

# Consumer market study on online market segmentation through personalised pricing/offers in the European Union

## Executive Summary

June 2018

### 1) Objectives, scope and main tasks

In December 2016, Ipsos, London Economics and Deloitte were commissioned by the European Commission to conduct a study on online market segmentation through personalised pricing/offers in the European Union (EU). The main aim of this study was to explore:

- the nature and prevalence of online personalised practices (ranking of offers/pricing/targeted advertising);
- whether businesses are transparent about online personalisation;
- consumers' awareness and perception of online personalised practices and problems experienced;
- and the economic value/effects of personalised pricing/ranking of offers.

Several tasks were carried out between December 2016 and November 2017:

- a literature review of online personalised practices;
- consultations with consumer and data protection authorities; national experts, and business operators;
- an assessment of the applicable EU Regulatory framework and sellers' awareness and compliance;
- an economic valuation that attempted to shed light on the economic effects of personalised pricing/ranking of offers;
- an online survey (covering the 28 EU Member States plus Norway and Iceland; n=23,050) measuring consumers' awareness of/opinions on online personalised practices;
- a mystery shopping exercise, covering 160 e-commerce websites, carried out in 8 EU Member States (CZ, DE, ES, FR, PL, RO, SE and the UK) and four market sectors (TVs, sport shoes, hotels rooms and airline tickets), designed to assess the prevalence of personalised pricing/ranking of offers;
- and an online behavioural experiment assessing consumers' ability to recognise online personalisation, their "willingness to purchase" personalised offers, depending on the transparency in communication by the online platform and the impact of layout, format and information content on their decisions.

### 2) The nature and prevalence of online personalised practices

**Evidence of online personalised ranking of offers** - The research method applied for this study found evidence for online 'personalised ranking of offers' (websites changing the order of search results when different consumers search for the same products online):

- Over three fifths of the 160 e-commerce websites (61%) visited for the mystery shopping in the study were found to practise personalised ranking of offers<sup>1</sup>, either based on information about the shoppers' access route to the website (through search engines or price comparison websites (PCWs) or different browsers or a mobile device) or based on information about the shoppers' past online behaviour (e.g. history of visits).
- Access through a PCW or a mobile device had the strongest impact on the ranking of offers, as opposed to using a different browser or accessing an e-commerce website via a search engine.
- The share of websites practising personalised ranking of offers was 92% for the airline ticket websites, 76% for hotel room websites, 41% for the websites selling sports shoes, and 36% for the websites selling TVs.

<sup>1</sup> Both whether the same five products were listed and whether they were in different order.

- The share of websites showing offer personalisation ranged from 42% in Germany to 79% in Poland.
- The mystery shopping did not find systematic price differences related to personalised ranking of offers in the four product markets, in case of different top ranked products shown to shoppers on the same website<sup>2</sup>. Some statistically significant but rather small results were found at the level of individual product categories.
- Across the EU28, approximately one in two respondents (53%) in the consumer survey reported that, according to their perception, nearly all or most websites use personalised ranking of offers.

**Evidence of online personalised pricing** - The research method applied in the mystery shopping *did not* find evidence<sup>3</sup> of consistent and systematic online personalised pricing (customising prices for some users for the same products) across the 8 EU Member States in the 4 markets covered:

- Across the four product markets assessed, price differences between personalisation and ‘no personalisation’ scenarios<sup>4</sup> were observed in only 6% of situations with identical products.
- Where observed, price differences were small, the median difference being less than 1.6%.
- Prices were not systematically higher or lower in the ‘personalisation’ scenarios compared to the ‘no personalisation’ scenario.
- Airline and hotel booking websites<sup>5</sup> showed relatively higher evidence of price personalisation compared to websites selling TVs and shoes: of the 34 websites showing price personalisation, 19 were for airline tickets, 9 for hotel bookings, 4 for shoes and 2 were for TVs.
- Accessing the e-commerce website via a PCW had the highest impact on the prices observed. In some countries, access to the website through a PCW was linked with a price difference of up to 3% on average compared to direct access to the webpage or access through a search engine.
- However, across the EU28, almost three in ten respondents (28%) in the consumer survey reported that they believed nearly all or most websites use online personalised pricing.

**Evidence of online targeted advertising** - The findings from the literature review, consumer survey and stakeholder survey suggest that online targeted advertising is the most prevalent online personalisation practice.

- Across the EU28, more than two thirds (71%) of respondents in the consumer survey reported that in their experience nearly all or most websites use online targeted advertising.
- In total, 15 out of 28 (54%) stakeholders reported that targeted adverts in their various forms are in their opinion used by “most websites” or “nearly all websites”.

### **Type of personal data collected and the techniques used to collect consumers’ personal data and segment consumers in online markets**

The literature, as well as the stakeholders’ and business operators’ surveys, show that there are many different technological means for data collection that can be used in online personalisation:

- Personal data can be volunteered or ‘surrendered’ by online users (e.g. when creating accounts online or interacting on social media), observed (e.g. when browsing activity is tracked using cookies) or inferred (e.g. by combining and analysing data obtained from different sources, often from data brokers).
- Online firms can use several tracking methods to follow consumers across platforms, websites and devices. These include the usage of cookies, but increasingly also more advanced and sophisticated tracking methods, such as digital fingerprinting and web beacons, which are harder for consumers to prevent or stop.
- The advanced tools needed to prevent sophisticated tracking methods, such as Virtual Private Networks (VPNs)<sup>6</sup> or the Tor browser<sup>7</sup>, are rarely used by online shoppers. In the consumer survey, 60% of EU28

<sup>2</sup> Not taking into account differences in quality or product features that may have an impact on consumer welfare.

<sup>3</sup> The results of the mystery shopping exercise are broadly consistent with the existing empirical literature, which does not find robust evidence of price personalisation. However, the mystery shopping data should be interpreted with care. The advanced technological means for online personalisation are extensive and developing rapidly, and hence difficult to detect, especially since pricing algorithms, increasingly used for both price discrimination and dynamic pricing, are often involved. It should also be noted that the mystery shopping results are based on a sample of 160 websites across 4 product categories and 8 EU Member States and may not be representative for the entire EU e-commerce environment.

<sup>4</sup> The mystery shopping exercise encompassed 4 scenarios, simulating: a) accessing the e-commerce website via a search engine (e.g. Google), b) accessing the e-commerce website via a price comparison tool (PCW), c) accessing the e-commerce website via a different browser, d) accessing the e-commerce website via a mobile device (as opposed to a desktop). In the ‘no personalization scenarios’, shoppers’ characteristics (either past online behaviour or information on access route to the website were not observable by e-commerce websites).

<sup>5</sup> Not websites of airlines as such but instead websites of platforms that sell air tickets.

<sup>6</sup> Virtual Private Networks (VPNs) are tools that establish encrypted communication channels with selected servers (usually operated by the VPN provider) and prevent other parties, including the Internet Service Providers (ISPs), to track and intercept their communication.

<sup>7</sup> The Tor browser is a modified web browser that directs internet traffic through an overlay network of relays to conceal a user’s location and usage from

respondents never used these tools or didn't know about them, whilst most others use these tools only sometimes or rarely.

- E-commerce websites that want to personalise results do not always collect and subsequently process consumer data/profiles themselves; instead, they often use specialised companies' personalisation or analytics software or services. The so-called 'data value chain' contains a variety of actors involved in collecting and transmitting users' data. The literature review showed that the marketing data and advertising industry is among the largest sectors in this ecosystem, encompassing various actors, such as marketing agencies, data brokers, online advertisers and e-commerce firms. Online platforms (including marketplaces such as Amazon and social media like Facebook) also play an increasingly important role as intermediaries<sup>8</sup>.
- A clear majority of business operators consulted agreed that emerging technologies such as Artificial Intelligence and the Internet of Things, will further expand the options for online personalisation.

The evidence from the literature and stakeholder survey shows that online firms collect many types of personal data, including socio-demographic data (age, gender, etc.), behavioural data (history of website visits etc.), technical data (type of browser etc.), and this may include potentially sensitive data (e.g. health, sexual orientation etc.). Although such personal data is often transmitted in 'anonymised' or 'pseudonymised' form, in practice this does not exclude the possibility of individuals being identified, notably because different data sources and types can be combined to enable targeting at individual level. This means the distinction between non-personal and personal data in (micro) targeting practices of online advertising, marketing and other content is often blurred.

Published literature finds that online business operators can use the described tracking methods and the collected data to target certain (groups of) consumers differently, for example segmenting users based on their willingness to pay. While practices like price discrimination (based on elaborate pricing algorithms) can theoretically benefit consumers, for example by offering lower prices to consumers with a lower willingness to pay, it could also be that, in certain cases, vulnerable consumers may be discriminated because of sensitive personal characteristics or that low revenue consumers may be charged more for a service if they are perceived more likely to for example default on a loan. This problem is exacerbated by the fact that consumers on average do not tend to use software to prevent (and detect) online personalisation, as shown by the consumer survey.

### **3) Consumers' awareness and perception of online personalised practices and problems experienced**

#### **Consumers' awareness of online personalised practices**

- Close to two thirds (67%) of EU28 respondents in the consumer survey indicated that they understood or had some understanding of online targeted advertising. For personalised ranking of offers the comparable figure was 62%, whereas for personalised pricing this was only 44%.
- The consumer survey and the behavioural experiment found that potentially vulnerable consumers, such as older people, those with low educational attainment, those having difficulty making ends meet, or those inexperienced with online shopping, have lower overall self-reported awareness of personalisation.
- The findings from the behavioural experiment<sup>9</sup> show that self-reported awareness does not necessarily translate to an ability to correctly identify online personalisation, as fewer than half of participants correctly identified online targeted adverts, personalised ranking of offers, or personalised pricing. For example, less than 20% of participants in the behavioural experiment correctly identified price personalisation when they

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network surveillance or traffic analysis.

<sup>8</sup> For example, they may not only collect personal data to better personalise their content for users, but also allow businesses to better target their products and services on the platform itself, based on users' data.

<sup>9</sup> The behavioural experiment took place in the same Member States that the Mystery Shopping did. It simulated an online search platform where participants were asked to purchase one of eight products listed there, based on information about their previous searches/purchases. In the experiment, participants were randomly allocated to one of the following types of personalisation scenarios:

- the 'baseline' or 'no personalisation' scenario, where the search results shown were presented randomly;
- personalised ranking of offers – where the ranking of offers shown was tailored to participants based on their previous search history or browser;
- price discrimination – where participants were shown higher, or lower, prices for the same product depending on their previous search history;
- And targeted advertising – where participants were shown a targeted advertisement, combined with either random sorting of search results, or results sorted based on their previous search history.

The behavioural experiment also tested the impact of treatments varying how transparently personalisation was communicated to participants.

- Low transparency: where it was not made clear to the participant that results were personalised;
- High transparency: where participants received salient communication that results were personalised to them; and
- High transparency + action: where participants received salient communication of personalisation, and it was easier for them to clear cookies and search again by a one click button.

experienced prices which were lowered based on the participants' previous search history.

- The proportion of participants in the experiment correctly identifying personalised ranking of offers *when it occurred* significantly increased as communication transparency about this practice increased on behalf of the online platform. For example, approximately 40% of participants in the higher communication transparency treatments<sup>10</sup> correctly reported that personalisation in terms of ranking occurred, compared to 29% of participants who correctly reported that personalisation had occurred in the low communication transparency treatment<sup>11</sup>. However, there was very little difference in the proportion of respondents correctly answering whether they have experienced personalised pricing or targeted advertising, as transparency in the communication increased.
- In the behavioural experiment, potentially vulnerable participants such as the economically inactive, those with financial difficulties, and participants with low experience of online transactions benefited most in terms of their awareness being raised due to more transparency about personalisation from the online platform.

### **Consumers' perception of online personalised practices**

- For each of the three personalisation practices covered by this study, less than 10% of EU28 respondents in the consumer survey indicated that they did not have any concerns whatsoever.
- Respondents in the consumer survey were most concerned about their personal data being used for purposes other than the ones for which it was gathered and/or not knowing with whom it might be shared (ranging between 36% and 49% for the three personalisation practices). Equally, concerns about users' data collected in order to make a profile out of them ranked particularly high (33% - 46%). A substantial proportion of respondents (16%-25%, depending on the online personalisation practice) indicated as one of their three main concerns that they cannot refuse/ prevent online personalisation, whereas as many as 28% of respondents were concerned about ending up paying more for products online as a result of personalised pricing.
- The share of EU28 consumer survey respondents who did not perceive any benefits from personalisation was 24% for targeted adverts, 25% for personalised ranking of offers and 32% for personalised pricing.
- Approximately 42% and 34% of EU28 respondents reported as their main benefit of targeted advertising and personalised ranking of offers that they can see the products that they might be interested in. For targeted advertising, reducing the number of irrelevant ads seen was reported by 23% of EU28 respondents as the second main benefit, whereas for personalised ranking of offers 23% of EU28 respondents reported that this practice saves them time when searching online. When it comes to personalised pricing, the most important perceived benefit reported was that it allows online firms to offer reductions/promotions (22%).
- The findings from the consumer survey, behavioural experiment and stakeholder survey show that a (relative) majority of consumers see both benefits *and* disadvantages of online targeted advertising and personalised ranking (51% of EU28 survey respondents for targeted advertising and 49% for personalised ranking of offers respectively). For personalised pricing only 36% of EU28 survey respondents reported so.
- Consumers would be more positive about online personalisation if they received more information about and had more control of these practices. About six in ten (62%) EU28 consumer survey respondents said that they would be more positive about online personalised practices if there was an easy option to refuse.

### **Consumers' bad experiences with online personalised practices**

- A substantial proportion of EU28 respondents in the consumer survey reported to have had (a) bad experience(s) with personalised practices (18% for online targeted adverts, 14% for online personalised ranking of offers, and 12% for online personalised pricing).
- Among the survey respondents who reported bad experiences, half (50%) reported that they had been offered a product they were not or no longer interested in, whilst roughly a quarter (27%) reported that they ended up paying more for something they bought.
- Almost three quarters (73%) of respondents in the consumer survey who reported that they had bad experiences indicated that they did *not* complain about them. If complaining, respondents most frequently addressed the website involved or a national consumer organisation (10% and 6%, respectively, of all respondents with bad experiences indicated they did so).

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<sup>10</sup> In the higher communication transparency treatments participants were informed by the online platform about seeing results based on their previous searches/purchases.

<sup>11</sup> In the low communication transparency treatment, no information was provided to the participant on the personalisation practice.

#### **4) Assessment of whether businesses are transparent about online personalisation and comply with the existing regulatory framework**

The stakeholder survey and mystery shopping exercise point to a lack of transparency about online personalisation by online business operators<sup>12</sup>:

- Close to two thirds (11 out of 17) of data protection and consumer protection authority respondents noted that usually business operators are not transparently informing consumers about the collection and processing of personal data.
- Most stakeholders reported cases where companies failed to provide adequate information to consumers (e.g. incomplete or misleading information clauses) and failed to obtain an informed consent from consumers in relation to data processing.
- Mystery shoppers could not find information about why they were shown targeted adverts in almost two thirds (65%) of the website visits during which they believed to have observed targeted adverts.
- Only in less than one in ten (9%) of the website visits for which targeted adverts were reported, shoppers were able to find information near the advert explicitly stating that it was personalised.

The vast majority of data protection authorities consulted reported that they rarely or never receive complaints about online personalised practices. Moreover, most consulted consumer protection authorities indicated to only rarely receive consumer complaints about online business operators' possible non-compliance with consumer law and the EU regulatory framework. On the occasions that they do, these relate mostly to complaints about consumers' personal data being used for other purposes. Nonetheless, the fact that consumers do not complain about them does not inevitably mean that they don't experience such practices, as shown in the consumer survey. Also, the issue of being in a weak position to detect certain practices like personalised pricing should be taken into consideration, as indicated by the rather low awareness of personalised practices in the behavioural experiment.

In the business operators' survey, most (7 out of 10) consulted online firms claimed to be either "almost ready" or "in the process of implementing" measures to ensure compliance with the General Data Protection Regulation (GDPR)<sup>13</sup>. However, the question remains what firms' compliance would mean in practice for consumers. E-commerce firms and national experts in the stakeholder survey noted that although consumers are usually informed about personalisation and data collection via privacy statements, these statements are rarely read. Stakeholders noted that consumers seldom take advantage of options to access, approve, edit or request the deletion of collected personal data, as doing so is not necessarily straightforward. Supporting this finding, only four in ten (41% of) EU28 respondents in the consumer survey noted that in their experience, all or most websites allow consumers to refuse cookies. Likewise, in less than a quarter (22%) of the mystery shopping visits it was possible to refuse cookies, as reported by the shoppers.

#### **5) Economic effects of online personalisation on consumers and sellers**

The collection of personal data and the profiling of consumers is enabled by the amount of data generated by multiple devices and the advances in tracking technologies and data analytics. This offers online sellers the possibility to offer consumers tailored (personalised) products and services and to be in a position to determine with greater accuracy the prices that consumers are prepared to pay according to their characteristics (e.g. affluent versus non-affluent shoppers) in an attempt to also better optimise their own revenues. In this context, the behavioural experiment showed that<sup>14</sup> in three scenarios when it was not likely that participants were aware of personalisation<sup>15</sup>, personalisation had an impact on the probability that a personalised product<sup>16</sup> was selected by participants. For example, in the price discrimination scenario where participants were shown lower prices, 66% of

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<sup>12</sup> It should be emphasised that the study's findings cannot provide conclusive evidence on the actual level of compliance by online business operators. Depending on the country, the interviewed data protection authorities are not necessarily the competent authorities to enforce Article 5(3) of the ePrivacy Directive and may hence not be able to provide accurate information on online firms' compliance with the EU data protection framework. Mystery shoppers may have missed more subtle information about why they were shown personalised results.

<sup>13</sup> Available at <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&from=EN>

<sup>14</sup> Although there was usually no significant difference in the probability of purchasing products overall, irrespective of the level of transparency in the communication of personalization on behalf of the online platform.

<sup>15</sup> If it was not communicated as such by the online platform (low transparency treatment).

<sup>16</sup> Products were targeted to respondents based on their previous online behaviour and placed prominently in positions 1-3 of ranked products.

them chose to purchase a personalised product, whereas in targeted advertising combined with personalised ranking of offers scenario 62% of participants chose to purchase one, as opposed to 50% in the baseline scenario of no personalisation. Moreover, existing evidence in the literature suggests that behaviourally targeted advertising increases by more than fivefold the percentage of website visitors who complete an online transaction<sup>17</sup>. Therefore, the benefits of online personalisation are obvious for online firms.

The existing literature suggests that online personalisation in theory can benefit consumers if it matches them to products that best suit their needs, lowers prices and reduces their search costs. However, personalisation can negatively affect consumers if it is used to steer them towards the most expensive products that they are willing to pay for. In turn, personalisation may benefit consumers who actively shop around and are tech-savvy. This is because, by comparing products between different online sellers, they are more likely to have a better knowledge of the online market and are therefore more likely to detect unfavourable personalisation or benefit from favourable personalisation when it occurs. However, personalisation, can harm consumers who are not able or willing to search due to for example time constraints, or those who have a high willingness-to-pay.

Market competitiveness may affect the impact of personalisation on the allocation of welfare between sellers and consumers. For example, in markets with intense competition personalisation can benefit consumers since sellers can compete with each other to adapt their prices and win consumers with a lower willingness to pay. However, in markets with weaker competition online personalisation can help sellers to extract more surplus from online transactions, by reaching additional consumers and extracting the maximum possible surplus from each transaction, which can be detrimental to consumers overall.

Engaged consumers can exert pressure on sellers and retain consumer surplus. Existing research shows that when consumers are aware of online personalisation and feel that it is unfair, there is a high risk that they will turn away from sellers who engage in these unfair practices. However, evidence from the behavioural experiment shows that it is difficult for consumers to recognise and identify online personalisation. In addition, the consumer and stakeholder surveys suggest that consumers do not often take the necessary steps to protect their data.

In addition to impacts on welfare allocation for online transactions, online personalisation may have wider long-term impacts. For example, price discrimination practices, by allowing firms to seize a greater share of surplus from transactions, can in theory lead to more investment in innovation. On the other hand, online personalisation can limit the range of products available to consumers, by directing them to options suggested by algorithms using often information about their previous purchasing/browsing behaviour. Hence, this can reduce competition and thus limit innovation as consumers are often targeted with products similar to the ones that they have recently purchased, preventing sales in other online market sectors.

The policy approaches suggested in this study should be seen in the light of the newly applicable General Data Protection Regulation (GDPR) and the reform of the ePrivacy Directive. Suggested policy approaches include actions in order to enforce the Regulation's rules with respect to online traders' transparency obligations towards consumers, as well as initiatives to increase the cooperation and information exchange on personalisation practices between consumer and data protection authorities. Self-regulatory actions are suggested for the e-commerce industry (including European e-commerce associations) such as the development of EU-wide standards and best practices on using personalisation practices. The study also suggests options to increase consumer awareness, including by national information campaigns, and concrete ideas for further research on the area.

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<sup>17</sup> 3.8% compared to an average of 0.7% for un-targeted advertising (IHM Markit, 2017).

