PERSONALIZED PRICES IN EUROPEAN COMPETITION LAW

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The advent of big data analysis techniques make personalized prices possible. This paper sketches a preliminary picture of this new phenomenon, first explaining how personalized prices flow from big data analysis, how personalized prices fit into the economic notion of price discrimination, how buyers perceive them, and how they affect consumer and social welfare. Then, seeking to square this new phenomenon with the existing legal framework, the article turns to the antitrust and contractual matters relevant to the *quantum* of personalized prices, as well as the unfair competition and privacy matters linked to the *process* whereby these prices are calculated and charged to consumers. The paper concludes that while personalized prices may give rise to some privacy concerns, from an antitrust perspective they very rarely harm the good functioning of the market insofar as it concerns variations in consumer welfare.

Key words: personalized prices, discrimination, antitrust, personal data, fairness

Classificazione JEL: K21, K29

1. Introduction

Tosca

Save him!

Scarpia

Me? You rather!

Come, my fair lady. Sit down here.

Shall we try to find together a way to save him?

Well then, sit down, and we shall talk.

Tosca

How much?

Scarpia

How much? [he laughs]

Tosca

What is your price?

Scarpia

Yes, they say that I am venal,

but it is not for money that I will sell myself to beautiful women.

I want other recompense

If I am to betray my oath of office.

Tosca

Oh, wretch

Oh, ghastly bargain!

[they argue; she stabs him][1]

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[1] http://www.opera-arias.com/puccini/tosca/libretto/english/

The reader will forgive the author for shortening this famous duet in which Tosca refuses as a "ghastly bargain" the price that Scarpia, the chief of the papal police, has asked for the release of her lover, Mario Cavaradossi. However, as explained in what follows, these verses offer some insight for those willing to study the phenomenon of personalized prices calculated using big data.[2]

Firstly, the duet assists in illustrating that the "other recompense" requested by Scarpia is not – and cannot be – considered a customized price because it is higher than what Tosca was prepared and able to offer for the release of Cavaradossi. Indeed, as economic theory provides (see Section 2), a personalized price equals the maximum amount of money that a potential purchaser – who according to the neoclassical paradigm is conceived of as a rational and informed agent – is willing to and able to pay for a particular product or service. Thus, personalized prices are not formulated to rip off those who are in a state of emergency or need. They are offered in light, not in spite, of the tastes and economic possibilities of potential buyers. While allowing no margin of savings to consumers, these prices reflect their preferences and budget constraints, matching the highest value that potential buyers are willing and able to pay to obtain the demanded product or service.

Secondly, the dialogue between Puccini's two characters exalts the value of negotiation as a tool to reveal the willingness of individuals to pay: it is from this exchange of opinions, as well as from subsequent events (Tosca stabs Scarpia, killing him), that we understand Tosca is not willing to pay the "other recompense". For years it was thought that customized prices represented little more than a theoretical possibility, since the standardization of production and communication had more or less eliminated Scarpia's invitation to "*talk*". Namely, those moments of intense bargaining between individuals, during an exchange which they are consciously aware is transpiring, in which they could be induced to reveal their mutual intentions. Now, it is true that individual negotiations remain very rare, especially in the digital environment. Nonetheless, as discussed below (see Section 3), the explosion in the amount of data that describes consumer behavior, as well as the incredible increase in computational capacity of information systems, has given firms the capacity to identify (or at least approximate) their customers' willingness to pay. This can occur without the need for individual negotiations, regardless of whether or not clients and consumers are informed or fully aware of this new capacity. In this sense, therefore, the duet between Scarpia and Tosca differs from present capabilities as, thanks to big data, the personalized prices that result are not due to intense negotiations in which customers and consumers consciously partake. Rather, these prices are born from the use of computer algorithms and other automated analysis tools that do not require or involve the participation of clients and consumers. Indeed, software can analyze data and information that customers and consumers may not have even contributed to revealing about themselves

Therefore, this raises two different issues that may have some legal significance. The first concerns the possibility that the buyers do not know about either the "data-driven" and "data set based" processes employed to formulate those prices or the "personalized" nature of the prices (i.e.: that there are different prices for each buyer). This form of "double ignorance" should encourage some reflection about the possibly unfair nature of the practice of customized prices (see Section 7). The second legal issue that we might consider concerns both compliance with the rules on personal data protection that guide the formation of the dataset, and the possibility that big data analysis could lead to the association of a digital identity with an individual. In the latter case, for example, this would

[2] For a background and non-technical explanation of the big data phenomenon, see V. MAYER-SCHÖNEBERGER, K. CUKIER, *Big data. A revolution that will transform how we live, work and think*, New York, Hodder & Stoughton, 2013 and T. DAVENPORT, *Big data at work: dispelling the myths, uncovering the opportunities*, Boston, Harvard Business Review Press, 2014.

be the assignment of assumptions about the individual's preferences and budget constraints that are not subject to the individual's control (see Section 7.2).

Thirdly, the duet between Tosca and Scarpia evokes a context in which one of the parties (in this case Scarpia, as the head of the papal police) has significantly more power than his interlocutor (Tosca, who seeks the return of her imprisoned lover), such that he can exploit the situation to his advantage. Even if the majority are correct in their observation that the ability to charge customized prices presupposes the existence of some degree of market power (cf. Section 2), this power need not amount to market dominance. Indeed, when personalized prices are charged by firms that operate in imperfect competition it is difficult to recognize and define the allocative and distributive effects that these practices can produce (cf. Section 5) in any kind of universal way.

Even on the assumption that firms who practice differential pricing are monopolist, it is not necessarily true that customized prices are exploitative of less affluent buyers, making them poor or rather, even poorer. Since personalized prices are calculated on the basis of the potential buyers' willingness to pay, customized prices are higher for those who have higher willingness to pay, and lower for those with a lower willingness. If, therefore, this willingness is always by definition an expression of preferences, as well as of individuals' income, personalized prices should make the wealthier buyers poorer and poorer buyers less poor (see Section 5).

Still, it is true that personalized prices charged by monopolistic firms reallocate, in their favour, wealth that otherwise would have remained in the hands of (at least some) buyers. However, this transfer of wealth may be counterbalanced by a relevant socially allocative effect, i.e.: the ability to make accessible goods which are otherwise unreachable by the poorest (cf. Section 5).

Finally, the duet between Tosca and Scarpia raises questions about why Scarpia considered it appropriate to request "other recompense" from Tosca. Evidently, Scarpia thought that this would match Tosca's maximum willingness to pay because he had wrongly (and fatally!) assumed the category of persons to whom Tosca belongs, women, to be among those people who would be willing to provide forms of payment other than money. This issue of classification also affects the world of big data. This is, first, because individuals may be included, despite their will, within some categories defined through the analysis of big data which may or may not represent them faithfully. Secondly, this is because the classifications could cause (or at least not counteract) forms of discrimination with socio-political consequences in cases where categorizations might create or reflect groupings based on gender, ethnicity and sexual orientation or conceal manipulations made for a prejudicial purpose (see Section 7).

Personalized prices calculated with big data can be made available to many firms, even those that operate offline, by applying algorithms and automatic analysis techniques to information inferred from data obtained in various ways. Moreover, while personalized prices can divert resources from some consumers toward others, they are not necessarily detrimental to the proper functioning of the market. Contrary to what might otherwise be thought, the legal considerations that arise from personalized prices do not primarily concern allocation issues related to the amount charged or distribution issues due to an absence of "equality" in pricing for everyone. As will be explained the issue of customized prices might not be an antitrust one, except where supported by a well-considered hypothesis that demonstrates anti-competitive effects, and might not justify the choice *de jure condendo* to make equal treatment a general, and not special, obligation (see Section 6). The main legal issues that seem to arise from personalized prices derived from big data concern the circulation and use of the information. Namely, the extent of information offered to buyers, digital or not, so that any purchases based on customized prices do not occur with their ignorance or lack of awareness as to the information upon which the price has been formulated. In addition, there is the issue of what rules are necessary to ensure individuals remain in control of their digital identity and the way in which it is used (see Section 7).

Therefore, the second section of this paper will discuss how economic thinking theorizes customized prices, the third section will attempt to describe the process, using big data, that leads to the formation of such prices, and the fourth section will be dedicated to how consumers perceive personalized prices. The fifth section adopts a more general perspective on the effects that personalized prices have on total and consumer welfare. The sixth section will analyze the conditions under which competition law can be used to regulate price discrimination, and will consider, more generally, the role that the principle of equal treatment plays in liberal market economies. The seventh section examines the type of information available to consumers who are charged personalized prices, in light of regulation regarding unfair commercial practices, personal data and privacy protection. Finally, the paper concludes that this new, though not yet widespread, phenomenon gives rise to many challenging questions, even though its implications have not yet been fully understood by the law or the commercial world.

2. Price discrimination and personalized prices in economics

In economics the term "price discrimination" refers those cases of imperfect competition[3] where a firm offers the same good at different price/cost ratios.[4] Except for those firms that discriminate by relying on their customers' risk propensity,[5] the primary purpose of firms opting for price

[3] As has been noted, perfectly competitive firms, due to their lack of market power, cannot engage in differential pricing but must apply a uniform price equal to their marginal cost. As a result, in order to conceive of a circumstance in which price discrimination could be practiced successfully, we need to suppose that the companies involved in the phenomenon hold some form, even if limited, and even if only for a brief period, of market power; that is, some ability to earn profits despite charging a price different from their marginal cost. In fact, major economic doctrine recognizes market power as one of the three conditions (together with the absence of arbitrage, and the knowledge, even if approximate, of the buyers' reserve price) required for price discrimination to be practicable – see specifically on market power: LA STOLE, *Price Discrimination and imperfect competition* (2003), p. 1, available at http://web.mit.edu/14.271/www/hio-pdic.pdf , P. AREEDA, H. HOVENKAMP, Antitrust law. *An analysis of antitrust principles and Their Application*, Boston, Aspen Publishers, IIB, 2007, 517, p. 150; S. CARBONNEAU, P. MCAFEE, S. MIALON, *Price discrimination and market power*, *Emory Economics*, 2004, p. 413, and H.R. VARIAN, *Price Discrimination*, in R. SCHMALENSEE, R.D. WILLIG (eds), *Handbook of industrial organization*, Vol. 1, 1989, p. 600 e P. BELLEFLAMME, M. PEITZ, *Industrial Organization. Market and Strategies*, Cambridge, Cambridge University Press, 2015, p. 198. This is a significantly different question from the most up-to-date analysis regarding price discrimination, which looks at a scenario in which this strategy is led by a monopolist. It is true that, historically, price discrimination was conceived of as a monopolist's practice. In addition, it is as a *second-best strategy*, being conduct which, in a context already deteriorated by the monopoly's inefficiencies, is still capable of increasing social welfare, for example by pushing output above the monopoly level. However, analysis conducted in relation to monopolistic firms: (i) does not exclude the possibility that companies that are not in a dominant position may discriminate - as noted above, in order to discriminate only *some* degree of market power is required; and (ii) evidently does not demonstrate that price discrimination always improves social welfare, for example when the starting point is not that of a monopolist. Cf. Section 5 on both points.

[4] See S. CLERIDES, *Price discrimination with differentiated products: definition and identification*, 20 *International journal of industrial organization*, 2002, p. 1385 which looks precisely at the levels of prices and marginal costs, whereas traditionally discrimination is defined by comparing the ratio between prices and marginal costs - see G.J. STIGLER, *The Theory of price*, New York, *The Macmillan Company*, 1966, p. 209. Beyond these distinctions, which share a common heritage in economic and more sophisticated econometric thought, however, it remains true that analysis of the marginal costs of a company (or, better, an analysis of the financial costs to be counted among the company's marginal costs) is a complex exercise which also involves a considerable degree of discretion, particularly in the context of differentiated products. On this point, see P. AREEDA, H. HOVENKAMP, *Antitrust law*, cit., 517c, p. 155.

[5] Price discrimination may also be calibrated as a function of variables other than the buyers' willingness to pay. For instance, insurance companies often offer different premiums according to the risk categories in which they place their potential customers. Not surprisingly, some literature on the subject of big data and price discrimination discusses precisely the legal, economic and (especially) social implications that could result if insurance companies were able to set their prices not only on the basis of individual risk profiles but also on the basis of profiles created through the analysis of correlations between data that otherwise would have remained hidden. Although, on the one hand, the sophistication of this analysis could reduce the risk of adverse selection (such that only the most risky subjects would find it worthwhile

discrimination is to free their prices from production and marketing costs, and to make them dependent on buyers' demand, which reflects their willingness to pay.[6]

However, it is not easy to identify the reserve prices of clients and consumers. Nor is it customary for a firm to have all the information necessary to know the preferences and budget constraints of its buyers. Indeed, in order to discriminate by price, firms must rely on some approximation of buyers' willingness to pay for their products or services.[7]

For example, in "third degree discrimination" or "group pricing" scenarios[8] a company chooses to use a verifiable criterion, such as the purchaser's age, occupation or geographical origin, to index her or his wealth and or desire for that product in order to cluster its customers into different categories of purchasers, to which it then charges different prices. Traditional forms of third degree discrimination are, for example, the reduced fees that universities charge low-income students or the discounts that theatres offer to children and the elderly because, in both cases, these individuals are assumed to have limited spending power. Likewise, the much more contemporary "geo-blocking technique"[9] represents a species of third degree discrimination because it is based on the assumption that the geographical areas in which people are an index of their willingness to pay.[10] In short, as also noted in the literature on market research, in order to improve their offers firms devote much of their

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to resort to the insurance system), on the other hand there is no way to prevent the possibility that insurance companies would demand exorbitant premiums from high-risk individuals whose risk profiles do not depend on their own reckless behavior but on circumstances outside their control, such as a high likelihood of contracting certain diseases (of which they may not even be aware), revealed through big data analysis based on an inferred profile of the individual. In such a circumstance, it is argued, the knowledge obtained through an analysis of the data, even if it could be considered accurate or true, could not only be considered substantially detrimental to individuals' privacy but also would have the effect of undermining the solidarity and/or mutual assistance mechanism underlying any insurance system, fueled by the inability of any one individual to know precisely her or his insurance coverage "needs". It is this eventuality, the elimination of this unawareness and uncertainty, which alarms some commentators, especially for socio-political reasons related to the absence of a welfare state, solidarity and a risk sharing culture - see Cfr. R. SWEDLOFF, *Risk classification's Big Data (R)evolution*, 21 *Connecticut Insurance Law Journal* 2014, p. 339.

[6] The marketing literature recognizes the difference between "customer value-based pricing" and "cost-based pricing" by clarifying how the first depends on buyers' needs and how they perceive the product's value: see Cfr. P. KOTLER, G. ARMSTRONG, *Principles of Marketing*, Pearson, Boston, 2016, p. 325.

[7] Here, we have chosen to use the terms "purchaser" and/or "buyer" to indicate the class of those who are placed on the demand side because it was considered that distinguishing between company buyers and consumer buyers was not crucial. For the role played by this distinction in, *inter alia*, antitrust law, refer to sections 6 and 7.

[8] These two designations, like those used later in the text to indicate other forms of discrimination, are contained respectively in A. C. Pigou, *The Economics of Welfare*, London, Macmillan and Co., 1920, and C. SHAPIRO, H.R. VARIAN, *Information rules: a strategic guide to the network economy*, Boston, Harvard Business School Press, 1999, and have now entered into the common language.

[9] The practice of geo-blocking concerns the situation in which a consumer in a given country (say, a buyer identified as Italian because of his Italian-originating IP address or Italian-issued credit card, which therefore links him to Italy) cannot access a site based in another country (such as amazon.co.uk) or cannot complete his purchases on that site or is re-directed to the website of the same company based in his country (such as amazon.it). Consequently, as the European Commission has pointed out, the double-risk of territorial restrictions and limits on the free movement of goods is produced: "[g]eo-blocking is one of several tools used by companies to segment markets along national borders (territorial restrictions). By limiting consumer opportunities and choice, geo-blocking is a significant cause of consumer dissatisfaction and of fragmentation of the Internal Market": see European Commission, Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the regions. *A digital single market Strategy for Europe*, COM (2015) 192 final, Brussels, 6.5.2015, p. 6.

[10] The European Commission affirms that where geo-localization practices are used "… different prices are automatically applied on the basis of geographic location, for example when online car rental customers in one Member State pay more for the identical car rental in a given destination than online customers in another Member State": see European Commission, *A digital single market Strategy for Europe*, cit., p. 9. In fact, apart from its evaluation from the antitrust perspective (see section 6), geo-blocking can also have other purposes. For example, it can be used to enforce the compliance of copyright licenses issued on a national basis.

time to customer segmentation; that is, dividing customers into groups characterized by homogeneous features such as age, gender, region, educational level, marital status, political orientation, religion, and other factors that aid in categorizing potential consumers.[11]

Similarly, in the "second degree discrimination" or "menu pricing" scenario a company solves its information deficit about buyers' willingness to pay by offering many different prices in relation to some features, such as the amount of the purchased product or the moment at which the purchase is completed. Thus, the company waits for buyers to reveal their reserve prices by making a choice with respect to those characteristics. This is the case, for example, for discounts for customers who "bulk buy" a particular good, for higher prices applied for tickets purchased during rush hours or in the case of airlines providing reduced prices for those who buy tickets in advance.[12] Another type of "second degree discrimination" concerns so-called "packaged goods", namely packages of goods which are comprised of a durable good, such as a printer, and assets complementary to them, such as ink cartridges. In this case, those who want to use more of the good than what is included as part of the package will have a higher willingness to pay which they will reveal over time, for example by purchasing several ink cartridges.[13]

Finally, in the "first degree" or "custom price" scenarios firms can charge different prices to different customers, for example in the case of car retailers offering the same car model at different prices at the end of individualized negotiations. This also occurs at the end of a so-called "Dutch auction", where the auctioneer starts with a very high price and then lowers the price until he meets the bids (which reflect his willingness to pay) of someone who, spurred by competition with other potential buyers, accepts the offer.[14] As marketing studies show, this desire to know their consumers' reserve prices has driven firms to conduct a new type of market research in the last thirty years which can describe consumers' purchasing behavior and the motivations that induce them to buy a certain good. This in turn allows firms to predict if, and in relation to which factors, purchasing and consumption choices will vary over time.[15] However, so far many have recognized that this form of

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[11] See, e.g.: H. ASSAEL, A. M. ROSCOE, *Approaches to market segmentation analysis*, 40 Journal of Marketing, 1976, p. 67 and W.D. WELLS, *Psychographics: A critical review*, Journal of Marketing Research 12, 1975, p. 196.

[12] However, what seems different is the so-called practice of "versioning" in which, in order to place a consumer in respect to a product, a company modifies an endogenous feature of the product, thereby developing "high end" and "low end" versions of it (for example, hardcover books versus paperback forms: see SIFRONIS K., K. CLERIDES, *Book Value: Intertemporal Pricing and Quality Discrimination in the US Market for Books, Economic inquiry* 42, 2004, p. 402. It only *seems* different because the line between exogenous and endogenous characteristics of an item is very thin, to the extent that one might even be tempted to say that traditional cases of second degree discrimination are actually types of versioning – cf. R. O'DONOGHUE, A.J. PADILLA, *The law and economics of article 102 TFEU*, Oxford, Hart Publishing, 2013, p. 783. That said, it should be noted that versioning exposes companies to the risk that the desire to discriminate might cause an artificial degradation in product quality, as was the case for some US railroad companies in the nineteenth century when, in order to identify travellers' willingness to pay, they decided to create third-class carriages that did not have a roof: see FP RAMSEY, *A contribution to the theory of taxation*, 145 The economic journal, 1927, p. 37. A contemporary equivalent might be adding or removing a computer or smartphone feature in order to create high-end and low-end versions of the same product: see A. ODLYZKO, *The Evolution of price discrimination in transportation and its implications for the Internet*, 3 Review of Network Economics, 2004, p. 3.

[13] In other words, by charging a price close to marginal cost for the main product and a very high price for the complementary good, the company can offer the same package with prices increasing based on how much consumers intend to use the complementary good. This is premised on the assumption that consumers' interest in the use of the good is directly proportional to their willingness to pay for it: see H.J. HOVENKAMP, *Tying and the Rule of Reason: Understanding Leverage, Foreclosure, and Price Discrimination* (2011), available at http://ssrn.com/abstract=1759552.

[14] See J. HORNER, L. SAMUELSON, *Managing Strategic Buyers*, 2010, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=167389.

[15] See, among many, R.W. BELK, *Situational variables and consumer behavior*, 2 Journal of Consumer Research, 1975, p. 157 and G.E. SMITH, T.T. NAGLE, *How much are your customers willing to pay?*, 14 Marketing Research, 2002, p. 20.

discrimination – not by chance also called "perfect price discrimination" – is so rare as to represent little more than a theoretical possibility[16] or at least a remnant of pre-industrial society. However, the use of the internet and digital technologies, the collection of big data and the development of increasingly powerful and sophisticated analysis techniques have altered this reality.[17] One would think that firms could now group their customers and consumers in a way that is so precise and detailed that it replicates in a significant way the perfect discrimination scenario. Of course, whether they would find it convenient and profitable is another matter (cf. Section 4).

3. From Big Data to Personalized Prices

The phenomenon of personalized prices resulting from big data can be characterized as the most extreme iteration of a series of processes already known within our economies. As long as they have existed, computer systems have always been used to collect sales data, organize customer lists, identify market segments and calculate prices to be tested in stores. For years, many types of companies, such as airlines[18] and supermarket chains,[19] have developed loyalty programmes to collect consumer data in order to offer products tailored to the needs of different categories of buyers.

Nevertheless, today firms can experiment without having to ask people's opinions in real time, and develop, with very contained costs, new forms of supply[20] and multiple pricing strategies in order to better understand the purchasing decisions of their customers, without the help of most experienced business profiles (HiPPO – the Highest Paid Person's Opinion). This can also occur without having to develop reliable theories about the causal connections between the consumption decisions of their customers and the corresponding characteristics of the product and/or the purchase's environment.[21] Consider, for example, that a recent study has reported on hundreds of thousands of experiments in which the same product has been offered several times from the same vendor at different prices (or

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[16] See, for example, M. MOTTA, *Competition Policy. Theory and Practice*, Cambridge, Cambridge University Press, 2004, p. 19, and A.A. MILLER, *What do we worry about When We worry about price discrimination? The law and ethics of using personal information for pricing*, 19 *Journal of Technology Law and Policy*, 2014, p. 41, which describes forms of price discrimination not based on big data but on particular datasets, namely past consumption habits or internet searches.

[17] For millennia, goods have been exchanged through individualized transactions in which individual sellers are confronted with individual buyers. Therefore, prices determined through bargaining varied according to the temperaments and skills of the merchant and the buyer. The industrial revolution, however, triggered the phenomena of standardized production, mass media and widespread distribution, which have over time led to the creation of national and international markets where goods are sold under increasingly uniform and homogeneous conditions. Today, however, technological development seems to have turned the clock back to a world that is no longer "product-centric" but instead "customer-centric": see R. G. CROSS, A. DIXIT, *Customer-centric pricing: the surprising secret for profitability*, 48 Business Horizons, 2005, p. 483, where the authors use the expression "back to the future" in order to emphasize the idea that technological development will allow a return to a world designed on the basis of the value that individuals give to the goods they choose to buy.

[18] See, for example, how in 1953 American Airlines had already developed a reservation system which by 1960 was already being used to study the patterns of behavior that characterized the booking process. Information on the SABRE system (i.e. Semi-Automatic Business Research Environment) available at http://www.sabreairlinesolutions.com/about/history.htm

[19] On the use that the supermarkets can make of scanned product data, see, for example, A. NEVO, C. WOLFRAM, *Why do manufacturers issue coupons? An empirical analysis of breakfast cereals*, 33 RAND Journal of Economics, 2002, p. 319 and I. HENDEL, A. NEVO, *Measuring the implications of consumer sales and inventory behavior*, Econometrica 74, 2006, p. 1637.

[20] For example, search engines offer advertisers several platforms on which they can place their advertisements in order to choose the one that works best for them. Similarly, there are several companies that offer website optimization services by creating environments in which different sites are tested to understand what graphic, functional and content combinations offer the best performance.

[21] Hal R. VARIAN, *Computer mediated transactions*, American Economic Review: Papers and Proceedings, 2010, p. 1, 5.

with different auction parameters) with the ultimate goal of observing the reactions of buyers and so learning which variables influence the demand for that product.[22]

Moreover, the spread of the internet and smartphones and the extensive use by digital platforms of the so-called "two-sided" and "ad-supported"[23] business models has increased by tenfold the data sources that can be used to extract information about buyers. Consider that, from among the data associated with individuals who browse the internet and use a smartphone, it is possible to gather, among other things: their personal information and email addresses for all the times those people have created an account, their geo-location due to IP addresses assigned to their smartphone, the content of their searches and the history of all the sites that those individuals have visited, their thoughts as they have reproduced them on a blog or posted them on a social network, their tastes because of the music and videos they have streamed, their "likes" on Facebook or YouTube or their "wishlist" stored on e-commerce sites, and certainly all their purchasing habits based on what they have bought over the internet.[24]

If this information is voluntarily offered by consumers or tracked by cookies intentionally received on their browsers, and we add the data sold by specialized brokers, the information held by public bodies that has now been gradually digitized, made available and reusable,[25] as well as data from the so-called "the internet of things",[26] we can appreciate how, due to technological development, it is currently possible to have millions and millions of pieces of data that can be processed to infer metadata about the preferences of different people (or rather, clusters of different people) and personal incomes, and therefore predict their willingness to pay. The above-mentioned extraction mechanism of information from the analysis of (big) data does perhaps deserve special attention given its novelty.

In the past, due to limited computational capabilities, the study of consumer behavior was based on building samples and conducting experiments, in addition to directly examining the reactions of a small number of people (for example, individual interviews, focus groups and desk research conducted to identify the motivations underlying various purchasing decisions). The samples were composed of a finite number, *n*, of observations, obtained by questionnaires and related to the conduct reported by the individuals, parts of the sample, who in turn had to be selected to be statistically representative for the number and quality of the entire market.

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[22] L. EINAV, T. KUCHLER, J. LEVIN, N. SUNDERSAN, *Learning from selling experiments in online markets*, NBER Working Paper No. 17385, 2011.

[23] The two-sided business model provides that a company: (a) responds simultaneously to two different demands, being aware that (b) there is a positive and indirect effect on networks between one and the other demand, which is why the firm (c) could choose to subsidize one demand in order to practice supra-competitive prices for those which form the other demand. An example of this is the "ad-supported" business model, used by Google and Facebook, which interacts, on the one hand, with users that receive search services and social networking at zero cost, and on the other with advertisers, which are offered the opportunity to engage in behavioural advertising at cost higher than zero. In these scenarios the user data collected not only allows for the improvement of each service, being searches and social networking services for the users' benefit, as well as the ability of behavioural advertising to be effectively focused in favor of advertisers, but also reinforces the positive and indirect effects of networks between user demands and advertisers' demands.

[24] Some technologies, such as Digital Rights Management systems included in music files, video files or electronic games, offer companies countless data about the users' consumption patterns - See, e.g., T. Rayna, L. STRIUKOVA, *White knight or Trojan horses? The Consequences of digital rights management for consumers, firms and society*, 69 Communications & Strategies, 2008, p. 109.

[25] In this context note the strategy followed by European institutions (see https://ec.europa.eu/digital-single-market/en/open-data-portals), which has one of its strong points in Directive 2013/37/EU on information reuse in the public sector, OJ L 175, 27.6.2013, p. 1 for the development of information-based products and services.

[26] We should not only look at online behaviours. The so-called "internet of things", namely the capacity for objects used in our daily life to collect and submit data about our habits, can transform even our offline behavior into digital data, such as the frequency with which we eat eggs or park a car in a no parking zone.

This was the only reliable way in which inferences made on the basis of the sample could have been generalized to all consumers, tolerating a margin of error. The experiments, like the "purchase laboratory" and the "market test", aimed to define the causal relationships between multiple variables, such as consumer purchasing choices and some of their features, and they also had to be conducted according to statistical rules that would guarantee the possibility of generalizing the outcomes to the entire market.[27]

Today, however, the development of computer technology not only allows for the storage, even if in no particular order (i.e. without the application of any selection criteria or classification), of huge amounts of data (called "raw" data because it has not been otherwise "treated")[28] but also allows for the processing of all this data.

In other words, the increase in our ever faster computational capabilities allow us to perform analysis on datasets where "*n* = All", and then to highlight correlations (i.e. the regularities involved in the relationship between individuals and the world that surrounds them), which could not otherwise emerge from a sample analysis or experiments on causal connections. This is why it is said that given the current state of knowledge a huge amount of data, quickly gathered and extremely diverse, namely "big data", can be analyzed automatically or semi-automatically[29] thanks to text mining programs and knowledge discovery in texts.[30] The ultimate aim is to extract from this data, or allow this data to reveal, implicit information which would otherwise be hidden, and therefore to acquire knowledge which can be used to decide which goods to offer for sale, how to promote them, where to sell them and at what price.[31]

We have just said "to allow this data to reveal implicit information" in order to highlight what really distinguishes the big data phenomenon, specifically the possibility that the data "speaks" without any human being using some form of pre-understanding of reality to "read" it. For example, recently, data on native Spanish speakers trying to learn to speak English using a particular piece of software revealed that the learning of a specific rule of English grammar slowed down their learning. This

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[27] See KOTLER P., G. ARMSTRONG, *Principles of Marketing*, Pearson, Boston, 2016, p. 128 et seq.

[28] Consider, for example, that every day Twitter generates more than 12 terabytes (1012) in tweets, Facebook more than 25 terabytes of data deriving from access, while the New York Stock Exchange generates around 1 terabyte of information on trades. About 30 billion (1012) of terabytes are created from RFID, while the number of sensors currently in use within the network exceeds 30 million and is growing at 30% per annum - See SAKR S. (eds), *Large scale and big data*, Boca Raton, CRC Press, 2014. According to IBM, 2.5 quintillion (1030) bytes of data are produced each day: see http://www-01.ibm.com/software/en/smarteranalytics. In order to make sense of these mentioned powers of 10, consider that they are usually used in astronomy. For example, the distance between Earth and Andromeda, the nearest galaxy to our planet, is measured as 1030 km (it is in fact equal to about 21 quintillion km).

[29] Machine learning is one of the key areas of computer science and artificial intelligence because it deals with the definition of algorithms for the synthesis of new knowledge; that is, in other words, the possibility that "machines" could learn to answer questions and/or solve problems without being instructed to do so, i.e. learning by themselves to do so. Much of the technology we use in everyday life uses machine learning: the search engines that give us ever-improved results, the anti-spam software that filters our emails, software related to credit card payment systems that detects fraud, digital cameras that detect faces and applications on smart-phones that recognize voice commands: see S. SHALEV-SHWARTZ, S. BEN-DAVID, *Understanding machine learning. From theory to algorithms*, Cambridge, Cambridge University Press, 2014.

[30] In other words, the proliferation of data and the ability to store it in large datasets requires the adaptation of analysis strategies and the development of automated methods to filter, select and interpret data. Now, just as it is necessary to remove tons of rocks before diamonds can be found, in the same way data mining software (and, in particular, text mining software and knowledge discovery in texts) removes an enormous number of "data rocks" before it reveals "information diamonds": cf. T. HASTIE, R. TIBSHIRANI, J. FRIEDMAN, *The elements of statistical learning: data mining, inference, and prediction*, New York, Springer, 2009; Kudyba S. (eds), Big Data Mining and Analytics, Boca Raton, CRC Press, 2014

[31] The expression "data-driven innovation" has been coined in relation to the various and multiple innovations that have arisen and may arise from the analysis of big data. For an initial reference on this topic, please refer to http://www.oecd.org/sti/ieconomy/data-driven-innovation.htm.

correlation had not been predicted or contemplated by any expert in the field until that point but this result may now lead teachers of English to Spanish speakers to postpone teaching this rule so as to not delay their progress.[32]

Therefore, the enhanced and amplified ability to understand the reality around us and individuals' behavior through data (i.e. the possibility of offering a representation of the world – even dynamically - composed of data) can reveal individuals' tastes and incomes and, therefore, allows us to understand that companies can now both approximate in great detail the way in which potential buyers perceive the value of their product and measure their willingness to pay.[33] Further, analysis of big data could allow firms to abandon forms of gross customer segmentation based on few variables and arrive at smaller and smaller clusters of individuals with many common and homogeneous characteristics, so as to draw ever closer predictions about their reserve prices.[34]

Nonetheless, in a case well-known in the literature involving the second type of price discrimination, in 2000 Amazon incurred the ire of consumers for offering some DVDs to its regular users, who were recognized by cookies stored on their computer, at higher prices than those offered to people visiting the site for the first time. More generally, it is widely thought that consumers, and in particular consumers who are not adequately informed as to the use of different prices, perceive price discrimination as an unfair and incorrect behaviour.[35] This is clear regardless of any legal classification given to the phenomenon.

4. Personalized prices and purchasers' hostility

The early empirically collected data suggests that that perfect price discrimination based solely on buyers' willingness to pay remains a phenomenon of very limited proportions.[36] Of course, this may be explained by the same factors that likewise normally prevent forms of second and third degree

[32] For a mention of this example, please see V. MAYER-SCHÖNBERGER, Y. PADUA, *Regime change? Enabling big data through Europe's new data protection regulation*, 17 The Columbia Sc. & Tech. Law Rev., 2016, p. 315.

[33] M. SPANN, A. HERRMANN, D. SPROTT, *Pricing in electronic markets and networks*, 20 Electronic Markets, 2010, p. 83.

[34] Personalized prices could therefore be analogized as a very sophisticated form of third type discrimination, rather than perfect price discrimination. Nevertheless, the difference between these forms of discrimination passes through the measurement of consumers' heterogeneity in a way that remains unobservable by companies: see STOLE, *Price Discrimination*, cit., P. 3. Thus, if the effect of such a heterogeneity of big data analysis can be mapped and therefore known by companies, then the equivalence with perfect discrimination is sustainable. A separate issue is that, while the criteria that guide "traditional" third degree price discrimination are usually explicit and known to consumers, the parameters that would shape this third type of discrimination based on big data remain hidden within the algorithms used by companies. However this, as opposed to being relevant to allocation and distribution issues, could be most relevant to the issues of transparency and information symmetry.

[35] See W. REINARTZ, *Customizing prices in online markets*, 1 Emerging Issues in Management, 2002, p. 55; J. M. VILLAS-BOAS, *Price cycles in markets with customer recognition*, 35 RAND Journal of Economics, 2004, p. 486, but also T. Rayna, J. DARLINGTON, L. STRIUKOVA, *Pricing music using personal data: mutually advantageous first-degree price discrimination*, 25 Electronic Markets, 2015, p. 139. Here the authors, looking at the market of online music distribution, suggest that the price of $0.99 for each track can be regarded as the "maximum amount of unfairness'" tolerated by consumers. Also, they contemplate the idea that you can trigger the reputational mechanisms by which certain categories of consumer may be proud of (and not regret) having paid more than other consumers if they can identify themselves as a major supporter of a particular artist.

[36] See *White House, Big Data and differential pricing*, 2015 available at https://www.whitehouse.gov/sites/default/files/docs/Big_Data_Report_Nonembargo_v2.pdf

discrimination, such as buyer arbitrage[37] and competition from rivals,[38] which in the digital age is enhanced by, for example, price comparison websites and applications.[39] However, according to surveys and analysis on the issue, it seems that the main reason companies today choose not to discriminate is because buyers consider customized prizes, and the similar practice of dynamic pricing, as both wrong and unfair.[40] The general public seems to be suspicious of practices within which the price charged for a product or service is not the same for all buyers who make the purchase within the same timeframe.[41]

There are at least three reasons that may explain this phenomenon. First, living in an industrialized and mass society seems to give rise to an expectation that individual consumers will receive standard treatment, which is by definition the same for everyone.[42]

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[37] Companies that would like to discriminate are not always in a position to prevent arbitrage; that is, to prevent buyers sharing property acquired at different prices among themselves. The absence of arbitrage may be the result of natural obstacles, such as transport costs or the perishable nature of the asset transferred, or it can also be induced by the company, which, for example, may prohibit its own customers from resale.

[38] As mentioned (see above n 2), price discrimination is possible in imperfectly competitive markets where, therefore, rival competition can effectively limit the scope of action of the discriminating company, preventing it from increasing its prices far above the marginal cost.

[39] On the importance of these sites and applications for price comparison, such as Yahoo! Shopping, Epinions.com, PriceGrabber.com, TheFind, eBay's RedLaser, Google Shopper, Amazon's Price Check, see P.K. KANNAN, P.K. KOPALLE, *Dynamic pricing on the Internet: Importance and implications for consumer behavior*, in 5 Int. J. Electronic Com., 2001, p. 63, 66-71 and 78-79.

[40] The only similarity between price discrimination and dynamic pricing is the possibility of changing prices according to the data because, unlike personalized prices, the dynamic price does not change depending on the buyer's reserve price but because of various factors such as: (a) the company's internal metrics (such as when a web site that sells tickets for shows and sporting events changes its prices because of low traffic logs), (b) competitors' prices (when the company changes its prices to keep up with competitors), (c) the real-time matching of supply and demand (as often happens regarding the prices of airline tickets and hotel rooms), and (d) any other external elements (such as weather conditions, in the case of transport). Famous in this regard is the "surge pricing" system, the dynamic pricing system employed by Uber: see https://newsroom.uber.com/guest-post-a-deeper-look-at-ubers-dynamic-pricing-model/. There seems to be no reason to consider this way of charging a price as infringing antitrust law. It mimics the textbook case of a market where prices (but in Uber's case also the quantity, that is the number of drivers available) adjust themselves almost instantly as a function of supply and demand. Moreover, "[w]e must look at the price system as such a mechanism for communicating information if we want to understand its real function – a function which, of course, it fulfills less perfectly as prices grow more rigid" – See DOES HAYEK, *The use of knowledge in society*, in 35 American Economic Review, 1945, p. 519, 526. On the theme of fairness, one could instead imagine the case of a buyer (for example, a mother) who chose to use a particular service (for example, Uber, so that her children have a lift home from school) when the price for the service was lower (assume 40 euros for the trip) than the price imposed at the time of use of the service (suppose 400 euros because in the meantime a blizzard has hit and there are few drivers on the roads). However, as long as the purchaser is placed in a position to terminate their contemplated use of the service (to continue using this example, Uber asks its customers to re-confirm their trip request if surge pricing affects their fare), an increase in the price which could be judged as being excessively high should not qualify as vexatious for the purposes of article 33 of the Consumer Code.

[41] The relationship between price and equity has taken on an important role for those who undertake economic studies: see J.J. ROTEMBERG *Fair pricing*, 9 Journal of the American Economic Association, 2011, p. 952 – as well as for those who undertake marketing studies – L. XIA, B. K. MONROE, J. L. COX, *The price is unfair! A conceptual framework of price fairness perceptions*, 68 Journal of Marketing, 2004, p. 1. According to this literature consumers perceive the fairness of a price in relation to variables such as prices charged by rivals, the cost of the product, their previous experiences of consumption, cultural differences between buyers, as well as the procedures used to set prices. On this last issue see also S. MAXWELL, *Rule-based price fairness and its effect on willingness to purchase*, 23 Journal of Economic Psychology, 2002, p. 191; and O. SHEHRYAR, D.M. HUNT, *Buyer behavior and procedural fairness in pricing: exploring the moderating role of product familiarity*, 14 Journal of Product & Brand Management, 2005, p. 271. See, also, E. GARBARINO, O.F. LEE, *Dynamic pricing in the retail Internet: effects on consumer trust*, *Psychology and Marketing* 20, 2003, p. 495 and K.L. HAWS, W.O. BEARDEN, *Dynamic pricing and consumer fairness perceptions*, 33 Journal of Consumer Research, 2006, p. 304.

[42] See CROSS, DIXIT, *Customer-centric pricing*, cit., Pp. 483-484. A different issue that demands further investigation is whether and to what extent the idea (or, perhaps, the cliché) of perfect competition has contributed to promulgating the

Secondly, contrary to other forms of personalized offers that create an advantage for both the companies who increase the effectiveness and efficiency of their processes and for consumers who get customized products tailored to their preferences, customized pricing implies a sacrifice for the buyer. Consumers subject to price discrimination know the practice not to be egalitarian but resulting in higher prices for some and lower prices for others, a situation which gives rise to bad feelings and scepticism towards firms that opt to charge personalized prices.

Upon closer examination, however, what seems to be motivating these reactions is not a general desire for equal treatment but the fear of being among those who are charged (and pay) more. It is not a coincidence that several studies[43] show that while consumers with lower incomes are willing to reveal their preferences and their reserve prices to fetch lower prices, more affluent consumers are more guarded about information that describes their tastes and willingness to pay because they would prefer by far to pay a single price.[44] In other words, what motivates this distrust of price discrimination is what the consumer psychology literature calls a "one-sided perception of inequity".[45]

Thirdly, a custom price calculated through big data causes hostility because it seems less transparent and opaque than other forms of second and third-degree price discrimination. Whereas a customized price is based on information inferred from big data in the sense that the information was not requested for that purpose, and thus consumers would not necessarily have wanted it to be revealed, second and third grade discrimination are based on, respectively, the self-selection of consumers who say they belong to a particular group of individuals, or on identification of a consumer as meeting a clear standard, defined prior to (or simultaneously with) the formulation of the price offer. Thus, apart from possible violations of the rules regarding personal data protection, customized prices based on big data are perceived as worse than other forms of discrimination because they do not need a voluntary act of acceptance;[46] they are undertaken through analysis and not entered into by the consumer.[47]

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perception of a mass society where a good is the same price for everyone. In this regard, note C. Kaysen, D.F. TURNER, *Antitrust policy: an economic and legal analysis*, Cambridge MA, Harvard University Press, 1959, p. 16:56, where the authors – with reference to US companies – explain how the model of perfect competition provides a standard for defining what constitutes "fair business conduct".

[43] Appropriately encouraged, consumers are usually ready to decrease their level of privacy. Among these incentives we count both the decision to clearly engage consumers in the treatment of data and the possibility of consumers obtaining financial gains and other forms of convenience. See, among others, A. SHOPPING, H.R. VARIAN, *Conditioning prices on purchase history*, in 24 Marketing Science, 2005, p. 367; K.L. HUI, H.H. TEO, T.S.Y. LEE, *The value of privacy assurance: An exploratory field experiment*, 31 MIS Quarterly, 2007, p. 19 and I.H. HANN, K.L. HUI, T.S.Y. LEE, I.P. PNG, *Overcoming online information privacy Concerns: An information-processing theory approach*, 24 Journal of Management Information Systems, 2007, p. 13

[44] See D. KAHNEMAN, J. L. Knetsch, R. THALER, *Fairness and the Assumptions of Economics*, 59 Journal of Business 1986, p. 286; B.S. FREY, W.W. POMMEREHNE, O*n the fairness of pricing – an empirical survey among the general population*, 20 Journal of Economic Behavior and Organization, 1993, p. 295; R.J. SHILLER, M. BOYCKO, and V. KOROBOV, *Popular Attitudes Toward Free Markets: The Soviet Union and the United States Compared*, American Economic Review 1991, p. 81.

[45] In this respect it should be emphasized that it would be useful for companies if consumers never knew about the existence of different prices because even if they do not find out until afterwards this does not solve the reputational problem but rather aggravates it: see TJ RICHARDS, J. LIAUKONYTE, N.A. STRELETSKAYA, *Personalized pricing and price fairness*, 2015, p. 2, available at https://courses.cit.cornell.edu/jl2545/papers/personalized_Pricing_IJIO.pdf which reads "this notion of self-centered inequity aversion, applied to market transactions for consumer products, implies that a regime of discriminatory pricing used by a consumer-products retailer is likely to fail, or be rejected as unfair by participants, if the agent has evidence that either others paid more or less than himself".

[46] N. ARORA et al., *Putting one-to-one marketing to work: Personalization, customization, and choice*, 19 Market Lett., 2008, p. 19 offer an interesting distinction between the "customization" based on consumers' proactive choices and "personalization" based instead on the available information about consumers.

[47] See J. COX, *Differential Prices Can be Fair?* Journal of Product and Brand Management, 2001, p. 10.

In short, the hostility that buyers show towards pricing strategies that do not involve the same price for all, such as customized prices, is based on two different assumptions. Firstly, consumers do not want to pay more than others do. Secondly, consumers do not know when the offered price is differentiated. Therefore, they perceive that their ability to decline the relevant purchase is precluded, even though that possibility may otherwise objectively still exist in the presence of competition. However, it still remains to be seen how these individuals' assumptions can be reconciled with the interests of the community. These interests can be appreciated by both an economy that selects individual consumer welfare and broader social welfare as parameters for the evaluation of the proper functioning of the market (cf. Section 5 below) and by a legal system that designates not only the above-mentioned welfare but also other values as worthy of legal protection (see Sections 6 and 7).

5. Personalized prices and welfare

Currently there are many studies examining the effects that discrimination produces on welfare when it takes place not in monopolistic markets but in oligopolistic and imperfectly competitive markets. These sophisticated models make the welfare effects dependent on many factors – such as the heterogeneity of consumers, demand elasticity, firms' cross-elasticity, entry time or industry costs – that cannot be taken for granted and are not easy to trace in reality.[48] In particular, these models show that in oligopolistic and imperfectly competitive markets discrimination produces positive effects on total welfare until it enables an output increase, while it causes ambivalent effects on consumer welfare depending on how the scenario examined is modelled. [49] In addition, these models demonstrate that when products are differentiated and markets are segmented – two conditions that can easily occur in real market scenarios – customized prices increase the level of competition[50] by allowing firms to poach consumers that have in previous periods purchased from rivals.[51] This last fact also emerges from some empirical studies which point to the conclusion that price discrimination intensifies competition in non-monopolistic markets[52] if – of course – firms do not collude to fix prices.

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[48] See, among others, T.J. HOLMES, *The effects of third degree price discrimination in oligopoly*, 79 Am. Econ. Rev., 1989, p. 244; K.S. CORTS, *Third degree price discrimination in oligopoly: all-out competition and strategic commitment*, 29 Rand. J. Econ., 1998, p. 306; STOLE, *Price Discrimination*, cit.; M. ARMSTRONG, *Price Discrimination*, 2006, available at http://else.econ.ucl.ac.uk/papers/uploaded/222.pdf; T. HAZLEDINE, *Price discrimination in Cournot-Nash oligopoly*, Economics Letters 93, 2006, p. 413; D. ENCAOUA, A. HOLLANDER, *First-degree discrimination by a duopoly: Pricing and quality choice*, 7 The B.E. Journal of Theoretical Economics, 2007, p. 1; D. ULPH, N. VULKAN, *Electronic Commerce, Price Discrimination, and Mass Customization*, 2007, available at http://vulkan.worc.ox.ac.uk/wp-content/images/combined-paper.pdf ; D. FUDENBERG, J.M. VILLAS-BOAS, *Price discrimination in the digital economy*, in M. PEITZ, WALDFOGEL J. (eds), *The Oxford Handbook of digital economy*, Oxford, Oxford University Press, 2012, p. 254; and R. BRANCA ESTEVES, *A survey on the economics of behavior-based price discrimination*, 2009, available at https://ideas.repec.org/p/nip/nipewp/5-2009.html.

[49] After all, This is given that «[a]ny economist well-trained in analytic methods can hypothesize a set of circumstances under which certain conduct is harmful to society» d – See, D. W. CARLTON, *Roundtable on Price Discrimination*, DAF/COMP/WD(2016) 82, p. 2, available at https://one.oecd.org/document/DAF/COMP/WD(2016)82/en/pdf. Here, the author criticizes the excessive attention paid to models showing the welfare decreasing effects of price discrimination.

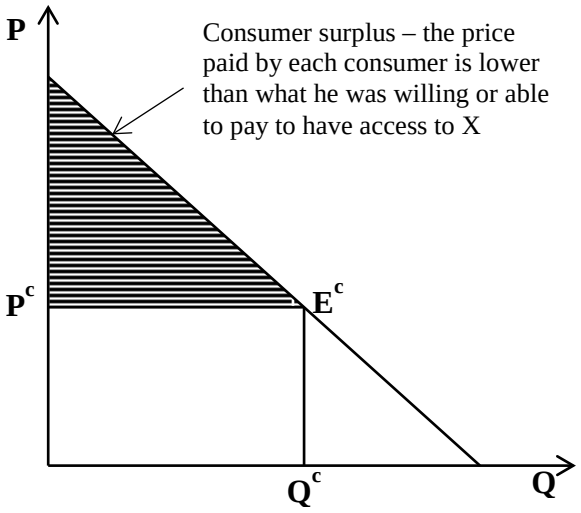
[50] B. REED SHILLER, *First Degree Price Discrimination Using Big Data*, 2013, available at http://www.brandeis.edu/departments/economics/RePEc/brd/doc/Brandeis_WP58.pdf.

[51] See T.P. GEHRIG, R. STENBACKA, *Price discrimination, competition and antitrust, in the Swedish Competition Authority (eds)*, The Pros and Cons of Price Discrimination, 2005, p. 131, available at http://www.konkurrensverket.se/globalassets/english/research/the-pros-and-cons-of-price-discrimination-9356kb.pdf

[52] Consider, for example, A. SHEPARD, *Price Discrimination and Retail Configuration*, 99 Journal of Political Economy, 1991, p. 30 with regard to the service-station market; P. LESLIE, *Price Discrimination in Broadway Theatre*, 35 Rand Journal of Economics 2004, p. 520, with regard to tickets for Broadway shows and M. BUSSE, M. RYSMAN, *Competition and Price Discrimination in Yellow Pages Advertising*, 36 Rand Journal of Economics 2005, p. 378, with regard to the sale of advertising space. Unlike the case studied in G. ELLISON, S. F. ELLISON, *Search, obfuscation, and*

However, given that economic considerations serve to trace the boundaries of acceptable conduct under antitrust law, competition law is allowed to be concerned with price discrimination (as well as with any other practice) when price discrimination is: (i) agreed by several firms or (ii) imposed by a firm holding a dominant position. Respectively, this means that: (i) antitrust law does not need to examine the welfare effect of conduct that constitutes nothing other than a cartel to fix prices, and that (ii) antitrust law must consider the effects on welfare that price discrimination produces only when it takes place in a monopolized market. In other words, unless one is willing to support ubiquitous price regulation being applied in any scenario of imperfect competition one should be interested in the welfare effects that occur when dominant firms charge personalized prices.

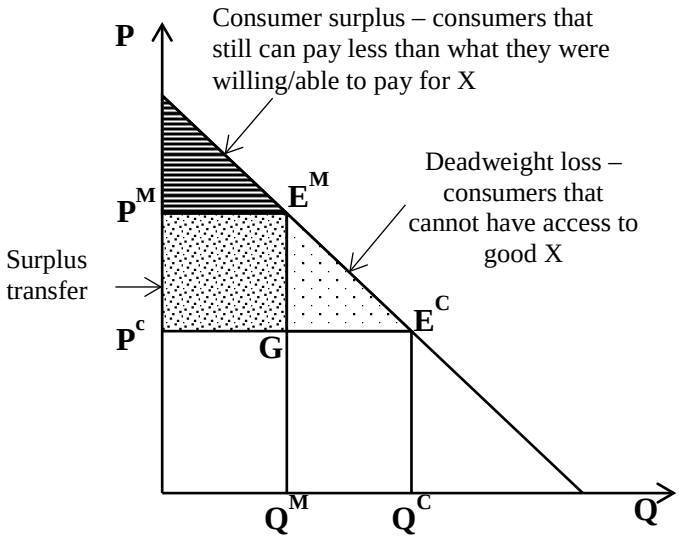
In the latter regard, consider that the effects of monopoly discrimination have long been investigated through simple exercises of comparative static. Namely, let us consider, with the aid of the graph below, the case of perfect competition. There: (i) the price charged for good X is the same for all buyers-consumers and is equal to its marginal cost,[53] PC = MC; (ii) the market produces the greatest possible amount of output, Q^C, since all consumers can afford to enjoy the good X; and (iii) individual welfare and the total welfare are maximum because every consumer interested in obtaining X pays no more than is strictly necessary to remunerate the production factors used by firms to produce X.



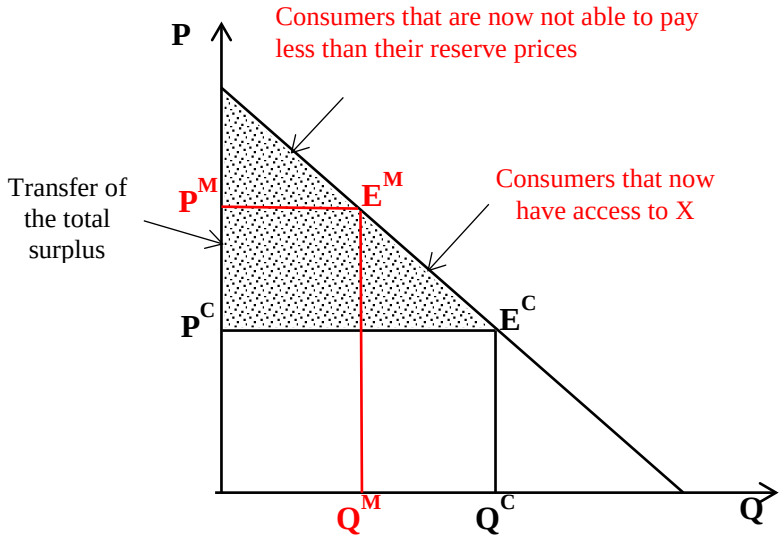
In contrast, in a market dominated by a monopolist: (i) the price charged for X is the same for all buyers, P^M, which corresponds to the value at which the marginal revenues of the firm match its marginal costs, MR = MC; (ii) the market produces a smaller amount of output, Q^M, and some buyers can no longer access the good X; (iii) individual welfare and total welfare are reduced because those who continue to consume the good X are forced to transfer the monopolist part of their wealth.

price elasticities on the Internet, Econometrica 77, 2009, p. 427, which involves a charging system which is customized but is complex, opaque and (often) designed to target less sophisticated buyers. Similarly, T. HOSSAIN, J. MORGAN, *Plus Shipping and handling: revenue (non)equivalence in field experiments on eBay*, 2006, available at http://faculty.haas.berkeley.edu/rjmorgan/ebay.pdf, which focused on the possibility of misleading consumers with opaque package prices.

[53] Traditionally, this economic analysis is carried out assuming that companies directly interact with consumers, i.e. that they sell their goods and services without resorting to any form of brokerage. A different question would be whether these "consumers of the economic models" are perfectly superimposable with consumers for the purposes of the Consumer Code since, if it is true that these consumers do not carry out any economic activity, they do not connote *ex ante* subjects subjected to conditions of inequality and information asymmetry.



Finally, if we look at the case of a monopolist charging personalized prices: (i) the price charged for the good X is different for each consumer (i.e.: for each point of the aggregate demand) and it is equal to the reserve price of each buyer; (ii) the market again produces the maximum possible amount of output, Q^C, thus all buyers are now in the position to access good X; and (iii) individual welfare and aggregate welfare are equal to zero because all buyers transfer their total wealth to the monopolist. [54]



Overall, therefore, it is true that the scenario of perfect competition is preferable to any other scenario – as any antitrust scholar knows well. However, if there is a non-regulated monopoly (or a dominant

[54] H.L.VARIAN, *Price Discrimination*, in R. Schmalensee, R.D. WILLIG (eds) Handbook of industrial organization, Vol. 1, Oxford, North-Holland, 1989, p. 597. With regard to the effects that instead are produced by discrimination in the second and third degree, the economic literature shows that both practices can be said to be beneficial as long as they increase the output offered to the market; that is, as long as they allow consumers to access the offered good who otherwise would not have been able to do so. If, however, these forms of discrimination only serve to gain surplus from consumers who otherwise would still have consumed the offered goods, the obvious reduction of consumer welfare is not offset by any increase in the total welfare: see R. SCHMALENSEE, *Output and welfare implications of monopolistic third-degree price discrimination*, 71 American Economic Review, 1981, p. 71; H.R. VARIAN, *Price discrimination and social welfare*, 75 American Economic Review, 1985 W. Kip VISCUSI, *Economics of regulation and antitrust*, 1995, p. 290-97; MOTTA, Competition Policy, cit., P. 496. In addition, see OECD, *Price discrimination*, DAF/COMP(2016)15, 29-30 November 2016, available at https://one.oecd.org/document/DAF/COMP(2016)15/en/pdf.

position) [55] personalized prices produce different impacts on total and consumer welfare. Indeed, in terms of total welfare, it is desirable that the monopolist opts for perfect discrimination, since the subsequent output increase would benefit those who otherwise could not have afforded the good X.[56] In contrast, in terms of consumer welfare the flat monopoly price remains preferable to personalized prices given that at least some consumers may retain part of their surplus.

More recently, some models have shown that the increased profits that price discrimination involves can produce an increase in dynamic efficiency.[57] In particular they argue that, whereas this wealth transfer can trigger investments in rent-seeking activities, it can also determine a better coverage of fixed costs – which is especially relevant for those companies, such as those operating in the field of information and digital technologies, which sustain high costs for research and development but almost zero marginal costs,[58] occasioning an increase in earnings and innovation.[59]

Therefore, when it comes to personalized prices, antitrust authorities should make a policy choice and decide whether to protect total or consumer welfare.

This holds until one focuses on price discrimination towards economic agents that are not firms because some recent models – very sophisticated ones based on the use of relationship modelling along the vertical supply chain – have discussed the effects of price discrimination imposed by a monopolist against other firms that are its own customers. Moving away from the case of firms that are both customers *and* competitors of the monopolist,[60] these studies show that the effects of discrimination against a mere customer to the benefit of others (i.e. the case of "secondary line discrimination") are ambiguous and bound to assumptions about a strict market's characteristics.[61]

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[55] For an analysis of price discrimination in regulated markets, see, among others, D.J. GIFFORD, R.T. KUDRLE, *The law and economics of price discrimination in modern economies: time for reconciliation?* 43 University of California, Davis, 2010, p. 1235.

[56] In infra-marginal terms personalized prices favor buyers with a lower willingness to pay than those with a higher willingness to pay This fact does not necessarily take on a pejorative meaning in redistributive and social terms, though a different opinion is held by some privacy scholars raising the possibility that the personalized prices make people who are already poor, poorer – see O. Tene, J. POLONETSKY, *Judged by the tin man: individual rights in the age of big data*, J. on Telecomm. & High tech. L., 2013, p. 351; R. CALO, *Digital market manipulation*, 82 Geo. Wash. L. Rev., 2014, p. 995; S. PEPPET, *Unraveling privacy: the personal prospectus & the threat of a future full disclosure*, 105 NW. U. L. Rev. 2011, p. 1153; and J.W. JEROME, *Buying and Selling Privacy: Big data's different burdens and benefits*, 66 Stan. L. Rev. 2013, p. 47.

[57] J. M. VILLAS-BOAS, *Price cycles*, cit., and D. FUDENBERG, J. TIROLE, *Customer poaching and brand switching*, 31 RAND Journal of Economics, 2000, p. 634.

[58] See B. KLEIN, J.S. WILEY Jr., *Competitive price discrimination as an antitrust justification for intellectual property*, 70 Antitrust L.J. 599 (2003) and M. J. MEURER, *Copyright law and price discrimination*, 23 Cardozo Law Review, 2001, p. 55.

[59] This is the "knock-on effect" as described by R. O 'DONOGHUE, A. J. PADILLA, *The Law and Economics*, cit., p. 784. See also M. MOTTA, *Competition Policy*, cit., Pp. 493-511.

[60] For example, in so-called "primary line discrimination" scenarios, where the harm to total welfare and consumer welfare should be appreciated by evaluating whether the anticompetitive foreclosure theory or other theories of competitive harm are or are not applied – see P. REY, J. TIROLE, *A primer on foreclosure*, in M. ARMSTRONG, R. Porter (eds), Handbook of Industrial Organization, North-Holland, 2003.

[61] On this point, please see M. DERTWINKEL-KALT, J. HAUCAP, C. WEY, *Input price discrimination (bans), entry and welfare*, 2013, available at http://www.dice.hhu.de/fileadmin/redaktion/Fakultaeten/Wirtschaftswissenschaftliche_Fakultaet/DICE/Discussion_Paper/099_Dertwinkel-Kalt_Haucap_Wey.pdf , who discuss the previous considerations of M. KATZ, *The welfare effects of third-degree price discrimination in intermediate goods markets*, 77 American Economic Review 1987, p. 154; P. DEGRABA, *Input market price discrimination and the choice of technology*, 80 American Economic Review, 1990, p. 1246. Y. YOSHIDA, *Third-degree price discrimination in input markets: output and welfare*, 90 American Economic Review, 2000, p. 240, which show the economic roots of the prohibitions on discrimination in intermediate markets. In addition, discussing secondary line discrimination, antitrust doctrine is used to consider why a dominant firm should put a client in an unfavorable

6. Personalized prices and EU Competition law

In order to understand whether personalized prices can be included in the wider category of discriminatory pricing we need to first define the boundaries of this offence. Namely, under art. 102(c) of the Treaty on the Functioning of the European Union (TFEU), a dominant firm abuses its market power[62] when it applies "dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage". Similarly, art. 101(d) of the TFEU states that an agreement is anticompetitive when it consists of the application of "dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage".

Now, it is true that the almost identical wordings of the above-mentioned provisions militate in favour of the uniform nature of the discriminatory offence: they subtract relevance from whether the conduct is multilateral or not[63]. Rather, these wordings draw attention to the twofold requirements that the practice consists of "dissimilar prices" for "equivalent transactions",[64] and that the different treatments have put the subjects discriminated against in a position of "competitive disadvantage" compared to their rivals.

However, if two or more firms decide by mutual agreement to charge the same prices, even though they are dissimilar, antitrust authorities are likely to consider this to be cartel conduct, and therefore it would be unnecessary to proceed with a further investigation to establish the existence of the constituent elements of the discrimination offence. Put a different way, even if the offence might be considered "cross-referencing" in terms of the provisions on agreements and abuses, it remains true that the fact that firms have colluded in fixing prices, although differentiated, is in itself sufficient to apply the prohibition contained in article 101 of the TFEU.[65]

Thus, where certain firms apply the *same* customized prices to their consumers or to their commercial counterparts, it would serve very little purpose to question the possibility of subsuming this behaviour

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condition in the absence of an objective justification for the discrimination: see R. O 'DONOGHUE, A.J. PADILLA, *The law and economics*, cit. 786-7.

[62] The dominant position can be appreciated by looking at different indices: the absolute and relative market shares of the firm, the barriers to entry that make the market less contestable, the bargaining power of the firm's counterparties. It is a different matter, however, to remember that the mere fact that a company chooses to discriminate through prices, while suggesting some degree of market power, does not prove market dominance – see, ex multis, E. ELHAUGE, *Defining better monopolization standards*, 56 Stan. L. Rev. 2003, p. 253, 258 which says "the price discrimination normally taken to evidence market power is so ubiquitous that it would indicate market power exists everywhere"; J. B. BAKER, *Competitive price discrimination: the exercise of market power without anti-competitive effects*, 70 Antitrust L.J. 2003, p. 643; W. J. BAUMOL, D.G. SWANSON, *The New Economy ubiquitous and competitive price discrimination: identifying defensible criteria of market power*, 70 Antitrust L.J. 2003, p. 666; J. C. COOPER et al., *Does Price Discrimination Intensify Competition? Implications for Antitrust*, Antitrust 72 L.J. 327 (2005). In this regard, see also the judgment in *Illinois Tool Works, Inc. v. Independent Ink, Inc.*, 126 S. Ct. 1281, 1292 (2006), where the United States Supreme Court has clearly stated that while price discrimination "may provide evidence of market power . . . it is generally recognized that it also occurs in fully competitive markets". This is because the (little) power required in order to discriminate may result from factors that are not in themselves destructive of competition, such as, for example, product differentiation, the existence of intellectual property rights or the existence of fixed costs.

[63] This is not arguing that the existence of a dominant position or of an agreement should not be assessed or that these essential elements of a discriminatory case do not have their own importance. On the contrary: the fact that we must verify the existence of a dominant position or of an agreement guarantees that the only conduct pursued is that undertaken by companies holding significant market power, either individually or aggregately.

[64] Or "equal prices" in face of "different performances": see CG, due 13/63, Italy c. Commission, Rec. 1963, p. 165, § 6, as it is understood that whether or not conduct constitutes discrimination is a matter of substance and not of form, such as that offering the same conditions in respect of non-equivalent performances being (also) discriminatory.

under the wider category of discriminatory pricing. It would not be that useful to discuss the possibility that those "dissimilar prices" had been imposed in "equivalent transactions", and that such treatment would place the subjects discriminated against in a condition of "competitive disadvantage" compared to their rivals. Joint determination of the same personalized prices should quite simply be qualified as an agreement on prices. Consequently, it should be prohibited because of its anti-competitive object and its inability to meet the conditions mentioned in the third paragraph of article 101 TFEU,[66] regardless of whether those discriminated against were consumers or firms.

Differently, "dissimilar prices", "equivalent performance" and "competitive disadvantage" remain the essential elements of unilateral pricing practices which may be characterized as discriminatory. Antitrust authorities have largely not examined these elements in depth,[67] since discriminatory pricing has often coincided with other unilateral practices already deemed unlawful[68] due to being exclusionary and anticompetitive.[69] Therefore, in the case of personalized prices that have been

[66] There are frequent cases in which the discriminatory nature of the conduct is not contested independently but in addition to the mere price-fixing. Consider, for example, the Commission of 23 July 1974, OJ L 237, 29.8.1974, p. 3, where the firms that were penalized for having agreed on a discount system – loyalty discounts capable of producing a significant foreclosure effect – had primarily agreed to offer the same prices, as well as various other sales conditions. When applied independently, article 101 (c) TFEU has in fact concerned cases of non-pricing practices, i.e. companies that, being part of the same association or sometimes linked to each other by vertical integration, discriminated against a third party, preventing its access to a product or activities and, therefore, reserving an unjustified different treatment from that offered to others: see Commission, December 12, 1988, *Publishers Association – Agreements for the sale of books at fixed prices*, OJ L 022, 26.1.1989, p. 0012, in relation to exclusionary conduct practiced against booksellers who had not adhered to net price agreements; Commission, July 11, 1988, *British Dental Trade Association – BDTA*, OJ L 233, 23.8.1988, p. 0015, § 26, with respect to participation in a non-UK companies' trade fair which did not have an association representative.

[67] See generally, R. O 'DONOGHUE, A.J. PADILLA, *The law and economics*, cit., P. 789 and I. VAN BAEL, J.F. BELLIS, Community competition law, Torino, Giapichelli, 2009, p. 607. In addition, A. JONES, B. SURFIN, *EC Competition Law*, Oxford, Oxford University Press, 2008, p. 595 especially with regard to the interpretation of "equivalent performances" and BELLAMY, CHILD, *European Union Law of Competition*, cit., P. 804 with particular reference to the manner in which analysis of "competitive disadvantage" has been carried out.

[68] There are many examples of behaviours which are already punishable under article 102 of the TFEU. Those which are most analyzed in the literature include: CG, case 85/76, *Hoffmann-La Roche v Commission*, OJ 1979, p. 461, §§ 90 and 123; T case T-83/91 *Tetra Pak v Commission*, OJ 1994, p. II-755, § 160; CG, Case 322/81 *Michelin I*, Official Journal 1983, p. 3461; and CG, case 95 / 04P, *British Airways v Commission*, OJ 2007, p. I-2331.

[69] It is true that predatory pricing and price squeezing (i.e.: price behaviors that can be considered exclusionary and anticompetitive under the above letter (b)) do not involve equal treatment; they are factually discriminatory. However, these behaviours are prohibited not only due to their discriminatory nature but also because they alter the normal functioning of the market without causing substantial pro-competitive effects: see also BELLAMY, CHILD, *European Union Law of Competition*, Oxford, Oxford University Press, 2013, p. 800 that, with specific reference to the case of *Compagnie Maritime*, clarifies how this case does not fall within the scope of paragraph (c) as it represents a case of exclusionary and anticompetitive abuse: see CG, Case C-395 / 96P, *Compagnie Maritime Belge Transports* SA, OJ 2000, p. I-1365. In addition, J. FAULL, A. NIKPAY, *The EU law of competition*, Oxford, Oxford University Press, 2014, p. 524 and 533, which clearly states that "when the abuse is also exclusionary, the Commission and the EU Courts have applied a very low standard under article 102(c). In such cases, it may be thought that the risk of error is lower than in cases where the abuse is *only* under article 102(c)" (emphasis added). For example, it may happen that a dominant company engages in a discount system that favors its subsidiary (or the distributor with which it has an exclusive relationship) and harms horizontal rivals (or other distributors of the downstream market). In this case it is certainly true that discrimination exists *in re ipsa* but what should be established in order to prohibit the behaviour is whether, having analyzed the dominant firm's costs, such a system of discounts results in a foreclosure of the dominant firm's horizontal competitors that seek access to the downstream market. In other words, the harmful aspect of the exclusionary and anticompetitive price conduct does not reside in the application of different prices but in the ability to ascertain the primary line injury's factual elements; that is, a scenario in which the dominant firm discriminates against customers which are at the same time its rivals in order to protect its dominance. On this issue, see the US Supreme Court in *Brooke Group v Brown & Williamson Tobacco*, 509 US 209 (1993).

unilaterally imposed, with reference to the definition of "dissimilar prices"[70] applied to different buyers who buy the same good, this seems to reproduce the hypothesis of dissimilar prices offered for equivalent performance.[71]

However, if we proceed further and reflect on the concept of "competitive disadvantage" the association between personalized prices and discriminatory prices no longer seems so immediate or, at least, it requires some further consideration. Indeed, scholars maintain that such "competitive disadvantage"[72] may only occur between firms.[73] Only firms can be the ones involved in a competitive game and the ones who, sometimes, succumb to competition. Only firms may be the ones who, due to the higher price paid, have fewer resources to invest in the competitive game, that is, in efficiency, quality and innovation.[74] On the other hand, consumers affected by a higher price may suffer a disadvantage, but this disadvantage cannot be qualified as "competitive" because consumers by definition do not perform any economic activity and, hence, do not compete one against the other. In addition, such harm would correspond to a mere decrease of income unable to affect the use of productive resources, which influence market performance.

According to this interpretation, then, since only firms can be discriminated against in accordance with article 102(c) of the TFEU, the only personalized prices that could be prosecuted under that provision would be those charged by a firm in a dominant position against other firms operating in the upstream or downstream market. Customized prices offered by a monopolist to all its consumers,

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[70] Consistent with the neoclassical theory that prices are determined as a function of supply is the idea that the application of dissimilar prices occurs when a company practices different prices for products with equal costs or the same prices for products with different costs. For the same reasoning also FAULL, NIKPAY, *The EU law of competition*, cit., P. 523.

[71] When considering the aspect of "equivalent performance", given that it is unlikely that one would ever be faced with two identical economic situations, authorities must analyze them without adopting the standpoint of one of the trading parties, and take into account all the elements that overall distinguish the business relationship in question – see R. O 'DONOGHUE, A.J. PADILLA, *The Economics of article 102*, cit., P. 790. Thus, it is necessary, for example, to assess the conduct as it was performed at the time of the transaction - T, Case T-301/04, *Clearstream Banking AG and Clearstream International SA*, Rec. 2009, p. II-3155 - the physical and functional characteristics of the offered goods, whether these goods can be considered as substitutes or whether the different components of the seemingly transactions cannot be considered comparable. Therefore, considered equivalents are transactions involving products with homogeneous and consistent physical properties, such as bananas – See CG, Case 27/76 *United Brands*, Rec. 1978, p. 207, § 204), railway lines with different mileages but otherwise fungible – See T, Case T-229/94, *Deutsche Bahn*, Rec. 1997, p. II-1689 – and handling services offered with and without the self-service option - See CG, Case C-82/01, *Aeroports de Paris*, Rec. 2003, p. I-9297. CG, Case C-52/07, *Kanal 5 Ltd, TV 4 AB v. Föreningen Svenska Internationella Tonsättares Musikbyrå (STIM) upa*, Rec. 2008, p. I-9275. It is then possible that the same facts that explain why two transactions are not equivalent to each other may well be used to illustrate why the sued company claims to have had objective reasons for applying dissimilar conditions. For example, to determine whether the commissions paid by British Airlines to travel agencies referred to different but equivalent services the Commission looked at these services' values, as well as their objective features, while it was considered not relevant that British Airlines was expecting to receive different services from the different agencies. However, this last circumstance was considered (although then rejected) as a potential objective justification for the airline company's conduct – see CG, caso 95/04P, *British Airways v Commission*, GU 2007, p. I-2331, §§ 138-140.

[72] In addition, this element of the discriminatory offence still raises interpretation questions as to how strong the competitive link between the parties that were treated differently should be – See O 'DONOGHUE, PADILLA, *The Economics of article 102*, cit., P. 78-79. An established point is that this disadvantage has to be sensitive, even if potential – See T, Case T-301/04, *Clearstream Banking AG and Clearstream International SA*, Rec. 2009, p. II-3155, § 144.

[73] In this sense, FAULL, NIKPAY, *The EU law of competition*, cit., P. 387, which reads "discriminatory abuses, in which competition is harmed by discriminatory prices … charged … by the dominant undertaking on an intermediate market with the effect of placing certain suppliers or customers of the dominant undertaking at a 'competitive disadvantage". Moreover, BELLAMY, CHILD, *European Union Law*, cit., P. 803, with regard to client companies operating in the downstream markets, when they do not discuss a case of preclusive discrimination.

[74] See Commission Decision IV / 35613, *Alpha Flight Services/Aéroports de Paris*, OJ L 230, 18.8.1998, p. 10, §§131 and 132, where the Commission explains how discrimination, impacting significantly on costs, affects the quality of the handling service, which is a crucial element of competition between those that provide ground-handling services.

in contrast, would not fall within discriminatory conduct as provided by European and national discipline about the abuse of dominant position.

Now, there are least two considerations that arise from these conclusions.

The first one is related to the previous paragraph, and allows us to analyse in depth the theme of personalized prices considered as one of many forms of price discrimination that a dominant firm can impose to the detriment of other firms. If firms facing price discrimination are at the same time rivals and customers of the dominant firm we could outline a hypothesis of *primary line injury*. This is why antitrust authorities, rather than relying on the discriminatory nature of personalized prices, mainly look at their exclusionary and anticompetitive nature, given the theories about competitive distortion that are usually developed regarding dominant firms that are also vertically integrated or multi-product. Moreover, in recent cases of discriminatory pricing such as *Tomra*[75] and *Intel*[76] the Commission has avoided considering the discriminatory elements of the case, limiting its analysis to the exclusionary and anticompetitive elements.

Even more explicitly, in *Deutsche Bahn Energie*[77] the Commission explicitly chose to analyse the conduct by classifying it as a case of margin squeezing and refusing to consider any discriminatory elements, unlike what it did in the previous case, *Deutsche Bahn.*[78] Quite clearly, then, the Court of Justice held that, "the fact that the practice of a dominant undertaking may…, be described as 'price discrimination', that is to say, charging different customers or different classes of customers with different prices for goods or services whose costs are the same or, conversely, charging a single price to customers for whom supply costs differ, cannot of itself suggest that there exists an exclusionary abuse".[79]

Thus, in the case of primary line injury, as noted above, the complex assessment of the ambivalent effects that discrimination produces in intermediate and final markets should not cause alarm because it complements the appreciation of foreclosure effects on welfare.

Otherwise, if the discriminated against firms are only mere customers or mere suppliers it would be a case of secondary line injury. In such a case it would be possible to use the earlier models that describe if and when discrimination in intermediate markets, instead of being a pure form of exploitation, affects social and consumer welfare and distorts competition by causing a "competitive disadvantage". Therefore, in this situation, antitrust authorities interested in catching sight of a competitive distortion originating from discriminatory conduct should first of all highlight that personalized prices have not resulted in an increase in output, and that, for example, they have also incentivized the monopolist to invest its extra profits into activities designed to protect its position and revenues.

The second point, however, concerns the possibility that the customized prices charged by a dominant firm to consumers may be still penalized under art. 102 based on its functional interpretation. In many cases the Commission has applied art. 102 (c) to prevent discriminatory conduct that primarily affected consumers. In particular, when the discriminatory behaviour, related to geographical origin, nationality and/or the domicile of the discriminated persons, has been deemed capable of affecting the process of formation of the single market, surreptitiously recreating geographical barriers between

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[75] T, Case T-155/06 *Tomra Systems*, Rec. 2010, p. II-04361 and CG, Case C-549 / 10P, *Tomra* et al., Available on the website www.curia.europa.eu.

[76] Commission Decision COMP / 37.990, *Intel*, May 13, 2009, available at http://ec.europa.eu/competition/sectors/ICT/intel_provisional_decision.pdf

[77] Commission Decision COMP / 39678 and COMP / 39731, *Deutsche Bahn AG*, OJ 2003 L 1, p. 1.

[78] CG, Case C-436/97P, *Deutsche Bahn AG*, Rec. 1999, ECR I-2387.

[79] CG, Case C-209/10, *Post Danmark*, Rec. 2002, ECR I-172, §30.

Member States.[80] In other words, it appears that interest in protecting the integrity of the European market, a policy objective clearly pursued by the European authorities in the application of competition law, has induced the Commission into following a particularly harsh interpretation which to some extent departs from the legal text or, at least, from what is currently their (otherwise) dominant interpretation.

Thus – one could argue – if the interest of consumers in not seeing their resources drained for the benefit of a dominant firm has been identified at the European level as an interest worthy of legal protection, that a stretch of art. 102(c) analogous to that imposed for geographic reasons relevant to the single market (or some other application of art. 102, which as we know does not provide for a closed number of abusive practices) could be supported. This would therefore allow the ban to be applied beyond the strict letter of the law.[81]

Moreover, a general prohibition on personalized prices would respond to the traditional interpretation of discriminatory abuses. Namely, the idea that, conceived of in terms of a relationship of species to genus, article 102 should safeguard integrity and fairness in negotiations to prevent a dominant player from exploiting the economic agents (both consumers and other firms) with whom it engages, in light of the more general European principle of equality or non-discrimination.[82] In other words, it is true that the current antitrust law is called upon to protect the normal functioning of the market, which can be appreciated, in the absence of a paradigm which describes it in detail, by the way in which it affects both total welfare *and* consumer welfare. However, while variations in total welfare give an account of how the market operates to allocate products and wealth, variations in consumer welfare indicate how the market distributes them.

Here, then, the perfect discrimination imposed by a dominant firm upon consumers poses a policy problem that, until now, has not needed to be resolved in a draconian way. It asks the question whether what should be protected is the market, whether it be the market as a tool for allocating resources or the market as a tool for distributing them. In fact, in most cases, this choice is not imposed because the lawful or unlawful nature of the conduct does not change depending on the index of welfare considered (total or consumer),[83] so in the case of perfect discrimination this equivalence does not work properly.

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[80] Consider, for example, CG, Case C-18/93, *Corsica Ferries v Italy Corps of Pilots of the Port of Genoa*, OJ 1994, p. I-1783, § 45, where the tariff system used by the company's legal monopoly provided, for the same service, a fare reduction benefitting only Italian vessels operating between ports within the national territory; CG, Case 27/76 *United Brands*, Rec. 1978, p. CG 207 and Case C-333 / 94P, *Tetra Pak II*, Rec. 1197, p. 5951. In the last two cases, the dominant firms were sanctioned for having applied different prices in different Member States and for having at the same time engaged in practices capable of preventing arbitrage between buyers located in different European countries. Discussing mere price discrimination, it is interesting to note that, in the aforementioned judgements, part of the doctrine upheld in *United Brands* and *Tetra Pak II* was that the competitive "wound" resided not in the application of different prices but rather in the partitioning of the single market, with the result of preventing (or discouraging) cross-border trade that the price delta would rather have incentivized – see J. FAULL, A. NIKPAY, *The EU law of competition*, Oxford, Oxford University Press, 2014, p. 527. Not surprisingly, in other decisions the Commission sanctioned precisely those incentive schemes and discount schemes that had, as their main goal, the ban on imports and exports – See CG, Case C-310 / 93P, *British Plasterboard*, Rec. 1995, p. 865. Finally, in the Commission Decision, *OPCOM / Romanian Power Exchange*, OJ L 314, p. 7, conduct was characterized as discriminatory where it was carried out by a firm which, in addition to dominating the Romanian electricity market, ran the Romanian power exchange and imposed an obligation to register for VAT in Romania on foreign traders who wished to conclude trades on the Romanian power exchange, even though they already held VAT registration in their home countries.

[81] See CG, Case C-333 / 94P, *Tetra Pak II*, Rec. 1197, p. 5951; Commission, 1998 *Football World Cup*, OJ L55, p. 5, § 100, and Commission Decision COMP / 35141, Deutsche Post AG, OJ L 125, 05.05.2001, p. 27.

[82] CG, Case C-497 / 99P, *Irish Sugar plc*, Rec. 2001, p. I-5333, § 240. Furthermore, see M. BISHOP, *Price discrimination under article 86. Political economy in the European court*, in 44 MLR 1981, p. 282.

[83] M. MOTTA, *Competition Policy*, Cambridge University Press, Cambridge, 2009, pp. 20-22.

If what is to be protected is total welfare, personalized prices charged by a dominant firm to consumers should be considered legitimate, as they cause an increase in the number of products available to all. Otherwise, if what is to be protected is consumer welfare, customized prices should be considered anti-competitive because – as has been said – they will enable a dominant firm to drain the entire consumer surplus.

At the moment, the lack of interest that the Commission has explicitly taken in the recent Guidelines[84] regarding pure exploitative abuses[85] would lead us to believe that a dominant firm that merely drains resources from consumers, in the absence of a competitive distortion, cannot be prosecuted. Yet, it is also true that EU Courts have not showed a lot of enthusiasm in following those guidelines.

7. Conclusions

Personalized prices are a new phenomenon that raises many questions. This article has framed its analysis from an antitrust perspective. However, before reaching its conclusions it is important to refer to the other collateral issues to which this phenomenon may give rise.

The first issue regards equal treatment between contracting parties. With reference to the antitrust discipline it must be pointed out that the issue of equal treatment has led some commentators to call for an analogous application of the discriminatory prohibition which also applies to firms without a dominant market position,[86] if not to consumers.[87] However, in market economies firms are thought to be subjects free not only to decide with whom to contract but also to establish what prices and conditions to apply to their transactions. Therefore, imposing regulation as to costs, rates and other contractual terms is usually understood to be a corrective, and extremely intrusive, measure, to be adopted only in those cases where the market mechanism fails. Rooted in liberal theory is the idea that the value of goods is to be determined solely by the subjective judgment of the parties, an rejection of "just price" theories belonging to the traditions of Roman and medieval law, which considered that goods have a fair, independent and objective price.[88] For example, the European Directive on unfair terms in *consumer* contracts (and not, therefore, contracts within the more neutral

[84] Communication from the Commission — *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, 24.2.2009, OJ C 45, p. 7. In § 7 we read that "conduct which is directly exploitative of consumers, …, is also liable to infringe Article 82. The Commission may decide to intervene in relation to such conduct, in particular where the protection of consumers and the proper functioning of the internal market cannot otherwise be adequately ensured".

[85] Also by virtue of (or due to) the lesser weight that values of fairness in relations between firms and equity in the distribution of wealth have acquired within the new antitrust law, it seems an unlikely hypothesis that at least the highest of the personalized prices charged by dominant firms could be prosecuted as unfair, being "unduly burdensome" within the meaning of the letter (a) of article 102 TFEU – see FAULL, NIKPAY, *The EU law of competition*, cit., P. 524-525, which reads that "price discrimination by dominant firms may reduce consumer welfare by extracting consumer surplus (without any exclusionary impact on competitors). This is generally referred to as 'exploitative' price discrimination. The test will therefore be whether the higher prices charged to certain, but not all, customers are exploitative".

[86] See MILLER, *What do we worry*, cit., P. 70, according to whom the RPA should be applied in a diffuse way and consistently with what was provided for by its drafters. For the current and different approach to the RPA see above nt. 61.

[87] See D.M. KOCHELEK, *Data Mining and Antitrust*, 22 Harv. JL & Tech. 2009, p. 515, 535 where the author argues that "[d]ata-mining-based price discrimination schemes fall into a gap between antitrust doctrine and the policies underlying the doctrine". The author believes that perfect price discrimination, which diminishes consumer surplus, produces the same effects as cartel conduct and therefore should also be prohibited even when it does not distort competition.

[88] Evidently, the literature is very rich on this issue. Among the most recent contributions are the essays in Micklitz H. (eds), *The many concepts of social justice in the European private law*, Edward Elgar Publishing, Cheltenham, 2011, and see H. EIDENMÜLLER, *Justifying fair price rules in contract law*, in ERCL 11, 2015, p. 220 and M. Hesselink Could a fair price rule (or its absence) be unjust? On the relationship between contract law, justice and democracy, 11 ERCL 2015, p. 185.

category of “buyers”) excludes the possibility that the unfairness of contractual terms may depend on the fairness of the price.[89] The European text states that, “assessment of the unfair nature of the terms shall relate neither to the definition of the main subject-matter of the contract nor to the adequacy of the price and remuneration, on the one hand, as against the services or goods supplies in exchange, on the other, in so far as these terms are in plain intelligible language”. The requirement that such contractual clauses must be drafted “in plain intelligible language” seems to have little weight, since this condition says nothing about the price level or about its proportionality in relation to the good/service offered but relates to a different requirement of transparency and fairness in the information.[90]

Moving away from these requirements of information transparency and fairness, we can introduce another hot topic connected with the formation of big data, this being consumers’ awareness about the content and use of this data collection. First, we need to consider, even if briefly, whether and to what extent the fact that buyers are not informed about the mechanisms that lead to the formation of customized prices, and about the nature of prices not being equal for all, may qualify price discrimination as unlawful conduct. According to the law of unfair commercial practices, it must be determined whether possible silence about the personalized nature of the price and/or its automated process of formation could be regarded as a misleading omission and/or as a form of undue influence, contrary to professional diligence obligations and detrimental to the average consumer's awareness in purchasing decisions. Marketing studies mentioned in Section 4 show that consumers who have purchased a particular product would have changed their decision if they had known that the price was personalized, especially if they discover that they are among those to whom higher prices were charged. Nevertheless, the provisions on the protection of personal data and privacy seem to offer an answer, perhaps still preliminary and still perfectible, to this problem of consumer awareness. Namely, firms would have to invite users of the network to consent in advance, freely and expressly,[91] to their “profiling”; that is, to be first linked to some category of subjects and then identified at the time of the charging of the customized price. This approach would mainly regulate the impact that the so-called “profiling” of individuals has not only on consumers’ commercial decisions but, more generally, on their social and political conditions, as well as their fundamental rights. In other words, the potential disadvantage caused by the use of asymmetric information, which may make consumers feel deceived, can be resolved by the application of privacy law, rather than resorting to the rules on unfair commercial practices to turn a consumer’s desire to spend less than another into an interest worthy of legal protection.

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[89] Directive 93/13 / EEC of 5 April 1993 on unfair terms in contracts concluded with consumers, OJ L095, 21/04/1993, p. 0029.

[90] See CG, Case C-96/14, *Van Hove v. CNP Assurances SA*, available at http://curia.europa.eu/juris/document/document.jsf?docid=163876&doclang=IT

[91] In other words, those who want to practice online personalized prices should obtain from their consumers prior, free and express consent to use their personal data, to be “profiled”, and even to cross data with others, not only in order to get personalized prices but also to be recognized when they are connected to the network. In this regard, the first literature commenting on the new EU legislation for the protection of individuals with regard to the processing of personal data and free movement of such data, Directive 2016/680/ EU and Regulation 2016/679/EU, have shown that these reforms do not entirely support the big data phenomenon. Therefore, those who wish to enjoy personalized prices using personal data should also look at rules that the art. 22 of the new European regulation has dictated with regard to profiling, which provides that “[t]he data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her, subject to the decision: (a) is necessary for entering into, or performance of, a contract between the data subject and a data controller; (b) is authorised by Union or Member State law to which the controller is subject and which also lays down suitable measures to safeguard the data subject's rights and freedoms and legitimate interests; or (c) is based on the data subject's explicit consent”.

Another matter of general interest that deserves to be mentioned in relation to processes flowing from big data, such as personalized pricing, concerns the identification of the cluster. The ability to classify individuals with a high degree of precision could trigger significant implications from a socio-political, if not legal, perspective. As observed by the highest US authorities,[92] analysis of big data could also lead to the discovery of non-controlled metadata and sensitive information, such as those related to people's ethnic group or religious orientation. Here, then, two scenarios could be envisaged: the decisions made on the basis of big data not only could unintentionally produce effects contrary to those principles promoted by anti-discriminatory legislation but also could be used to hide choices deliberately contrary to the interests of certain minorities behind the application of ostensibly neutral algorithms.[93] In addition, we can return to the theme of the article, which considers the possibility that personalized prices could produce negative consequences for the financial situations of the so-called "protected classes".[94] It remains the case that, except for price discrimination based on risk categories in which individuals may be included, customized prices are generally calculated in relation to individuals' willingness to pay, which is a function not only of their preferences but also of their income. For this reason, except in circumstances of wilful manipulation of the decisions that feed into big data, the probability that customized prices are worsening the economic conditions of already economically disadvantaged minorities is not sufficiently high so as to cause concern. However, some could argue that, for some firms, so-called "minorities" may not be their target audience, so that those firms which do offer goods and services to these individuals may be able to charge higher prices in the face of less competition. That said, in such a situation price discrimination should not be considered the problem but rather the solution. In fact, only a firm that is free to discriminate, i.e. to charge higher prices to those with a higher willingness to pay, could consider entering into a market with such low margins. This, of course, would be provided that such entry would not cause reputational damage to the company, and that the lower prices would provide for the recovery, in addition to marginal costs, of entry costs. In this sense, then, the free activity of firms may even contribute to the realization of the public interest in raising the standard of living of the most disadvantaged classes.

Finally, from a strict antitrust perspective the main concern about personalized price relates to the allocation of products and/or services as well as the distribution of "money" used to purchase them. However, it has been shown that personalized prices allow, even when charged by a dominant firm, for the satisfaction of more consumers than only those who were content with equal prices for all, reducing only the surplus of those consumers who have a greater willingness to pay and a greater interest in those products and/or services. Unless we decide that the welfare of these subjects is worthy of legal protection, and unless we want to affect the efficient allocation of products, antitrust law should not pursue personalized prices, even if charged by a dominant firm.

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[92] See White House, *Big data*, cit., pp. 16-17

[93] See K. CRAWFORD, J. SHULTZ, *Big data and due process: toward a framework to redress predictive privacy harms*, 55 *B.C.L.REV.*, 2014, p. 93.

[94] In the United States it has been argued that price discrimination which produces a negative impact on the so called "protected classes" may be in violation of the *Civil Rights Act* and *the Fair Credit Reporting Act*, which also prohibit conduct which, although not intentionally targeted to discriminate, nonetheless produces a discriminatory impact. Considering this issue in the context of Europe is not entirely bizarre. In fact, the first paragraph of art. 19 of the TFEU provides that "... the Council ... may take appropriate action to combat discrimination based on sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation". As a result, today there are quite a few anti-discrimination directives (i.e. directives with the objective of excluding cases of unfair treatment decided on the basis of the factors mentioned in Art. 19). For instance, Directive 2000/43/ EC of 29 June 2000 implementing the principle of equal treatment between persons irrespective of racial or ethnic origin, OJ L 180, 19/07/2000, p. 0022 and Directive 2004/113/EC of 13 December 2004 implementing the principle of equal treatment between men and women in the access to and supply of goods and services, OJ L 373, 21/12 / 2004, p. 37.