Introduction

Algorithmic Price Personalization: From Laesio Enormis *to* Laesio Algorithmica?

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I.1 THE CONCEPT OF THE HANDBOOK

Of the many concerns triggered by the rapid growth of digital commerce and the expansion of the data-based economy, price personalization occupies a prominent yet peculiar position. For many firms, the availability of big data and refined algorithmic tools has opened unprecedented avenues to learn about consumers' financial and personal standing, market preferences, and transactional behaviour patterns. Building on these insights, firms have (at least to some degree) obtained an ability to make behavioural predictions about the future conduct of their clients, including their interest in a particular assortment of products, responsiveness to certain forms of advertising, and – not least importantly – their willingness to pay a certain price. Hence, it became possible to price consumers along the lines of this willingness, offering higher prices to those who were evaluated by an algorithm as being ready to pay them. This practice, commonly referred to as price personalization or price discrimination,[1] is becoming an increasingly widespread business model in the online economy. Although most firms desist from disclosing any algorithm-based price differentiation to the outside word, a growing array of empirical studies, media revelations, and litigation leaves no doubt that various modes of algorithmic pricing are commonplace in numerous market sectors. The mounting awareness of these practices has prompted numerous economists and lawyers to voice concerns about possible detriments to the market and social structures that these practices may likely bring about.

The *Cambridge Handbook on Algorithmic Price Personalization and the Law* contains contributions from a multidisciplinary group of scholars with substantial expertise in legal, economic, data science, and marketing research on consumer prices. The authors, from various European and non-European jurisdictions, have

[1] See also Section I.2.

different perspectives on personalized prices. The plurality of voices collected in the Handbook stimulates readers to form their own opinions and join the collective reflection on what, if anything, the law should do about algorithmic price personalization. The structure of the Handbook rests on three interdependent parts, each containing chapters by experts from law and other social sciences.

Part I sets the stage by presenting background knowledge about the historical, normative, technological, and economic context that is needed to reflect critically on price personalization. Tagiuri reminds us that personalized prices are not a new phenomenon and perhaps have been more common historically than standard prices.[2] Offering a data scientist's perspective, Han then introduces clear criteria by which to define price personalization, explains how it works, and points out that we can expect it to spread offline as well. Next, Brinca, Costa, and Martinez discuss the theoretical and empirical insights into price personalization that are critical to putting this pricing technique into perspective.[3] Davola, Esposito, and Grochowski delve more deeply into the interconnection between personalization of prices and other contract terms, using insurance and financial service agreements as illustrations.[4] Against the need to choose in favour of or against price personalization, Bagchi[5] reviews the main normative perspectives on price personalization.

Part II looks at the European Union (EU) regulatory framework, which deserves to be analysed in great detail given the bloc's pro-active stance, relative to other jurisdictions, on regulating various aspects of the digital marketplace. Maggiolino and Caforio identify the limits of EU competition law and the EU's Digital Markets Act in the governance of price personalization.[6] Jabłonowska, Lagioia, and Sartor provide an overview of EU consumer data law to identify a set of existing constraints on price personalization strategies.[7] Finally, Artigot Golobardes and Gómez Pomar, taking a law and economics approach, cast doubt on the ability of the Unfair Contract Terms Directive (UCTD) to limit algorithmic price personalization.[8]

Part III complements Part II with a legal comparative perspective. Meyerhof Salama and Batista da Silva build on a recent decision that found that price personalization infringed general Brazilian consumer law and privacy law to reconstruct the interaction between consumer, privacy, and competition law.[9]

[2] Giacomo Tagiuri, 'The Rise and Uneasy Decline of the Impersonal Price'.
[3] Pedro Brinca, João Ricardo Costa Filho, and Luis F. Martinez, 'The Economics of Price Personalization: Theory and Evidence'.
[4] Antonio Davola, Fabrizio Esposito, and Mateusz Grochowski, 'Price Personalization vs. Contract Terms Personalization: Mapping the Complexity'.
[5] Aditi Bagchi, 'What Is the Problem with Price Personalization?.
[6] Valeria Caforio and Mariateresa Maggiolino, 'EU Competition Law and Personalized Pricing'.
[7] Agnieszka Jabłonowska, Francesca Lagioia, and Giovanni Sartor, 'Beyond the Price Tag: Personalized Pricing and the Pre-contractual Rights of Consumers and Data Subjects under EU Law'.
[8] Mireia Artigot Golobardes and Fernando Gómez Pomar, 'Personalized Prices and Contractual Controls in EU Consumer Law'.
[9] Bruno Meyerhof Salama and Leda Batista da Silva, 'Personalized Pricing in Brazil'.

Chapdelaine presents the legal landscape of algorithmic personalized pricing in Canada by focusing predominantly on personal data protection as well as on contracts and consumer and anti-discrimination law.[10] Ge explains that in China, 'big data backstabbing' is regulated by a dense web of legal sources and enforced by various authorities that significantly limit retailers' power to personalize prices.[11] Porat finds that relevant principles for the governance of price personalization can be extracted from US law, in particular from the individual's ability to withdraw their data from the pool used for personalized price setting.[12] All the relevant legal instruments are decentralized (as they operate only in selected state law), and none of them addresses personalized prices up-front. Finally, Ashok and Abhay Jain provide a comprehensive picture of the legal framework that applies (or may possibly apply) to personalized pricing on various levels of the Indian legal order.[13]

Each part of the Handbook creates a thorough overview of the various issues associated with algorithmic pricing in law and other social sciences. Overall, the Handbook shows that while the technology is steadily evolving, legal academics have struggled to identify general normative premises on which to build a coherent and effective regulatory response based on existing legal materials or even to formulate promising legal reforms.

At the same time, the traditional set of legal principles and rules that have long governed contracts and the emerging principles governing algorithms appear suited to provide normative and institutional guidance for reflecting on how to regulate price personalization. In fact, as we elaborate in Section I.3, the interplay of transparency and substantive considerations about prices and algorithms forms the main ingredient of all the regulatory solutions explored in this volume. From a broader perspective, as we explain in Section I.2, what price personalization really does is inject an unprecedented level of granularity into long-standing market practices. But at the same time, virtually all contributors to this volume acknowledge that price personalization could lead to unfair outcomes. What follows is a plea for a regulatory response that is a capable match for the economic and legal particularities of algorithmic pricing. We believe that the search for such a response should follow the rule of thumb that more granular market practices are to be complemented by more granular legal principles and institutions.[14]

[10] Pascale Chapdelaine, 'The (Il)legality of Algorithmic Personalized Pricing: A Canadian Perspective'.
[11] Jiangqui Ge, 'Algorithmic Price Personalization in China'.
[12] Haggai Porat, 'Algorithmic Personalized Pricing in the United States: A Legal Void'.
[13] Pratiksha Ashok and Sunitha Abhay Jain, 'Price Personalization: An Indian Perspective'.
[14] Christoph Busch and Alberto De Franceschi, Granular Legal Norms: Big Data and the Personalization of Private Law, in Vanessa Mak, Eric Tjong, Tjin Tai, and Anna Berlee (eds.), *Research Handbook in Data Science and Law* (Edward Elgar, 2018); Marietta Auer, Granular Norms and the Concept of Law: A Critique, Christoph Busch and Alberto De Franceschi (eds.), *Algorithmic Regulation and Personalized Law: A Handbook* (CH Beck; Hart; Nomos, 2021). These uses of the expression 'granularity' and its cognates are not to be confused with their uses in legal informatics; see Vytautas Cyras and Friedrich Lachmayer, Dual Textuality of Law, in Vytautas Cyras and Friedrich Lachmayer (eds.),

For these reasons, we think that the yardstick for algorithmic pricing, or – to put it differently, the borderline between admissible and inadmissible price personalization – should be constructed idiosyncratically. Just as the classical discourse on price fairness has frequently referred to *laesio enormis*,[15] is it now time to think of *laesio algorithmica*? If so, what would be its core premises and benchmarks? This volume attempts to answer at least some of these questions.

1.2 PERSONALIZED – DYNAMIC – ALGORITHMIC PRICING

As Tagiuri evidences in his broad historical panorama of impersonal versus personalized price schemes, pricing customers differently for the same goods or services is not a new commercial practice,[16] but the way it is changing in the online economy raises several new legal and ethical issues. Not only has the development of massive data harvesting techniques combined with robust computation skills employed in processing the data made the price calculations much more sophisticated than ever before, but it has also opened an entirely new chapter in our understanding of the relationship between the individual on the market and the value of a good or service. But legal scholarship has referred to the notion of algorithmic pricing in many, and not always fully coherent, ways. The conceptual structure of price personalization involves and rests on three essential building blocks.

First, the relationship between price personalization and price discrimination has been a source of much doubt among legal scholars. The more economically oriented accounts tilt towards discrimination and generally equate[17] price discrimination with offering differentiated prices to different groups of market actors. In this setting, 'discrimination' is understood, mostly in descriptive terms, as a synonym for divergent pricing schemes.[18] But this account does not convey any clear moral judgment as the notion of discrimination in a legal or ethical analysis would, a caveat

Essays on the Visualisation of Legal Informatics (Springer International Publishing, 2023) https://doi.org/10.1007/978-3-031-27957-7_16 accessed 29 October 2023.

[15] Thomas Finkenauer, Laesio Enormis, Jürgen Basedow, Klaus J. Hopt, Reinhard Zimmermann, and Andreas Stier (eds.), *Max Planck Encyclopedia of European Private Law* (Oxford University Press, 2012); Reinhard Zimmermann, *The Law of Obligations: Roman Foundations of the Civilian Tradition* (1990; paperback edn 1996), 259 ff; Frederik Willem Grosheide, Iustum Pretium Redivivum?, Frederik Willem Grosheide and Ewoud Hondius (eds.), *International Contract Law*, 2003 (2004), p. 69ff; James Gordley, *Foundations of Private Law: Property, Tort, Contract, Unjust Enrichment* (2007), pp. 364ff.

[16] Tagiuri in this volume.

[17] Sometimes however, discrimination based on idiosyncrasies of individuals' conduct ('behavioural discrimination') is perceived as generally advantageous for enhancing market fairness; see Ariel Ezrachi and Maurice E. Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (Harvard University Press, 2016), pp. 117–130.

[18] On this confusion also, long before the era of algorithmic pricing, Kenneth W. Dam, The Economics and Law of Price Discrimination: Herein of Three Regulatory Schemes, *University of Chicago Law Review*, 28, 1963, p. 1.

that must be acknowledged in any cross-reference between economics and the other disciplines that have approached the issue of differentiated pricing. In other words, not every discriminatory price in the economic sense will be legally or ethically intolerable discrimination.

Second, it is necessary to distinguish among various premises of price differentiation. This is the least confusing part of the conceptual framework of personalized pricing. Its foundations were laid in the 1930s already by Arthur C. Pigou[19] and until the present had remained mostly uncontested. With the advent of algorithmic pricing, his long-established typology underwent a renaissance, and numerous scholarly accounts and policy papers (many referred to in this volume) have invoked it recently. In the Pigouvian view, price personalization can be divided into three layers.

The first layer assigns every customer a tailor-made price that reflects the highest amount that this particular individual is willing to pay. This is the 'reservation price', which denotes a clearly futuristic state of affairs in which suppliers are capable of precisely identifying each client's willingness to pay. Hence, this type of differentiated pricing – often referred to as the 'perfect price discrimination'[20] – operates mostly as a yardstick for the pricing techniques that are actually applied in practice, allowing a better understanding of the extent to which a particular pricing scheme corresponds to the preferences of a generic customer or can accommodate to a more idiosyncratic degree an individual's willingness to pay. As will be explained later in this section, algorithmic price calculation firmly promises to bring consumer prices into close proximity with a perfectly personalized price. Algorithms can make a specific behavioural prediction about an individual, estimating their willingness to pay a particular price in the given circumstances (imagine, for example, a man who has just become a grandparent for the first time and is looking for baby clothes). But for epistemic reasons having to do with data availability and analytical power, perfect personalization is not currently feasible and will in all probability remain the Holy Grail of the consumer economy for the foreseeable future.

The second layer of Pigouvian price discrimination represents a pricing scheme whereby customers are grouped by distinctive features such as age, income or geographical location that in the supplier's view will affect their willingness to pay. This scheme sets the reservation price separately for each such cluster as an approximate willingness to pay evaluated in reference to one or more distinctive properties. This way of pricing is relatively far removed from the 'perfect personalization' ideal but at the same time is actually closer to the epistemic reality of the consumer market. Naturally, it is easier to identify the key premises that determine the client's attitude towards price for an average group member than for an idiosyncratic individual.

[19] Arthur C. Pigou, *The Economics of Welfare* (1932).

[20] See, for example, Dirk Bergemann, Benjamin Brooks, and Stephen Morris, The Limits of Price Discrimination, *The American Economic Review*, 105, 2015, p. 921.

This model of pricing underpins all the existing schemes of algorithmic pricing, which build on automated pooling of consumers into clusters. These clusters are then priced differently based upon distinguishable characteristics. Over time, such pooling techniques will supposedly tend towards apportioning clients into increasingly smaller clusters – hence striving for the 'perfect personalization' ideal.

While price personalization fashioned after the first and second Pigouvian layers may not always reflect established market practice, it may also be conducive to other forms of personalizing the contract. Most indicative of how personalization can affect terms other than price are various instances in which price depends on a personalized risk assessment in the insurance and financial services industries. However, as Chapter 3 argues, such dependencies do not apply universally to all consumer transactions. Instead, they typically presuppose two neoclassical model conditions: first, prices must be set at marginal costs; second, consumption must have no externalities. If at least one of these conditions does not hold (and they often do not), term personalization can occur without price personalization.

The third layer of personalized pricing refers to the natural process of charging different prices for the same asset in response to objective market criteria such as fluctuations in the price of raw materials and shipment costs to different locations. This mode of price differentiation can hardly be described as belonging in the milieu of 'personalization' as such. It relates instead to the general cost/price dynamic and hardly involves those personal idiosyncrasies that affect the value of the performance for the client (the willingness to pay).

Here, one must distinguish between personalized pricing and dynamic pricing. 'Dynamic' refers to price differences that track vacillations in supply and demand or in the costs associated with procuring a good or with conducting the transaction itself. Widespread (and widely accepted) practices along these lines for decades have been to price train tickets differently for peak versus off-peak travel, to charge different fuel prices at gas stations depending on the day of the week, or to airlines changing their fares to reflect higher or lower demand. Although dynamic pricing is at times placed in the same rubric as price personalization, the two phenomena are structurally different. Whereas dynamic pricing is primarily concerned with responding to changing market dynamics, personalization schemes aim more or less directly at the client's individual features. To the extent that the client's reservation price may rise or fall along with the overall market, the two mechanisms may converge in practice. But this will not be the rule. And even if such convergence actually occurs, the premises for the price calculation will differ, at least in part. Qiwei Han's chapter illuminates the mechanics of price setting and the role played by data (personal as well as aggregated big data) in this process.[21] In particular, Han's chapter discusses how algorithms are capable of identifying patterns across the data

[21] Qiwei Han, 'Personalized Pricing in the Age of Big Data: A Technical Perspective'.

pool and of associating them with individual consumer characteristics. Han also discusses the dimensions of privacy and threats to privacy from this practice. At the same time, his chapter argues that data pools themselves offer an opportunity to mitigate privacy shortcomings. Even anonymized data can still be a viable resource for identifying market preferences and arriving at reservation prices for clusters of consumers.

Keeping in mind the multitude of terms used in the discourse over algorithmic pricing, one clarification is needed. Though this Handbook focuses on 'algorithmic price personalization', it should however be noted that some contributors prefer to refer more generally to 'price personalization' or to 'algorithmic pricing' as the analytical categories. Unless the context indicates otherwise, these notions are used interchangeably to denote first- and the second-degree price discrimination in the Pigouvian construct. Finally, unless something else follows from the context, price personalization also encompasses personalized discounts arrived at where the initial price is calculated impersonally but an algorithm allocates discounts to particular clients.[22]

I.3 FAIRNESS AND TRANSPARENCY

I.3.1 *Emphasis on Algorithmic Decisions or on the Price?*

The literature on algorithmic price personalization, including the contributions to this volume, maps along an axis of whether the authors emphasize that an algorithm is taking decisions or that the decisions taken are about price. This axis is particularly conspicuous in discourse about the fairness and transparency of algorithmic price personalization.

In a first approximation, scholars focusing on algorithmic fairness are investigating price personalization in reference to an already pretty robust body of literature on the general fairness of algorithmic decisions. The price-focused literature in turn looks at algorithmic price personalization from the perspective of contracts and competition, and of market law more generally, to identify instances of fair as well as unfair algorithmic price personalization. Consequently, scholars emphasizing the transparency of algorithmic decision-making rely primarily on the vast literature on transparency and explainability (the algorithmic 'black box' problem) and on the 'human in the loop' idea of algorithmic bias and related problems.

The accounts tilting towards the price dimension refer more frequently to the economic parameters of personalized pricing, including its welfare and distributional outcomes as well as its effects on competition and antitrust law. In addition, the price-centred accounts often invoke transparency, which in this context refers not to algorithmic transparency as such, but to informing consumers about price

[22] See also Joseph Turrow, *The Aisles Have Eyes: How Retailers Track Your Shopping, Strip Your Privacy, and Define Your Power* (Yale University Press, 2017).

and its basic parameters. Less commonly, this thread of literature also invokes the link between personalized pricing and classical price fairness doctrine as well as the general toolbox for reviewing price clauses (which includes such instruments as the EU Unfair Contract Terms Directive [UCTD]).

A deeply intertwined set of concerns, situated somewhere between price and fairness, is privacy.[23] By its nature, algorithmic pricing builds on harvesting and processing personal data from the consumer market. Hence, algorithmic pricing clearly falls within the ambit of privacy regulations such as the General Data Protection Regulation (GDPR)[24] and the California Consumer Privacy Act (CCPA).[25] Consequently, algorithmic pricing is also incidentally subject to rules on automated profiling in the EU law, especially to Article 22 of the GDPR[26] (notwithstanding that the real significance of this rule for price personalization is limited and cumbersome). From the algorithmic pricing perspective, privacy can be seen in a twofold way. First, if it is considered to constitute a stand-alone value in personalized pricing, privacy may be situated near the algorithmic-price-fairness end of the spectrum.[27] Second, privacy can also be understood instrumentally, as a component of the transparency requirement. Seen through this prism, privacy is more of a procedural than a substantive standard, meant to protect other interests (e.g., not being exploited or discriminated) by prohibiting the use of consumer information in ways that will harm them.

In the background of these institutional and normative standpoints lies a broad cluster of empirical studies into consumer attitudes towards dynamic and personalized pricing schemes. All these studies point to a clear bottom line: consumers are generally strongly averse towards algorithmic pricing[28] (and generally towards all instances of price differentiation in online and offline contexts[29]). Arguably, this

[23] Frederik Zuiderveen Borgesius, Natali Helberger, and Agustin Reyna, The Perfect Match? A Closer Look at the Relationship between EU Consumer Law and Data Protection Law, *Common Market Law Review*, 54, 2017, p. 1427.

[24] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (OJ L 119, 4.5.2016, pp. 1–88).

[25] CCPA of 28 June 2018, California Civil Code §§ 1798.100; on the relevance of this legislation for personalized pricing, see also Porat's contribution in this volume.

[26] Mateusz Grochowski et al., Algorithmic Price Discrimination and Consumer Protection: A Digital Arms Race?, *Technology and Regulation*, 4, 2022, p. 43; Fabrizio Esposito, Making Personalised Prices Pro-Competitive and Pro-Consumers, *CAHIERS DU CeDIE WORKING PAPERS 2020/02*.

[27] On the link between algorithmic price fairness and privacy, see Section I.3.2.

[28] See also Lina M. Khan, Amazon's Antitrust Paradox, *Yale Law Journal*, 126, 2017, p. 763; Oren Bar-Gill, Algorithmic Price Discrimination When Demand Is a Function of Both Preferences and (Mis) perceptions, *The University of Chicago Law Review*, 86, 2019, p. 242.

[29] Kelly Haws and William O. Bearden, Dynamic Pricing and Consumer Fairness Perceptions, *Journal of Consumer Research*, 33, 2006, p. 309; Timothy J. Richards, Jura Liaukonyte, and Nadia Streletskaya, Personalized Pricing and Price Fairness, *International Journal of Industrial Organization*, 44, 2016, p. 150; P. K. Kannan and Praveen K. Kopalle, Dynamic Pricing on the Internet: Importance and Implications for Consumer Behavior, *International Journal of Electronic Commerce*, 5, 2012, p. 73; Haws and Bearden, Dynamic Pricing, pp. 308–310; Sophie C. Boerman, Sanne Kruikemeier,

aversion is rooted in consumers' intuition that price differentiation carried out by a machine is substantially different from similar operations in the brick-and-mortar setting.[30] In other words, popular perception holds algorithmic pricing to be ethically questionable, not only because it allocates different prices to different clients[31] but also because the differentiation in question is based on personal details analysed by a de-humanized agent.

The relevance of the empirical studies in question is two-fold. First, the pedestrian view of price fairness can serve as a guideline in setting regulatory frameworks for personalized pricing. Although collective moral judgments are not definitive for the design of legal rules, they do however provide relevant signposts for understanding where the boundaries of price personalization should be placed.[32] Second, consumer backlash may dissuade firms from using algorithms at all (or at least, from using them opportunistically, as a way of rent-seeking). This pertains especially to what is known as 'dual entitlement theory', which provides an explanatory formula for social attitudes towards price changes identified through empirical studies. Dual entitlement theory holds that firms are generally averse to increasing prices solely due to fluctuations in demand or for certain other reasons that consumers generally do not deem acceptable. In turn, the dual entitlement view holds that firms are more inclined to increase prices to reflect increased costs of producing or obtaining a good (or at least, they are inclined to present price increases this way), as this is the only type of price increase that the majority of consumers tends to approve of. From a normative perspective, while dual entitlement theory taken by itself is merely one guide, its fitness with a broader fairness account needs to be stressed and is discussed in Section I.3.2.

I.3.2 *Fairness*

The bourgeoning use of personalized (that is, of individual or at least of granularized) prices, based on profiling of individual market preferences, triggers academic and policy discussion along several lines. One of the most foundational (and

and Nadine Bol, When Is Personalized Advertising Crossing Personal Boundaries? How Type of Information, Data Sharing, and Personalized Pricing Influence Consumer Perceptions of Personalized Advertising, *Computers in Human Behavior Reports*, 4, 2021 pp. 8–10; The European Consumer Organization (BEUC), *Connected, But Unfairly Treated. Consumer Survey Results on the Fairness of the Online Environment* (Brussels 2023), p. 10.

[30] Martin Fassnacht and Sebastian Unterhuber, Consumer Response to Online/Offline Price Differentiation, *Journal of Retailing and Consumer Services*, 28, 2016, p. 146; Gerrit Hufnagel, Seeking the Perfect Price: Consumer Responses to Personalized Price Discrimination in e-Commerce, *Journal of Business Research*, 143, 2022, pp. 355–357.

[31] Bar-Gill, Algorithmic Price Discrimination, p. 227.

[32] In a similar way, the relevance of empirical evidence on social perception of fairness; see Daniel Kahneman et al., Fairness as a Constraint on Profit Seeking: Entitlements in the Market, *The American Economic Review*, 76, 1986, p. 729. See also, in this volume, Brinca, Costa Filho and Martinez in this volume.

chronologically, the most seminal[33]) of them ponders the (un)fairness of price calculation schemes.[34] The widespread use of various argumentative formulas, also in this regard, ultimately seems inconclusive, or at least not fully consistent in its ends.[35] In many instances, fairness operates as the epitome of an unspecified set of values that embody the moral features of a 'proper' algorithmic price calculation. At the same time, fairness-based assertions occupy a particularly prominent position in the algorithmic pricing debate. The emergence and rapid proliferation of automated price calculation have brought the long-stagnant and 'distinctly unfashionable'[36] debate over price fairness to the fore again. It has revived foundational questions of the ethics of setting prices and is attempting to incorporate into them a partly altered domain of market phenomena and ethical judgements.

In the general debate on algorithms, the notion of fairness hence functions as something of a nebulous concept of certain values or moral principles that can serve as a yardstick for gauging whether the use of a particular algorithm is, broadly considered, ethical.[37] In a nutshell, fairness-based arguments are underpinned by one of the two patterns mentioned earlier.[38] They gravitate either towards the question of price per se or towards the fairness of the algorithmic procedure. Under the latter view, the concept of algorithmic fairness encompasses a diverse set of issues.[39] Some of these issues involve imperfections in the algorithmic decision and the biases affecting it.[40] Other issues may be more foundational, as they regard the right to be left alone, understood in this context as the wish to keep one's 'private' life and persona separate from one's 'market' persona.[41] Here, again, it is possible

[33] The discussion about the permissibility of algorithmic pricing originated as early as 2000, when it became apparent that Amazon was differentiating prices for DVDs (Craig Bicknell, Online Prices Not Created Equal, *Wired*, 7 September 2000). The general unrest of that time, encapsulated in Paul Krugman's op-ed: Reckonings; What Price Fairness?, *New York Times*, 4 October 2000, spurred ample debate over price personalization, which before then had been quite limited – for a historical outline of this discussion, see, for example, Frederick Zuiderveen Borgesius and Joost Poort, Online Price Discrimination and EU Data Privacy Law, *Journal of Consumer Policy*, 40, 2017, pp. 348–350.

[34] On the concept of fairness in the algorithmic context, see Mateusz Grochowski, Algorithmic Price Fairness (2024).

[35] See especially an ample analysis by Akiva A. Miller, What Do We Worry about When We Worry about Price Discrimination – The Law and Ethics of Using Personal Information for Pricing, *Journal of Technology Law & Policy*, 19, 2014, pp. 68ff.

[36] Robert C. Hockett and Roy Kreitner, Just Prices, *Cornell Journal of Law and Public Policy*, 27, 2018, pp. 771–796.

[37] See also Aditi Bagchi, 'What Is the Problem with Price Personalization?'.

[38] See Section I.3.1.

[39] Tal Zarsky, The Trouble with Algorithmic Decisions: An Analytic Road Map to Examine Efficiency and Fairness in Automated and Opaque Decision Making, *Science, Technology, and Human Values*, 41, 2016, pp. 118–132; Aditi Bagchi, 'What Is the Problem with Price Personalization?'.

[40] Further on the biases embedded in the algorithmic design, see, for example, Anupam Chander, The Racist Algorithm?, *Michigan Law Review*, 115, 2017, pp. 1023–1045; Kate Crawford, The Hidden Biases of Big Data, *Harvard Business Review*, 1 April 2013; Tar Zarsky, 'The Trouble'.

[41] On the 'digital persona' and its implications for personalized pricing, cf. Mateusz Grochowski, 'Algorithmic Price Fairness'.

to operate along the lines of the fairness and transparency lenses. And in fact, it is perfectly imaginable that some portion of the population may have an intrinsic distaste for the merging of their private and market personas. Others, however, might be distinctly concerned that the merging of the two spheres will lower the quality of their market options. Apprehension on the part of some consumers suggests that the ethics of algorithmic pricing rest on a broader foundation than does the classic concept of a fair price. In this sense, moral concern about algorithmic pricing may far precede any contractual relationship between the parties. In this way, algorithmic calculation of prices extends the fairness argument into areas that normally fall outside the scope of axiological interest in contract law.

Accordingly, 'fairness' should be invoked with caution in the algorithmic context, as it often serves as an umbrella for various arguments related to the ethics of price differentiation introduced by an algorithm. It may be more fruitful to look at the fairness of price personalization from the perspective of contract law. Prices set using algorithms are part of the same axiological universe that emerged at the outset of modern contract law by developing the notion of *laesio enormis*, which puts a threshold on the substantive outcomes of the bargaining process. The current contract law debate has voiced concern over and against this idea, presenting it as too paternalistic and overly vague in its axiological fabric.[42]

Other, more optimistic views have pointed towards a large toolbox that could ensure the substantive fairness of personalized prices. This pertains especially to various devices in contract law, such as unconscionability, or to the judicial review of price terms, which a prevalent view would also hold is also applicable in the classical framework of contract law.[43] Indeed, contributors to this Handbook have taken seriously the possibility of such substantive intervention. Chapters in all three parts of the Handbook have recognized that there is normative justification for the claim that personalized prices can be too high.

Thus, while the difficulty of identifying a benchmark might well justify limited legal review, the normative concern seems easy to articulate: exploitation. As Paul Krugman puts it, personalized prices are 'undeniably unfair' when 'some people pay more just because of who they are'.[44] This normative intuition finds deep roots in the idea of individual and, more precisely, of consumer sovereignty, as well as of its

[42] See Martijn W. Hesselink, Could a Fair Price Rule (or Its Absence) Be Unjust?, *European Review of Contract Law*, 185, passim, and the reply by Horst Eidenmüller, Justifying Fair Price Rules in Contract Law, *European Review of Contract Law*, 11, 2015, pp. 220–228.

[43] Daniel T. Ostas, Ethics of Contract Pricing, *Journal of Business Ethics*, 11, 1992, pp. 137–145; Mark Klock, Unconscionability and Price Discrimination, *Tennessee Law Review*, 69, 2002, p. 317–382; critically, among others, Richard A. Epstein, Unconscionability: A Critical Reappraisal, *The Journal of Law and Economics*, 18, 1975, pp. 293–315.

[44] Paul Krugman, Reckonings; What Price Fairness?; see also Fabrizio Esposito, Innovation Letter – Price Personalization: Walking the Not-so-blurred Line between Innovation and Exploitation, *Journal of Law, Market & Innovation*, 3, 2024, pp. 7–13.

welfare equivalent: consumer welfare maximization. Indeed, in an account of market relations based on consumer sovereignty, '[a]s consumer the individual is sovereign; as producer he is subject'.[45] This normative asymmetry actually relies on a strong notion of substantive equality: everyone as a consumer is sovereign and everyone as a trader is a subject. The emphasis is on traders endeavouring to offer consumers the best deals and then competing with one another on the merits to attract consumers rather than competing to indirectly maximize social or total welfare.

It is apparent that we are far from an ideal of consumer sovereignty if traders are using consumer data to extract value from them. Moreover, this normative concern has significant empirical support. As the dual entitlement theory[46] emphatically illustrates, price variations are subject to widely shared social beliefs (that are mostly at odds with using price personalization to charge consumers higher prices). Second, at least in the EU, similar considerations also motivate vast branches of market regulation.[47] The development of EU energy law provides direct examples of this. For instance, the Court of Justice of the European Union (CJEU) has interpreted a vague reference to a right to reasonable prices in Directive 2003/55/EC as a proxy for the right to a competitive price.[48] Subsequent legislative reforms in the energy sector have made this individual right to benefit from competition even more explicit.[49]

I.3.3 *Transparency*

While prices might be difficult to regulate directly, transparency-based interventions might go a long way by empowering consumers to look after themselves. But the appeal of transparency-based tools also derives from individual autonomy; in particular, transparency appeals to individual preferences and decisional processes while shielding consumers from third-party assessment.[50]

The issue of transparency in algorithmic pricing sits at the juncture of two more generic questions: one, of transparency in consumer transactions; and two, of the

[45] William H. Hutt, *Economists and the Public Interest. A Study of Competition and Opinion*. (Jonathan Cape, 1936), p. 257.

[46] In this volume, see Brinca, Costa Filho, and Martinez in this volume.

[47] See Fabrizio Esposito, *The Consumer Welfare Hypothesis in Law and Economics: Towards a Synthesis for the 21st Century* (Edward Elgar Publishing, 2022), pp. 97–174.

[48] Court of Justice of the European Union, Judgement of 20 April 2010, Federutility and others v Autorità per l'energia elettrica e il gas, C-265/08, EU:C:2010:205.

[49] For a discussion, see Lucila de Almeida and Fabrizio Esposito, A Shocking Truth for Law and Economics: The Internal Market for Electricity Explained With Consumer Welfare, in Bruce Hubner and Klaus Mathis (eds.), *Energy Law and Economics* (Springer, 2018), pp. 127–128. More recently, see Recitals 2, 13, and 22 Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU OJ L 158/125.

[50] Ian Carter, Respect and the Basis of Equality, *Ethics*, 121, 2011, pp. 538–571; Fabrizio Esposito, Carrying the Choice Theory of Contracts Further: Transfers, Welfare, and the Size of the Community, *European Review of Contract Law*, 15, 2019, pp. 297–334.

overall cognizability of algorithmic decision-making (often referred to in scholarship as 'algorithmic fairness').[51] Understood in this way, transparency of algorithms operates not merely as a procedural requirement but as an indirect guarantee that the process of price calculation will be understandable for the individuals subject to price personalization and will allow them to scrutinize its premises[52] and to make a decision about opting out of the personalization scheme. However, the exact content of the transparency requirement is itself not very transparent. Depending on one's vantage point, the prescription may encompass a 'thinner' or 'thicker' version of transparency. Thinner transparency relates to the transparency of price personalization as such, mandating clarification that the particular price is differentiated for various consumers through algorithmic decision-making. Thicker transparency refers to the setting in which not only the fact of personalization but also the criteria used to calculate the price are revealed to the consumer. This thicker transparency may rest either on criteria set ex ante (indicating the premises to be taken into account by an algorithm) or on ex post elucidation of why the particular price was calculated in a certain way (and hence tending towards 'algorithmic explainability').[53]

[51] Gerhard Wagner and Horst Eidenmüller, Down by Algorithms? Siphoning Rents, Exploiting Biases, and Shaping Preferences: Regulating the Dark Side of Personalized Transactions, *The University of Chicago Law Review*, 86, 2019, pp. 604f; Frederick Zuiderveen Borgesius and Joost Poort, 'Online Price Discrimination', pp. 356–364; Michal Gal, Algorithmic Challenges to Autonomous Choice, *Michigan Technology Law Review*, 25, 2018, p. 74; Tal Zarsky, 'The Trouble'; see also Marc Bourreau and Alexandre de Streel, OECD Directorate for Financial and Enterprise Affairs Competition Committee, The regulation of personalised pricing in the digital era, 2018 (https://one.oecd.org/document/DAF/COMP/WD(2018)150/en/pdf), pp. 10–12. In a broader context of algorithmic transparency, see also Frank Pasquale, Beyond Innovation and Competition: The Need for Qualified Transparency in Internet Intermediaries, *Northwestern University Law Review*, 105–173, 2010; Danielle K. Citron and Frank Pasquale, The Scored Society: Due Process for Automated Predictions, *Washington University Law Review*, 89, 2015; Min Kyung Lee et al., Procedural Justice in Algorithmic Fairness: Leveraging Transparency and Outcome Control for Fair Algorithmic Mediation, *Proceedings of the ACM on Human-Computer Interaction*, 3, 2019, pp. 1–26.

[52] The general assertion that algorithms should be transparent does not finally answer the question of the optimal form of this requirement. Certainly, simple transparency of the algorithm (disclosure of the code) has much less informative value to an average offeree than algorithmic explainability – that is, the possibility of understanding the origins of a particular price, in particular the clarity of the premises the calculation took into account (on this issue, against the backdrop of EU consumer law, cf., for example, Christian Twigg-Flesner, The EU's Proposals for Regulating B2B Relationships on Online Platforms – Transparency, Fairness and Beyond, *Journal of European Consumer and Market Law*, 7, 2018, pp. 222–233; cf. also Louise Matsakis, What Does a Fair Algorithm Actually Look Like?, *Wired*, 10 November 2018). Further on the relation – and separation – of transparency and explainability, see Ignacio N. Cofone and Katherine J. Strandburg, Strategic Games and Algorithmic Secrecy, *McGill Law Journal*, 64, 2019, pp. 623–663; on practical mechanics of algorithmic transparency, see Kartik Hosanagar, People Want to Know About Algorithms – but not too much, *Wired*, 12 March 2019.

[53] Cf. Mateusz Grochowski, Agnieszka Jabłonowska, Francesca Lagioia, and Giovanni Sartor, Algorithmic Transparency and Explainability for EU Consumer Protection: Unwrapping the Regulatory Premises, *Critical Analysis of Law*, 8, 2021, pp. 43–63.

In the existing EU legal framework, requiring transparency is the most basic approach to price regulation, including personalized pricing. First, the UCTD[54] eschews price control and leaves it to the parties' autonomous choice. Article 4(2) UCTD excludes from the unfairness assessment terms that determine 'the main subject matter of the contract' as well as 'the adequacy of the price and remuneration … as against the services or goods supplies in exchange'. The application of this exclusion is conducive to transparency of the price term (i.e., when it may be assumed that a consumer was able to understand the price and make a meaningful market choice). Hence, the UCTD approach to price rests on a strong assertion that fairness-based interventions into price are only legitimate as long as the price as such is not transparent[55]; the procedural (formal) premise supersedes the substantive one. However, this is a weak policy choice, since the directive provides only a minimum of harmonization, and some member states have opted for allowing substantive review even if the price was not found opaque.

The detailed considerations that underpin the application of the UCTD in the context of personalized pricing are discussed in Chapter 7. Building on a thorough analysis of the economic premises of algorithmic price control, they conclude that the existing instruments are of limited applicability in this regard. Most importantly, they do not see how it is feasible to construct convincing benchmarks (such as an average market price) that could allow the conventional contract law toolbox to apply. Instead, they advocate seeking outside the contract law domain, and indeed outside the perspective of individual consumer-to-business relations.

Second, EU law reinforces the disclosure-based paradigm even further by indicating, in Article 6(1)(d) of the UCPD,[56] that what constitutes a misleading commercial practice is not informing, or at least deceptively communicating to, a consumer about 'the price or the manner in which the price is calculated, or the existence of a specific price advantage'. The lack of proper disclosure amounts to an unfair practice only as long as it may substantially distort the client's market behaviour (i.e., when it 'causes or is likely to cause him to take a transactional decision that he would not have taken otherwise'). This provision, paired with the UCTD, quite

[54] Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts, OJ L 95, 21 April 1993, pp. 29–34.

[55] Cf. Fabrizio Esposito and Mateusz Grochowski, The Consumer Benchmark, Vulnerability, and the Contract Terms Transparency: A Plea for Reconsideration, *European Review of Contract Law*, 18, 2022, pp. 15–17; Tycho de Graaf, Consequences of Nullifying and Agreement on Account of Personalized Pricing, *Journal of European Consumer and Market Law*, 5, 2019, pp. 184–193; on the rationale for this mechanism cf. Glenn Heirman, Core Terms: Interpretation and Possibilities of Assessment, *Journal of European Consumer and Market Law*, 6, 2017, pp. 30–34.

[56] Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council, OJ L 149, 11 June 2005, pp. 22–39.

conspicuously indicates that EU contract law concerns itself mostly with the question of the procedural fairness of algorithmic pricing, rather than with its substantive outcome. In general, under EU law, price personalization as generally practiced is acceptable as long as the fact of personalization has been properly disclosed to a consumer. Finally, Article 4(4)(a)(ii) of the 'Omnibus' Directive[57] takes the most straightforward step towards algorithmic pricing transparency. It mandates that all traders who apply such pricing techniques must inform consumers 'that the price was personalised on the basis of automated decision-making'.

This provision from the Omnibus Directive does not specify what it understands personalized pricing to be, which is quite perplexing, given the multitude of meanings discussed earlier.[58] The essential question of transparency in algorithmic pricing, however, lies elsewhere. As Jabłonowska, Lagioia, and Sartor explain in their chapter, none of the three provisions discussed in the foregoing paragraphs indicates what particular issues should be taken into account in assessing the procedural fairness of algorithmic pricing. The only clear and universal obligation they impose is that providers must disclose the fact that the price was personalized by an algorithm. The exact parameters of price calculation, the internal architecture of the algorithm, and the pool of data used for algorithmic pricing need not be revealed to any extent. Even the UCPD's provision, which could possibly mandate that business should reveal more detail about the premises of price calculation, is of negligible practical importance. It applies only to the extent that the lack of proper disclosure may negatively impact consumer market behaviour, which admittedly will not be the case for every situation in which consumers do not receive detailed information about the algorithmic pricing scheme. Quite the opposite: in many instances, awareness of the details may be much less important to consumers than knowing that the price they are paying is not excessive compared to the market average.

Consequently, as Bagchi's contribution to this volume elucidates, the optimal disclosure model should go further than merely informing consumers that the price was calculated in a personalized way. It also should provide consumers with a certain degree of clarity as to the extent to which their individual features have contributed to the final price. Hence, as Bagchi explains, a well-conceived duty of disclosure should 'satisfactorily alert consumers as to the personal characteristics reflected in their prices, each one of which plausibly informs buyer's decision to buy'.[59] Her analysis is motivated by a concern for making algorithms transparent to consumers, which is one of the key challenges posed by personalized pricing.

[57] Directive (EU) 2019/2161 of the European Parliament and of the Council of 27 November 2019 amending Council Directive 93/13/EEC and Directives 98/6/EC, 2005/29/EC and 2011/83/EU of the European Parliament and of the Council as regards the better enforcement and modernisation of Union consumer protection rules, OJ L, 328, 18 December 2019, pp. 7–28.

[58] See Section I.2.

[59] See Bagchi in this volume.

However (and as Bagchi, as well as Jabłonowska, Lagioia, and Sartor rightfully point out), one must be mindful that providing complex information to consumers has obvious limits. Even if consumers could act upon it in theory, one can never be sure what actually drives their behaviour.

Moving away from the concern for price fairness leads to emphasizing mostly (if not exclusively) the right to know the impersonal price. According to this view, instead of knowing the parameters used to calculate the personalized price, it is more attractive to make sure consumers know the impersonal price along with the personalized price. After all, the material information is the price to be paid, not how it was calculated. As we explain later, one way, and it is not without challenges, to fulfil this blueprint may be to disclose an impersonal price to consumers.[60] This information seems simpler both to provide and to take into account, and it seems more informative than the main parameters leading to a personalized price.

To illustrate, suppose a website offers identical tablets to each editor of this volume, one for 549.99 EUR (Mateusz) and the other for 489.99 EUR (Fabrizio). Each is told that the price was calculated taking the following parameters into consideration: age, profession, country of residence, and familial status. It is apparent that this information is not very useful for either of us. Instead, suppose we are both told that the impersonal price is 489.99 EUR. Fabrizio is reassured; Mateusz becomes alarmed that he is being asked to pay more than the impersonal price, and at least he can exit the website and return, this time denying access to his personal data and thus being offered the impersonal price of 489.99 EUR.[61] For this reason, the impersonal price appears more important from a consumer protection perspective than the personalization parameters.

Be that as it may, disclosure duties (even if more sophisticated than under the current EU model) should only be part of a much more complex regulatory system. Consumer protection based merely on information mandates can in many instances prove illusory if not coupled with meaningful market choice for the consumer. As explained earlier,[62] even when properly informed about the basic parameters of the price calculation process, consumers may not be able to find a substantially different option. For these reasons – as several contributors to this volume point out – supplying consumers with information must be coupled with other regulatory instruments, in particular with regulating competition and data flows on the market. From this vantage point, price personalization comes with major caveats against the clustering of legal analysis into conceptual silos and strongly incentivizes systemic thinking.

[60] See Section I.4.2.
[61] See later, Section I.4.1.
[62] See Section I.3.4.

I.3.4 *Efficiency and Distribution*

Applying the traditional economic categories to price personalization poses another clear issue. The traditional approach to price assessment harbours a tension between the efficiency of algorithmic price personalization and its distributive effects. Under this view, algorithmic price personalization can increase market access and therefore total economic welfare, which is normally taken for a synonym of increasing the efficiency of market allocations. However, while some consumers may benefit from algorithmic pricing, others will lose – and the aggregate effect is therefore hard to measure. The inability to go beyond this finding hampers some scholarly analyses of personalized pricing and seems to impede the search for concrete and actionable conclusions.

The specific challenges of studying algorithmic prices can be eased by following two complementary routes. The first hinges upon the notion of institutional necessity. In other words, it asks to what extent it is necessary to harm some consumers to increase market access for those consumers who are offered a lower price. As pointed out by Brinca, Costa, and Martinez,[63] nothing in the mechanics of algorithmic price personalization makes harming some consumers necessary to ensure that other consumers benefit from algorithmic price personalization in the form of lower prices. Indeed, as several chapters in this Handbook point out (especially Chapters 6 and 9–13), legal systems are willing to balance a practice's positive against its negative effects if the negatives are found necessary to obtain the positives; otherwise, there is no need to balance them.

This point might be especially hard to grasp in the traditional economic analysis of law because – as recently pointed out by Bayern – the field's methodology is overshadowed by an 'analytical failure' in failing to consider more nuanced institutional arrangements.[64] In the context of algorithmic price personalization, this analytical failure manifests in not taking into account institutional arrangements in which price personalization for some consumers is allowed only if it is beneficial to them, regardless of the impact of the practice on other consumers. In other words, trade-offs between consumer groups are unnecessary.

Davola, Esposito, and Grochowski offer some insights in this regard. They expose two crucial limitations to the idea that price personalization should be considered necessary every time traders invest in the personalization of other contractual terms. The first is that the market these traders are operating in is perfectly competitive, because when it is not, traders need not engage in price personalization in order for term personalization to be feasible. Second, the market under consideration is one in which the contract has no relevant effect on third parties. To illustrate, the authors point out that risk distribution in insurance markets may justify limiting price personalization in light of socially desirable distributive effects. A case in point is the law forcing insurance companies to ignore gender as a variable in calculating premiums.

[63] Brinca, Costa Filho, and Martinez in this volume.
[64] Shawn Bayern, *The Analytical Failures of Law and Economics* (Cambridge University Press, 2023).

Nevertheless, traditional economic analysis can be invoked to insist that consumer harm is irrelevant or less relevant than pure efficiency considerations (in the total welfare maximization sense). The strong version of this approach struggles to acknowledge the primacy of consumer interest. Notably, this strong version is challenged in its very conceptual foundations by the economic view that consumer welfare is the only relevant consideration for judging the effects of the relative efficiency of market outcomes. According to this rediscovered view, the distributive concern is part of the efficiency concern, not complementary to it.[65] From this perspective, it becomes apparent that there is no such thing as a merely distributive concern about the impact of algorithmic prices in the relationship between consumers and traders: every cent, penny, real, rupee, and yuan traders make by harming some consumers is a cause of inefficiency, and therefore an alternative market arrangement without such harm is more desirable in pure efficiency terms.

The weaker version of this total-welfare approach consists of an institutional shell game[66] in which, when analysing legal route A, it is determined that the issues are best left to legal route B to address. Then, the analysis of route B leaves it up to route C, and so on, up to an unavoidable outcome either of going a route where there is no political will to address the issue[67] or of closing the circle by once more indicating route A as the relevant one.

I.4 REGULATORY OPTIONS: SEARCHED AND FOUND

I.4.1 *Framework*

One of the key factors motivating the contributions to this volume is mapping the existing approaches to price personalization from analysis of actual legal systems. EU law plays a prominent role, but some of the most insightful findings come from other jurisdictions. They allow us not only to understand various regulatory mindsets in response to algorithmic pricing but also to look critically at the view that the EU is the global champion in regulating digital commerce. Personalized pricing makes a vivid case for a more contextualized approach towards comparative studies in the domain of online contracting, digital platforms, and consumer privacy protection.

In exploring the regulatory options for personalized pricing, the Handbook focuses on individual consumer transactions and competition issues. In so doing, it spotlights making personalized prices per se fair (which so far has also been the

[65] Esposito, *The Consumer Welfare*, pp. 25–59.

[66] A similar phenomenon has been pointed out by business ethicist Michael Heath regarding the relation of business ethics and law, see Joseph Heath, *Morality, Competition, and the Firm: The Market Failures Approach to Business Ethics* (Oxford University Press, 2014), p. 14.

[67] One of such instruments is taxation, which has been long considered the traditional dead-end in the economic analysis of law, see Ramsi Woodcock, *The Progressive Case against Progressive Antimonopolism* (SSRN, 2021).

main gird of the discussion on algorithmic price calculation globally).[68] The analysis does not delve into instruments that may mitigate the negative consequences of price personalization after a contract is formed. One of these instruments is taxation, which in the case of personalized pricing may follow one of two models. In particular, a tax is conceivable that redistributes directly to recover the 'consumer surplus'[69] from the firms applying personalized pricing and redistributes it back among consumers. In this way, every firm would be entitled to a certain profit margin below the total profit that could be accrued through personalized pricing, while the rest of the revenue is clawed back as a 'consumer surplus tax'.

The jurisdictions covered in this volume have been chosen along two lines. First, our aim was to investigate the legal systems that have explicitly engaged with algorithmic price personalization (the EU, China, and Brazil). Second, as a counterpoint to the latter, the volume also discusses jurisdictions in which, despite the lack of direct regulatory measures for algorithmic pricing, the issue has entailed several difficulties and challenges, coupled with scholarly and policy output.

Contributors to this volume have been asked to take as a benchmark a framework of three questions, which can now be used as *tertium comparationis*[70]: (1) does a right to an impersonal price exist in the considered legal framework? And do consumers know it? (2) Do consumers have a right to opt out of the personalized price in favour of the impersonal one? If so, how easy is it to opt out? (3) Is there a way to avoid manipulation of the impersonal price?

I.4.2 *Focus: Impersonal Price*

The expression 'impersonal price', to the best of our knowledge, was introduced into this debate by Esposito.[71] Nevertheless, Carlton used it in the 1989 edition of the *Handbook of Industrial Organizations*, in which he wrote of 'impersonal markets' and 'impersonal prices' to refer to situations in which traders rely only on

[68] It also should be noted that some regulatory proposals opt for a more restrictive attitude, taking a general prohibition of personalized pricing as a starting point and allowing only for clearly defined exceptions. Recently, this approach has been suggested by a position paper of the BEUC that proposed allowing personalized pricing in two instances only: when the price is 'fully transparent' (i.e., transparent about 'the data and assessments involved' and hence leaning towards algorithmic decision transparency), and when the basis for personalization is 'limited to such data and types of assessment that are strictly necessary and directly relevant to performing the given service, such as insurance risk assessments'; The European Consumer Organization (BEUC), Each consumer a separate market? – BEUC position paper on personalized pricing (Brussels 2023), pp. 23–24.

[69] Along a similar thread, Ben-Shahar advocates for a tax imposed on companies that use personalization schemes based on clients' data; Omri Ben-Shahar, Data Pollution, *Journal of Legal Analysis*, 11, 2019, pp. 104–159.

[70] On this concept, see Uwe Kischel, Tertium Comparationis, in Jan M. Smits, Jaakko Husa, Catherine Valcke and Madalena Narciso (eds.), *Elgar Encyclopedia of Comparative Law* (Edward Elgar, 2023).

[71] Fabrizio Esposito, The GDPR Enshrines the Right to the Impersonal Price, *Computer Law and Security Review*, 45, 2022, p. 105660.

consumer information derived from 'an impersonal (auction) market that clears by price alone'.[72] Indeed, this is the intuition behind the idea of the impersonal price as the opposite of the personalized price; or, more precisely, it is 'a price that was not set on the basis of the processing of personal data (including automated decision-making)'.[73] Legal systems traditionally recur to the idea of a market price or value, often to fill contract gaps. For example, the Vienna Convention on the Sale of Goods establishes that if the parties have not determined the price, then it is assumed they have 'made reference to the price generally charged at the time of the conclusion of the contract for such goods sold under comparable circumstances in the trade concerned' (Article 55). Similarly, under the Draft Common Frame of Reference (DCFR),[74] the price can be determined by looking at 'the price normally charged in comparable circumstances at the time of the conclusion of the contract or, if no such price is available, a reasonable price' (II. – 9:104 DCFR).

The main argument raised against this benchmark is its alleged impracticality. A general market valuation of a good or service cannot be established, goes the critique, with a sufficient degree of certainty.[75] Hence, it would be unreasonable to rely on impersonal prices as a rubric for market regulation or for the review of prices in particular agreements. But the following observation could be made in counterargument: suppose that an online shopper refuses to consent to the processing of their personal data for the purposes of personalizing the price. The price offered to said person is impersonal; personalized prices higher than said price are personalized surcharges, and those lower are personalized discounts. In reference to the traditional legal solutions mentioned earlier, issues of time and place – which would relate to dynamic pricing[76] – could be accommodated easily into the determination of the benchmark. Or, at the very least, the determination of this benchmark does not seem to encounter challenges much different from those customarily faced in an unfair-price case under competition law[77] or from the challenges of determining the usury interest rate.[78]

[72] Dennis W. Carlton, The Theory and the Facts of How Markets Clear: Is Industrial Organization Valuable for Understanding Macroeconomics?, in Richard Schmalensee and Robert Willig (eds.), *Handbook of Industrial Organization*, vol. 1 (Elsevier, 1989), p. 939. See also, more generally, Erik Kimbrough, Vernon Smith and Bart Wilson, Building a Market: From Personal to Impersonal Exchange, in Paul J. Zak (ed.), *Moral Markets: The Critical Role of Values in the Economy* (Princeton University Press, 2007).

[73] Esposito, The GDPR Enshrines, p. 2.

[74] Ch. Von Bar et al. (eds.), Principles, Definitions and Model Rules of European Private Law. Draft Common Frame of Reference (DCFR) (Sellier, 2009).

[75] Artigot Golobardes and Gómez Pomar in this volume.

[76] Cf. Section I.2.

[77] Behrang Kianzad, Are Excessive Pricing Cases Few and Far Between? A Quantitative Analysis of Fifty Years of European Jurisprudence 1971–2021, *Concurrences Review*, 0, 2023.

[78] See, generally, Udo Reifner and Michael Schröder, *Usury Laws: A Legal and Economic Evaluation of Interest Rate Restrictions in the European Union* (BoD – Books on Demand, 2012).

The concept of impersonal price can be a promising avenue for regulating algorithmic pricing practices. This triggers the key question of how the disclosure duties for impersonal consumer prices should be designed. The first intuition suggests that disclosing the impersonal price together with the personalized one is a simple and effective way to limit the diffusion of personalized surcharges.[79] In other words, as is often the case, this book reflects on the best possible transparency-based regulatory intervention before venturing into substantive controls.

The literature has been paying primary attention to comparisons between the particular personalized price offered to a person and the personalized prices paid by others.[80] Upon reflection, it becomes apparent that the impersonal price is the price being paid by a specific other: the perfect stranger. Instead of having to discuss the various complexities (statistical, design, cognitive) or the usefulness of disclosing the price paid by everyone else or by an average consumer, the simplicity of the impersonal price seems worthy of consideration.

Moreover, and somewhat contradictorily, the policy analysis considers the possibility of providing an opt-out from personalization,[81] which indeed logically presupposes the existence of a price to fall back on without personalization, which it seems will have to be the impersonal price. Moreover, once the right to opt-out is considered, it is apparent that for the consumer to make an informed decision about opting out, the alternative should be known.[82]

The last component of the analytical framework aims to address the strategic response of traders. As Jabłonowska, Lagioia, and Sartor put it in this volume, 'The impersonal price may be misleading when set to an artificially high level, just in order to convey the idea that the proposed personalised prices are highly convenient'.[83] The goal is to find a price that is somewhat meaningful and that can be used as reference point for calculating the level of discounts and surcharges. Something similar is already provided by EU law for discounts: a discount must be calculated using as a benchmark a 'reference price', which consists of the lowest price applied by the trader in the previous thirty days (Article 6a(2) Directive 98/6/EC). Even more specifically, Portuguese law introduces a price cap for dynamic pricing in platform-based local transportation (Uber, Lyft, Bolt, etc.), where the price increase is limited to 100 per cent of 'the average price charged for the services provided in

[79] Fabrizio Esposito, Making Personalised Prices; see also Brinca, Costa Filho, and Martinez in this volume.

[80] Alexandre de Streel and Florian Jacques, *Personalise pricing and EU law* (Econstor 2019); Antonio Davola, Ilaria Querci and Simona Romani, No Consumer Is an Island – Relational Disclosure as a Regulatory Strategy to Advance Consumer Protection Against Microtargeting, *Journal of Consumer Policy*, 46, 2023, pp. 1–25.

[81] OECD, Personalised Pricing in the Digital Era, 2018, p. 31.

[82] The general point was recently made in Court of Justice of the European Union, Judgment of 15 June 2023, Arkadiusz Szcześniak v Bank M, C-520/21, EU:C:2023:478.

[83] Agnieszka Jabłonowska, Francesca Lagioia, and Giovanni Sartor in this volume. See also Fabrizio Esposito, Making Personalised Prices, p. 16.

the immediately preceding 72 hours' on that platform (Article 15(5) Law 45/2018 of 10 August). A claim along similar lines has also been advanced by marketing scholars,[84] who have lamented the diffusion of 'fictitious prices' and advocated for the disclosure of the 'true normal price', namely the most commonly applied price in the relevant business period.

I.4.3 *Findings*

Based on Chapters 9–13, the surveyed legal systems can be divided according to the replies to the three questions posed earlier: an explicit affirmative answer (EA); an affirmative answer via a controversial interpretive and integrative legal analysis (IA); an explicit negative answer (EN); a negative answer via a controversial interpretive and integrative legal analysis (IN); and no answer in light of the proposed analysis (NA).

The following two tables are designed to reflect these categories. Table I.1 looks at the EU as a whole and compares it with the other jurisdictions surveyed in Part III of the Handbook. Table I.2 zooms in on the different branches of EU law as surveyed by the different chapters. Jurisdictions are presented in rows, while the three columns refer to the right to the impersonal price; the right to opt out; the right to the integer impersonal price.

The findings on EU law have been aggregated and included in Table I.1 in the following way: the conclusion that a right exists in one branch of EU law is sufficient to find that said right exists. This same approach also informs, albeit implicitly, the analysis of the other jurisdictions included in Table I.1.

Table I.1 shows that the system that most clearly endorses the regulatory framework described in Section I.4.2 is the Chinese one. China recognizes both a right to the

TABLE I.1 *Overview of the different jurisdictions examined in the book*

	Right to the impersonal price	Right to opt-out	Right to the integer impersonal price
EU law	IA*	IA(poor)	IN
Brazilian law	NA	NA	NA
Canadian law	IA	IA(poor)	NA
Chinese law	EA	EA	NA
Indian law	IA	NA	NA
US law	IA	IA(poor)	NA

[84] Richard Staelin, Joel Urbany and Donald Ngwe, Competition and the Regulation of Fictitious Pricing, *Journal of Marketing*, 87, 2023, pp. 1426–1434.

TABLE 1.2 *Focus on EU law*

	Right to the impersonal price	Right to opt-out	Right to the integer impersonal price
Competition law	NA	NA	NA
Precontractual rights	IA	IA(poor)	IN
Unfair contract terms	IN*	NA	NA

impersonal price and a right to opt out. The recognition of these rights derives from a series of ad-hoc provisions introduced through different legal instruments, which, as Ge points out in his chapter, raises some coordination problems.[85] EU, Canadian, and US law appear to be similarly situated in terms of rights and their origins and limits. In fact, like in the Chinese legal system, only the right to the impersonal price and the right to opt out have been identified. But the list of similarities continues, in that the origin of the rights in each case is a careful analysis of the privacy law framework. The right to an impersonal price can be inferred from an analysis of privacy law for the Indian legal system as well. Regarding US law, the finding is built on the analysis of California's privacy law and is therefore limited in its geographical ambit. Moreover, in each case, the right to opt out is narrow in scope, in that it only allows consumers to limit access to their data after it has been used for personalization. The outcome is that consumers can access the service again (or stay within a contractual relation) without giving access to personal data. This is admittedly a cumbersome procedure that also seems to be quite lacking in terms of effectiveness of the right.

1.5 FOUR OPEN QUESTIONS

The Handbook focuses primarily on contextual considerations (Part I) and on the substantive dimension of the legal framework applicable to price personalization (Parts II and III): the rights, powers, duties, and so on of consumers and traders with regard to the use of personalized prices. Scholars have already spotlighted these areas, which has naturally predestined them to be the starting point for this Handbook. At the same time, this volume also grapples with lacunae in both methodology and substance in the state of the art in law and other social sciences. The contributors have identified four such questions as especially relevant, unanswered, and important for future investigation.

The first, as the previous pages have made apparent, is that any regulatory framework that opts for the impersonal price as its cornerstone must reflect on how to ensure its integrity. Otherwise, at the extreme, we will start living in a world of personalized discounts instead of personalized prices.

[85] See also Ge in this volume.

The second question is rather a number of still-pending empirical tasks to be carried out in the study of personalized pricing. For instance, to the best of our knowledge, the impact of the impersonal price on disclosure design has yet to be studied. Moreover, much of the evidence on personalized prices was collected by asking questions about personalized prices, but without distinguishing scenarios in which the price was more or less advantageous to the consumer. Hence, it is difficult to understand why participants showed hostility to the practice. Was it because the process was unfair or lacked transparency? Or because the price was unfair or lacked transparency? As seen in Section I.2, different scholars place different emphasis on these four elements, and market participants can be expected to do the same.

Third, what is the appropriate remedy when a personalized price is found unlawful? This topic has received little attention.[86] The reason seems to be twofold. First, different triggers of unlawfulness will be easier to connect with different legal consequences. For example, contractual invalidity (partial or total; with or without term substitution) as a penalty seems harder to connect to violations of transparency norms for algorithmic decisions than to substantive fairness norms of the price itself. But the discussion of legal consequences should not be limited to contractual remedies, either. Traditional consequences in public law, such as fines and market access restrictions, would need to be considered. Additional considerations include the characteristics of collective redress mechanisms available in a particular jurisdiction. For example, well-functioning class action lawsuits coupled with treble damages might make public enforcement superfluous. In sum, discussion of enforcement solutions needs to examine a much broader set of institutional considerations, and it is probable that different institutional clusters will provide similar results in terms of deterrence and overall outcomes for consumers.[87]

Fourth, one issue that has received surprisingly little attention is the detection of algorithmic pricing.[88] Most contributors to this volume have pointed out that there is limited evidence of the diffusion of price personalization. Notably, this limitation

[86] Seminal with regard to EU law, Tycho de Graaf, Consequences of Nullifying.

[87] Nuno Garoupa, Carlos Gómez Ligüerre, and Lela Mélon, *Legal Origins and the Efficiency Dilemma* (Routledge, 2019); Bob Hancké, Martin Rhodes and Mark Thatcher (eds.), *Beyond Varieties of Capitalism: Conflict, Contradictions, and Complementarities in the European Economy* (Oxford University Press, 2007).

[88] The detection issue may be – at least to some extent – alleviated by the reallocation of the burden of proof in individual cases upon the business part and the mandated disclosure of algorithms to public authorities – on both solutions, see Peter Rott, Joanna Strycharz and Frank Alleweldt, *Personalised Pricing*, European Parliament: Policy Department for Economic, Scientific and Quality of Life Policies, Directorate-General for Internal Policies (2022), p. 42f. Both solutions raise however several more specific questions related to the exact extent of algorithmic transparency. In the case of prices calculated upon complex pools of personal data, full transparency and disclosure may be unfeasible, as it would be impossible to trace back the exact set of primary and derived data used by the algorithm, as well as connections made between them in the price-setting process. The use of artificial intelligence (AI)-based algorithmic pricing may further blur this picture, making it even less possible to fully understand the decision-making path that underlies a certain price.

does not mean we do not know whether price personalization is happening; quite the opposite. But despite a general awareness that consumer data is often used for pricing schemes, there is very little proof to substantiate it beyond sparse and incidental evidence from journalists, the stray empirical experiment, or regulatory or judicial proceedings. The seminal study by Hannak et al. developed a promising approach in this regard,[89] but recent attempts to replicate the study have highlighted its practical challenges.[90] Yet developing adequate detection tools seems a prerequisite to making duties concerning the transparency and fairness of personalized prices actionable.

Contemporary legal systems that have traditionally been concerned with *laesio enormis* have reason to take *laesio algorithmica* head-on. In fact, these systems have long recognized that exchanges can be exploitative and, thus, that the legal system should develop institutionalized responses. With the emergence of algorithmic pricing, the exploitation has become more granular and more common, which has defanged many of the existing price-control schemes. An adequate response – as the Handbook suggests – should attempt to proactively grasp these new specific challenges and to think outside the classical regulatory toolbox. The ambition of this volume is to provide points of reference for structured, well-informed analytical and policymaking work in the field of algorithmic pricing. In particular, we hope that the collective effort of the several contributors, from various disciplinary backgrounds, will help to elucidate the conceptual and political framework for *laesio algorithmica*. As things stand, there is no reason to wait any longer.

[89] Aniko Hannak and others, Measuring Price Discrimination and Steering on E-Commerce Web Sites, *Proceedings of the 2014 Conference on Internet Measurement Conference* (Association for Computing Machinery, 2014) https://dl.acm.org/doi/10.1145/2663716.2663744 accessed 6 March 2024. See also Le Chen, Alan Mislove and Christo Wilson, An Empirical Analysis of Algorithmic Pricing on Amazon Marketplace, *Proceedings of the 25th International Conference on World Wide Web* (International World Wide Web Conferences Steering Committee, 2016) https://dl.acm.org/doi/10.1145/2872427.2883089 accessed 6 March 2024; Le Chen, Alan Mislove, Christo Wilson, An empirical analysis of algorithmic pricing on amazon marketplace, in Proceedings of the 25th international conference on World Wide Web, 2016.

[90] See Qiwei in this volume.