An empirical legal investigation of online price discrimination

Heidary, K.

1 Introduction

1.1 Background and rationale

Our personal data has increasingly become a commodity and the insights gained from the collection of this data have enabled companies to move from mass communication towards more targeted forms of marketing communication, sometimes even targeting consumers on an individual level.[1] This trend towards targeting and personalization occurs in all areas of marketing communication, such as advertisements, recommendations, and customer service. Now, it has reached arguably the most fundamental part of a transaction: the price. The price we pay when purchasing a product or service online is not always the same as what other consumers are paying. This may be because there is a difference in cost or because there is a change in supply and demand, but it may also very well be the case that a price difference is based on our personal characteristics. The latter is the phenomenon of online price discrimination (or: personalized pricing – I will discuss the exact terminology later in this introduction), where companies analyze consumer data to estimate the consumer's willingness to purchase a product or service at a certain price. This is the subject of this thesis, in which I examine the perceptions of consumers and companies regarding this practice and assess the implications of these perceptions for further regulation.

For many decades, uniform pricing was the norm. There are thought to be two underlying reasons for the introduction of fixed prices. On the one hand, some say that the idea originated from the religious belief that since everyone is equal before God, everyone should be charged the same price. Charging different prices based on appearance or negotiation ability was considered immoral.[2] On the other hand, fixed prices are thought to be introduced because of efficiency, so that the seller and buyers did not have to negotiate for every product.[3] Although there was (and is) much emphasis on supplier freedom to set prices, pricing regulation introduced some boundaries, for example to rebalance consumers' bargaining power and to prevent harm and inequality.[4]

Differentiating between consumers and the price they pay, is not entirely new. For example, students and the elderly have long paid a lower price through student and senior discounts. In places where not all products have fixed prices, such as at the city market or at a car dealer, consumers with strong negotiating skills will often walk away with a better deal than consumers who cannot disguise their interest in the product well enough. Or consider loyal customers who are offered special discounts. At first glance, these are quite innocent and generally accepted ways of distinguishing between consumers. With such forms of price discrimination entering the realm of pricing many decades ago, the uniformity or fixed nature of prices has since not been absolute.

[1] Townley, Morrison & Yeung 2017.
[2] Kent 1983.
[3] Adams 2017.
[4] Think of the Price Indication Directive (Directive 98/6/EC of the European Parliament and of the Council of 16 February 1998 on consumer protection in the indication of the prices of products offered to consumers), for example.

Other forms of price discrimination are considered less acceptable. There are examples that, although they are a deeply ingrained part of our daily lives, still provoke debates about acceptability. One of these is making a distinction based on gender, with women often getting the short end of the stick and paying a higher price: the so-called pink tax.[5] Another example is selectively charging higher prices, for example for consumers living in a wealthier neighborhood[6] or a 'fine' for loyal customers.[7] An assessment of the valence of the public debate reveals that media coverage about online price discrimination is also quite negative.[8] Anecdotal evidence and empirical research show that the practice often provokes resistance from consumers; they generally view the practice as unfair and illegal.[9] Online price discrimination has been a widely debated topic among various disciplines, attracting ample research attention in economics,[10] law,[11] and business ethics.[12]

As price discrimination continues to evolve and moves online, the information that the differential treatment is based on becomes more sophisticated. The rapidly growing flow of all kinds of (personal) data, combined with technological developments such as data mining and algorithmic decision-making,[13] have opened the door for advanced forms of price discrimination. Since these technologies are often quite complex in nature (e.g., 'black box' algorithms), this seems like a recipe for disaster in terms of transparency and the power position that companies accumulate by confuscating their price-setting practices.[14]

An extensive body of research has raised potential challenges and questions regarding future (legal) regulation in relation to the direction in which this practice seems to be heading, which revolve around the potential disadvantages that online price discrimination could have for consumers and the relationship between companies and consumers.[15] The challenges mentioned mainly concern the potentially negative consequences that price personalization could have for consumer trust in the market and exacerbating the already asymmetrical power relationship between companies and consumers.[16] Other challenges that have been raised are that of (in)direct discrimination based on legally prohibited

[5] Research has found that in the United States, women on average pay 7% higher prices than men. See NYC Department of Consumer Affairs 2015. For a Dutch perspective, see Zoetekouw 2015. If such a pink tax would be proven, it would constitute legally prohibited discrimination.
[6] Maxwell & Garbarino 2010.
[7] It is the elderly and consumers with lower educational levels or income that often get the shorter end of the stick. See CMA 2018 and Voermans 2020.
[8] See for example the headline in Angwin, Mattu & Larson 2015, labelling price discrimination based on ethnicity as 'Tiger Mom Tax'.
[9] Turow, Feldman & Meltzer 2005; Poort & Zuiderveen Borgesius 2019.
[10] Varian 1989; Armstrong 2006.
[11] Zuiderveen Borgesius & Poort 2017; Sears 2020.
[12] Elegido 2011; Seele et al. 2021.
[13] Calders & Custers 2013.
[14] See for example Moriarty 2021.
[15] See for example Odlyzko 2003; Moriarty 2021; Seele et al. 2021.
[16] Moriarty 2021; Seele et al. 2021; Helberger et al. 2021.

grounds, exploitation of consumer vulnerabilities and the extraction of consumer surplus.[17] Although this information asymmetry between companies and consumers is not new and our data have long been used for all kinds of personalization (such as recommendations or advertisements), personalization and the associated information asymmetry now has the potential to directly hit us where it hurts most: our (in)ability to pay.

For companies, personalizing prices based on consumer data can prove to be quite fruitful. From a business perspective, online price discrimination and the technologies used to differentiate among consumers offer several advantages for companies, such as a more efficient decision-making process,[18] revenue optimization and profit maximization,[19] and the ability to provide more relevant offers for consumers.[20] These benefits are similar to those of personalized marketing communication in general, where personalization is often better received than mass communication: consumers tend to appreciate *some* degree of personal treatment and 'reward' the company by clicking on advertisements or slowly but surely becoming a loyal customer.[21] However, when certain boundaries are crossed,[22] practices are perceived as unfair, unethical, creepy and even illegal.[23]

The current European legal framework does not explicitly prohibit online price discrimination, but it does pose certain boundaries as to the rightful use and processing of data for personalizing prices and the transparency that needs to be provided by companies who engage in the practice. Anti-discrimination law and data protection law bring forward clear prohibitions of certain grounds, competition law plays a role insofar the use of online price discrimination would constitute an abuse of dominance or economic power and consumer law provides for concrete transparency requirements. Even though consumers show strong negative reactions towards the practice,[24] the legislator has not gone further in addressing the practice more directly than introducing an information requirement in Article 6(1)(ea) of the Consumer Rights Directive ('CRD').

Different authors have placed question marks regarding whether the current legal framework is equipped to address the challenges associated with online price discrimination.[25] At the time of writing, there have been few companies to voluntarily disclose that they engage in online price discrimination.[26] This could mean that companies are simply

[17] Zuiderveen Borgesius & Poort 2017; Heidary & Custers 2021; Strycharz & Duivenvoorde 2021; Duivenvoorde 2023.
[18] Townley, Morrison & Yeung 2017.
[19] Studies indicate potential increases in business profits as much as 12% and 19%, see Shiller 2014; Dubé & Misra 2022.
[20] OECD 2018a.
[21] Bleier & Eisenbeiss 2015; McKinsey 2021.
[22] See for example Boerman, Kruikemeier & Bol 2021.
[23] Turow, Feldman & Meltzer 2005; Poort & Zuiderveen Borgesius 2019.
[24] Turow, Feldman & Meltzer 2005; Poort & Zuiderveen Borgesius 2019.
[25] Barros Vale 2020; Sears 2020, Grochowski et al. 2022.
[26] See Appendix 1 for two examples of companies complying with the disclosure requirement. As can be seen, companies disclose the personalized price differently. One discloses the use of personalized pricing in-text, while the other requires the consumer to hover over a button.

not (yet) engaging in the practice, but as will become clear from the anecdotal instances mentioned in this thesis, we have quite some reasons to believe that online price discrimination is already prevalent.

Although few companies have complied on their own with the legal obligation to disclose personalized pricing, a recent case of personalized pricing that has come to light has clearly set the tone for the practice going forward. On 7 March 2024, dating app Tinder was found to use personalized discounts, without telling consumers.[27] Tinder would track whether consumers using the free version of the application showed interest for the paid premium version. If consumers showed only little or no interest, Tinder would present consumers with an offer for 50% off the first month of the premium service. This process was automated by Tinder's systems.[28]

The collective action of European consumer authorities, spearheaded by the Autoriteit Consument & Markt (ACM) in the Netherlands and the Konsumentverket in Sweden, has led Tinder to commit to clearly disclose personalized discounts moving forward, to not apply personalized pricing based on age without informing consumers upfront and clearly and to inform consumers why they are offered personalized discounts, for example because they were not willing to purchase Tinder's premium services at a standard rate.[29] Tinder has committed to this by April 2024, so it remains to be seen whether it will live up to their promise. This case is not only more proof that companies are personalizing prices, but from this case it also becomes unmistakably clear that personalized discounts are considered personalized pricing as well and consequently should be disclosed. In this thesis, there is special attention to personalized discounts, as I deem it highly likely that this is the way in which online price discrimination will further develop itself.[30]

Online price discrimination is a fascinating yet complex puzzle to investigate. Online price discrimination is not inherently wrong when viewed from an economic perspective, as it could potentially open the market to consumers who might not have been able to access a product or service under a regime of equal pricing.[31] However, consumers react strongly to instances of the practice,[32] companies have an economic incentive to engage in it and so far, the only direct mention of the practice in the legal framework is through a recently proposed information requirement in Article 6(1)(ea) CRD.[33] Our understanding of the

[27] EC 2024; ACM 2024.
[28] Interestingly, earlier research had called out Tinder in 2022 for offering different prices based on age. See Sveriges Konsumenter 2022; Consumers International & Mozilla 2022. Tinder stopped this practice in April 2022, before the current investigation, which started in July 2022.
[29] EC 2024; ACM 2024.
[30] See also the findings from the interview study, which I report on in Chapter 3.
[31] Zuiderveen Borgesius & Poort 2017; OECD 2018a, p. 5 and 18.
[32] Rosencrance 2000a; Rosencrance 2000b; Ward 2000; Baker, Marn & Zawada 2001.
[33] Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council [2011] OJ L 304.

practice is not yet fully crystallized, making it difficult to assess the role that (legal) regulation could and should play. As such, a complete prohibition of the practice[34] or, alternatively, giving companies free reign,[35] would not do justice to the different interests involved in the playing field of online price discrimination. The truth lies somewhere in between these two extremes, striking a balance between these interests.

1.2 Research aim and research questions

The aim of this thesis is to study the different perceptions of companies and consumers involved in online price discrimination and to analyze the implications of these current perceptions on online price discrimination. From there, I put forward recommendations for future research and regulation of online price discrimination as the practice progresses.

The key research question therefore is:

> *What are the perceptions of consumers and companies of online price discrimination, and what are the implications of these perceptions for market regulation?*

The key research question is broken down in five subquestions, addressed respectively in five subsequent chapters (i.e., Chapters 2 through 6 of this thesis). The subquestions are as follows:

RQ1 – What is the current legal framework on online price discrimination?
RQ2 – What are companies' perceptions of online price discrimination and what are possible factors influencing their engagement in online price discrimination?
RQ3 – What are the mechanisms through which consumers form fairness perceptions and what are possible consequences of these fairness perceptions?
RQ4 – What are consumers' fairness perceptions of segmentation bases and to what extent do they line up with grounds currently prohibited in law?
RQ5 – What are (future) regulatory avenues for online price discrimination?

[34] See Edwards 2006, who argues that a strictly enforced equality rule would forbid potentially beneficial price discrimination practices. See also Odlyzko 2003, p. 365.
[35] See for example Miller 2014, p. 93-96 and Chapdelaine 2020, p. 44-45 for telling illustrations of the consequences of maintaining the status quo of regulation regarding online price discrimination.

1.3 Overview of methodology

To answer the research questions, both doctrinal legal and empirical research methods are needed. Within doctrinal legal research, it is imperative to study a number of areas of law, as online price discrimination touches upon various principles as embedded in different fields of law: think of consumer empowerment and protection (consumer law), protection of autonomy and privacy (data protection law), assuring a fair and competitive market (competition law) and protection of human dignity and access to goods (anti-discrimination law). These fields of law do not operate in a vacuum but should rather be viewed together for a more integrated and *true-to-life* perspective on emerging technologies and the digital economy.[36]

Beyond doctrinal legal research, there is a great role of importance for empirical methods. Empirical research helps us understand the *real world* in which law operates. Without this reality check, the legal framework might become (more) disconnected from societal needs and technological developments.[37] Combined, empirical-legal research helps us study the underlying (behavioral) assumptions of law, and how the law operates in practice.[38] Research of this nature provides insights that help assess whether the law and its institutions are able to respond adequately to current developments in the digital economy and serve as the intended safeguard for fundamental rights that are challenged by these developments. To make a meaningful contribution to this discussion in the context of online price discrimination, it is imperative to empirically examine the business models, technology and consumer perspectives underlying this practice.

For that reason, this thesis employs a mixed method approach, combining both doctrinal legal, qualitative, and quantitative research methods. In Chapter 2, the legal framework and its current application to online price discrimination is analyzed through doctrinal legal desk research. Doctrinal legal research is well suited for this approach, as it helps to gather, organize and describe the law, in order to compose a descriptive and detailed analysis of legal rules and normative considerations found in primary sources (e.g., legislation, policies, legal scholarship and case law).[39] This analysis of the legal framework provides a solid foundation for undertaking the empirical parts of this thesis and answering the main research question.[40]

In Chapter 3, company perspectives are investigated through the means of interviews conducted with Dutch companies. This qualitative method helps to 'set the scene' regarding company perspectives and is exploratory and inductive in nature – meaning a collection

[36] See for example Helberger, Zuiderveen Borgesius & Reyna 2017 (on the interplay of consumer law and data protection law); Koolen 2023.
[37] Van Boom 2013 (on the role of empirical findings in private law: his comments apply universally to the added value of empirical research in general); Davies 2020.
[38] Van Boom, Desmet & Mascini 2018.
[39] Smits 2015.
[40] Smits 2015, p. 16.

of a large amount of textual data on different themes – to gain a broad understanding of company perspectives, the state of the art and the way in which online price discrimination will likely develop.

Chapters 4 and 5 explore consumer perspectives through the means of survey studies (Chapter 4 and 5) and an experiment (Chapter 4). Both are forms of quantitative research methods and are well suited to assess perceptions amongst a larger group of respondents.[41] Survey studies, as employed in Chapter 4 and 5, allow for assessments of correlational associations and how respondents relate to certain variables: for example, are fairness perceptions related to purchase intention?[42] However, survey studies are not suited for testing causal relations, which is where experimental studies come in.[43] The experimental study as used in Chapter 4, allows for more precise testing of causal relations between variables and to assess the effects of manipulating a certain variable (e.g., the effect of a lower versus a higher price on fairness perceptions).[44]

In Chapter 6, the empirical and doctrinal parts of this thesis are brought together and analyzed in terms of their implications for future regulation. Here, I explore what regulatory avenues are thinkable for further shaping the playing field that online price discrimination finds itself in. This analysis is done through doctrinal legal desk research.

1.4 Scope of this thesis

The research in this thesis does not focus on a certain product or market. Rather, I explore online price discrimination across different perspectives and different market sectors, as it can constitute more pressing challenges in some markets over others (e.g., markets where there is a high *need* for a product or service or other reasons why consumers in specific markets might be deemed vulnerable). There is a geographical focus in this thesis, as Chapters 3, 4, and 5 report on studies conducted among companies and consumers in the Netherlands. Although perceptions regarding online price discrimination may differ between countries, the regulatory debate surrounding online price discrimination in the Netherlands is mainly that of European law. I believe that regulatory implications as proposed in this thesis are likely to apply in other European markets as well.[45]

I will not study differences in service quality, which is sometimes used to underserve or exclude certain consumers – although this could lead to comparable outcomes as with changing the price, I have chosen to focus solely on differences in price as a means to differentiate between consumers. This thesis covers both price increases and discounts.

[41] Van den Bos 2020.
[42] Van den Bos 2020, p. 55-56.
[43] Van den Bos 2020, p. 56.
[44] Van den Bos 2020, p. 61-62, 65-66.
[45] See also Sections 3.6.3, 4.6.4 and 5.6.4, where I discuss limitations and future research suggestions for the empirical studies conducted among Dutch companies and consumers.

This thesis mainly focuses on direct price discrimination, where companies set the prices based on consumer data, rather than letting consumers choose from a 'menu'. The latter, i.e., indirect price discrimination, through which consumers are allowed to sort themselves, can also be paired with deceptive techniques.[46] However, in general it does not require the same amount of personal data and can often also concern differentiated products rather than the same product, which is the case with direct price discrimination. Therefore, it is excluded from the definition of online price discrimination in this thesis. I will use 'personalized pricing' and 'online price discrimination' interchangeably, referring to the current application of online price discrimination where consumer data is used to optimize general consumer segments, moving towards more individualized applications.[47]

The aim of this thesis is not to investigate the substantive fairness of charging different prices according to willingness or ability to pay. As such, this thesis will not conduct economic analyses of (consumer) welfare, competitive effects and the distribution of goods under online price discrimination. Such analyses have already been conducted by scholars and revealed ambiguous effects.[48] This thesis builds on the assumption that online price discrimination has neutral (or: ambiguous) competitive effects with a likelihood of decrease in consumer welfare.[49]

Allocative efficiency, the distribution of goods and services in society, relies on an equality norm, how we deem the distribution of advantages and disadvantages to be fit.[50] This notion of the distribution of goods has been a debate that stretches beyond prices and can for example also be seen in relation to traffic fines: some European countries use an income-related fine system, where offenders with a high income pay higher traffic fines than low-income offenders.[51] Such a system could help reduce existing wealth inequalities and the mental impact on low-income offenders.[52] However, there are many countries that do not employ such a system and charge an equal price for all offenders. Ultimately, how goods – or in this case: price advantages and disadvantages – are (or should be) distributed is a political choice. Rather, the goal of this thesis is to help identify which elements of online price discrimination can possibly endanger our understanding of a 'fair market' and propose routes for regulation and research that can aid against existing inequalities and challenges from becoming worse.

[46] Van der Rest et al. 2020.
[47] See Section 1.5.1 for a more detailed discussion of the concepts 'online price discrimination' and 'personalized pricing'.
[48] See for example Varian 1989 and Armstrong 2006.
[49] See also Zuiderveen Borgesius & Poort 2017, p. 354-355; Chapdelaine 2020, p. 29.
[50] Esposito 2022a.
[51] Finland, Germany and Zweden are among the EU countries that have such an income-based system in place. In 2023, this led to a Finnish businessman being fined €121,000 for going 30 km/h over the speed limit. See Henley 2023.
[52] Schierenbeck 2018; EUR 2022.

The empirical parts of this thesis do not aim to find quantitative evidence for the existence of online price discrimination. This has been attempted before by various scholars, some of them in collaboration with computer scientists and programmers, who would create numerous different shopper profiles to uncover the existence of price discrimination in different markets.[53] While previous research found price fluctuations, it is difficult to uncover the true cause of these fluctuations and to isolate the data on which this segmentation occurred.[54] Therefore, I have not attempted to recreate such studies – the complexity of uncovering price discrimination will, however, serve as an important argument about the opacity of the practice and the difficulties that this poses for enforcement. Alternatively, I have tried to gain knowledge about the existence and state of the art in a qualitative manner, through an interview study.

The focus of this thesis is on European and Dutch law, as most relevant provisions that apply to the Netherlands (and online price discrimination) are harmonized from European Directives. Four fields of law are of central relevance: consumer and contract law, anti-discrimination law, data protection law and competition law. I discuss the legal framework as it stands at the time of writing until March 2024. I incorporated the Digital Service Act, Digital Markets Act and the AI Act: although they do not (directly) apply to online price discrimination, I argue there are lessons that can be learned.

1.5 Building blocks

In this section, I discuss the most important building blocks that make up this thesis. Section 1.5.1 starts out with a comprehensive description and definition of online price discrimination. It covers what in this thesis is understood as online price discrimination, and what is not.[55] Section 1.5.2 discusses the main ingredient needed to engage in online price discrimination, which is personal data. It maps the various data that can be used to personalize prices, how those data are collected and what its implications are for privacy policy. Section 1.5.3 covers the concept of fairness and its relation to consumers' trust and participation in the market. The notion of fairness underpins the regimes relevant to online price discrimination and consequently forms the common thread in this thesis, serving as the standard against which online price discrimination is held in terms of its desirability.[56]

[53] Mikians et al. 2012, Hannak et al. 2014, EC 2018a.
[54] See for example Mikians et al. 2012; Hannak et al. 2014; Vissers et al. 2014.
[55] As McAfee already noted, 'many common firm behaviors are inappropriately identified as price discrimination'. See McAfee 2008, p. 472.
[56] See Graef, Clifford & Valcke 2018; Häuselmann & Custers 2024.

1.5.1. Online price discrimination

This thesis uses the following definition of online price discrimination:

> 'The practice of setting different prices for consumers for the same product or service, based on willingness to pay as inferred from consumer data.'[57]

Not every situation in which prices differ among consumers constitutes price discrimination. Common company behaviors, such as fluctuating prices based on demand and supply, are often inappropriately defined as price discrimination. Price differences due to a difference in delivery or production costs, or for example due to a higher risk for an insurer, are not considered price discrimination.[58] In many cases, price differences are a result of (subtle) cost differences.[59] When a company charges two consumers two different prices for the same product because one consumer lives abroad and the company has higher shipping costs as a result, this cannot be regarded as price discrimination.[60] Instead, with price discrimination, the difference in price is based on the information the company has about (prospective) clients.[61] The reasoning behind this pricing strategy is that consumers value products and services differently and therefore vary in their willingness to pay for products and services.[62] After all, if all consumers have the same willingness to pay, price discrimination is not profitable for companies.[63]

Understanding the different forms of price discrimination requires a quick dive into economic literature. Price discrimination comes in roughly two forms: direct and indirect discrimination.[64] In the case of direct price discrimination, the company bases prices on observable differences in consumer characteristics, derived from information they have about the consumer. This can be first-degree, where prices are differentiated on an individual basis, or third-degree, where prices differ between segments.[65] In some situations, the differences are not immediately noticeable. The company then gives consumers a choice from a 'menu' with different options. In that case we speak of second-degree price discrimination.[66] Consider, for example, quantity discounts, with a lower price for bulk packaging than regular packaging. The consumer then selects which option he or she wants to use. Consumers indirectly divide themselves into segments of, for example, price-sensitive cus-

[57] Note that this definition, or very similar variations, has already been widely used by other scholars. See for example: OFT 2013a, p. 2; Rott, Strycharz & Alleweldt 2022, p. 8; OECD 2018a, §2.1.
[58] For more examples of price differences that do not constitute price discrimination, see McAfee 2008, p. 472-473 and Lott & Roberts 1991.
[59] Lott & Roberts 1991.
[60] McAfee 2008.
[61] Carroll & Coates 1999; McAfee 2008; OECD 2018a.
[62] Varian 1989; OECD 2018a.
[63] Stole 2007.
[64] McAfee 2008; Miller 2014.
[65] Pigou 1920; Shapiro & Varian 1999; Miller 2014.
[66] Pigou 1920; Carroll & Coates 1999.

tomers or large-use consumers; that is why this form is called 'indirect price discrimination'. This thesis focuses on direct price discrimination, in the form of lower and higher prices.

First- and third-degree price discrimination form a spectrum along which personal prices can be classified. Figure 1.1 shows this spectrum. On the left side of the spectrum is third-degree price discrimination: here, the segmentation takes place at group level and there is usually a 'yes/no' question that needs to be answered. Are you a student? Do you live in country X? Are you female? Depending on the answer, a corresponding price will be offered. This often concerns one data point (e.g., student status, place of residence, gender) and results in global segments. Moving towards the right side of the spectrum, we find first-degree price discrimination: a personal price for every individual. This would mean, for example, that within the 'student' segment each student would be charged an individual price, because of refined profiles that consist of a combination of multiple data points.

First-degree price discrimination is often deemed a 'theoretical holy grail' of economic models, meaning that it is likely an unattainable ideal: it would require companies to perfectly observe every individual consumer and charge prices accordingly.[67] As far as can be traced from empirical research and anecdotal evidence, direct price discrimination is *on average* currently somewhere in the middle of this spectrum, with a trend to the right: consumer data is increasingly used to refine and optimize existing segments.[68]

Personalized pricing is a form of online price discrimination, but online price discrimination is not always personalized pricing. When I refer to personalized pricing, I refer to the form that direct price discrimination has now taken on, sitting somewhere in-between third- and first-degree price discrimination, moving towards more targeted and individualized forms of price discrimination. Therefore, it does not have to be targeted at individuals or extract the precise willingness to pay of an individual but can also entail forms of price discrimination that personalize based on more general segments or that only extract a part of the willingness to pay.[69] Since there is considerable overlap between these two terms in practice, the interchangeable use is not problematic in general. If I am referring to a different form of online price discrimination, such as second-degree price discrimination, I will state this explicitly.

[67] Odlyzko 2003, p. 357.
[68] Some companies might be able to engage in more individualized personalized pricing and are, consequently, already situated more towards the right side of the spectrum.
[69] OECD 2018a, p. 8.

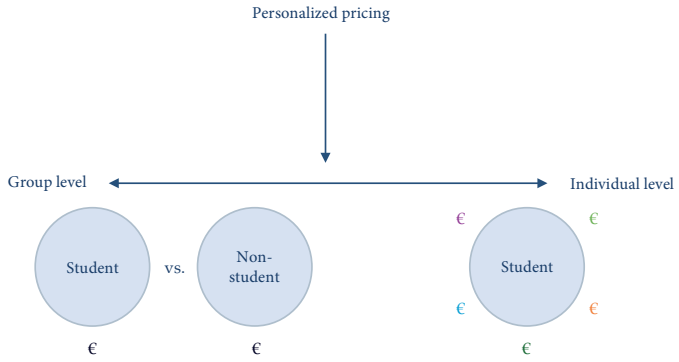

Figure 1.1. *Spectrum of direct price discrimination*

Sometimes, company pricing behavior is wrongly labeled as price discrimination. There are some pricing or personalization tactics that might seem like price discrimination at first glance but should not be considered price discrimination. First, dynamic pricing, where companies set prices based on fluctuations in demand and supply. For example, cinemas often offer reduced ticket prices during the day and during the week, people can travel by public transport for a lower rate during off-peak hours and airlines usually charge a higher price for a ticket that is booked a few days before the flight instead of six months in advance. Every consumer who purchases a ticket at a certain time should be presented with the same price under the dynamic pricing regime. In principle, this approach does not immediately lead to consumer outrage, although there are anecdotal examples where dynamic pricing did not go down well with the public.[70]

These two practices, dynamic pricing and online price discrimination, share very similar mechanisms: the use of algorithms to differentiate and fluctuate prices.[71] When the algorithms consider market circumstances, such as weather or demand and supply, we define it as dynamic pricing.[72] When it is personal data or information about consumer preferences, we consider the algorithm to serve the purpose of online price discrimination.

[70] For example, Coca-Cola launched a vending machine that used a temperature sensor to charge a higher price for a bottle of Coke on hot summer days. Taxi platforms Uber and Lyft, which increased the prices for a ride after a shooting incident in the New York district of Brooklyn – in which people tried to flee the neighborhood in panic – also received little sympathy. See Leonhardt 2005 and Bever 2022.

[71] See also Seele et al. 2021 for an explanation of the differences, the communalities, and the ethicality of these two pricing tactics.

[72] Commission Notice – Guidance on the interpretation and application of Directive 2005/29/EC of the European Parliament and of the Council concerning unfair business-to-consumer commercial practices in the internal market, C/2021/9320, ('Guidance UCPD'), §4.2.8. Dynamic pricing is allowed, as long as companies inform consumers about total costs and how they are calculated. See Article 6(1)(d) and 7(4)(c) UCPD.

In practice, dynamic pricing and price personalization cannot always be separated: it can happen that two people who both try to book a flight ticket on the same day at 8 a.m. see two different prices. Moreover, it can be argued that price discrimination does take place in those instances, namely based on time. Train passengers who have no choice but to travel during rush hour cannot claim the lower prices that apply during off-peak hours. Families who cannot travel outside the high season due to school holidays pay a higher price than low-season travelers. The time at which a product or service is purchased is therefore a data point in the consumer profile, as it indirectly says something about the type of consumer someone is.

Other related but different practices are search discrimination and product differentiation. Search discrimination involves the same technology and mechanisms as price discrimination, but here the insights are used to personalize the order in which the products and services are displayed. The prices of the products shown remains the same, but consumers with a higher willingness to pay are shown the more expensive options first. Consumers who do not bother to scroll further down and compare prices pay the top price. This practice differs from price personalization because the actual prices of the product or service do not change.[73]

With product differentiation (or: versioning) different prices are charged, but this price difference is the result from (subtle) differences in the product that is offered. Technically, it is therefore not the 'same' product, as is the case with price discrimination. For example, functions are added or removed from software packages and smartphones are often released with different levels of storage capacity. This practice has been around for many decades: one example dates to the 1980s, when IT company IBM deliberately added microchips to some of their printers to slow down printing speed.[74] IBM sold these printers to consumers for a lower price; it would not be profitable if these printers printed as fast as the (much more expensive) printers purchased by companies. After all, companies would then switch to the consumer model.

1.5.2. Data and privacy

Adjusting prices online requires two ingredients: data on which to base prices and (analysis) technology to optimize and differentiate prices. As a result of digitalization and the widespread use of information and communication technologies, there is a rapidly growing flow of all kinds of (personal) data. The process of price discrimination starts with the collection and preparation of data on which to base the different prices. To arrive at such different prices, it is important to be able to distinguish between consumers and their (assumed) price sensitivity. As follows from the recent case on Tinder's pricing practices, the bar for

[73] Mikians et al. 2012.
[74] McAfee 2008, p. 474-475; Davies 2016.

a price to qualify as personalized is met when the price is adapted automatically to the consumers' interest for the service.[75]

Consumer segmentation can take place at the group level, in the form of group profiles, but also at the individual level, in the form of individual profiles.[76] The level of segmentation depends largely on the level of (real-time) data that a seller is able to collect about (prospective) clients, as well as the technology that is available to companies to analyze such data.[77] Table 1.1 shows the methods of data collection and examples of types of data that can be used for online price discrimination: note that 'personal data' does not necessarily mean data as classified in data protection law, but rather information about a person that is demographic in nature or relates to one's identity. Some types of data might be collected through more than one method: for instance, companies can infer age from someone's interests and online behavior, but consumers can also volunteer this information themselves.

Table 1.1. *Methods of online data collection and examples*

	Observed	Inferred	Volunteered (by consumers)
Behavioral data	Purchase history, search history, social media activity (likes, comments), website visits, time spent on pages, etc.	Responsiveness to ads, mood, vulnerabilities (e.g., mental health, substance abuse), etc.	Loyalty program membership, survey responses, etc.
Personal data	Location, social media posts, etc.	Income, health status, brand loyalty, political ideology, preferences, gender, age, etc.	Name, date of birth, address, education level, occupation, etc.
Technical data	Device type, IP address, browser type, battery percentage, etc.		

Companies have an economic incentive to engage in price discrimination, which has in turn led to a powerful movement of privacy erosion.[78] This erosion of privacy allows companies to learn more about consumers' willingness to pay, with data also being regularly collected without the consumer being (fully) aware of this. Data protection law aims to ensure that the processing of personal data happens in a manner that is fair, lawful and transparent.[79] The framework requires transparency regarding personalized pricing and in most cases requires companies to obtain the consumers' (explicit) consent before engaging in such a pricing practice. Even with the protections put in place by the GDPR, the average consumer

[75] ACM 2024.
[76] Custers 2013.
[77] Miller 2014.
[78] Odlyzko 2003. This privacy erosion is, of course, not only the case in price discrimination, but concerns a wider trend.
[79] See Article 5(1)(a) GDPR and Article 8 CFEU.

still experiences great difficulty to protect privacy online, leaving behind a digital trail that can be tracked and exploited by companies.[80]

Under the current regime of 'notice and consent', consumers sign away their personal data by consenting to privacy statements without reading them. Behavioral studies have pointed out that few people read, let alone understand, the privacy policies (or have little choice but to consent, for example when access is otherwise denied).[81] In this context, there also exists a 'privacy paradox', where individuals report to be concerned about their (online) privacy,[82] but do not change their behavior accordingly.[83] Currently, a lot of the responsibility is still on consumers to be vigilant and assess the worth (or risk) of handing over their personal data ('i-frame' regulation). It has been argued that exploration of 's-frame' intervention, focusing on system-level change ('changing the rules'), rather than individual-level interventions, is crucial for privacy protection.[84]

1.5.3. Fairness and trust in market

Fairness lies at the root of our transactions and underpins the fields of law that are relevant to online price discrimination. Even if a market would be deemed economically efficient, we should still ask ourselves whether it is acceptable if this efficiency was obtained through extracting consumer surplus and potentially unfair personalized transactions.[85] Fairness has a central position in competition law, consumer law and data protection law, showing the normative commonalities underlying the rationale and enforcement of these fields of law.[86] For instance, maintaining trust in the market is an underlying value of competition law's goals in securing an efficient market.[87] When competition works, we end up with a market that treats its people more fairly.[88] Albeit not new to law, fairness considerations are increasingly becoming part of the larger debate of how to cure asymmetries and how to balance profit allocation in digital services.[89] Recent EU legislative initiatives are explicitly declared to promote fairness in the digital economy.[90]

Fairness is typically categorized into two types: procedural and distributive (or: substantive) fairness.[91] Procedural fairness entails the fairness of the underlying procedure that

[80] Chater & Loewenstein 2022, p. 23-24.
[81] Loewenstein, Sunstein & Golman 2014; McDonald & Cranor 2008.
[82] See for example Eurobarometer Survey 431 2015.
[83] Acquisti 2004; Barth & de Jong 2017.
[84] See for example Acquisti, Brandimarte & Loewenstein 2015; See also Chapter 6, which explores a holistic view on regulation of online price discrimination.
[85] Chapdelaine 2020, p. 29-30.
[86] Graef, Clifford & Valcke 2018; Häuselmann & Custers 2024.
[87] OECD 2018b.
[88] Vestager 2018.
[89] Colangelo 2023.
[90] Colangelo 2023.
[91] Organizational literature has long made a distinction between different types of justice perceptions: distributive, procedural, and interactional justice. Interactional justice concerns the interpersonal treatment received during the process. Some scholars argue that this last type of justice should be considered a subset of procedural justice. See Walker, Lind & Thibaut 1979; Moorman 1991; Colquitt 2001; Colquitt 2012.

leads to an outcome, while distributive fairness focuses on the outcome of a process.[92] In the context of pricing, the actual price shown to consumers is considered the outcome, and the way in which a price was set (e.g., the grounds that it was based on, the level of transparency), is considered the procedure.[93] In the context of online price discrimination, it is important to take into account both fairness types. Even if all the requirements for procedural fairness are met (e.g., transparency, not using certain data, etc.), the results of such processing could still very well be considered unfair from a substantive perspective, for example because it exploits consumer vulnerabilities.[94]

Perceptions of unfairness can lead to a loss of trust in companies and the digital market, which could in turn lead to diminished participation in the digital market.[95] Perceptions of fairness of (online) price discrimination find their basis for a great part in social norms, customs and existing trade practices, from which consumers form expectations about how their information should be used.[96] When presented with a (personalized) price, consumers judge the fairness of the price along many lines, among which their internal reference price, their relationship with the seller, existing pricing norms, price comparisons with peers and the procedure by which the price is set, but also their own attitudes and beliefs regarding how they wish to be treated.[97] Weighing all these heuristics, consumers consider a price to be unfair when the process or outcome is unreasonable, unacceptable and/or unjust. A fair outcome is important, but a fair process is as well.[98] A price that is set on grounds that seem arbitrary or exploitative is likely to be perceived as unfair by consumers, even if they receive a 'good' deal. An important sidenote that should be placed here, however, is that the consumer usually does not know about the grounds on which a price is set. The current legal framework does not require companies to disclose which parameters were used for a personalized price, only that it is taking place.

Personalized marketing applications, such as online price discrimination, offer companies the potential to target consumers' personal characteristics and influence consumers at a personal level.[99] As such, the lines between persuasion and manipulation (or: deception) are increasingly blurred.[100] As observed by Helberger et al. (2021), there are structural power imbalances in digital markets and personalization is affecting freedom of choice: not only because of the very large size of companies or consumers' dependency on said companies,

[92] Walker, Lind & Thibaut 1979; Colquitt 2001.
[93] Maxwell 2002; Chapuis 2012; Ferguson, Ellen & Bearden 2014.
[94] See Malgieri 2020; Häuselmann & Custers 2024.
[95] EC 2012; OECD 2018b; Malgieri 2022.
[96] Garbarino & Maxwell 2010; Townley, Morrison & Yeung 2017, p. 711.
[97] Xia, Monroe & Cox 2004.
[98] Ferguson, Ellen & Bearden 2014; Chapuis 2012. The latter even more so; see the survey study as reported in Chapter 4.
[99] Calo 2014, p. 999; Townley, Morrison & Yeung 2017.
[100] Susser, Roessler & Nissenbaum 2019. See also the ACM *Guidelines on the protection of the online consumer*, in which the line between between persuasion and deception plays a central role, acm.nl/en/publications/information-for-companies/acm-guideline/guidelines-protection-online-consumer.

but also because of the structural inability of consumers to use their agency to shape the outcome of economic interactions.[101] Online, any consumer can be rendered vulnerable when interacting with the digital environment: this is referred to as 'digital vulnerability'.[102]

Therefore, the distinction between the 'vulnerable' and 'non-vulnerable' consumer is increasingly under scrutiny, as it is not limited to a group of consumers who are categorically vulnerable (e.g., because of low digital literacy, education level, or old and young age).[103] This digital vulnerability of consumers can be targeted and exploited by companies, which would only exacerbate the power asymmetry between companies and consumers.[104] This observed imbalance between consumers and companies forms the background against which the facets of fairness are examined in this thesis.

Considering fairness as the sum of procedural and distributive fairness, deducting its elements from multiple fields of law is needed to ensure a more holistic approach to consumer protection, data protection and market regulation.[105] To address such challenges is not a question of only consumer empowerment through consumer law, for example, but also (or: rather) of addressing the underlying markets (and digital asymmetries) that enable unfair commercial practices in the first place.

There are several principles that can be deduced from the EU legal framework that help assess the fairness of online price discrimination behavior. Table 1.2 shows these principles. In contract and consumer protection law, fairness acts as a yardstick against which the legality of contract terms and commercial practices are tested.[106] Party autonomy when entering contracts is fundamental and dependent on a baseline degree of nonexploitation and reciprocal 'bona fides' ('good faith'[107]): contract parties must consider each other's interests, avoiding significant imbalances in the parties' rights and obligations arising from a contract to the detriment of the consumer.[108] This is related to the 'professional diligence' required from companies under the UCPD: absence of this professional diligence might constitute an unfair commercial practice.[109]

Autonomy in this sense encompasses not only one's freedom (how) to enter into contracts and its contents, but also the ability to exercise control over one's personal information and what it should entail when entering into a contract.[110] Personalized pricing – and personalization techniques more generally – obfuscates consumers' ability to compare

[101] Helberger et al. 2021.
[102] Helberger et al. 2024.
[103] Strycharz & Duivenvoorde 2021; Helberger et al. 2022; Helberger et al. 2024.
[104] Helberger et al. 2021.
[105] Alper 2022; Koolen 2023; Häuselmann & Custers 2024.
[106] Graef, Clifford & Valcke 2018.
[107] Zimmermann & Whittaker 2008.
[108] See Article 3(1) UCTD; Alper 2022, p. 8. See also ECJ 14 March 2013, C-415/11, ECLI:EU:C:2013:164 (*Mohamed Aziz*), §69.
[109] See Article 2(h) and 5(2)(a) UCPD.
[110] Alper 2022, p. 10; Grochowski et al. 2022, p. 40.

prices, disempowering consumers in their purchasing decisions.[111] Commercial practices that unduly interfere with the consumers' ability to make informed and autonomous choices (e.g., aggressive or misleading practices) are prohibited.[112] This notion of autonomy can also be found in data protection law, as the ability to exercise (meaningful) control over one's personal data and the right to privacy as a prerequisite for autonomy.[113] Limits can also be set on the processing of certain grounds, as well as outcomes that differentiate based on certain grounds: this is reflected in anti-discrimination law[114] and data protection law.[115] Outcomes (read: prices) that are inaccurate, for example because they are based on inaccurate data, could also be considered unfair.[116]

Going back to the inherent power and information asymmetry between consumers and companies, there are two more facets of fairness that can be identified and apply to online price discrimination: transparency and non-abuse of dominant position. It almost goes without saying that companies find themselves at much more advantageous positions than consumers in terms of information and power. In the context of online price discrimination – or personalized marketing communication in general – there is an observable lack of transparency: consumers are often not aware of its existence, let alone the underlying mechanisms and the magnitude of personal data that can in theory be used.[117]

Furthermore, the problem of transparency arises due to the opaque nature of the practice. As there are only a few anecdotal instances of online price discrimination that have come to light, it is reasonable to think that consumers do not (yet) expect prices that are based on their personal characteristics, at least not beyond 'known' cases such as student status or loyalty status. While more transparency will not necessarily make personalized pricing substantively fairer, a *lack* of transparency can make a commercial practice such as personalized pricing more unfair.[118] The centrality of transparency is reflected in consumer law and data protection law. Competition law provides a lead for another facet of (un)fairness, namely the (non-)abuse of a dominant position. It is conceivable that larger companies have more access to the means (e.g., consumer data and technological resources) to engage in price personalization: abusing such a market position or power inequalities, for example combined with non-compliance with data protection law, could also hint at a personalized pricing practice being unfair.[119]

[111] EC 2024, see quote by Commissioner Reynders.
[112] See Article 5-8 UCPD.
[113] Häuselmann & Custers 2024, p. 7.
[114] Article 21 CFEU.
[115] Article 9 GDPR.
[116] Häuselmann & Custers 2024, p. 10.
[117] Chapdelaine 2020, p. 26.
[118] Chapdelaine 2020, p. 26. See also Article 7 UCPD.
[119] Häuselmann & Custers 2024, p.8. See also ECJ 4 July 2023, C-252/21, ECLI:EU:C:2023:537 (*Meta v Bundeskartellambt*), §47.
[120] Based on Häuselmann & Custers 2024.

Table 1.2. *Facets of fairness deducted from the current EU legal framework*[120]

Element of fairness	Type of fairness	EU law
Use of prohibited grounds (without legitimate basis)	Procedural	Non-discrimination law, data protection law
Transparency	Procedural	Consumer and contract law, data protection law
Autonomy	Procedural, Substantive	Consumer and contract law, data protection law
Good faith	Procedural, Substantive	Consumer and contract law
Abuse of dominant position	Procedural, Substantive	Competition law
Detrimental effects (e.g., discriminatory, exploitative, inaccurate or otherwise unfair outcomes)	Substantive	Consumer and contract law, data protection law, anti-discrimination law, competition law

1.6 Reading guide

This thesis is structured as follows. Chapter 2 maps the four relevant fields of law and the provisions (potentially) applicable to online price discrimination: consumer and contract law, data protection law, anti-discrimination law and competition law. It assesses the current level of protection, considering potential loopholes and inconsistencies in the legal framework that might hinder compliance with the current law. As such, the chapter answers the question *'What is the current legal framework on online price discrimination?'* (RQ1).

Chapter 3 reports on the interview study that was conducted with companies and experts on their views of online price discrimination. It sets the scene for this thesis by providing a 'behind the scenes' view of how companies perceive price discrimination practices and what justifications they bring forward. Although the European Commission has assumed in its current legislation that companies are currently engaging in personalized pricing, few companies are coming forward by disclosing engagement in online price discrimination. The interview study brings forward factors that determine company engagement in the practice, as well as their views on regulation and the future of the practice. These insights can prove to be fruitful for legislators, to draft and adjust legislation that keeps in mind this state of the art and the interests of companies, such as the freedom of entrepreneurship. This chapter answers the question *'What are companies' perceptions of online price discrimination and what are possible factors influencing their engagement in online price discrimination?'* (RQ2).

Chapter 4 reports on the survey and experimental study, which assessed Dutch consumers' fairness perceptions regarding different conditions of online price discrimination, along with the role of possible antecedents (i.e., cynicism and norm alignment) and consequences (i.e., behavioral, attitudinal and emotional) of these fairness perceptions. The study considers both the outcome of a personalized price (i.e., a higher or lower price), as well as the price setting process (i.e., the data on which the personalized price difference is based). This is not only insightful for companies looking to engage in the practice in a fair manner, but also for assessing the current information requirement set in place by the legislator. If consumers respond strongly to the way in which a price is set, this might require the cur-

rent information requirement to be revised, or other regulation to be considered. As such, this chapter answers the question '*What are the mechanisms through which consumers form fairness perceptions and what are possible consequences of these fairness perceptions?*' (RQ3).

Chapter 5 discusses the results from the second consumer survey on consumer perceptions regarding legally prohibited and permitted segmentation bases that could be used for personalizing prices. This chapter builds on the findings from Chapter 4 and dives deeper into the procedural fairness of online price discrimination, i.e., the segmentation grounds that are used for price personalization. This chapter aims to assess to what extent consumer perceptions of fairness are in line with the existing legal framework, serving as a foundation for a discussion on the extent to which legislation can (and should) keep up with changing ethical and social norms regarding the data that can be used to personalize prices. This chapter answers the question *'What are consumers' fairness perceptions of segmentation bases and to what extent do they line up with grounds currently prohibited in law?'* (RQ4).

Chapter 6 discusses how online price discrimination could be regulated, assessing regulatory modes beyond legal regulation. From the findings in Chapters 3 through 5, I identify elements of online price discrimination that potentially pose challenges for consumers, companies and the market, as well as the extent to which these elements might require regulation beyond the current legal regulation in place. Drawing inspiration from Lessig's regulatory model, which also considers the regulatory power of social norms, markets and technology, this chapter aims to bring forward a *holistic* view on the regulatory possibilities to mitigate challenges identified in the case of online price discrimination, while considering the interests of all stakeholders. This chapter answers the question *'What are (future) regulatory avenues for online price discrimination?'* (RQ5).

Chapter 7 concludes by answering the main research question: *What are the perceptions of consumers and companies of online price discrimination, and what are the implications of these perceptions for market regulation?*' In addition, this chapter discusses the contribution of this thesis to theory and practice and offers four recommendations for regulating and investigating online price discrimination going forward.