance of working closely with the ICO to ensure a consistent and proportionate approach to regulation.

Our response

The ICO is the regulator responsible for firms' compliance with data protection legislation, and we do not wish to duplicate the important role they play in this space but will work in collaboration with the ICO where appropriate. Any such review of whether firms are complying with data protection legislation falls within the remit of the ICO and is not therefore something we would undertake. As above, we do engage and collaborate with the ICO on these issues where appropriate. We have engaged with the ICO throughout the Cfl and will continue to do so in the future.

In keeping with our collaborative approach, we plan on hosting a joint roundtable with the ICO on the use of data in retail GI. This will give retail GI firms and other stakeholders the opportunity to discuss and debate some of the data use issues that have been raised throughout the Cfl.

Should the FCA introduce guidelines on the ethical use of data?

- 5.10** Several respondents asked us to consider introducing ethical guidelines on the appropriate use of data. This reflected the fact that some firms felt uncomfortable using certain kinds of data, even though they considered that such use may be legally permitted.

- 5.11** For instance, the majority of respondents considered that data from social media, e.g. Twitter and Facebook, should not be used in risk pricing. There appears to be an underlying concern that this could be viewed as unreasonably invasive by some consumers.
- 5.12** Several firms told us that they did not use social media data because of how consumers might react, and that using it could result in reputational damage. Another stakeholder pointed out that, because of its unstructured nature, is it not easy to validate social media data to a sufficient degree for it to be used in risk pricing.
- 5.13** We saw several other examples where firms were not willing to use some proprietary personal data they held. This was because the firms did not believe that consumers would be happy for them to use these data for insurance pricing purposes.
- 5.14** However, we found that firms' appetites to use innovative forms of personal data varied across the industry. For example, we spoke to insurance providers that are more receptive to utilising new sources of personal data, such as obtaining consumers' consent to analyse social media accounts and the connections between members. We also spoke to some insurance firms who are utilising new types of data in pricing, for example, using behavioural factors from retailers to build a better profile of customers in order to offer discounts.

Existing research on consumers' attitudes to Big Data

As several respondents had discussed their concerns about what data consumers would find it acceptable for insurers to use, we wanted to understand consumer attitudes. Consequently we carried out some desktop research into consumers' attitudes towards firms' use of data.

The following pieces of research are particularly relevant and indicate how consumers feel about the use of their personal information:

- EY's 2013 research, 'The Big Data Backlash', suggests that consumers currently have a conservative approach to sharing their personal data.⁴¹ For example, only 3% said they 'always' share personal information and 41% said they 'rarely' or 'never' share information. Almost half of consumers surveyed say they will be less willing to share personal information in the next five years.
- Guardian Media Network/GfK's 2013 research found 49% of consumers consider companies are not clear about what information they are collecting about them.⁴² In addition, only 27% of consumers think it is a 'good thing' if the data that a company holds about them shapes the way they deal with them.
- More recently, in 2015, BCG carried out consumer research⁴³ in 20 countries and found that 78% of respondents believe they have to be cautious about sharing their personal information online. In addition, their research showed consumer attitudes about confidentiality vary according to the type of data. For example, consumers were much more likely to consider data about financial and payment card use to be private over location, email and use of social networks (although 50% consider such data to be private as well).

⁴¹ [www.ey.com/Publication/vwLUAssets/EY-The-Big-Data-Backlash/\\$FILE/EY-The-Big-Data-Backlash.pdf](http://www.ey.com/Publication/vwLUAssets/EY-The-Big-Data-Backlash/$FILE/EY-The-Big-Data-Backlash.pdf)

⁴² www.theguardian.com/media-network/media-network-blog/2013/oct/04/consumer-marketing-big-data-perceptions

⁴³ www.bcg.fr/documents/file184443.pdf

- Conversely, Deloitte carried out a survey in 2014 that found two thirds of consumers are willing to share their personal information if they can identify a tangible benefit, e.g. saving money or more personalised products.⁴⁴
- The CMA's 2015 report on 'The commercial use of consumer data' broadly found that although most consumers know their information is being collected, they are less aware of the various ways in which it can be collected or how else it might be used. However, this can differ among different age and social groups. In addition, they noted that consumers appear unhappy with how well firms explain why they collect data and feel more could be done to improve transparency.⁴⁵

The available research suggests that consumers may be unclear as to how their information is being used, are somewhat cautious about sharing their personal data and that some may be more willing to do so if they can see a tangible benefit. This appears to confirm and validate the above stakeholder concerns about the use of consumers' personal data.

Our response

Existing data protection legislation sets out the rules that govern firms' use of data. All firms are legally obliged to comply with the Data Protection Act 1998⁴⁶ (DPA), which sets out the UK law on the way personal data can be used. Under the Act, firms processing data must obtain the individual's consent to their personal data being collected and used in the manner and for the purposes in question.⁴⁷

The firms that we spoke to believed they had the necessary consent to use consumers' personal data, yet some were still concerned that consumers may not be comfortable with particular uses of data – for example, using data in a way that may result in their premium increasing. To ensure they comply with data protection legislation, we suggest firms review their privacy notices and policies to ensure they give the customer sufficient information about how their data are being used so that they can give their informed consent.

If firms feel consumers are not comfortable with the use of data then this brings into question the nature of the consent that was provided. If firms are using data about their customers in this way they will need to ensure that its use is in line with data regulations, e.g. the customer has the required level of understanding about how the firm is using the data and has provided any necessary consent.

The ICO is the regulator that is responsible for data protection issues, including enforcing legislation and publishing guidance. The ICO issues practical guidance on what the law says and how to apply it, for example, the ICO has provided

⁴⁴ www2.deloitte.com/content/dam/Deloitte/uk/Documents/deloitte-analytics/deloitte-uk-data-nation-2014.pdf

⁴⁵ www.gov.uk/government/uploads/system/uploads/attachment_data/file/435817/The_commercial_use_of_consumer_data.pdf

⁴⁶ www.legislation.gov.uk/ukpga/1998/29/contents

⁴⁷ Consent is one of the available conditions for processing personal data; there are others, e.g. processing is necessary for performance of a contract.

supplementary guidance for firms using information in its Personal Information Online Code of Practice⁴⁸. The Code offers best practice guidelines for firms in meeting the requirements of the DPA when collecting and using personal data online. It states that personal data should only be used in a way that the data subject would be likely to expect and be comfortable with, and to ensure data subjects are aware of how information about them will be used. We expect firms to take this Code into account when considering their approach to data collection and usage.

Although the ICO is responsible for compliance with data protection legislation, the FCA also has a role to play when firms communicate with consumers and whether firms use data in a fair way. Firms are reminded of the requirement to be fair, clear and not misleading⁴⁹ when communicating with consumers and this would include when communicating how the firm is using consumer's data. We would also remind firms of the obligation to pay due regard to the interests of its customers and to treat them fairly⁵⁰. This would include when firms process and use personal data.

We will continue to monitor developments in data and how firms use data in our ongoing supervisory work.

Should the FCA issue insurance-specific guidance on the General Data Protection Regulation (GDPR)?

- 5.16** The General Data Protection Regulation (GDPR) is a piece of European legislation that will harmonise data protection legislation across the EU. In brief, it will introduce stricter rules for protecting the data privacy rights of individuals and impose harsher fines for breaches. Agreement was reached on the legislation in December 2015, and it will come into force in May 2018.
- 5.17** A number of firms highlighted the GDPR, noting that it will have an impact on insurance profiling. One insurer suggested that insurance-specific guidance on the GDPR may be required, although they acknowledged this may be in the remit of the ICO. Another noted that the GDPR will restrict the free use of data and we could issue guidance on its application.

Our response

The final wording of the GDPR includes provisions regarding profiling, which are likely to have an impact on the insurance industry. However, the draft also notes that the European Data Protection Board (EDPB) may issue guidelines, recommendations and best practices for further specifying the criteria and conditions for decisions based on profiling.

The EDPB is a European body that will be made up of representatives from the data protection authority of each EU Member State (including the ICO), the European Data Protection Supervisor and the European Commission. Its aims include giving expert advice to Member States about data protection, promoting

⁴⁸ www.ico.org.uk/media/for-organisations/documents/1591/personal_information_online_cop.pdf

⁴⁹ Principle 7

⁵⁰ Principle 6

the GDPR's consistent application and giving the Commission opinions on laws affecting the right to protection of personal data.

The ICO is the appropriate regulator to lead the implementation of the GDPR in the UK. We will engage with the ICO throughout this process, as appropriate.

International developments

- 5.18** Finally, we asked respondents if they were aware of international developments in regulations that have supported innovation in the interest of consumers through increased application of Big Data. We were not informed of any examples.
- 5.19** We have developed our Feedback Statement in the context of the existing UK and EU regulatory framework. We will keep our findings under review to assess whether we need to take action in the event of changes in the UK regulatory framework, including as a result of any negotiations following the UK's vote to leave the EU.
- 5.20** We are aware that some European bodies are carrying out work on the topic of Big Data. For example, the three European Supervisory Authorities (ESAs) have begun joint work on Big Data, which may lead to a Discussion Paper later in the year. One aspect being considered is the use of Big Data in profiling customers by financial institutions, though the work is likely to involve a broader view of existing regulatory frameworks and whether any gaps or other issues might need further attention.
- 5.21** In parallel, the European Banking Authority (one of the ESAs) is looking into innovative uses of consumer data specifically in its own banking and payments sector. We are engaged with these European regulatory bodies to contribute to the work that is under way.

6. Next steps

- 6.1** Having considered the responses and information we examined in our Call for Inputs, we have decided not to launch a full market study at the present time. We consider the increasing use of Big Data is broadly having a positive impact on consumer outcomes, by transforming how consumers deal with retail GI firms, streamlining processes and encouraging more innovation in products and services. However we have decided to take forward two key actions to engage further with industry on the issues we have identified.
- 6.2** First, **we intend to jointly host a roundtable discussion with the ICO** on the use of data in retail GI. This will give retail GI firms and other stakeholders the opportunity to discuss and debate some of the data use issues that have been raised.
- 6.3** We plan to hold this event in autumn 2016. We will invite a selection of insurance providers, consumer groups and relevant trade bodies. We will contact firms and other stakeholders shortly with invitations, agenda points and further details on logistics.
- 6.4** Secondly, we found that an increasing amount of data, from a wider range of sources, is being used in pricing. This, in conjunction with sophisticated analytical tools, might lead to pricing practices that are not risk or cost reflective becoming more prevalent. To better understand how these developments are affecting the market, **we will start a piece of discovery work to look at pricing practices in a limited number of retail GI firms** later this year. We will select a range of firms to engage with across the retail GI sector. We will contact these firms in due course. We will also engage with trade bodies and other relevant stakeholders during our work. This will be a discovery piece of work, and we would only intervene if we identify one or more market issues where we think a regulatory intervention would improve outcomes. We discuss this issue further in Chapter 3.
- 6.5** Additionally, **we will stay up to date with Big Data innovations and developments** in the market through our usual supervisory and intelligence activities, and keep under review the questions around risk segmentation.

Annex 1

List of non-confidential respondents

Association of British Insurers

Admiral Group Plc

Ageas UK Limited

AXA UK Plc

Barclays Bank Plc

Financial Services Consumer Panel

Bought By Many Ltd

Chartered Insurance Institute

Information Commissioner's Office

Institute and Faculty of Actuaries

Insurance Law Research Group, University of Southampton

LexisNexis

Lloyds Banking Group Plc

RDT Ltd

Scope

techUK

Unlock

Annex 2

Broker survey

1. In this annex, we summarise the methodology and findings from our recent survey of retail GI brokers who serve consumers with non-standard risks.

Overview

2. In our engagement with stakeholders, we heard anecdotal information on the impact of Big Data on access for consumers with non-standard risks. As described in Chapter 3, some considered that increased risk segmentation caused by Big Data could lead to reduced access for higher risk groups. Conversely, some thought that increased risk segmentation could lead to better outcomes for certain groups, e.g. more granular risk assessment for older consumers.
3. We had limited quantitative data to support and verify what we had heard. We decided to survey GI brokers who serve consumers with non-standard risks, as they could provide an indication of trends in the market.

Methodology

4. We chose three groups of consumers with non-standard risks on the basis of feedback we had received from consumer organisations – disabled consumers, consumers with unspent criminal convictions, and consumers over the age of 85. These three groups were specifically mentioned to us by respondents.
5. The FCA does not currently hold a list of brokers' specialisms, so we identified brokers to survey through BIBA's 'Find a Broker' service. We searched the website and surveyed all brokers who are listed on the service as specialising in serving at least one of the three groups of consumers – a total of 151 firms.
6. Our survey asked a number of questions about brokers' experience in providing insurance to these groups of consumers, including the following:
 - **We wanted to test whether coverage has changed over the last five years.** We asked approximately how many underwriters each broker used to provide insurance to the group(s) of consumers they served, and whether this had increased or decreased over the past five years. If this had decreased it could indicate that underwriters are withdrawing from that part of the market and highlight a reduction in coverage for these consumers.
 - **We wanted to test whether access to insurance has changed over the last five years.** We asked approximately what percentage of their consumers could brokers provide

with an insurance quote, and whether this had increased or decreased over the past five years. Any decreases could be an indicator of an access issue for these groups of consumers.

- **We wanted to know if underwriters' risk factors have increased or decreased over the last five years.** We asked whether the brokers had seen a change in the number of risk factors requested by underwriters for these groups of consumers. By risk factors, we mean the characteristics or attributes that can have an impact on the risk to be insured. We considered that an increase in factors could be an indicator of increased risk segmentation – a topic we discussed in further detail in Chapter 3.

Responses

7. Brokers responded to the survey on a voluntary basis. We received 38 responses – a response rate of 25%. Given the relatively low response rate, the results should be interpreted with some caution.
8. *Which groups of consumers did they serve?*
 - 22 respondents serve disabled consumers.
 - 21 respondents serve consumers with unspent criminal convictions.
 - 22 respondents serve consumers over 85.

Summary of results

Consumers with unspent criminal convictions (21 respondents)

- Average number of underwriters used by brokers serving this group: 4.
- 75% of respondents said this had broadly stayed the same.
- Average success rate for providing quotes: 67%¹.
- 85% of those who responded said this had broadly stayed the same.
- Over half of the respondents thought the number of risk factors had not changed.

Disabled consumers (22 respondents)

- Average number of underwriters used by brokers serving this group: 14.
- 82% said this had broadly stayed the same.
- Average success rate for providing quotes: 57%.
- 95% of those who responded said this had broadly stayed the same.
- 80% of respondents thought the number of risk factors had not changed.

¹ Two responses not included due to inconsistencies in the data: one respondent noted a 1% success rate for 2 customers and one noted an 8% success rate for 10 customers.

Consumers aged over 85 (22 respondents)

- Average number of underwriters used by brokers serving this group: 6.
- 73% said this had broadly stayed the same.
- Average success rate for providing quotes: 45%.
- 75% of those who responded said this had broadly stayed the same.
- 73% of respondents thought the number of risk factors had not changed.

Conclusions

9. Across the three groups, the number of underwriters covering each of them appears to have remained broadly static. Although our findings do not cover the entire market, this is an indication that coverage has not changed significantly for these groups over the past five years.
10. In terms of brokers providing quotes for these consumers, the success rates have again remained broadly the same for all three groups. The lowest average success rate that we encountered was 45% for consumers aged over 85, which could be an indication that this group has more difficulty finding motor insurance than the other two groups. This is likely to reflect the fact that underwriters generally consider that older drivers represent a higher risk than younger drivers. Under the Equality Act 2010, insurers are allowed to discriminate on the grounds of age, if the relevant information that is used for the risk assessment is from a source that is reasonable to rely on².
11. Finally, the majority of respondents told us that the number of risk factors that underwriters take into account has broadly stayed the same. We considered that an increase in the number of risk factors could indicate an increase in risk segmentation (as discussed in Chapter 3). The findings of our survey do not show that brokers are seeing an increase in risk factors taken into account by underwriters. This suggests that an increase in risk segmentation is not yet apparent to brokers. However, as we discussed in Chapter 3, various insurers have told us that the number of risk factors they use has increased over the last five years.

BIBA Find a Broker service

12. We liaised with BIBA following the outcome of the survey, as we found a number of inconsistencies between the groups of consumers that firms had told BIBA they serve and how they responded to the survey. To ensure that the website service is operating as effectively as possible for consumers, BIBA has agreed to carry out a refresh of its member data and update its Find a Broker database as necessary. BIBA will work with their members to update the data (as fundamentally they rely on their members to advise them). BIBA also noted that the Find a Broker telephone-based service is a more personal refined approach, matching the client to a known expert broker. This leads to higher success rates in matching customers to brokers compared to the website service.

² www.legislation.gov.uk/ukpga/2010/15/schedule/3/paragraph/20A

Annex 3

Price comparison website analysis

Introduction

1. In this annex, we present some high-level analysis which looks at whether some of the concerns about the use of Big Data are reflected in consumer level data over time, particularly the potential effects of risk micro-segmentation (see Chapter 3 for further discussion of these). We collected data from two PCWs to see whether we can observe the following two hypotheses in industry trends. These are:
 1. **Changes in price dispersion** – has increased risk micro-segmentation led to greater dispersion in prices? As insurers use more variables and more granular data in their risk modelling, we might see some consumers receive lower quotes but others receive much higher quotes.
 2. **Access to insurance** – has the availability of insurance decreased for some types of consumers, for example for those deemed higher risk due to risk micro-segmentation and consumers with non-standard risks, such as older drivers and disabled drivers? If so, we may see more customers receiving no, or very few, quotes.
2. We undertook this work as a proportionate way to get an indication of how the industry is evolving without putting a large information burden on firms. While the data do not cover the whole market (e.g. insurance is sold through other channels), they provide an indication of the changes that have occurred in the market. It should also be noted that consumers who use PCWs may be different to all consumers who purchase insurance¹ and this will not provide any insight into those consumers who purchase directly from insurers and other intermediaries.
3. This analysis cannot determine whether any trends identified have been caused by Big Data. Rather, we are looking to see whether we can observe certain effects on consumer outcomes that match the potential effects of Big Data and may give us cause for concern or identify areas of further work. It is possible that Big Data itself may be affecting the insurance market in ways we cannot see because other factors hide these effects. However, while it is difficult to draw definite conclusions from the data, it does provide a potential indication of Big Data's effect on consumers in these insurance markets.

Our data

4. We collected anonymised consumer level data covering both motor and home insurance from two PCWs. This contained information on:

¹ For example, in OP12 we found that consumers facing higher prices are more likely to switch insurance, with many consumers who switch using PCWs to search. See www.fca.org.uk/news/occasional-paper-no-12.

- the characteristics of each individual consumer entered into the PCW to assess their risk (e.g. age of driver and postcode for motor insurance, or number of bedrooms and postcode for home insurance)
 - the quotes returned to consumers following an enquiry and
 - the subsequent purchases consumers made
5. Throughout our analysis we refer to the PCWs that provided us with data as PCW1 and PCW2. Table 1 sets out the time coverage, the number of enquiries, and the percentage of enquiries made by disabled and older consumers both by PCW and type of insurance.

Table 1: Summary of quote data collected from PCWs

	Motor insurance		Home insurance	
	PCW1	PCW2	PCW1	PCW2
Period	2010 – 2016	2013 – 2015	2011 – 2016	2012 – 2015
No. of enquiries ³	c. 20m	c. 8m	c. 1m	c. 0.3m
<i>of which:</i>				
<i>disabled consumers</i>	0.8%	2.7%	1.5%	0.8%
<i>older consumers</i>	0.1%	0.1%	1.0%	0.9%

6. We requested data from these PCWs to cover the last five years (the period we asked respondents to consider in our CfI). Since the PCWs we looked at received over 100,000 enquiries a day, we requested data for a short period of time at the start of each quarter. This enabled us to observe trends of interest while collecting a proportionate amount of data.
7. Some data presented here does not completely cover the five year period as it could not always be easily provided.³ The data received from both PCWs was not complete for the entire period. In particular, the data for home insurance was less complete than data for motor insurance – home insurance data for 2015 and 2016 for PCW2 is partially missing.

Methodology

Changes in price dispersion

8. We use the coefficient of variation⁴ (CV) as our measure of dispersion. CV describes the amount of variability in prices relative to the average price. We prefer a relative measure, like CV, rather than an absolute measure because it is unaffected by changes in average prices.
9. We calculated this price dispersion measure for the cheapest quotes that consumers received over time. We considered that the cheapest quote was a good indication of the prices available

2 The number of enquiries does not provide an indication of the market share of the PCWs for two reasons: the number of quarters for which data has been provided varies between the two PCWs and the number of days per quarter for which data has been provided is also not the same for the two PCWs.

3 Firms' systems have changed over time, making some past data less accessible as data has been archived.

4 The coefficient of variation is the ratio of standard deviation to the mean. Standard deviation is a measure that quantifies how much a set of values are spread out, the higher the standard deviation the greater the spread. It is calculated by taking the square root of the average squared deviations from the mean.

to consumers as it is more likely to be indicative of the insurance a consumer might buy.⁵ Furthermore, our analysis showed that consumers often receive a long tail of much higher quotes that they are highly unlikely to take up. The presence of these very high quotes distorts any average quote figure we might have otherwise used. We tested our findings using other measures⁶ of quotes consumers received and these alternatives do not affect our findings. If prices were becoming more dispersed over time, we would expect to see this effect by looking at the cheapest quote.

10. We also looked at price dispersion within different groups of consumers. While we had concerns that price dispersion may be increasing, when we looked at the overall population we did not find this increase in dispersion. We grouped consumers based on some of the key characteristics used to assess their risk, as entered into the PCWs.⁷ We then looked at how the average within-group dispersion had changed over the period.
11. We also calculated this price dispersion measure for actual prices paid by consumers who bought insurance through the PCWs. This dataset was less complete because the information on the price consumers actually paid, given to price comparison websites, is not always complete or accurate in our dataset. It depends on whether this information was reported accurately back to the PCWs by providers. We also note that actual purchase prices may understate any price dispersion effects. This is because consumers who receive high price quotes are, all other things being equal, less likely to buy the insurance. However, we have used these data as a check on our findings.

Access to insurance

12. We looked at how access has changed for consumers by looking at how the number of quotes consumers received on the PCWs, and the proportion of consumers who get few quotes, have changed over time. While this may not be a perfect measure of access (e.g. some consumers may receive some very high quotes where insurers cannot accurately price the risk, which consequently makes insurance inaccessible for these consumers), we believe that it provides an indication of how access has changed over the period.
13. We were particularly interested in the experience of older consumers and disabled consumers. For older consumers we looked at the availability of quotes for those over 85 years of age for both motor and home insurance. We used 85 years as the cut off as this matched the cut off we used in our broker survey (see Annex 2).
14. PCWs do not ask consumers about disabilities directly. So, in motor insurance, we used three indicators to identify consumers with disabilities, which were:
 - modifications made to the car⁸
 - whether the DVLA has been notified that the primary driver on a policy has a medical condition or disability that will affect their ability to drive safely, or
 - they are unemployed due to a disability

⁵ We note that consumer do not always purchase the lowest quote they receive on price comparison websites, nor is this the insurance that they should necessarily purchase to best meet their needs.

⁶ For instance, the average of the three cheapest quotes the consumers received.

⁷ For motor insurance these were age of the driver, postcode, no claims discount, a measure of vehicle risk (e.g. ABI risk category), and the age of the vehicle. For home insurance these were age of the consumer, postcode, property type, the date that the property was built and the number of bedrooms.

⁸ We used three modifications as indicators. These were pedal modifications, wheelchair ramps and wheelchairs winches.

15. For home insurance, we only have the last indicator, but we might expect disability to have less effect on risk and pricing for home insurance than motor insurance. While none of these perfectly identifies disabled consumers, we would expect these data to give us an indication of whether insurance has become more or less available to these consumers over time.
16. Some consumers carry out more than one search for insurance in a short period of time. Consequently, some consumers will be counted more than once if they made separate searches in the same time period, particularly if they inputted different characteristics about themselves in each search. Many of these searches have different search criteria⁹. It is impossible to determine which of these searches is the closest to that consumer's risk profile and desired product. We looked at all enquiries, but note that this overestimates the proportion of consumers getting few quotes. This is because those getting few quotes are likely to search more so will be counted more than once.

Findings

17. In this section we present our findings on the two hypotheses set out above. In brief:
 - **we did not observe any increase in price dispersion** across motor and home insurance for the two PCWs in our analysis
 - **we did not find any serious concerns with the availability of quotes** for consumers across motor and home insurance for the two PCWs
18. We set these out in more detail below.

Changes in price dispersion

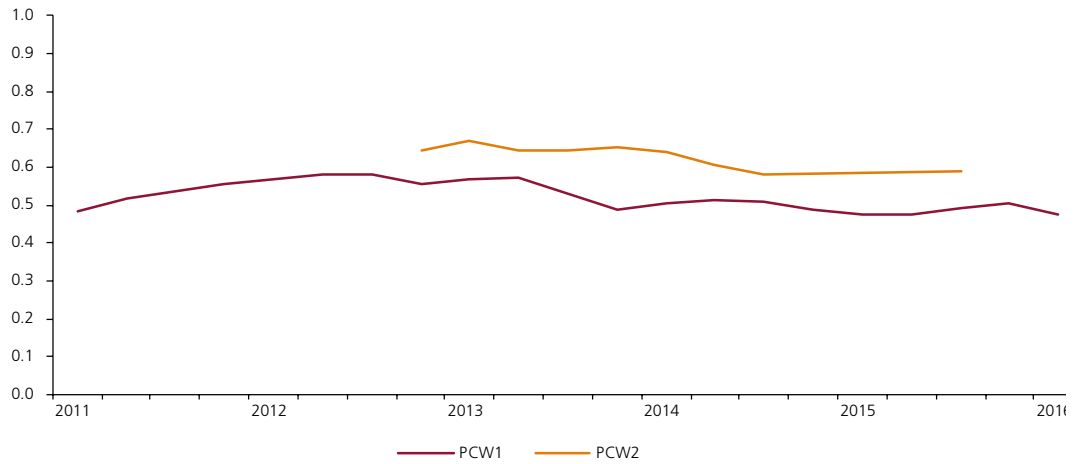
19. We did not observe any increase in price dispersion across motor and home insurance at either of the PCWs. Generally we observe that, over the periods for which we have data, price dispersion is relatively unchanged. We set out below:
 - motor insurance results
 - home insurance results and
 - our conclusions on changes in price dispersion

Dispersion in motor and home insurance

20. Figure 1 and Figure 2 show the trends in price dispersion over the periods for which we have data for both motor and home insurance at both PCWs. As explained above, we measured price dispersion based on calculating CV for the cheapest quotes that consumers received.
21. Our analysis showed differences in dispersion between the two PCWs. This may be a result of the types of consumers that use each PCW or because we could not use the same groups for both PCWs – there was some variation in the information provided by the PCWs that we used to create the groups.
22. For motor insurance, we found that dispersion is relatively stable over the period. For PCW2, dispersion is slightly higher than PCW1 but is stable and not increasing.

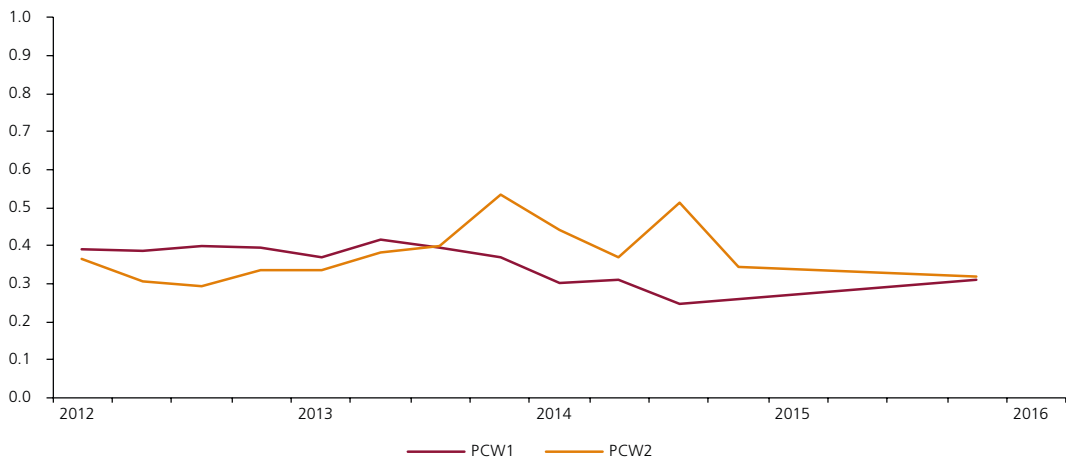
⁹ E.g. searches made by the same consumer which differ in the key characteristics used to assess their risk.

Figure 1: MOTOR insurance – Change in quote dispersion (CV)



- 23. For home insurance, we found more volatility in the dispersion compared with motor insurance, particularly for PCW2. However, we note that overall dispersion is stable and non-increasing through the period.

Figure 2: HOME insurance – Change in quote dispersion (CV)



- 24. We carried out additional checks to ensure that our finding was consistent when using other measures and using alternative approaches. These included looking at standard deviation and inter-quartile ranges, which did not affect our findings.
- 25. Although we had less data available on the prices paid by consumers who purchased their insurance through the PCWs, we also analysed these data as a check. This also showed no upward trend in price dispersion.

Our conclusions on changes in price dispersion

- 26. In conclusion, we do not observe any increase in price dispersion in the PCW data we have looked at.

27. This does not mean that risk micro-segmentation is not happening. Firms have told us that they are using additional, and more granular, data in their risk models (as discussed further in Chapter 3).
28. However, there are a number of potential reasons why we do not see an accompanying increase in price dispersion. For example:
- Individual consumers may face different prices than before, but not enough to change the distribution of prices across consumers (simply put, they did not receive much lower or much higher prices).
 - There may be other factors that are leading to lower price dispersion, which might offset the increases caused by risk micro-segmentation. For example, increasing the amount of data used might allow firms to assess risk with more certainty. This might in turn lead to lower prices, since firms can reduce the amount that they have priced in for potential errors in assessing risk.
29. While our analysis cannot definitively explain why we observe the trends discussed above, it does indicate that concerns about increased price dispersion as a result of risk micro-segmentation are not yet being realised.

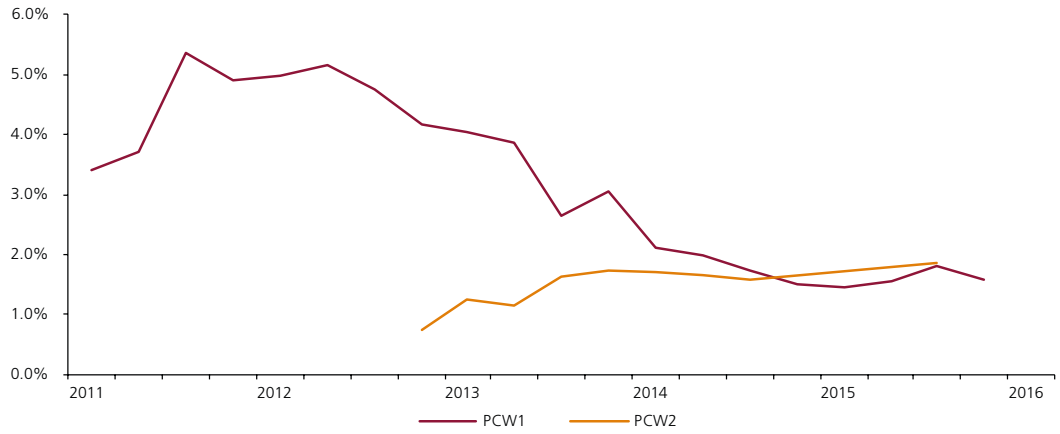
Access to insurance

30. We were also interested in seeing if the proportion of consumers receiving no or very few quotes over time was changing. We were interested in the experience of all consumers and particularly disabled and older consumers. Across the two PCWs, we found that the proportion of people receiving few quotes was broadly static. We also found no significant changes in the number of quotes available to consumers in either home or motor insurance. We set out below results for:
- all consumers, for motor insurance
 - all consumers, for home insurance
 - older drivers and drivers with disabilities, for motor insurance
 - older drivers and drivers with disabilities, for home insurance and
 - our conclusions on access to insurance

All consumers, motor insurance results

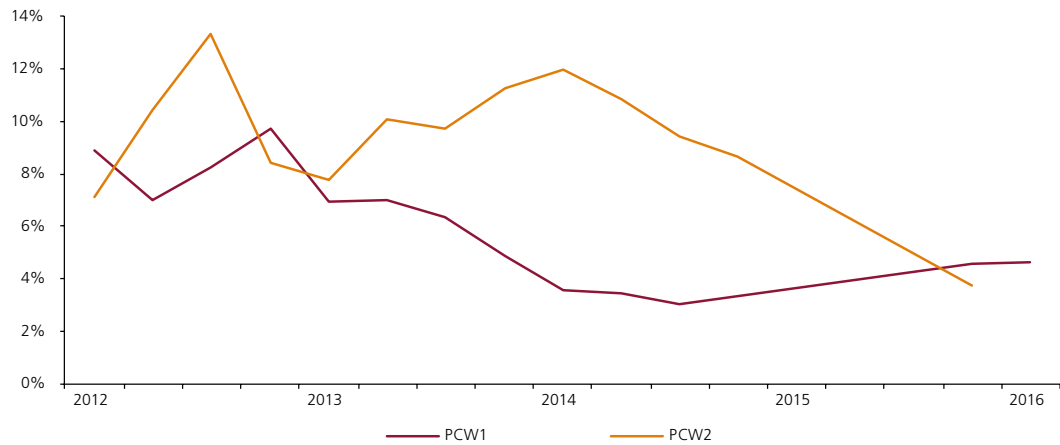
31. For motor insurance, we found that there were very low proportions of consumers receiving five quotes or fewer for both PCWs. We note that the trends in these proportions differed. At PCW1, the proportion of consumers receiving five quotes or fewer fell substantially over the period. For PCW2 there was an initial rise from a very low level, before leveling out at around 1%, similar to PCW1. However, we consider that neither of these trends are a cause for concern, since these proportions, in the case of PCW1, are falling or, in the case of PCW2, remain low.

Figure 3: MOTOR insurance – % of consumers receiving five or fewer quotes



- 32. All consumers, home insurance results** For home insurance, as with our dispersion findings (see above), we found greater volatility than in motor insurance. However, for both PCW1 and PCW2, we saw a decline in the proportion of consumers receiving five or fewer quotes over five years. While this proportion appears to be slightly increasing again for PCW1, it remains low at under 5%.

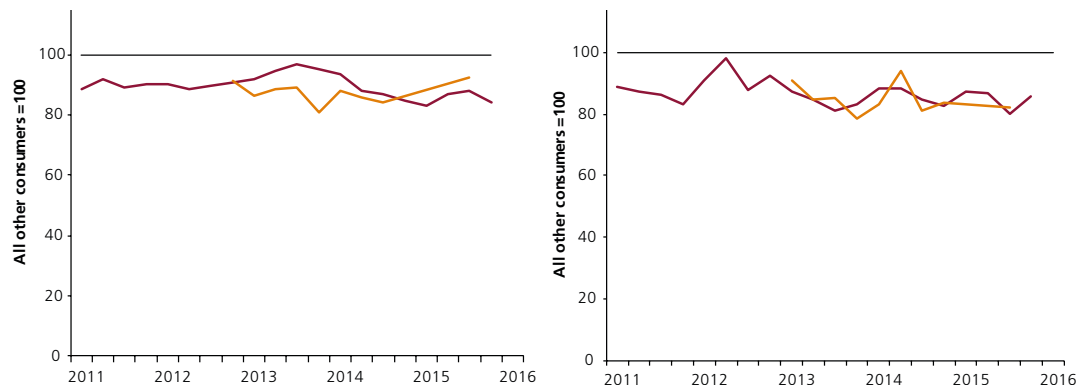
Figure 4: HOME insurance – % of consumers receiving five or fewer quotes



Older consumers and consumers with disabilities, motor insurance results

33. Figure 5 shows the average number of quotes received by older consumers and consumers with disabilities for motor insurance, relative to all other consumers.

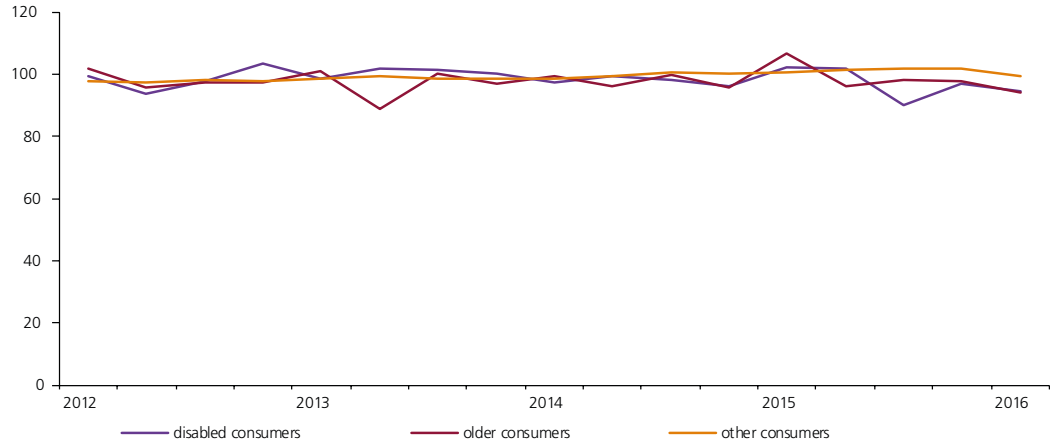
Figure 5: MOTOR – The number of quotes received by older and disabled consumers compared with all other consumers



34. There is a small difference between the PCW1 and PCW2's results, but both show that the relative number of quotes for older consumers and consumers with disabilities appear to remain broadly constant relative to all other consumers.
35. We see that while older and disabled consumers do, on average, receive fewer quotes than all other consumers, the difference is small and not increasing over the period.
36. We also note that, on average, older consumers and consumers with disabilities received over 40 quotes on average in the last period. This indicates that these consumers are still receiving a reasonable level of quotes.
37. We are aware of some concerns that the quotes offered on a PCW may change after entering additional data on an insurer's website. If this were more likely to happen for older or disabled consumers then the above analysis would potentially be misleading. Consequently we also checked our results using purchase data on home and motor insurance from PCW1.¹⁰
38. We found that, although the trend for older and disabled consumers is more volatile than for all other consumers (because there are fewer older and disabled consumers), the difference in price paid compared with lowest average quote was very similar for older, disabled and all other consumers. This is demonstrated in Figure 6 below, which shows this trend for motor, where we might expect age and disability may be more significant risk factor and so produce a wider difference. This suggests that the findings based on our analysis of quotes data would be similar if we performed the same analysis on sales data.

¹⁰ We had more data from PCW1 than PCW2.

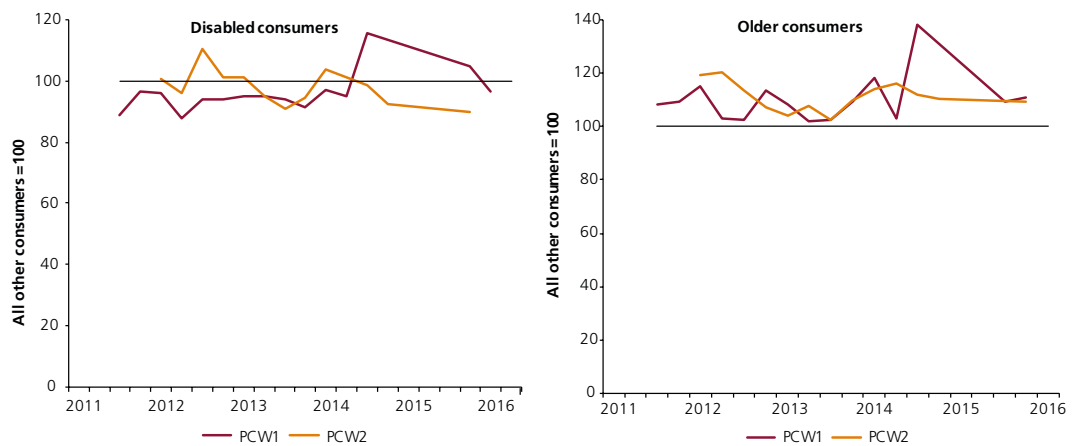
Figure 6: Motor – Price paid for insurance relative to lowest quote¹¹



Older consumers and consumers with disabilities, home insurance results

- 39. For home insurance quotes we found that the number of quotes received by consumers was fairly constant over the period. We see that older consumers tend to get more quotes than all other consumers whereas disabled consumers receive a similar number of quotes compared to all other consumers.
- 40. Although there is some volatility in the numbers, more so for PCW1, there is no obvious trend suggesting that increased risk segmentation is leading to older or disabled consumers receiving fewer quotes (see Figure 7).

Figure 7: HOME – The number of quotes received by older and disabled consumers compared with all other consumers



¹¹ We note that consumers appear to pay less than the lowest quote on average. There are a few different reasons for this: insurers provided inaccurate purchase price data, insurers updated quotes after receiving additional information or consumers reduced the level of cover after proceeding to the insurer's website. Regardless of the reason, it does not invalidate our findings that the difference in price paid compared with lowest average quote was very similar for older, disabled and all other consumers.

Our conclusions on access to insurance

- 41.** In conclusion, we did not find that consumers received fewer insurance quotes, suggesting that this concern about the effect of growing risk segmentation may not yet be realised. In particular, we did not see an increase in the proportion of all consumers who received five or fewer quotes, and the number of quotes received by older and disabled consumers does not seem to have fallen relative to all other consumers.

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