Personalizing EU Private Law

From Disclosures to Nudges and Mandates

EUROPEAN REVIEW OF PRIVATE LAW (forthcoming)

Philipp HACKER*

Abstract

A key problem in EU private law is actor heterogeneity. While special rules exist for certain subgroups of actors, for example consumers or retail investors, the members of these legal categories still exhibit vast differences in behaviour, degrees of rationality, vulnerability, and economic endowment. Therefore, private law stands much to gain from tailoring its regulatory apparatus to the individual addressees. This article draws on behavioural economics and Big Data analytics to develop a comprehensive framework for the personalization of EU private law across different regulatory tools such as disclosures, nudges, and mandates. Hitherto, in market settings, data mining techniques have almost exclusively been used by tech-savvy companies. The time seems ripe for lawmakers to use digital technologies in order to take European market regulation one step further. By harnessing Big Data techniques, laws can be tailored to individual characteristics of addressees; the relevant parameters could then be stored and updated in a "legal blockchain". Through the use of different metrics and pseudonymization, the right to privacy, a key feature of European law in the digital age, can ultimately be respected. The article shows how laws can be personalized in a variety of different settings. Examples range from the salience and complexity of disclosures in consumer and investment law, to default caps on overdraft charges, debiasing optimism bias, and usury laws. Finally, it is argued that personalization can inspire a novel theory of legal categories which transcends the traditional, status-based dichotomies of, for example, "consumer-seller" or "retail-professional investor". By providing a tool for making empirical distinctions, which affect the impact of laws, legally relevant, personalization thus ultimately serves equality before the law.

L'hétérogénéité des acteurs est un problème clé du droit privé de l'UE. Bien que des règles spéciales existent pour certains sous-groupes d'acteurs, par exemple les consommateurs ou les investisseurs de détail, les membres de ces catégories juridiques présentent encore de grandes différences de comportement, de degré de rationalité, de vulnérabilité et de dotation économique. Par conséquent, le droit privé a beaucoup à gagner en adaptant son appareil de réglementation aux acteurs individuels. Cet article s'appuie sur l'économie comportementale et l'analyse de données (Big Data) pour développer un cadre détaillé pour la personnalisation du droit privé de l'UE à travers différents outils de réglementation tels que les divulgations

* Dr. iur.; LL.M. (Yale); Max Weber Fellow, European University Institute. This paper benefitted from comments by Omri Ben-Shahar and Giovanni Sartor. All errors remain entirely my own.

d'informations, les *nudges* et les mandats. Jusqu'à présent, dans les marchés, les techniques d'exploration de données ont été presque exclusivement utilisées par les entreprises technophiles. Le temps semble opportun pour les législateurs d'utiliser les technologies numériques afin de faire avancer la réglementation européenne du marché. En exploitant les techniques de Big Data, des lois peuvent être adaptées aux traits individuels; les paramètres pertinents pourraient alors être mémorisés et mis à jour dans un «blockchain juridique». Grâce à l'utilisation de différentes métriques et à la pseudonymisation, le droit à la vie privée, élément clé du droit européen à l'ère numérique, peut être respecté. L'article montre comment des lois peuvent être personnalisés dans une variété de situations différentes. Les exemples vont de la mise en évidence et de la complexité des divulgations d'informations dans le droit des consommateurs et des investissements, aux plafonds sur les frais de découvert, à la réduction des distorsions d'optimisme (optimism bias) et aux lois sur l'usure. Enfin, la personnalisation peut inspirer une nouvelle théorie des catégories juridiques qui transcende les dichotomies traditionnelles fondées sur le statut des personnages, par exemple, de «consommateur-vendeur» ou de «investisseur professionnel-de détail». En fournissant un outil pour faire légalement pertinentes des distinctions empiriques qui affectent l'impact des lois, la personnalisation sert ainsi en fin de compte l'égalité devant la loi.

Ein Schlüsselproblem des europäischen Privatrechts ist Aktorheterogenität. Obwohl für bestimmte Gruppen von Akteuren, z.B. für Verbraucher oder Kleinanleger, besondere Regelungen bestehen, weisen die Mitglieder dieser rechtlichen Kategorien bedeutsame Unterschiede in Verhalten, Rationalitätsgrad, Vulnerabilität und wirtschaftlicher Ausstattung auf. Daher kann das Privatrecht viel gewinnen, wenn sein Regulierungsapparat an die einzelnen Adressaten angepasst wird. Dieser Artikel nutzt die Verhaltensökonomik und Big Data-Techniken, um einen umfassenden Rahmen für die Personalisierung des europäischen Privatrechts hinsichtlich verschiedener regulatorischer Instrumente, wie Pflichtinformationen, Nudges und zwingendem Recht, zu entwickeln. Bisher wurde Datenanalyse in Marktkontexten fast ausschließlich von technologisch versierten Unternehmen genutzt. Die Zeit scheint reif für den Gesetzgeber, selbst digitale Technologien zu nutzen, um die europäische Marktregulierung weiterzuentwickeln. Durch die Nutzung von Big Data-Techniken können Gesetze auf individuelle Merkmale von Akteuren zugeschnitten werden; die relevanten Parameter könnten dann in einer "gesetzlichen Blockchain" gespeichert und aktualisiert werden. Durch den Einsatz unterschiedlicher Metriken und von Pseudonymisierung kann das Recht auf Privatsphäre, ein Schlüsselprinzip des europäischen Rechts im digitalen Zeitalter, letztlich respektiert werden. Der Artikel zeigt auf, wie Gesetze in einer Vielzahl von verschiedenen Situationen personalisiert werden können. Die Beispiele reichen von der Salienz und Komplexität von Pflichtinformationen im Verbraucher- und Investmentrecht, dispositiven Obergrenzen bei Überziehungskrediten und der Reduzierung von Überoptimismus bis hin zu Wucherverboten. Schließlich wird argumentiert, dass Personalisierung zu einer neuartigen Theorie juristischer Kategorien führt, welche die traditionellen, statusbasierten Dichotomien etwa von "Verbraucher vs. Unternehmer" oder "professioneller vs. Kleinanleger" transzendiert. Personalisierung macht empirische Unterscheidungen, von denen die realen Auswirkungen von Gesetzen abhängen, rechtlich relevant und dient damit letztlich auch der Gleichheit vor dem Gesetz.

Keywords: Big Data, blockchain, personalized law, consumer law, investment law, disclosure, overdraft protection, nudging, usury

TABLE OF CONTENTS

1 INTRODUCTION 4

2 TWO METHODS OF PERSONALIZING LAW 5

3 THE BENEFITS OF PERSONALIZATION 8

4 DIFFERENT METRICS 10

5 OBJECTIONS 11

5.1 VALIDITY OF DATA 11
5.2 PRIVACY AND DATA PROTECTION CONCERNS 12

6 PERSONALIZED EU PRIVATE LAW 14

6.1 DISCLOSURE 15
6.1.1 Salience 15
6.1.2 Complexity 17
6.2 NUDGES 18
6.2.1 Default Rules 18
6.2.2 Debiasing 19
6.3 MANDATORY LAW 20
6.3.1 Content of Mandatory Law 20
6.3.2 Applicability of Mandatory Law 21
6.3.2.1 Consumer vs. Sellers 21
6.3.2.2 Retail vs. Professional Investors 22
6.3.2.3 Toward a New Theory of Legal Categories 22

7 CONCLUSION 23

1 Introduction

1. Algorithms define our lives. Whether we shop on the Internet, board a plane, invest in the stock market, play a song or organize a political campaign: in all of these situations, we are today subject to the power of algorithms.[1] Worldwide revenues in Big Data and business analytics approximated a staggering $ 122 billion in 2015 – and the amount is set to increase by more than 50 % over the next five years.[2] Like mathematization[3] in early modern times and economization[4] since, at the very latest, the 19th century, it is now digitization that extends to every forlorn corner of our world. This process may be greeted or condemned. What remains uncontroversial, however, is that we have to bid farewell to a number of insights long thought to be unshakable, and that a host of social processes and problems have to be examined and discussed anew.

2. This credo holds true for the law as well. Digitization generates new questions, holds vast challenges, but also harbours a specific potential for the law. While much of the debate in the legal arena has so far focused on the distinct challenges Big Data raises for citizen's privacy,[5] for the exploitation of market participants,[6] and for free and meaningful agency in a "scored society",[7] this article takes a different perspective and suggests actively tapping the power of Big Data for the transformation of legal categories. It offers a new way to conceive of the regulation of market behaviour by tailoring legal norms to individual characteristics. The complex interferences between private law, behavioural economics and Big Data have so far been subjected to little scientific scrutiny;[8] in Europe academic contributions to this topic are even more scarce.[9] This article therefore presents the first systematic treatment of personalized law across the whole range of regulatory instruments, and introduces the instrument of a "legal blockchain" to operationalize personalized law in different settings.

---

[1] See, e.g., E. BRYNJOLFSSON and A. MCAFFEE, *The Second Machine Age* (New York: Norton 2014); SILVER, *The Signal and the Noise* (New York: Penguin Press 2012); AYRES, Super Crunchers (New York: Bantham 2007); for a critical account, see C. O'NEIL, *Weapons of Math Destruction* (New York: Crown 2016).

[2] www.idc.com/getdoc.jsp?containerId=prUS41306516/.

[3] See, e.g., R. DESCARTES, *Discours de la Méthode* (1637); B. SPINOZA, *Ethica ordine geometrico demonstrata* (1677); I. KANT, *Kritik der reinen Vernunft* (1781), particularly in the 'Vorrede zur 2. Aufl." (1787); for an overview, see L. DASTON, *Classical Probability in the Enlightenment* (Princeton: Princeton University Press 1988); cf. also S. FLEISCHACKER, *A Short History of Distributive Justice* (Oxford: Oxford University Press 2004), pp 113-114 (discussing utilitarianism and Rawls).

[4] This is particularly apparent in the works of the marginalists, see, e.g., F. EDGEWORTH, *New and Old Methods of Ethics, or "Physical Ethics" and "Methods of Ethics"* (Oxford: James Parker 1877); furthermore, even more radically, in the law and economics movement, see, e.g., G. BECKER, 'Nobel Lecture: The Economic Way of Looking at Behavior", 101. *Journal of Political Economy* 1993, p 385.

[5] See, e.g., O. TENE and J. POLONETSKY, 'Big Data for All: Privacy and User Control in the Age of Analytics', 11. *Northwestern Journal of Technology and Intellectual Property* 2013, p 239; C. HOOFNAGLE, *Federal Trade Commission. Privacy Law and Policy* (Cambridge: Cambridge University Press 2016).

[6] R. CALO, 'Digital Market Manipulation', 82. *George Washington Law Review* 2014, p 995.

[7] See, e.g., F. PASQUALE, *The Black Box Society* (Cambridge, MA: Harvard University Press 2015).

[8] An exception are A. PORAT and L. STRAHILEVITZ, 'Personalizing Default Rules and Disclosure with Big Data', 112. *Michigan Law Review* 2014, p 1417; O. BEN-SHAHAR and A. PORAT, 'Personalizing Negligence Law', *NYU Law Review* (forthcoming).

[9] But see C. BUSCH, 'The Future of Pre-Contractual Information Duties: From Behavioural Insights to Big Data' in: C. Twigg-Flesner (ed.), *Research Handbook on EU Consumer and Contract Law* (Cheltenham: Edward Elgar 2016), p (221) at 231-239; P. HACKER, 'Nudge 2.0 – The Future of Behavioural Analysis of Law, in Europe and Beyond', 24. *European Review of Private Law* 2016, p (297) at 321-322.

Such a perspective does not deny the manifold problems the use of Big Data raises, but the article claims that, as in the case of every novel technology, it may serve better or worse causes. The true challenge therefore lies in overcoming the facile dichotomy of Big Data techniques as the object and law as the executor of regulation. Rather, private law should embrace and actively harness Big Data and digital technologies, wherever possible, as a source of social good in order to solve legal problems in novel ways. As part of this endeavour, this article suggests using Big Data and blockchain to cope with the regulatory challenge of actor heterogeneity in market settings. I argue that the personalization of different types of regulatory tools, from disclosures to nudges and mandates, may not only produce solutions tailored to the needs of individual actors, thus creating specific, autonomy-respecting rules; but that it ultimately also furthers legal equality.

3. The article is organized as follows: Section 2 shows how personalized law can be operationalized in practice, using government-based or company-based data. Section 3 expounds the benefits of personalization. Different metrics along which personalization may take place are explored in Section 4. Section 5 discusses objections. Section 6 provides examples of personalization in different market contexts and for different regulatory tools. Section 7 concludes.

2 Two Methods of Personalizing Law

4. It is already easily possible to present personalized advertisements on the Internet,[10] to adapt political campaign brochures to the individual preferences of voters,[11] or to fit medical treatment to the single patient.[12] Private law, this article claims, should equally strive to tailor its rules to individual legal subjects, according to their revealed and often easily accessible behaviour.

Big Data is one of the buzzwords of our time. Of course, data has always been collected, by private and public actors. The distinguishing characteristic of Big Data is that i) the superior calculation powers of computers are used, which leads to ii) the measuring and processing of amounts and types of data that were unmanageable in previous times.[13] Moreover, iii) raw data points collected about an individual can be combined so as to relate them to a personality structure or to cognitive factors in order to predict future behaviour.[14] Such data-driven predictive analysis is not perfect, but already surprisingly precise, often more so than the respective judgments by humans.[15] As more data and novel methods become available, the analyses will likely become ever more precise. They are based on close correlations between

[10] See, e.g., C. HOOFNAGLE et al., 'Behavioral Advertising: The Offer You Cannot Refuse', 6. *Harvard Law & Policy Review* 2012, p 273.

[11] Cf. adage.com/article/campaign-trail/ready-hillary-signals-super-pacs-data-election/298029/.

[12] See, e.g., www.leopoldina.org/uploads/tx_leopublication/2014_Stellungnahme_ IndividualisierteMedizin.pdf.

[13] Cf. M. STUCKE and A. GRUNES, *Big Data and Competition Policy* (Oxford: Oxford University Press 2016), Chapter 2.

[14] A. GANDOMI and M. HAIDER, 'Beyond the hype: Big data concepts, methods, and analytics', 35. *International Journal of Information Management* 2015, p (137) at 143.

[15] W. YOUYOUA, M. KOSINSKI and D. STILLWELL, 'Computer-based personality judgments are more accurate than those made by humans', 112. *PNAS* (*Proceedings of the National Academy of Sciences*) 2015, p 1036; M. KOSINSKI et al., 'Mining big data to extract patterns and predict real-life outcomes' 21. *Psychological Methods* 2016, p 493; A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, at 1435.

certain types of personality or cognitive structures and certain types of behaviour, which in turn become apparent in the data patterns.

Psychologists Chittaranjan, Blom and Gatica-Perez, for example, were able to show, in a much noted field study, that the five psychological standard personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism – the so-called *Big Five*[16]) can be reconstructed by the analysis of metadata from smartphone users.[17] Furthermore, a host of studies unearths similar correlations for the use of data of social media networks such as Facebook[18] or Twitter.[19] Similarly, we could measure the cognitive dimensions of individuals, such as the degree of rationality or willpower.[20] These findings in turn allow for novel legal applications: once the personality or cognitive traits of an individual have been ascertained, legal norms can be tailored precisely to them. Two methods may be employed to achieve this result: either, the data forming the basis of personalization is ultimately processed and stored by a government institution (government-based personalized law); or the data entirely remains with data-collecting companies, who are in turn legally required to act differently vis-à-vis their customers based on the data they have (company-based personalized law).

5. Logically, five steps should be separated in both procedures: first, individuals have to be sorted into a category according to a certain metric (for example, personality type or cognitive traits). With the help of Big Data, this is already possible. Whoever moves in the digital world leaves behind traces that are collected and analysed by companies. As the studies mentioned above show, these traces can be related to different individual metrics. For government-based personalized law, the regulator, however, must be in possession of the relevant data to complete the sorting procedure. There are two ways in which the information can be obtained: either, the regulator herself conducts empirical studies (direct government data collection), or she requires companies that are collecting information to disclose them to the regulator (indirect government data collection). In the case of company-based personalized law, by contrast, the personal data remains with companies that are processing these data anyways as part of their business model, as most large companies nowadays do. The regulator requires the company to disclose the metrics, and the *possible* scores, along which its clients are profiled, but not the *individual* scores of the clients. Thus, the regulator knows the categories used for profiling, but the actual sorting procedure is left to companies.[21]

6. Once the subject has been categorized by the regulator or companies, legal norms can be personalized in a second step. A "general personalization law" has to specify which legal consequences the scores in the different categories engender. For example, personalized

[16] The *locus classicus* is E. TUPES and R. CHRISTAL, *Recurrent Personality Factors Based on Trait Ratings*, USAF Tech. Rep. ASD-TR-61-97 (1961); overview in R. MCCRAE and O. JOHN, 'An introduction to the five-factor model and its applications', 60. *Journal of Personality* 1992, p 175.

[17] G. CHITTARANJAN et al., 'Mining large-scale smartphone data for personality traits', 17. *Personal and Ubiquitous Computing* 2013, p 433.

[18] M. BACK et al., 'Facebook Profiles Reflect Actual Personality, Not Self-Idealization', 21. *Psychological Science* 2010, p 372; M. Kosinski et al., 'Facebook as a research tool for the social sciences', 70. *American Psychologist* 2015, p 543.

[19] D. Quercia, 'Our twitter profiles, our selves. Predicting personality with twitter', *Proceedings of the 2011 IEEE Third International Conference on Privacy, Security, Risk and Trust (PASSAT)* 2011, p 180.

[20] See *infra*, Section 4.

[21] Privacy concerns are addressed *infra*, Section 5.

disclosures can be tailored to specific bundles of personality types or to differing degrees of willpower: score x leads to disclosure D_x, score y to disclosure D_y etc. Since the regulator in both government- and company-based personalization knows which scores are generally possible, this abstract allocation can be achieved.

7. Third, using the data collected in the first step, each subject is matched with specific legal consequences, as determined in the previous step, based on its individual scores. If a subject has score x, it must be shown D_x (in the relevant disclosure situation). In the case of government-based personalized law, the regulator knows the scores and establishes the match. For company-based personalized law, companies are required to conduct the matching and to adapt their disclosures and contracts according to the general personalization law. However, this requirement would only apply if companies in fact are lawfully collecting relevant data; they are under no obligation to collect data. But if they do, they cannot use the data only for their own ends, but have to apply personalized law as well. The matching procedure itself would, of course, be automated to the greatest extent possible.

8. Fourth, the data has to be stored and updated.[22] In this way, norms can be synchronized with the current user data in real time. Often, the scores, such as bundles of personality traits or degrees of willpower, will be rather stable, but even if they change, this could be detected in the data patterns, and the legal norms could change alongside them. Companies may keep their own registers, subject to monitoring and scrutiny by public authorities checking for unbiased handling and processing of the data. Citron and Pasquale have made concrete and workable proposals for a regime of checking and monitoring data processing by companies.[23] This could be implemented, and adapted were necessary, to fit the needs of company data collection. For government-based personalized law, the available scores of all individuals (of one state) relevant for personalization can be stored in a government-run "legal blockchain". This makes the scores difficult to manipulate while strengthening the privacy of citizens. The blockchain is a particularly suitable tool for these purposes; used so far mostly for the design of Bitcoin and other cryptocurrencies,[24] a blockchain is a digital protocol which logs information in a decentralized way. Since it is kept simultaneously on many different computers, it is highly resistant to hacking attacks. Updating is achieved by attaching new pieces of information (blocks) to the previous chain of data stored in the protocol, creating an exhaustive list. Finally, people can interact on the blockchain in a pseudonymous way as they are identified not with their real names but with pseudonyms[25] chosen by themselves or by the lead operators of the blockchain. These features make this ground-breaking digital technology attractive for different legal purposes.[26] In the present context, blockchain technology can be leveraged to create a decentralized, pseudonymous and dynamic government database which stores the relevant parameters for personalized law, such as the degrees of bounded rationality or specific personality traits of different persons. The blockchain could be distributed between a large number of government servers (nodes)

[22] C. BUSCH, in: *EU Consumer and Contract Law*, at 235-236.
[23] D. CITRON and F. PASQUALE, 'The Scored Society: Due Process for Automated Predictions', 89. *Washington Law Review* 2014, p (1) at 18-28.
[24] G. DWYER, 'The economics of Bitcoin and similar private digital currencies', 17. *Journal of Financial Stability* 2015, p (81) at 83.
[25] S. MEIKLEJOHN et al., 'A fistful of bitcoins: characterizing payments among men with no names', *Proceedings of the 2013 Conference on Internet Measurement* 2013, p (127) at 128.
[26] See, e.g., D. YERMACK, *Corporate Governance and Blockchains* (NBER Working Paper No. 21802, 2015).

tasked with not only storing but also updating the chain as new information becomes available.

9. Fifth, while the "general personalization law" (step 2) is publicly available, citizens and their counterparties must in addition have knowledge of the personalized version of concrete laws applying to them (step 3). Citizens already have a right to know their profiles kept by companies (Art. 15, para. 1, s. h General Data Protection Regulation (GDPR)). With company-based personalized law, companies would additionally be required to disclose what this profiling means for the disclosures and contracts their clients enter into. With government-based personalized law, citizens themselves could have access to a customized version of the legal blockchain through an app or a webpage which shows them what personalization category they are currently grouped into, and what the consequences are in the formation of "their" personalized law. In addition, they receive a unique identifier (public key). When dealing with a counterparty, they would disclose their public key before contract formation. This gives the counterparty access to the personalized rules relevant for the transaction, so that the disclosures and contractual content can be personalized.

Hence, under company-based personalization, if citizen A with score x intends to form a contract with company B, x is known to A and may be known to B. The generalized personalization law tells B how to adapt disclosures, default and mandatory rules governing the contract, given x; if B does not know x because B does not collect the relevant data, the transaction is governed by non-personalized law (the law currently governing transactions in the EU). Under government-based personalization, x is known to A and the regulator. When A approaches B, she provides A with her public key (A*). Using A*, B has access to the personalized version of laws applicable to A. Hence, B must may adapt disclosures, default rules, and mandatory laws accordingly.

3 The Benefits of Personalization

10. This overview of the operationalization of the personalization of law has pointed toward some of its potential. First, it minimizes regulatory errors generated in the current practice of private law. Already, legal norms do differentiate between different groups of persons: for example, different rules exist for consumers and sellers/traders, or for professional and retail investors. These distinctions draw on particular, status-based legal categories that carry with them vague psychological notions (the inexperienced consumer; the sophisticated professional investor etc.).[27] These categories, however, are often simultaneously over- and underinclusive. For example, partners of major law firms are considered consumers when buying a house for themselves, while owners of small pet shops in their business dealings are not, despite the fact that the former certainly have more business experience and expertise than the latter. A central problem for the contemporary theory of private law, therefore, is the staggering degree of heterogeneity *within* the groups the law traditionally distinguishes between – be it differences in experience, rationality, willpower, economic resources, or else.[28] Personalization can bring behavioural science and technology to bear on these problems. Legal categories can thus be rendered more precise, granular and refined. In the end, different metrics such as bundles of personality traits or degrees of willpower produce a

[27] Cf. F. CAFAGGI, 'From a Status to a Transaction-Based Approach? Institutional Design in European Contract Law', 50. *CMLR* (*Common Market Law Review*) 2013, p 311.
[28] Cf. A. SCHWARTZ, 'Regulating for Rationality', 67. *Stanford Law Review* 2015, p 1373.

vast array of fine-grained categories; different legal consequences may be attached to each. Personalization thus effectively addresses actor heterogeneity.

11. Second, the protective purposes of legal norms can be deployed more effectively. Most laws rest upon an implicit concept of human agency, for example that of a *homo economicus*.[29] If premise and reality fall apart, the purpose of the norm will often be missed. This gap can be narrowed, and ideally closed, by increasing degrees of personalization. Particularly, norms that are not justified by negative externalities but by paternalism limit choices in order to make the protected agent better off. Where personalization tailors these limits of contractual choice to individual characteristics, freedom of contract is ultimately strengthened.

12. Third, personalization of law has the potential to harness the massive collection of data by companies for the benefit of customers and furthermore for public good in society. So far, Big Data has mainly helped companies to maximize profits, creating instances of "digital market manipulation" on the way.[30] Empirical studies by Hayan Shui and Lawrence Ausubel,[31] Oren Bar-Gill[32] and Michael Grubb[33] forcefully demonstrate that companies often collect data in order to present their customers with options that are not the best for customers but instead are the most profitable ones for companies. This is not surprising in the face of behavioural market failures[34] and other types of market inadequacies, yet the asymmetry in computing power between customers and companies calls for new ways to legally intervene. Personalization can counteract these new, technologically mediated market failures. If tech-savvy companies are required to personalize disclosures and contracts for the benefit of the counterparty, a balance of interests between clients and companies may be restored.

13. A final aspect concerns legal equality.[35] Equal treatment may even *require* the application of different norms if Big Data analysis reveals relevant differences between persons: the CJEU has made it clear that, as much as equality of treatment demands we treat the same situations in the same way, it also asks us to treat different situations differently.[36] Relevant differences among actors may now, on many occasions, become observable thanks to the use of Big Data. If certain disclosures only work for certain actors, it would seem to violate equality to knowingly apply them to those actors who do not benefit from them. If a certain default rule produces an equitable outcome for some actors, but not for others who are clearly distinguishable with the help of Big Data, equality again demands to only apply the rule to the former. By making such differences legally relevant, personalization may further equality before the law.

---

[29] P. HACKER, 'The Behavioral Divide. A Critique of the Differential Application of Behavioral Law Economics in the EU and the US', 11. *European Review of Contract Law* 2015, p 299.

[30] R. CALO, 82. *George Washington Law Review* 2014, p 995.

[31] H. SHUI and L. AUSUBEL, 'Time Inconsistency in the Credit Card Market', http://www.ausubel.com/creditcard-papers/time-inconsistency-credit-card-market.pdf/.

[32] O. BAR-GILL, *Seduction by Contract* (Oxford: Oxford University Press 2012), pp 217-223.

[33] M. GRUBB, 'Overconfident Consumers in the Marketplace', 29. *Journal of Economic Perspectives* 2015 (4), p 9.

[34] O. BAR-GILL, *Seduction*, Chapter 1.

[35] Cf. also, for a similar argument with respect to personalizing negligence standards, O. BEN-SHAHAR and A. PORAT, *NYU Law Review* (forthcoming), at 39-40; a detailed account of the interactions between personalization and legal equality is provided in P. HACKER, 'The Ambivalence of Algorithms. Gauging the Legitimacy of Personalized Law', in: M. Bakhoum et al. (eds.), *Personal Data in Competition, Consumer Protection and IP Law – Towards a Holistic Approach?* (Springer, forthcoming).

[36] ECJ 13 November 1984 *Racke v. Hauptzollamt Mainz*, EU:C:1984:344, curia.europa.eu/juris/documents.jsf?num=C-283/83, paragraph 7.

4 Different Metrics

14. Before addressing objections to personalization, we should note that laws can be tailored to individuals along a whole range of different metrics,[37] which in turn invite different critiques. Most prominently, Ariel Porat and Lior Strahilevitz have suggested personalizing disclosures and default rules according to personality types.[38] These, however, are particularly sensitive with respect to privacy,[39] and other individual metrics may be a better fit for several regulatory challenges in market contexts. As an increasing number of such individual traits are linked to easily observable behaviour or public data, they become available as potential categories for personalization.

For example, a key distinction is made in contemporary debates on private law reform between rational and boundedly rational subjects.[40] Thus, the degree of rationality can be a potent source for the personalization of law. In recent years, behavioural science research has made increasing progress on linking different biases to common roots;[41] in the future, it might therefore be possible to determine a general factor accounting for the degree of rationality of a person. Already, intelligence scores can be recovered from Facebook "like" patterns;[42] and a cognitive reflection test correlates well with a number of metrics measuring dimensions of rationality.[43] Furthermore, specific biases and particular facets of bounded rationality can be uncovered. For example, David Laibson has introduced the so-called ß factor to measure the degree of bounded willpower.[44] The factor ranges between one and zero; the closer it is to zero, the more willpower is bounded, i.e., the less the degree of self-control. This results, for example, in a present bias which overweights instantaneous gratification vis-à-vis long-term benefits. Bounded willpower, therefore, is a powerful analytic tool with which to assess the capacity of subjects to make intertemporal decisions and to rationally plan ahead. Data mining could help to determine an individual's ß factor, for example by analysing credit card repayment reports, or outstanding debt.[45]

15. Other metrics do not measure cognitive traits, but rather the objective characteristics of a person. The best example is the – quite controversial – use of credit rating scores, such as the FICO score in the US or the SCHUFA score in Germany, to assess the eligibility of individuals for different contracts.[46] To the extent that such credit scores speak to the capacity of individuals to predict their future income and spending patterns, they can be used as a proxy for financial savviness. Since they also, however, correlate with vulnerability and income, they may be used in personalization to single out actors that are in particular need of reinforced

[37] Cf. O. BEN-SHAHAR and A. PORAT, *NYU Law Review* (forthcoming), at 44-51.
[38] A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, p 1417.
[39] See *infra*, Section 5.2.
[40] A. SCHWARTZ, 67. *Stanford Law Review* 2015, p 1373.
[41] M. DEAN and P. ORTOLEVA, *Is it All Connected? A Testing Ground for Unified Theories of Behavioral Economics Phenomena* (Working Paper, 2015), ssrn.com/abstract=2643355.
[42] M. KOSINSKI et al., 'Private Traits and Attributes Are Predictable from Digital Records of Human Behavior', 110. *PNAS* 2013, p 5802.
[43] S. FREDERICK, 'Cognitive Reflection and Decision Making', 19. *Journal of Economic Perspectives* 2005 (4), p 25.
[44] D. LAIBSON, 'Golden Eggs and Hyperbolic Discounting', 112. *Quarterly Journal of Economics* 1997, p (443) at 449-451.
[45] Cf. C. HARRIS and D. LAIBSON, 'Hyperbolic Discounting and Consumption', in: M. Dewatripont et al. (eds.), *Advances in Economics and Econometrics*, Vol. 1 (Cambridge: Cambridge University Press 2003), p (282) at 282-283.
[46] D. CITRON and F. PASQUALE, 89. *Washington Law Review* 2014, at 8-16.

forms of consumer or debtor protection.[47] Moreover, income and wealth levels can be used as direct inputs for personalization, especially in order to equalize the impact of monetary sanctions across individuals with different financial capacities.[48] Finally, aggregate scores can be constructed using the metrics already mentioned as starting points.[49]

In all of this, Big Data is crucial to determine the exact value of the scores in the first place (such as with personality traits, degrees of bounded willpower, or credit scores), or to control the accuracy of information obtained directly from the individuals (income and wealth).[50]

5 Objections

16. Different metrics entail different challenges. Two objections, however, are particularly noteworthy across all of the mentioned metrics: the validity of data, and privacy as well data protection concerns.[51]

5.1 Validity of Data

17. As noted above, regulators have the choice between conducting empirical studies themselves and using data from data-collecting companies such as Facebook, Twitter or Google (indirect government data collection or company-based personalized law). If empirical studies are conducted by the regulators themselves, the usual limits of internal and particularly external validity apply.[52] However, regulatory agencies in Europe are increasingly conducting studies in a successful way, both on the national and on the European level.[53] While no empirical study can deliver perfect correlations or unfailing data, the true challenge for these studies would be to provide results that are more in tune with the real behaviour of the addressees of regulation than the current categories used. Since empirical rigor is still largely absent from most lawmaking in the EU at the moment,[54] this requirement will often be fulfilled if the studies adhere to the state-of-the-art of empirical methodology. As mentioned, correlations are never perfect, but already robust for some of the metrics mentioned and likely to improve as more data and new techniques become available.[55] Two novel methods can help to obtain the necessary data for the relevant metrics: first, speech analysed with Big Data techniques reveals an astonishing amount of information about the cognitive and psychological profile of the speaker.[56] With the right algorithms, such analysis

[47] Id., at 14-15.
[48] See, e.g., P. HACKER and B. PETKOVA, 'Reining in the Big Promise of Big Data', *Northwestern Journal of Technology and Intellectual Property* (forthcoming), ssrn.com/abstract=2773527 = dx.doi.org/10.2139/ssrn.2773527.
[49] Several further metrics will be introduced in the examples in Section 6.
[50] smartalwayswins.kpmg.be/corporate/technology/big-data-and-tax/.
[51] More objections to personalized law, such as questions of equality and distributive justice, a potential loss of the expressive function of the law, and the possible technicization of the democratic discourse, are treated in P. HACKER, in: *Personal Data in Competition, Consumer Protection and IP Law* (forthcoming).
[52] R. LAWLESS et al., *Empirical Methods in Law* (Aspen: Wolters Kluwer 2010), pp 36.
[53] JOINT RESEARCH CENTRE, *Behavioural insights applied to policy: European Report 2016*.
[54] A.-L. SIBONY and G. HELLERINGER, 'EU Consumer Protection and Behavioural Sciences: Revolution or Reform?', in: A. Alemanno and A.-L. Sibony (eds.), *Nudge and the Law* (Oxford: Hart 2015), p (209) at 214 et seqq.
[55] See *supra* note 15 and accompanying text.
[56] T. POLZEHL, *Personality in Speech* (Cham: Springer 2015), pp xii-xiv and 143-153; F. ALAM and G. RICARDI, 'Fusion of Acoustic, Linguistic and Psycholinguistic Features for Speaker Personality Traits Recognition', *Proceedings of the 2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* 2014, p. 955; cf. also

does not take more than a five-minute phone call, and the results are very difficult to manipulate by the speaker.[57] Furthermore, Porat and Strahilevitz suggest using reference groups ("guinea pigs"), which are thoroughly analysed with respect to the desired parameters in controlled experiments.[58] All other citizens subsequently simply have to be compared to this reference sample to determine which reference group, and thus which parameters, they most closely match.

18. However, if data collected by companies such as Facebook, Google or Amazon is used, there are two additional caveats. First, it is often unclear precisely how the data is processed by these companies, making it difficult to ensure that rigorous methodological standards are followed.[59] Second, if companies anticipate that their data will be requested and used by lawmakers for regulatory purposes, this might alter their incentives to collect unbiased data. Companies might be tempted to selectively collect or disclose data so that personalized laws constructed with these data sets benefit not the data subject but, rather, the company. For example, we can imagine that a company would have an incentive to portray its clients as more rational, more understanding, and more capable of processing large amounts of information if, as a result, certain protective legal features which are reserved for less rational clients do not apply. Therefore, as discussed above,[60] a robust system of monitoring and auditing the data processed by companies is necessary if this path is chosen by regulators for obtaining data.

Still, valid data may not be obtainable for all citizens, particularly not for all relevant metrics. In such cases, the law cannot be personalized for those citizens for which the data is lacking or obviously corrupted. Rather, the regular, non-personalized law currently in place will remain applicable to these citizens. Therefore, the law will have to consist essentially of two different bodies: a default legal regime for all those situations in which valid data is not available, and the personalized regime for the growing number of situations in which it is.[61]

5.2 Privacy and Data Protection Concerns

19. Privacy and data protection concerns arise whenever personal data is collected, stored, or otherwise processed. Since these actions are at the heart of personalized law, they immediately raise the question of their adequacy in view of possible violations of privacy and data protection norms in the EU. While the protection of privacy is less pronounced in the US, the EU adheres to a strict regime of prevention of privacy breaches both by private parties and by the state; privacy is not only perceived as a central element of the dignity of a person,

---

J. PENNEBAKER, *The secret life of pronouns: What our words say about us* (New York: Bloomsbury Press 2011), Chapter 4; A. GANDOMI and M. HAIDER, 35. *International Journal of Information Management* 2015, at 140-141.

[57] See previous note and faz.net/aktuell/gesellschaft/menschen/software-erkennt-persoenlichkeit-mit-sprachanalyse-13596216.html/.

[58] A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, at 1450-1453.

[59] C. BUSCH, in: *EU Consumer and Contract Law*, at 235.

[60] See *supra* note 23 and accompanying text.

[61] Due to space constraints, it cannot be discussed at length here whether citizens should be allowed to opt out of the personalized regime and into the default regime if they object to personalization. *Prima facie*, it seems sensible to provide for such an opt out, at least for a transition period, in order to allow citizens to register and act on their anti-personalization preferences, consonant with Art. 22, para. 1 GDPR; see P. HACKER, in: *Personal Data in Competition, Consumer Protection and IP Law* (forthcoming); cf. also C. BUSCH, in: *EU Consumer and Contract Law*, at 237-238.

but also as a prerequisite for unconstrained and authentic agency by the individual.[62] Hence, it is protected by Article 8, paragraph 1 of the Charter of Fundamental Rights of the European Union (the 'Charter') and by Article 16, paragraph 1 TFEU. Concerns about an increase in the processing of personal data, which personalized law would potentially imply, therefore have to be treated with the utmost seriousness in the context of European law.[63]

20. First and foremost, it would be necessary to enact a law sanctioning the collection and processing of data for the purpose of personalization, cf. Recital 45, Article 6, paragraph 3, and Article 22, paragraph 2, section b GDPR. The aim of tailoring laws to individual data subjects also ensures that the data is collected for specified, explicit and legitimate purposes, Article 5, paragraph 1, section b GDPR. In the case of company-based personalization, only data lawfully collected by the companies may be used for personalization. With government-based personalization, pseudonymization of the data in a legal blockchain would ensure that the identifiability of data subjects is minimized,[64] cf. Recital 28 and Article 5, paragraph 1, section e GDPR. However, citizens have to share their public key before transactions with companies (see above, Section 2, step 5). While this does not give companies direct access to the citizen's scores – rather, only to the personalized legal regime relevant for the transaction – the scores may potentially be reconstructed from the personalized legal regime (e.g., if a certain regime applies only in case of a certain score). This implies that government-based personalized law should be restricted to metrics that are either less privacy-sensitive or which companies can be assumed to possess themselves independent of the shared public key. For example, loan originators may be expected to themselves possess, or explicitly ask for, credit scores of future clients.

Finally, the use of metrics which are particularly sensitive,[65] i.e., which reveal a particularly large amount or a particularly intimate type of personal information about a data subject (such as personality traits), must be restricted to instances in which vast gains for the affected parties are to be expected. Given the significant risk of the abuse of encompassing personality information by malevolent authorities, and in view of the spread of authoritarian forms of government even within the Western world and the EU in recent years, it even seems advisable to refrain from the use of specific personality trait information by the state. Wherever possible, we should use different metrics (as discussed in the preceding section), operating with a less holistic evaluation of the personality of the addressees.

21. Therefore, EU data protection law does not categorically rule out the individual tailoring of laws; but it should be treated as a yardstick against which the degree of invasiveness of every collection of data in the name of personalization, and the risk it poses for the personal integrity of the data subject, must necessarily be measured.

In sum, the discussed objections can be answered by combining different metrics with different methods of personalization (government- or company-based). Personalized law must aim at minimal invasiveness into privacy and maximum scrutiny of the validity of data,

---

[62] See Recital 51 of the GDPR.

[63] The question of a potential abuse of personal data by the government is treated in P. HACKER, in: *Personal Data in Competition, Consumer Protection and IP Law* (forthcoming).

[64] Cf. P. DE FILIPPI, 'The Interplay between Decentralization and Privacy: The Case of Blockchain Technologies', 7. *Journal of Peer Production* (forthcoming), https://ssrn.com/abstract=2852689.

[65] Cf. Recital 53 of the GDPR.

which makes trade-offs necessary. Government-based personalization allows for more robust data validity checks by the regulator; however, it also allows companies to potentially reconstruct personal scores of counterparties; and data abuse by governments remains an issue. Therefore, the best strategy must be determined for each concrete instance of personalization, as the next Section shows.

6 Personalized EU Private Law

22. The remainder of the article will discuss concrete examples taken from different fields of private law, and suggest how personalized law can contribute to a new theory of legal categories. In the following sections, three different types of tools for market regulation are examined with respect to their potential for personalization: disclosures, nudges (such as default rules and debiasing), and mandates.

The different metrics, and thus different types of data, can be matched with different regulatory tools to solve various legal problems. Table 1 presents examples of possible fruitful pairings between certain metrics and certain types of regulation. Insofar as they have not been dealt with in the literature yet, they will be analysed in detail in the next sections; the future will tell whether the boxes now empty will be filled over time.

	Disclosure	**Nudge**	**Mandate**
Personality Type	Content of Disclosures Generally[66]	Content of Default Rules Generally[67]	x
Degree of Rationality	Complexity of Disclosures	Debiasing	Applicability of Norms (e.g., consumer and investor protection)
Degree of Willpower	Salience of Different Price Elements	Stickiness of Defaults; Amount for Caps of Overdraft Charges	Applicability; Usury Threshold
Capacity to Create and Control Risk	X	X	Negligence Standards[68]
Credit Score	Salience of Different Price Elements	Stickiness of Defaults; Amount for Caps of Overdraft Charges	X
Income & Wealth	X	X	Monetary Sanctions[69]

[66] A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, at 1470.
[67] Id., at 1433.
[68] O. BEN-SHAHAR and O. PORAT, *NYU Law Review* (forthcoming).
[69] P. HACKER and B. PETKOVA, *Northwestern Journal of Technology and Intellectual Property* (forthcoming).

Table 1. Overview of Possibilities of Personalization in Private Law

6.1 Disclosure

23. Disclosures are a ubiquitous, perhaps even the central, form of market regulation in the EU. Born in the beginning of the 20th century in the US, the disclosure paradigm has gradually expanded from securities regulation to virtually all other markets with incomplete or asymmetric information.[70] In the EU, it has become a cornerstone of market integration: cross-border trade of goods with a great variety of characteristics must be allowed as long as their relevant features are prominently disclosed.[71] However, in recent years, concerns over the effectiveness of disclosure have grown. Indeed, as an increasing number of scholars argue,[72] the current regime of disclosures mainly produces information overload and fails to adequately inform market participants. Indeed, Article 6, paragraph 1 of the Consumer Rights Directive[73] can be considered the epitome of such informational overreach, with a list of 20 items (often with various sub-items) to be disclosed for any distance or off-premises sale of a consumer good. Thus, the key problem with the current disclosure regime is the peril of information overload, fuelled by the equal weight accorded to every piece of information: so far, every consumer is given the same pieces of information. However, not everything is equally important for everyone. Against this backdrop, personalization could tailor the salience of certain items and the degree of complexity of disclosures to the individual disclosee, reducing the risk of information overload.

6.1.1 Salience

24. Ariel Porat and Lior Strahilevitz have recently argued that personalization can be operationalized for disclosures.[74] A move toward greater individualization has been discussed for the last few years in this area.[75] Oren Bar-Gill, for example, has suggested mandating disclosure not only of product attribute but also of personal use information.[76] Porat and Strahilevitz now maintain that the attributes disclosed to consumers could vary in content and design from personality type to personality type.

However, it seems unnecessary to use personality types, which are particularly objectionable in terms of privacy, for the personalization of disclosure. Rather, more specific metrics can be used that generate less concern with respect to privacy. One important measure is the ß factor mentioned above (Section 4), which captures the degree of present bias and thus speaks to the capacity to correctly forecast future consumption behaviour. For example, the salience of

---

[70] O. BEN-SHAHAR and C. SCHNEIDER, *More Than You Wanted to Know* (Princeton: Princeton University Press 2014), Chapters 2-3.

[71] The *locus classicus* for the priority of disclosure over the regulation of the content of products is ECJ 20 February 1979, *Cassis de Dijon*, curia.europa.eu/juris/documents.jsf?num=C-120/78 = *ECR* 1979, 649, particularly para. 13.

[72] See, e.g., A.-L. SIBONY and G. HELLERINGER, 'EU Consumer Protection and Behavioural Sciences'; BEN-SHAHAR and SCHNEIDER, *More Than You Wanted to Know*.

[73] Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, http://eur-lex.europa.eu/legal-content/ALL/?uri=CELEX:32011L0083 = *OJ* 2011, L 304/64 (hereafter: CRD).

[74] A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, at 1470-1476.

[75] See, e.g., C. SUNSTEIN, *Impersonal Default Rules vs. Active Choices vs. Personalized Default Rules: A Triptych*, (Working Paper, 2013), ssrn.com/abstract_id=2171343/.

[76] O. BAR-GILL, *Seduction*, at 33 et seqq.

certain types of prices can be varied along this scale for products with multidimensional prices. Take, for instance, cell phone contracts: today, they often include a fixed number of minutes and a fixed amount of data. The "regular price" a client pays per month covers only this pre-specified budget. Once the phone is used beyond the budget, a different price sets in, which is higher per unit. Personalization can make the type of price most relevant for the individual client most salient in the disclosure. For example, someone who has a tendency to consume more than she expected (the "uncalibrated" type: low ß factor)[77] could be informed in a salient way about high back-end fees which are due once the monthly budget is used up. On the other hand, someone who practically always remains within the bounds of her own estimated future phone communication behaviour (the "well-calibrated" type: high ß factor) may be informed in a salient manner about the costs of the regular tariff. Both types would receive information about all price features, but highlighted differently. For instance, as the ß factor rises, the salience of the regular price could be incrementally increased, and the salience of the back-end fees decreased, by varying font size, boldness, and colour. Credit card prices can be disclosed similarly, with a focus on an introductory teaser or on the long-term interest rate, depending again on the ß factor of the potential borrower. Since companies already regularly register such user behaviour,[78] government-based (disclosure of the public key would not hurt) or company-based personalization (companies have the information) could be used.

In fact, most products we acquire today consist of multidimensional prices,[79] be it the hotel room where extra charges apply for Internet use, the flight ticket which does not include baggage costs, or the sales price quoted on eBay excluding shipping fees. The ß factor will only be relevant for multidimensional pricing in which a price component is triggered if an initially projected consumption volume is exceeded. This will likely be the case for baggage costs (people with difficulties planning ahead might underestimate the amount of luggage they need), and for hotel rooms with extra internet charges (present bias leads to spontaneous craving for immediate use of the Internet); other multidimensional prices can be personalized along different metrics, such as limited attention.[80] While each of the cases merits further scrutiny, the salience of individually relevant information has immediate advantages for recipients in all cases. In fact, personalization takes a well-known obligation to a new level: *know your customer*[81] is thus digitally realized.

Similarly, many other pieces of information can be made more or less salient. If the data analysis of previous transactions shows, for example, that a certain client is particularly prone to missing deadlines for withdrawal rights (e.g., sending products back after the deadline expired), personalized law could require the sellers to highlight withdrawal deadlines when this client places an order online. Amazon, for example, is already storing such information about its clients,[82] and could be required to tailor the salience of deadlines along a metric of "withdrawal diligence".

---

[77] Cf. also M. GRUBB and M. OSBORNE, 'Cellular Service Demand: Biased Beliefs, Learning, and Bill Shock', 105. *American Economic Review* 2015, p (234) at 261 (discussing overconfident consumers).

[78] O. BAR-GILL, *Seduction*, Chapters 3 and 5.

[79] Cf. O. BAR-GILL, 'Price Caps in Multi-Price Markets', 44. *The Journal of Legal Studies* 2015, p (453) at 454.

[80] Cf. L. EINAV et al., 'Assessing Sale Strategies in Online Markets Using Matched Listings', 7. *American Economic Journal: Microeconomics* 2015, p (215) at 239-241.

[81] See D. HODGSON, 'Know your customer', 40. *Management Decision* 2002, p 318.

[82] theguardian.com/money/2016/mar/18/banned-by-amazon-returning-faulty-goods-blocked-credit-balance.

6.1.2 Complexity

25. However, disclosures are not only about salience, but also about complexity. Here, a promising criterion for distinction between different recipients is their degree of rationality, as approximated, for example, by the cognitive reflection test.[83] While more fully rational agents are able to fruitfully process highly complex disclosures, boundedly rational agents are prone to ignore or misunderstand them. Therefore, as I have argued at length elsewhere, disclosures should be designed as multi-layered formats, with each layer increasing in complexity.[84] For example, before making an investment decision, an investor should not be handed over a lengthy prospectus, but have a choice between at least three different documents of varying complexity. Personalization would take this proposal yet another step forward, determining the optimal level of complexity of the disclosure for the recipient. If, for example, on a scale from 0 to 10 her degree of rationality is 5, she would be given a document of intermediate complexity. She would also have access to the other disclosure documents of different complexity; however, empirical research shows that people rarely click through to other disclosure documents even if they are directly hyperlinked.[85] Therefore, it is of importance to make the document matching her cognitive skills immediately available. To consider another example: in some situations, conflicts of interests have to be disclosed by the conflicted party. Under Article 23, paragraph 2 MiFID II,[86] investment advisors are required to disclose "the general nature and/or sources of conflicts of interest" to their potential clients. The more detailed the facts provided, the more accurately the recipient can theoretically judge whether the particular conflict negatively impacted the advice. However, more facts also make information overload more likely. Therefore, as Stefan Grundmann and I are suggesting, the level of detail of the disclosure should depend on the degree of rationality of the disclosee.[87] Here, as in other contexts, disclosure of more specific information can be superior, but only if the recipient is able to adequately cognitively process it.

Hence, at a time when disclosure is increasingly criticized as ineffective, personalization presents a way to strip disclosures of their excessive length and complexity. By tailoring them to the needs of the recipients, disclosures can again be made meaningful devices of market regulation in instances of information asymmetry. In fact, personalized disclosures are already a reality in some market transactions, as large companies use Big Data to provide individualized advice and information to clients. For example, the OPOWER Home Energy Reports, which accompany electricity bills in some regions in the US, include personalized energy saving tips for clients based on their energy use and housing profile.[88] If companies successfully tap the power of Big Data for their client information, private law should, wherever possible, follow suit.

---

[83] S. FREDERICK, 19. *Journal of Economic Perspectives* 2005 (4), p 25.

[84] P. HACKER, *Verhaltensökonomik und Normativität. Die Grenzen des Informationsmodells im Privatrecht und seine Alternativen* (Tübingen: Mohr-Siebeck, forthcoming).

[85] P. KELLEY et al., 'Standardizing privacy notices', *Proceedings of the 28th International Conference on Human Factors in Computing Systems* 2010, p (1573) at 1579.

[86] Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments (MiFID II), eur-lex.europa.eu/legal-content/ALL/?uri=CELEX:32014L0065 = *OJ* 2014, L 173/349.

[87] S. GRUNDMANN and P. HACKER, 'Conflicts of Interest', in: D. Busch and G. Ferrarini (eds.), *Regulation of EU Financial Markets: MiFID II* (Oxford: Oxford University Press, 2017), p (165) at 190-191, no. 7.51-7.52

[88] H. ALLCOTT, 'Social Norms and Energy Conservation', 95. *Journal of Public Economics* 2011, p (1082) at 1084.

6.2 Nudges

26. Since disclosures have already been dealt with separately, the most prominent nudging techniques which remain to be discussed with respect to personalization are default rules and debiasing.

6.2.1 Default Rules

27. As Porat and Strahilevitz have suggested, the content of default rules can be personalized along personality traits.[89] The following section complements their analysis by presenting different metrics to personalize not the content, but the stickiness of default rules. As Ian Ayres has pointed out,[90] an often overlooked, but highly relevant, feature of default rules is altering rules, i.e., the rules specifying how to opt out of a default rule. So far, most often everyone can contract around legal default rules in the same way. As Omri Ben-Shahar and John Pottow have suggested, however, different degrees of stickiness may be optimal for different actors.[91] Hence, stickiness should be varied by tailoring altering rules to the individual characteristics of the party or parties.

28. A relevant example is the regulation of overdraft charges for bank accounts. These charges amount to relatively high sums, accounting for roughly a third of the revenue of retail banks generated by personal current accounts.[92] They are also regarded as one of the entry points into a debt spiral. [93] Clients are not always well-positioned to protect themselves: a recent study concludes that "60 percent of overdrafters reported overdrafting because they 'thought there was enough money in [their] account.'"[94] Furthermore, clients who use overdrafts heavily tend to be less educated and poorer than the average client.[95] EU Member States are currently contemplating capping, or otherwise restricting, the fees and interest rates banks can charge for overdrafts. In the UK the Competition and Markets Authority (CMA) in August 2016, after a detailed retail banking markets investigation, stopped just short of imposing mandatory caps on UK banks for charges on unarranged overdrafts.[96] In the US, default rules were introduced in 2010, specifying that banks could not charge a fee for most overdrafts by checking account holders unless these specifically opted into an overdraft regime with the bank.[97] The default arrangement was designed to protect vulnerable clients from excessive charges. As Lauren Willis has meticulously shown, however, banks systematically lobbied the

[89] A. PORAT and L. STRAHILEVITZ, 112. *Michigan Law Review* 2014, at 1422.
[90] I. AYRES, 'Regulating Opt-Out: An Economic Theory of Altering Rules', 121. *Yale Law Journal* 2012, p 2032.
[91] O. BEN-SHAHAR and J. POTTOW, 'On the Stickiness of Default Rules', 33. *Florida State University Law Review* 2006, p 651.
[92] Competition and Markets Authority (CMA), *Retail banking market investigation*, Final Report (August 9, 2016), p ix.
[93] ft.com/content/b5acdcb0-4515-11e6-b22f-79eb4891c97d.
[94] V. STANGO et al., 'Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees', 27. *Review of Financial Studies* 2014, p (990) at 996.
[95] CMA, *Retail banking market investigation*, at xiii, xvi, xviii; L. WILLIS, 'When Nudges Fail: Slippery Defaults', 80. *University of Chicago Law Review* 2013, p (1155) at 1178.
[96] CMA, *Retail banking market investigation*, at xlii-xliii.
[97] 12 CFR § 205.17(c).

most vulnerable, i.e. the poorest, account holders into opt outs, depriving the default regime of its effectiveness.[98]

Against the backdrop of the US experience, personalization may be used by EU Member States to bolster protection for the most vulnerable debtor groups. Specifically, the stickiness of a default regime imposing overdraft charge protection (for example, a default cap on overdraft charges) can be tailored to the credit rating score of the account holder. For clients with a lower score, additional safety measures can be implemented to make opt outs more difficult and more informed. Furthermore, these safety measures should also be required if clients have particular difficulties in forecasting their future spending behaviour (low ß factor). As the CMA notes, "over half of overdraft users we surveyed underestimated their usage [of monthly overdrafts] by two or more months in a year."[99] Again, the scores are mostly known to banks already, mitigating privacy concerns. In cases of low credit score or low ß factor, altering rules should include additional elements of advice or help, such as the intervention of a public notary; an independent evaluation by a consumer protection agency; or cooling-off periods. The simple ticking of a box, systematically used in the US to contract around overdraft protection, should not suffice if it puts some of the most vulnerable and least informed debtors at risk. Finally, the cap itself could also vary with the mentioned scores (credit rating and ß factor): lower scores could imply lower caps, by default protecting particularly vulnerable groups from excessive fees.[100]

6.2.2 Debiasing

29. An even more direct form of behaviourally-informed regulation is debiasing, i.e., the attempt to reduce biases on a cognitive level.[101] A simple debiasing measure is to warn of a specific bias. Despite its simplicity, this intervention has been shown to work on a number of biases, for example overconfidence bias.[102] The latter is particularly important as overconfident consumers are prone to be exploited by their counterparties even in competitive market settings, potentially creating significant welfare losses.[103] Furthermore, overconfident investors hurt themselves by making unwise investment decisions.[104]

Therefore, debiasing overconfident consumers and investors should help them to make better decisions in the marketplace. However, debiasing is not without cost if applied to non-biased individuals. The intervention imposes cognitive costs, and in case of a warning, rational agents may be over-deterred or de-calibrated. Personalization, however, can turn debiasing into a tool of "asymmetric paternalism",[105] targeting only boundedly rational individuals but leaving more rational ones untouched. Such tailored debiasing would only be triggered, as a pre-

[98] WILLIS, 80. *University of Chicago Law Review* 2013, at 1185-1199.
[99] CMA, *Retail banking market investigation*, at xv.
[100] The equilibrium effects of such a cap would have to be closely investigated, however, see O. BAR-GILL, 44. *The Journal of Legal Studies* 2015, p 453.
[101] C. JOLLS and C. SUNSTEIN, 'Debiasing through Law', 35. *Journal of Legal Studies* 2006, p 199.
[102] M. ALPERT and H. RAIFFA, 'A progress report on the training of probability assessors' in: D. Kahneman et al. (eds.), *Judgment under Uncertainty* (Cambridge: Cambridge University Press 1982).
[103] M. GRUBB, 29 *Journal of Economic Perspectives* 2015 (4), at 12-13.
[104] T. ODEAN, 'Do Investors Trade Too Much?', 89. *American Economic Review* 1999, p 1279.
[105] C. CAMERER et al., 'Regulation for Conservatives: Behavioral Economics and the Case for "Asymmetric Paternalism"', 151. *University of Pennsylvania Law Review* 2003, p 1211.

contractual duty, if a certain threshold on an overconfidence metric is surpassed.[106] For example, investment service providers could be compelled to monitor the performance of the investment decisions of their clients; if the data suggests that their turnover is too high (a sign of overconfidence),[107] or if they have incurred large losses in the past (a potential sign of overoptimism), a warning against the specific bias could be shown before the next investment decision.

6.3 Mandatory Law

30. If instances of market failure, lacking self-control or rampant unfairness cannot be remedied with disclosures or nudges alone, mandatory provisions are needed. Here, the potential for personalization is essentially twofold: on the one hand, its contents can be tailored to the addressees. On the other hand, the applicability of mandatory law can be personalized along novel and more granular categories constructed with the help of Big Data.

6.3.1 Content of Mandatory Law

31. An example of a mandatory provision governing all market transactions is the prohibition of usury found in the national law of Member States.[108] While often different factors will play a role in determining whether a certain loan is qualified as usurious, a key criterion in German law is the charging of an interest rate in excess of a certain threshold. A strong presumption of usury arises when the interest rate is more than the market rate of interest plus 12 percentage points.[109] This rule is meant to both safeguard a general concept of fairness in transactions and protect the borrower from potentially entering into a debt spiral. However, it also deprives high-risk borrowers from access to credit if the lender would have to charge more than the legal threshold for the loan to become profitable to her (in terms of expected value).

To square individual protection of the borrower with maximum access to credit, these legal thresholds could be adapted to reflect the individual repayment probability of the borrower. Higher rates of interest may thus be legal vis-à-vis those who, based on data analysis, are predicted to be well-calibrated and to repay their loans on time in the current situation; this would yield a possibility for such well-calibrated individuals to become eligible for credit even under dire financial circumstances. For example, the threshold could be set at the market rate of interest plus 20 percentage points for borrowers with a proven history of timely repayments, or with a high ß factor close to one. Conversely, the threshold could be lowered to the market rate of interest plus 5 percentage points for badly calibrated subjects, who may be expected to default on loans with a higher interest rate. Again, this example shows that stronger personalization can bring the protective purpose of the norm into greater concordance with the legitimate interests of the acting person, i.e., maximum access to repayable credit.

---

[106] For the construction of an overconfidence metric (δ), see M. GRUBB and M. OSBORNE, 105. *American Economic Review* 2015, at 252-253.

[107] T. ODEAN, 89. *American Economic Review* 1999, p 1279.

[108] For another example, see O. BEN-SHAHAR and A. PORAT, *NYU Law Review* (forthcoming) (discussing negligence law).

[109] Bundesgerichtshof 13 March 1990, XI ZR 252/89.

6.3.2 Applicability of Mandatory Law

32. In contrast to usury prohibitions, mandatory law governing market transactions in the EU often does not apply to all market participants, but differentiates between subgroups deemed worthy of varying degrees of protection. Consumer and capital markets law are two cases in point: consumer law applies only in the presence of consumers, and capital markets law fundamentally distinguishes between retail and professional investors. However, these groups are also the epitome of heterogeneous subject pools, and personalization thus holds a great potential for refining these legal categories.

6.3.2.1 Consumer vs. Sellers

33. The inadequacy of the current consumer concept is epitomized by the Costea case decided in September 2015 by the CJEU.[110] The Court ruled that even a specialized commercial lawyer, when acting outside his business, should qualify as a consumer in all legal transactions. This points to a larger problem: European consumer law traditionally was, and to a large extent still is, based on the assumption that consumers are less sophisticated, potentially vulnerable parties,[111] subject to "abuse of power by the seller or supplier",[112] easily surprised or psychologically pressured when caught off-guard,[113] and thus in need of special, mandatory protection.[114] The design of consumer law creates a mismatch between this assumption and reality when highly sophisticated parties, including those with legal training and experience, are grouped together with truly unsophisticated and vulnerable groups. Conversely, sellers are not a homogenous group, either. They include both highly professional groups of companies such as Google, Walmart, or Daimler-Chrysler, as well as the small shop around the corner selling used books, and the tech start-up in a garage in the outskirts. The *uniform* scope of protection that mandatory consumer law affords, and the obligations it produces for sellers and traders, must necessarily either excessively restrict freedom of contract for sophisticated parties or fail to address the needs of unsophisticated actors. Given the highly heterogeneous pool of actors, a homogeneous design of consumer law will always face this dilemma of simultaneous under- and overprotection. The Consumer Rights Directive nonetheless flatly maintains that even particular vulnerability or other "specific needs should not lead to different levels of consumer protection."[115] Personalized law upends this credo by taking these special needs, or special capacities, seriously.

---

[110] ECJ 3 September 2015, *Costea*, EU:C:2015:538, curia.europa.eu/juris/documents.jsf?num=C-110/14.
[111] See, e.g., Recital 7 CRD.
[112] Recital 9, Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts, eur-lex.europa.eu/legal-content/ALL/?uri=CELEX:31993L0013 = *OJ* 1993, L 97/29.
[113] Recital 37 CRD.
[114] See, e.g., Recital 22 of the Directive 1999/44/EC of the European Parliament and of the Council of 5 May 1999 on certain aspects of the sale of consumer goods and associated guarantees, eur-lex.europa.eu/legal-content/ALL/?uri=CELEX:31999L0044 = *OJ* 1999, L 171/12; on the changing consumer paradigms in European law, see, however, H.-W. MICKLITZ, 'The Expulsion of the Concept of Protection from the Consumer Law and the Return of Social Elements in the Civil Law: A Bittersweet Polemic', 35. *Journal of Consumer Policy* 2012, p 283.
[115] Recital 34.

6.3.2.2 Retail vs. Professional Investors

34. A similar problem arises in investment law, which makes a fundamental distinction between retail and professional investors. Again, the rules for professional investors are designed to reflect the greater degree of rationality, sophistication and expertise of these actors (such as banks, investment firms, particularly large undertakings etc.[116]). For example, sufficient knowledge and experience is assumed for professional actors, and the exploratory duties of the investment service provider are waived.[117] Most disclosure duties are even fully waived vis-à-vis so-called eligible counterparties (Art. 30 MiFID II), a sub-category of professional investors comprising particularly large professional clients. However, at the European level, the financial crisis has also led to the insight that even professional actors and counterparties can be subject to cognitive biases and suffer from information overload, cf. Recital 104 of MiFID II. Conversely, it is clear that some retail investors, despite investing only moderate sums of money, are highly investment-savvy individuals with degrees in finance or business. Under the MiFID regime, retail investors can apply to be treated as professional investors if they fulfil certain objective criteria of expertise;[118] and professional investors can request non-professional treatment.[119] Thus, investment law already provides for some degree of personalization; however, it distinguishes on the basis of previous experience with investment and the size of the financial instrument portfolio, failing to capture more subtle differences in degrees of rationality or willpower, for example. Within both retail and professional investors, there is a spectrum of sophistication and rationality ranging from low to high. Big Data, again, can uncover these differences by specific analyses of previous investment behaviour, or by potentially correlating certain other data points, such as the types of books bought online, with degrees of financial sophistication. Such analyses are the starting points of personalized law, which goes beyond the retail-professional investor dichotomy. In sum, while the European legislator himself concedes a high degree of heterogeneity within the key categories of investment law, non-personalized law can only imperfectly match this insight with rules tailored to individual differences.

6.3.2.3 Toward a New Theory of Legal Categories

35. European private law, therefore, seems to need a new theory for the construction of its legal categories. Key categories, such as consumers and sellers, or professional and retail investors, are simultaneously over- and underinclusive. Legal categories, however, should strive to match reality as closely as possible. Since the law does not have direct access to reality, categorization will always use proxies to distinguish certain groups to which certain rules apply. These proxies can be easy to verify, such as objective monetary limits determining whether investors are regarded as retail or professional. Personalized law will often use proxy measures that are more difficult to calculate, such as the degree of bounded willpower, of optimism bias, or of financial sophistication. Big Data techniques help to determine such scores, but they are not infallible, either. As they can only uncover probabilistic correlations, the calculated scores may deviate from reality. However, this does not mean that the new

[116] See Annex II, I. MiFID II.

[117] Art. 35, para. 2 of the Commission Directive 2006/73/EC of 10 August 2006 implementing Directive 2004/39/EC, eur-lex.europa.eu/legal-content/ALL/?uri=CELEX:32006L0073 = *OJ* 2006, L 241/26.

[118] Annex II, II. MiFID II.

[119] Annex II, I.(4) MiFID II.

proxies are worse than the old ones. For the old proxy categories, such as "consumer" or "retail investor", it is thus often simple to determine whether a person belongs to them are not; but they do not adequately match the real need for the applicability of protective norms. Whether a person is endowed with or invests large amounts of money says little about whether she is able to handle investment decisions without advice or protective rules; and even experience does not eradicate bias, for example.[120] Simple categories therefore create but an illusion of regulatory fit; in fact, they do not prevent but rather invite regulatory error.

The new proxy categories of personalized law are more difficult to calculate, but if their measures can be sufficiently approximated with the help of Big Data, they provide a much closer match of reality. When results are statistically significant, they will often perform better than the current non-personalized regime. More granular, personalized categories promise to reduce regulatory error by minimizing false positive and false negative attributions of subjects to categories. By combining empirical rigor with digital technologies, they make significant differences legally relevant and thus, eventually, contribute to legal equality.

7 Conclusion

36. The key motivation for personalized law is to use digital technologies, such as Big Data and blockchain, for regulation which benefits the data subject instead of exploiting her. At the moment, data mining is most often used unilaterally by tech-savvy companies to further their idiosyncratic goals. If European private law is to fully step up to the challenges of the digital era, it needs to acknowledge the inherent ambivalence of algorithms, which may be used with different goals by different actors. This article proposes tapping the power of algorithms to respond to one of the key problems of private law today: actor heterogeneity. Currently, regulations sometimes do distinguish between different groups, such as consumers vs. sellers, or retail vs. professional investors. However, these large categories still comprise actors vastly different in their degree of rationality, willpower, vulnerability, or economic means. Using data to a large extent already available, Big Data can help to tailor laws to fit these individual characteristics, thus minimizing regulatory error. The relevant information can be stored, and updated, in a "legal blockchain", making it both pseudonymous and highly difficult to compromise. Laws can be personalized in ways that safeguard the right to privacy, a key component of the European digital agenda. Since differences between legal subjects are respected, the regulatory purpose can often be better achieved than by using a "one-size-fits-all" approach. This eventually contributes to legal equality: similarly situated subjects are treated similarly, and differently situated ones – differently.

[120] P. BREST and L. KRIEGER, *Problem Solving, Decision Making, and Professional Judgment* (Oxford: Oxford University Press 2010), pp 298-301.