

**TILBURG UNIVERSITY**  
**LAW SCHOOL**  
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Henrik Trasberg

**QUANTITATIVE LEGAL PREDICTION AND THE RULE OF LAW**

Supervisor: Ronald Leenes, prof.dr.

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# INTRODUCTION

## 1.1. Background

Creating an algorithm capable of correctly solving legal matters with high consistency is the holy grail of legal tech. There have been several waves of research into how the legal system could be automated, with the eventual goal of enabling machines to replace judges.<sup>1</sup> Already in 1949, Lee Loevinger proposed applying quantitative methods for law – an approach contrasting to jurisprudence that he coined as ‘jurimetrics’.<sup>2</sup> According to Loevinger, while jurisprudence is a philosophical approach where questions of law are subject to speculation, jurimetrics, in contrast, adopts scientific methods to infer relevant conclusions about law.<sup>3</sup> Essentially, as envisioned by Loevinger, questions of law could be determined by applying data-based investigation.

While Loevinger’s work remained as a theoretical proposal at the time, a new and more practical approach of automating law emerged in the 1980s in the form of legal expert systems.<sup>4</sup> The promise of legal expert systems comprised of translating legal rules into a machine-readable system of logic, enabling an algorithm to read law and apply it to specific circumstances. However, as the sources of law and interpretation of legal rules can be ambiguous and inconsistent, representing and applying law through logic-based automated legal systems has failed to deliver considerable success outside of some narrow use cases. Yet, in recent years a new wave of using artificial intelligence in law has emerged in form of data-driven machine-learning techniques. One of the most exciting domains within the emerging wave of artificial legal intelligence is quantitative legal prediction or, in short, QLP.

Quantitative legal prediction employs statistical means to predict various forms of outcome – such as what might be the litigation outcome; which arguments, evidence or case law might be relevant for a particular case; what might be the length of the litigation process; what are the possible costs of the case, etc.<sup>5</sup> The prediction model of QLP is created based on a dataset of previous cases, which the algorithm uses as input to “learn the correspondence between case

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<sup>1</sup> See for example Lee Loevinger, ‘Jurimetrics: The next Step Forward’ (1948) 33 *Minnesota Law Review* 455 <<http://www.jstor.org/stable/29761220>>; Anthony D’Amato, ‘Can/Should Computers Replace Judges?’ (1977) 11 *Georgia Law Review* 1277 <<http://heinonline.org/HOL/Page?handle=hein.journals/geolr11&id=1&size=2&collection=journals&index=journals/geolr>>; Lee Loevinger, ‘Jurimetrics: Science and Prediction in the Field of Law’ (1962) 3 *MULL: Modern Uses of Logic in Law* 187 <<http://www.jstor.org/stable/29760903>>.

<sup>2</sup> See ‘Jurimetrics: The next Step Forward’ (n 1). According to Loevinger, while jurisprudence is a philosophical approach where questions of law are subject to speculation, jurimetrics, in contrast, uses data-based investigation to infer relevant conclusions – Loevinger, ‘Jurimetrics: The next Step Forward’ (n 1) 31.

<sup>3</sup> Loevinger, ‘Jurimetrics: The next Step Forward’ (n 1) 23–26; 31.

<sup>4</sup> See more about the legal expert systems: G. Greenleaf, A. Mowbray, and A. L. Tyree, ‘Expert Systems in Law: The Datalax Project’, *Proceedings of the First International Conference on Artificial Intelligence and Law - ICAIL ’87*, 1987, 9–17 <<https://doi.org/10.1145/41735.41737>>; G. Greenleaf, A. Mowbray, and P. Chung, ‘Building Sustainable Free Legal Advisory Systems: Experiences from the History of AI & Law’, *Computer Law and Security Review*, 34.2 (2018), 314–26 <<https://doi.org/10.1016/j.clsr.2018.02.007>>.

<sup>5</sup> See more about QLP use-cases: Daniel Martin Katz, ‘Quantitative Legal Prediction—or—How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry’ (2013) 62 *Emory Law Journal* 909, 913–914 <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2187752](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2187752)>.

features and target outcomes.”<sup>6</sup> In the context of predicting outcome of a case, the above means that correlations are created between certain data available in court cases (such as who is the judge, what are the words used, which precedents are cited, what is the legal domain of the dispute, etc.) and the outcome of those cases, as a result of which certain value is assigned to each data point. Thus, instead of trying to mimic the legal argumentation-based prediction of a lawyer, QLP creates its own model via drawing correlations between case data and outcome.

On top of case outcome prediction, QLP can identify useful patterns regarding what are arguments, court precedence, evidences, etc. used in previous cases that most significantly correlate with a positive outcome. In fact, these correlations can be identified about specific regions, courts, judges or juries. Notably, this effectively enables to draw conclusions about what a judge might like or not like within the adjudication process.

Quantitative legal prediction is gaining increasing traction in academic community, legal market as well as general media. For example, a prediction algorithm developed in 2017 by Daniel Katz *et al.* is capable of correctly predicting 70,2 % of Supreme Court case outcomes.<sup>7</sup> In comparison, in a study carried out in 2012, legal experts were able to correctly predict only 59 % of the outcomes of Supreme Court cases.<sup>8</sup> In Europe, a team of academics have created a prediction model for European Court of Human Rights, allegedly capable of predicting the right outcome of the case, on average, with a 79 % accuracy.<sup>9</sup> Simultaneously, we are seeing a sprout of commercial projects such as Lex Machina, Predictice and Premonition, which provide law professionals (and in case of Premonitions – for law firm clients) data-based insight into what may be the most advantageous path in proceeding with a lawsuit, by suggesting which lawyers tend to be most successful with a particular judge, which cases the judge tends to cite, which legal arguments it adopts, etc.

It thus emerges that predictive justice<sup>10</sup> has started to generate a growing amount of excitement in the United States and European legal practices. While it would be far-fetched to presume that data-based models start replacing judges or administrative decision-making in the foreseeable future, their potential effect on the adjudication should not be underestimated. Prediction constitutes a fundamental part of the legal practice. As Oliver Wendell Holmes Jr., one of the most famous American jurists, has stated: „The primary rights and duties with which jurisprudence busies itself again are nothing but prophecies.“<sup>11</sup> QLP tools that would predict case outcomes, on average, with higher precision than lawyers or which outline certain

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<sup>6</sup> Kevin D Ashley, *Artificial Intelligence and Legal Analytics* (Kindle Edition, Cambridge University Press 2017) 107 <<http://ebooks.cambridge.org/ref/id/CBO9781316761380>>.

<sup>7</sup> D. M. Katz, M. J. Bommarito, and J. Blackman, ‘A General Approach for Predicting the Behavior of the Supreme Court of the United States’, *PLoS ONE*, 12.4 (2017), 1–18 <<https://doi.org/10.1371/journal.pone.0174698>>.

<sup>8</sup> Josh Blackman and Corey Carpenter, ‘FantasySCOTUS : Crowdsourcing a Prediction Market for the Supreme Court’ (2012) 10 *Northwestern Journal of Technology and Intellectual Property* Volume 125 <<https://scholarlycommons.law.northwestern.edu/njtip/vol10/iss3/3/>>.

<sup>9</sup> N. Aletras and others, ‘Predicting Judicial Decisions of the European Court of Human Rights: A Natural Language Processing Perspective’, *PeerJ Computer Science*, 2.M1 (2016), <<https://doi.org/10.7717/peerj-cs.93>>.

<sup>10</sup> The thesis occasionally adopts the term ‘predictive justice’ as a synonym to QLP. According to the definition provided by Council of Europe, predictive justice is „the analysis of large amounts of judicial decisions by artificial intelligence technologies in order to make predictions for the outcome of certain types of specialised disputes.“ – See Yannick Meneceur, ‘Small Glossary on Artificial Intelligence’, CEPEJ, Justice of the future: Predictive Justice and Artificial Intelligence Newsletter, No 16 (2018), 4 <<https://rm.coe.int/newsletter-no-16-august-2018-en-justice-of-the-future/16808d00c8>>.

<sup>11</sup> Oliver Wendell Holmes Jr., ‘The Path of Law’ (1897) 10 *Harvard Law Review* 457, 458.

tendencies of courts and judges, seemingly hold significant promise in enhancing lawyers' duty of prediction. However, there is a substantial difference between the prediction carried out by a QLP tool and lawyers. Lawyers' prediction of case outcomes is rooted in the various sources of law – e.g. regulations, rules of interpretation, fundamental legal principles – and the more subjective conception and experience of justice. Such prediction, in substance, models how the judges make their decisions.

The output by QLP, on the other hand, relies solely on data-based correlations – it is not based on semantic understanding of the laws themselves. In essence, use of these tools brings about a shift, which Mireille Hildebrandt refers to as “shift from reason to statistics”<sup>12</sup> – decision-making process by lawyers would no longer be solely based on their understanding of legal rules, their interrelations and interpretation, but strongly influenced by the data-based correlations identified by the algorithms.

In light of the development of machine-learning based technologies and the perennial accumulation of relevant data, QLP is likely to provide increasingly meaningful input for the litigation parties within the adjudication process – this can provide a new layer of transparency and knowledge that enables individuals to make more informed decisions and manage legal processes with better efficiency. For example, QLP can outline tendencies of a judge that would otherwise be outside of cognitive abilities of lawyers. Before and throughout the litigation process, this data provided by QLP can be the most tangible knowledge in pointing towards certain outcome, providing key input on whether to commence litigation in the first place, choice of jurisdiction, which motions to submit, whether to seek settlement, etc.

## 1.2. Legal Problem and Research Question

As the above illustrates, the added insight that QLP enables can provide meaningful impact for the litigation parties throughout the various stages of litigation. But adjudication is also a delicate system which serves to safeguard the effective functioning of the rule of law. It is through adjudication that the law is experienced by the people – it is a forum where an individual will interact with the legal system. Adjudication, thus, has a fundamental role in creating a positive perception of the legal system within the society and in ensuring treatment of individuals as „moral agents entitled to dignity and respect.“<sup>13</sup>

The rationale behind the subject matter of this thesis is rooted in the concern that the increasing shift from reason to statistics – which the QLP algorithms enable – will start to transform how adjudication is approached and perceived. As QLP based algorithms derive their conclusions by creating opaque and non-falsifiable correlations between various data points, it contrasts to the legal reasoning and legal argumentation that is firmly rooted in law. When we consider, for example, that QLP enables to make, on average, better predictions about litigation outcomes than lawyers, then its adoption as a basis for making litigation decisions seemingly diminishes the role of legal rules. This is effectively a risk management process, rather than 'seeking of

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<sup>12</sup> See M. Hildebrandt, 'Law As Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics' (2017) *SSRN* 458–60. <<http://dx.doi.org/10.2139/ssrn.2983045>>.

<sup>13</sup> Karen Yeung, 'Blockchain, Transactional Security and the Promise of Automated Law Enforcement: The Withering of Freedom Under Law?' (2017) King's College London Law School Research Paper Paper No. 2017-20 1, 6–7.

justice’, purporting pre-determination, as opposed to the idea that law is something that should be debated and formed within the adjudication process. This raises a number of questions, such as, how does relying on QLP for rendering a legally significant decision relate to the notion that individual is a moral agent that can contest and shape how human behavior should be governed within the adjudication process? Secondly, if QLP algorithms are able to increasingly identify patterns and tendencies about judges or courts, doesn’t this capability also enable to zoom into and exploit the disparities that exist within the legal system and the biases of particular judges? If so, would this undermine the fairness of adjudication by enabling to exploit factors that are not rooted in law? In order to tackle these questions, this thesis undertakes to identify how using QLP within the adjudication process interferes with the rule of law, seeking to answer the following research question:

**What are the principal rule of law implications of adopting QLP-based technologies within the adjudication process?**

Consequently, the thesis explores the following sub-questions:

1. What is the value and potential of using QLP for decision-making within the adjudication process?
2. What is the role of adjudication process in safeguarding the rule of law?
3. Does the adoption of QLP to decide whether to adjudicate or not undermine the role of adjudication?
4. In consideration of the fact that administration of justice is a key institution for ensuring the rule of law, how does the identification of tendencies of judges and courts – as potentially enabled by QLP – affect realization of the rule of law within the adjudication process?

### **1.3. Methodology and Literature**

The research will be conducted using doctrinal legal research, comprising of analysis of the academic literature on chosen capabilities and legal effects of QLP technology, as well as doctrinal analysis on the role of adjudication process in the theory of rule of law. To narrow the scope of the analysis, the thesis is limited to following two specific and prominent applications of QLP within the adjudication process – case outcome prediction and identifying patterns about judges and courts based on historical data.

There are several academic studies and theorizations on the technological feasibility of adopting QLP as a decision-making tool by courts.<sup>14</sup> Additionally, Mireille Hildebrandt outlines some of the important disruptions that the development of machine learning will incur on the rule of

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<sup>14</sup> See for example: Daniel Martin Katz, ‘The MIT School of Law? A Perspective on Legal Education in the 21st Century’ (2014) *University of Illinois Law Review* 1431 <<https://ssrn.com/abstract=2513397>>; Katz (n 5); Ashley (n 6); Aletras and others (n 9).

law,<sup>15</sup> while Ian Kerr,<sup>16</sup> Graham Greenleaf,<sup>17</sup> Emre Bayamlioğlu & Ronald Leenes<sup>18</sup> and Frank Pasquale & Glyn Cashwell<sup>19</sup> discuss, from the jurisprudential perspective, the possibility of adopting data-based decision-making by the judiciary or within other procedures of public administration. All of the above have provided valuable insight for this thesis about the future of jurisprudence and adjudication as a result of developments in machine learning. Furthermore, significant input for this thesis comes from Neil McCormick,<sup>20</sup> Jeremy Waldron,<sup>21</sup> Joseph Raz,<sup>22</sup> Oliver Wendell Holmes Jr.<sup>23</sup> and Karen Yeung<sup>24</sup> regarding the role of adjudication in safeguarding the rule of law – most notably concerning the importance of debating what is the legal norm within adjudication. Finally, it is necessary to outline Daniel Chen for the academic studies he has done in identifying biases of judges and the effects of such biases on case outcomes.<sup>25</sup>

It is evident that the academic community is increasingly attentive to the implications of machine learning and the shift towards data-based decision-making within the legal sphere. However, while there are theorizations on the rule of law interferences if QLP was adopted as a formal decision-making tool instead of a human being, there is no prior academic research on the more immediate impact that widespread adoption of QLP algorithms is bound to have: the rule of law interferences as a result of adoption of QLP by the litigation parties and their legal counsel in course of the adjudication process. Thus, this thesis aims to provide an initiatory exploration into this matter.

#### 1.4. Limitations and Preliminary Remarks

I have introduced some important constraints to limit the scope of the analysis. Firstly, QLP-based algorithms have a wide array of use-cases, including in the context of e-discovery or

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<sup>15</sup> Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics’ (n 12); Mireille Hildebrandt, ‘Law as Information in the Era of Data-Driven Agency’ (2016) 79 *Modern Law Review* 1.

<sup>16</sup> Ian Kerr, ‘Prediction, Pre-Emption, Presumption: The Path of Law After the Computational Turn’ (2013) *SSRN*. <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3395450](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3395450)>.

<<https://static1.squarespace.com/static/56b8dbd62eeb817f29aa3265/t/57675d1fd482e92ff40fcf66/1466391840142/SUBMISSION-Prediction-Presumption-Preemption-CFS.-August-2011-Website-Template-Edits.pdf>>.

<sup>17</sup> G. Greenleaf, ‘Review Essay: Technology and the Professions: Utopian and Dystopian Futures’, *UNSW Law Journal*, 40.1 (2015), 302–21.

<sup>18</sup> Emre Bayamlioğlu and Ronald Leenes, ‘The “Rule of Law” Implications of Data-Driven Decisionmaking: A Techno-Regulatory Perspective’ (2018) 10 *Law, Innovation and Technology* 295.

<sup>19</sup> Frank Pasquale and Glyn Cashwell, ‘Prediction, Persuasion, and the Jurisprudence of Behaviorism’ (2017) University of Maryland Francis King Carey School of Law Legal Studies Research Paper No. 2017-34 1 <<http://ssrn.com/abstract=3067737>>.

<sup>20</sup> Neil McCormick, *Rhetoric and The Rule of Law* (Oxford University Press 2005) <<http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199571246.001.0001/acprof-9780199571246>>.

<sup>21</sup> Jeremy Waldron, ‘The Rule of Law and the Importance of Procedure’ (2010) NYU School of Law, Public Law Research Paper No. 10-73 1 <<https://ssrn.com/abstract=1688491>>.

<sup>22</sup> Joseph Raz, *The Authority of Law: Essays on Law and Morality* (Oxford University Press 1979) <<https://www.oxfordscholarship.com/10.1093/acprof:oso/9780198253457.001.0001/acprof-9780198253457>>.

<sup>23</sup> Holmes Jr. (n 11).

<sup>24</sup> Yeung (n 13).

<sup>25</sup> See for example: Matt Dunn and others, ‘Early Predictability of Asylum Court Decisions’ (2017) *SSRN* <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2816191](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2816191)>; Daniel L Chen and Arnaud Philippe, ‘Clash of Norms: Judicial Leniency on Defendant Birthdays’ (2019) *SSRN* <<https://www.ssrn.com/abstract=3203624>>; Daniel Chen, Yosh Halberstam and Alan CL Yu, ‘Perceived Masculinity Predicts U.S. Supreme Court Outcomes’ (2016) 11 *PLoS ONE* 1 <<http://dx.doi.org/10.1371/journal.pone.0164324>>.

automated document assembly. However, as indicated above the thesis will specifically focus on the two most prominent functionalities of QLP – case outcome prediction and identifying patterns of decision-makers – whereas others are excluded from the analysis due to their presumably lesser effect on the rule of law.

Secondly, the thesis will focus on the impact that QLP-based technologies have on the decisions made by the *litigation parties* within the adjudication process. As such, the thesis refrains from substantially analyzing the use of QLP as a formal decision-making tool within the administration of justice (i.e. replacing judges with algorithms). The adoption of QLP as an official dispute resolution mechanism is a separate matter raising a different set of legal concerns as already analyzed by several legal scholars, while using QLP as a formal decision-making tool will require substantial development of the procedural law as well as the technology itself, which excludes applying QLP in such manner in the foreseeable future.

Finally, the thesis adopts near-future perspective when discussing the capabilities of the QLP technology, meaning that the abilities I attribute to QLP are largely derived from the current state-of-the art QLP-based algorithms, but in identifying some of the risks that the adoption of this technology may incur, I simultaneously also assume that its performance in identifying significant correlations in adjudication will continue to significantly improve within the upcoming few years.

## **1.5. Structure**

The thesis is divided into three substantial chapters, in addition to the introduction and the conclusion.

Chapter II explores the technical characteristics of QLP and analyses why QLP has become relevant – that is, what is the value of QLP and how it enables to augment the decision-making undertaken by litigation participants. Among else, I will look at the limitations of legal system, as a result of which court rulings are often influenced by extraneous factors and, consequently, become highly unpredictable providing an indication as to why data-based correlations and predictions are potentially able to provide significant input for making adjudication decisions. I will also make a brief introduction on the rule of law concept and the reasons why it is challenged by QLP.

Chapter III will analyze whether using QLP's capability to predict case outcomes as a mechanism for making litigation decisions interferes with the rule of law considering that QLP would thus function as key heuristic in deciding, for example, whether to litigate or not, while its suggestions/decisions have no basis in the legal rules.

Chapter IV analyses QLP's capability to identify various behavioral patterns of judges and seeks to establish whether QLP can be utilized as a tool to exploit the cognitive biases of judges and, if so, whether such exploitation should be regarded as undermining the rule of law.



## CHAPTER II: CHARACTERISTICS OF QLP AND THE LEGAL SYSTEM

### 2.1. Introduction

There is an occasionally re-surfacing notion about law that because legal rules are written down in a systematic manner, the legal domain should be easily subjected to automation.<sup>26</sup> This notion was especially evident during the 1980s in form of legal expert systems – it was conceived that all one has to do is to translate the existing body of rules and regulations into executable code to create an expert legal system that has the capability to perform complex legal reasoning.<sup>27</sup> As described by Kevin Ashley, the concept of expert legal systems is that they “not only model legal reasoning tasks but also actually perform them.”<sup>28</sup> In context of dispute resolution, such system would thus have the ability to deduct the outcome of a legal matter using logic-based legal reasoning.

Yet, the dream of widespread emergence of such legal expert systems has so far not come to pass. Instead, legal automation is increasingly shifting towards adopting data-based models in constructing legal prediction (using “brute force”, as Greenleaf puts it),<sup>29</sup> rather than seeking to derive legal conclusions from logic. To understand the reasons behind such tendency, this chapter will, firstly, proceed to briefly analyze why law (and applying the law) is difficult to capture via the logic-based legal expert systems while – simultaneously – significant conclusions can be drawn using QLP algorithms that lack any semantic understanding of the law.

Subsequently, I will explore the characteristics of QLP, its potential, limitations and the emerging commercialized applications. I will also briefly analyze the notion of rule of law and outline some of the rule of law concerns which hinder adoption of QLP-based algorithms within formal decision-making processes (e.g. to replace judges) in the near future.

### 2.2. Limitations of Law and Adjudication

As indicated above, the idea behind legal expert systems was to capture the intellectual thought process of a lawyer by understanding and transforming this process into computational steps. That means teaching the algorithm legal rules and the mechanism of applying such rules to a set of circumstances, which results in the algorithm being capable of outputting a reasoned position on how the particular set of circumstances is to be regulated. This effectively mimics how a lawyer is supposed to think.

While the logic-based systems can be efficient in solving simple matters, their use for predicting case outcomes is rather limited. Firstly, the intricate circumstances that life can throw at law make it impossible to foresee and proactively regulate all legal conflicts. Thus, law is

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<sup>26</sup> Greenleaf, Mowbray and Chung (n 4) 317.

<sup>27</sup> Such notion was, for example, purported by Donald Michie and Rory Johnston, *The Creative Computer: Machine Intelligence and Human Knowledge* (Hardcover, Viking 1984); See the Datalex project as an example of an attempt to create legal expert system: Greenleaf, Mowbray and Tyree (n 4) 2–6.

<sup>28</sup> Ashley (n 6) 4.

<sup>29</sup> Greenleaf (n 17) 312.

constructed as an abstraction, which can be fully substantiated only in light of the particular circumstances. This means that logically deducting one correct answer from the body of law becomes very difficult very quickly. Simultaneously, applying law is rarely a simple formalized deduction made based on the canon. While law should be a holistic and well-structured system of rules, it simply isn't. Rather, legal rules are ambiguous, often created so purposefully to ensure that their abstract nature enables the necessary flexibility to respond to all relevant circumstances that require governance. As a result, settled practices on how law applies to certain matters is not established in existing regulation, but can only be extracted from prior case law. Extracting information from previous case law also has its challenges, as it requires a high level of understanding the particularities of the case. In addition, "the meaning of a case, or indeed of a word in a statute, might change over time as the body of basic legal materials change; there is a constant need to interpret and reinterpret fundamental legal source material."<sup>30</sup> Therefore, it is necessary to have a deeper understanding of legal development to distinguish obsolete case law from the relevant. As outlined by Greenleaf et al: "Because of the [...] difficulties of formulating legal rules from the primary sources, lawyers have developed a large body of very informal knowledge which assists in understanding and reasoning with the body of more formal legal knowledge."<sup>31</sup>

It thus emerges that the legal system has a knowledge representation bottleneck – there are many different types of legal sources, the relevance and superiority of which is often ambiguous and changes over time, making it difficult to establish a coherent system of legal rules. Due to these reasons there exist many cases to which Dworkin refers to as 'hard cases' – cases in which "the result is not clearly dictated by statute or precedent."<sup>32</sup>

In addition to law being (partially) ambiguous and inconsistent, resolving a legal matter is further complicated by the fact that, in practice, legal disputes must be debated in conditions of limited knowledge and finite resources. As a result, the outcome of adjudication is strongly influenced by the particular facts and evidences the judge accepts and how it chooses to interpret the law in the specific circumstances it has regarded as being true. For example, if an action is deemed a violation of law, then provided that the alleged offender acted with negligence the judge is not only required to identify and apply the relevant legal norm, but must ascertain what is the action that took place, whether there existed conditions that point towards or against a negligent behavior (whereas behaving 'negligently' is a relatively subjective characteristic), whether the existence of the conditions is proven and whether the evidence that provides proof has been gathered lawfully. Even if the facts and the applicability of a particular legal norm are ascertained, there *still* remains the question of how should the law and the legal theory be interpreted in context of the very specific conditions that were established as truth in the particular case.

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<sup>30</sup> Greenleaf, Mowbray and Tyree (n 4) 4.

<sup>31</sup> *ibid.* In context of legal expert systems, this has some important consequences, as stated by Greenleaf et al.: "This [informal] knowledge must somehow be incorporated into any useful legal expert system. In applying this knowledge to the interpretation process, lawyers routinely use a wide variety of reasoning processes. These range from straight deductive reasoning, which is relatively easy to incorporate into an expert system, through analogical reasoning, particularly when dealing with case law and matters of interpretation, to some form of common sense which relies on a large body of seemingly extraneous knowledge" - *ibid.*

<sup>32</sup> Ronald Dworkin, 'Hard Cases' (1975) 88 *Harvard Law Review* 1057, 1 <<https://www.jstor.org/stable/1340249?origin=crossref>>.

Therefore, applying the law by courts goes beyond the mere mechanical process of identifying the relevant legal rule from the body of norms. In fact, since the legal realism movement in the 20<sup>th</sup> century, there is a general acceptance that it is not only the positivistic norms which regulate judges' behavior, but moral motivation that is rooted in psychology and neuroscience.<sup>33</sup> This means that the ideologies, attitudes, emotions, heuristics and other extraneous factors end up playing a key role in the judges' decision-making process, further influenced by the adversarial argumentation taking place within adjudication process.<sup>34</sup> It, thus, could be observed that the law often ends up functioning as a mere signpost in determining what is the outcome of a dispute.

Considering that the law is riddled with inconsistencies and the factual circumstances of the dispute can be difficult to ascertain, the judge has a significant role in shaping the outcome. While this hints towards why the legal expert systems struggle when the matter exceeds certain basic obviousness, there is something in this ambiguity that can be captured by the quantitative legal prediction models.

### 2.3. Overview of Quantitative Legal Prediction

This current wave of legal artificial intelligence has abandoned the idea of algorithms mimicking the thought process of lawyers. Rather, the predictive justice algorithms turn to quantitative approaches, i.e. utilizing brute-force processing of data.<sup>35</sup> The development in this field is propelled by the increasing computing power, declining data storage costs, better access to data and improvements in machine learning and other artificial intelligence technologies.<sup>36</sup>

Specifically, quantitative legal prediction is based on supervised machine learning techniques which employ data of previous cases as input to predict the result of a future case.<sup>37</sup> This method applies statistical means to “induce a prediction model (or function) from a dataset that can be used to predict an outcome for a new case.”<sup>38</sup> QLP thus creates an “inverse” model in which correlations are created between certain elements available in the case (such as specific words used) and the outcome of a case, as a result of which certain value is assigned to each element. As described by Katz, “[s]imply put, one uses the observables to build the model rather than using the model to assign causal weight to those observables.”<sup>39</sup> In context of legal prediction, this means that certain parameters or features of a case (e.g. who is the judge, what is the

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<sup>33</sup> See more about legal realism: Michael S Green, ‘Legal Realism as Theory of Law’ (2005) 46 William and Mary Law Review 1915.

<sup>34</sup> The above is merely meant to provide a brief introduction into why applying law and resolving legal disputes is considerably more complicated than one might conceive. Several of the above-mentioned factors which influence case outcomes will be further elaborated on when discussing the effects of QLP in Chapters III and IV.

<sup>35</sup> Greenleaf (n 17) 312; For a further description of utilizing big data for building legal prediction models see Richard Susskind and Daniel Susskind, *The Future of the Professions: How Technology Will Transform the Work of Human Experts* (Oxford University Press 2015) 226–228 and 276–278.

<sup>36</sup> An overview of advances in computer hardware and artificial intelligence powering the development of quantified legal prediction is provided by Katz (n 5) 913–923.

<sup>37</sup> It is regarded as „supervised“ since it involves inferring a classification model from labeled training data – see Ashley (n 6) 109. Ashley further explains the functioning of supervised machine learning: „The training data comprise a set of examples that have been assigned outcomes. Each example is a pair consisting of an input object (often a vector of feature values) and a desired output value. The learning algorithm needs to generalize from the training data to unseen situations.“

<sup>38</sup> *ibid.*

<sup>39</sup> Katz (n 5) 952.

subject-matter of the case, which words or phrases are present in the case documentation, etc.) are assigned a value that would indicate which way a case would be decided based on past patterns.<sup>40</sup> It is worth noting that the QLP tools will not discover the features that influence outcomes, but instead learn the weights of such features.<sup>41</sup>

Quantified legal prediction is what Daniel Katz categorizes as “soft artificial intelligence” in the sense that the algorithms aim to achieve outcome that would mimic human intelligence while the process to achieve the outcome does not.<sup>42</sup> There is thus no legal reasoning employed in the predictions of the quantified prediction models. Importantly, data-based prediction models require elements that are relatively simple to extract – there is no input needed from the larger body of legal system. There is also no knowledge representation bottleneck that arises with the legal expert systems as the model does not require semantic understanding or the context of the information extracted.

## 2.4. Applications of QLP

QLP can serve many purposes, one of the more intriguing of which is predicting court case outcomes – seemingly with a better precision than legal experts. An example of such functionality is the algorithm developed by Katz et al. which enables to predict US Supreme Court case outcomes with 70,2 % accuracy.<sup>43</sup> While such prediction models largely dismiss legal causality, Katz considers that “it is not always necessary to have a deep theory in order to generate a well-functioning prediction engine.”<sup>44</sup> The algorithm by Katz et al. uses as input information about the case (e.g. who are the parties, type of law, the source circuit court, the judgement at lower court, issue area), background information (e.g. name of judge(s), age and gender of judge, party of the appointing president) and trends (e.g. historic trends of Supreme Court, current trends of Supreme Court, trends of lower courts, trends specific to individual Supreme Court justice) in creating the outcome prediction.<sup>45</sup> In a study conducted by Blackman et al. in 2012, three distinguished legal experts were tasked with predicting outcomes of 171 SCOTUS cases, predicting correctly only 59 % of the cases.<sup>46</sup> While this sample is too small to make exhaustive conclusions, it does give promise to the idea that QLP can predict case outcomes, on average, with a better accuracy than expert lawyers and could thus emerge as a genuine mechanism for making litigation decisions.

Using meta-data from previous cases to draw conclusions about emerging legal matters is also employed by many commercialized predictive justice products (for example, Premonition, Blue J Legal, Courtquant and Predictice). In some domains of law this may be particularly effective: a prediction model developed by Dunn et al. was able to predict judge’s ruling in asylum applications with 80 % accuracy while merely having information about the judge and the applicant’s nationality.<sup>47</sup> Blue J Legal, which creates its predictions by combining data-based

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<sup>40</sup> See *ibid* 952–953.

<sup>41</sup> Ashley (n 6) 125.

<sup>42</sup> See Katz (n 5) 913 and 918.

<sup>43</sup> Katz, Bommarito and Blackman (n 7).

<sup>44</sup> Katz (n 5) 950.

<sup>45</sup> Katz, Bommarito and Blackman (n 7) 7.

<sup>46</sup> Blackman and Carpenter (n 8).

<sup>47</sup> Dunn and others (n 25).

prediction based on patterns from prior case law with input provided by the user, is able to consistently predict correctly over 90 % of outcomes of tax law cases in Canada.<sup>48</sup>

The algorithm developed by Aletras et al., which predicts cases of European Court of Human Rights with a 79 % accuracy, has adopted a different direction – instead of assigning value to certain meta-data, it creates correlations between sequences of words (n-grams)<sup>49</sup> available in certain parts of a case (e.g. the legal circumstances and facts) and case outcome. For example, the term ‘second applicant’ has a significant correlation with ECtHR identifying an infringement. Another similar model was able to predict ECtHR case outcomes with 75 % accuracy.<sup>50</sup> Potentially, such algorithm could be provided the lawsuit application and/or other case documentation as input and, based on the language used in the input, it predicts (the likelihood of) positive/negative outcome.<sup>51</sup>

There are many other models developed to predict, for example, security fraud class actions and settlement amounts,<sup>52</sup> likelihood of patent being litigated,<sup>53</sup> and appeal decisions in tax law in Germany.<sup>54</sup> The knowledge that these tools provide can enable valuable input for significant litigation decision, for example whether to litigate or not as well as whether to seek compromise or discard specific claims. One could envision that if the prediction accuracy of these models continues to significantly rise, they may be adopted by courts and other public institutions for making administrative decisions and solving legal disputes (on this matter, see Section 2.7. below).

In addition to case outcome prediction, QLP also enables some other significant use-cases. To bring a few examples, QLP-based algorithms can mine and aggregate information from prior case that enables, for example, to predict how long the case might take, what are the likely legal costs, what is the best way to staff a particular legal dispute, etc.<sup>55</sup> But most significantly, predictive justice tools can identify certain patterns about how the courts and the judges operate, such as which prior cases a particular judge likes to refer to, how the judge tends to decide in non-obvious cases in regard of a particular subject-matter, whether there are certain lawyers that tend to win with a particular judge, what are the types of arguments that the judge tends to embrace, etc. These patterns, which are largely based on the data about how the judge has ruled in the past, render the adjudication process more transparent as they provide insight into what a particular judge might find relevant in regard of a certain legal debate. This enables legal counsel to make better strategic decisions and tailor the legal arguments within the adjudication process for the particular judge. In light of the notion that the judge’s decision is influenced by its attitudes, biases and other cognitive processes, the input into tendencies of a judge can have

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<sup>48</sup> Benjamin Alarie, Anthony Niblett and Albert Yoon, ‘Using Machine Learning to Predict Outcomes in Tax Law’ (2017) SSRN <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2855977](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2855977)>.

<sup>49</sup> N-grams are contiguous word sequences within the text. See Aletras and others (n 9) 8–9.

<sup>50</sup> Masha Medvedeva, Michel Vols and Martijn Wieling, ‘Judicial Decisions of the European Court of Human Rights: Looking into the Crystall Ball’ (2018) University of Groningen, Department of Legal Methods 1 <<http://martijnwieling.nl/files/Medvedeva-submitted.pdf>>.

<sup>51</sup> Whether that is actually feasible is analyzed in Section 2.5. below.

<sup>52</sup> Blakeley B Mcshane and others, ‘Predicting Securities Fraud Settlements and Amounts: A Hierarchical Bayesian Model of Federal Securities Class Action Lawsuits’ (2012) 9 Journal of Empirical Legal Studies 482.

<sup>53</sup> Colleen V Chien, ‘Predicting Patent Litigation’ (2011) 90 Texas Law Review 283.

<sup>54</sup> Bernhard Walzl and others, ‘Predicting the Outcome of Appeal Decisions in Germany’s Tax Law’ (2017) 10429 (eds) Electronic Participation. ePart 89 <[http://link.springer.com/10.1007/978-3-319-64322-9\\_8](http://link.springer.com/10.1007/978-3-319-64322-9_8)>.

<sup>55</sup> Katz (n 5); Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics’ (n 12) 11.

transformational impact on the transparency of adjudication and the predictability of a judge's actions.

As another use-case, there are some QLP-based software being adopted by the decision-makers within (pre-)adjudication process. For example, a few US courts are using data-based tools to assess the risk of recidivism of convicted criminals – a major factor in contemplating the choice and extent of punishment.<sup>56</sup> In law enforcement, predictive justice tools are used for assessing whether a suspect should be held in pre-trial detention or not.<sup>57</sup>

What QLP thus promises is an augmented insight into what might be the outcome of a particular case, enabling to make smarter decisions related to commencing litigation or in course of the adjudication process. This value should not be understated – lawyers are surprisingly bad at predicting outcomes of court cases that exceed certain basic level of difficulty.<sup>58</sup> Furthermore, while a lawyer's ability to reason far exceeds any algorithm, humans' capacity to shift through thousands of court cases and identify correlations from historic patterns that may play a significant role in the outcome of a current case or provide insight into behavior of the judge is dwarfed compared to the ability of AI. QLP thus enables lawyers to overcome some of the cognitive limitations of the human brain.

## 2.5. Limitations of QLP

Despite its potential, QLP simultaneously contains some significant limitations which hinders its adoption within the adjudication process. Firstly, the usefulness of a prediction algorithm depends on identifying variables that reliably correlate with case outcome while also being readily available prior to or in an early stage of the adjudication. For example, the model developed by Aletras et al. was trained by seeking correlations between case outcome and the procedure, facts, law and circumstances of the case that were written *in the actual judgment*. It is evident that the choices made in drafting the text on circumstances and facts of the case will be significantly influenced by the outcome that is established in the same judgment. Thus, it is unknown (not to say: extremely unlikely) that the model of Aletras et al. would have any reliability when it is ordered to predict outcome based on the input that is extracted from the lawsuit application or any other documentation available before the judgment.

Secondly, many of the correlations between input data and output that the QLP algorithms identify may be misleading. As framed by Cashwell and Pasquale, “Any student of statistics knows, if one tests enough data sets against one another, spurious correlations will emerge.”<sup>59</sup>

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<sup>56</sup> For example, Compas software by Equivant is used by several courts in US. See Adam Liptak, 'Sent to Prison by a Software Program's Secret Algorithm', The New York Times, 01.05.2017. <<https://www.nytimes.com/2017/05/01/us/politics/sent-to-prison-by-a-software-programs-secret-algorithms.html>>. However, it must be noted that using the Compas software has been met with significant scepticism – see for example Jason Tashea, 'Courts Are Using AI to Sentence Criminals. That Must Stop Now', Wired Magazine, 17.04.2017 <<https://www.wired.com/2017/04/courts-using-ai-sentence-criminals-must-stop-now/>>. See also Ed Yong, 'A Popular Algorithm Is No Better at Predicting Crimes Than Random People', The Atlantic, 17.01.2018. <<https://www.theatlantic.com/technology/archive/2018/01/equivant-compas-algorithm/550646/>>

<sup>57</sup> Nick Statt, 'UK police will start using AI to decide whether suspects should be kept in custody', The Verge, 10.05.2017. <<https://www.theverge.com/2017/5/10/15614980/uk-durham-police-ai-risk-assessment-policing>>

<sup>58</sup> See analysis of the study by Jane Goodman-Delahunty, Maria Hartwig, and Elizabeth F Loftus in Section 3.3.

<sup>59</sup> Pasquale and Cashwell (n 19) 9.

There is thus a considerable likelihood that the correlations between majority of the n-grams or other factors taken into account by the QLP algorithms, in reality, do not provide any useful knowledge about the outcome but are, in fact, spurious.

In addition to the (current) technical limitations which restrict the usefulness of the QLP algorithms, their approach to solving legal disputes fundamentally clashes with the notion of law and the rule of law, causing a great number of legal challenges. The issue emerges from the fact that the output of QLP is based on the seemingly random correlations that the algorithm has identified, rather than “inferences from any causal model.”<sup>60</sup> As such, the insights it provides ignore the substantial merits of the case. In fact, the current quantitative legal prediction models give no regard to semantic understanding of legal arguments or legal deduction. Consequently, these algorithms are not able to provide an explanation, not to mention legal reasoning, for the conclusions reached. On this note, Susskind argues that in many areas “we can develop high performing, non-thinking machines that can outperform the best human experts, even though they go about their business in quite unhuman ways” and thus “we will not need to understand and then replicate the way human experts work, nor will we need to develop thinking machines to replace much of the work currently undertaken by human professionals.”<sup>61</sup> Yet, does our idea of law permit a situation where important (legal) decisions have no causative basis in law?

Evidently, it raises some significant concerns. For example, as the output of QLP is not cast into form of legal argumentation and the reasoning (logic) based on which the algorithms reach conclusions remains opaque and unintelligible, the decision or a suggestion of a QLP-based algorithm effectively cannot be contested.

Furthermore, these models are never „unbiased, objective nor neutral in their prediction“ but are „affected by a series of design decisions by its developers.“<sup>62</sup> Notably, developing the model requires a trade-off „between volume, relevance, completeness, accuracy and correctness of the training dataset, the dimensionality and aptitude of the hypotheses space, the time taken for iterant testing, and the availability of the relevant domain expertise.“<sup>63</sup> Since these choices will significantly influence the conclusions reached by the model, it essentially means that the developers of the algorithms will have the power to direct the output of a model and thereby influence legal decision-making.

The above-described limitations hint towards some of the rule of law implications that arise with the emergence of data-based legal decision-making. However, before going into the specifics of the rule of law implications that QLP brings about, I will provide a brief introduction into the rule of law concept.

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<sup>60</sup> See Greenleaf (n 15) 312.

<sup>61</sup> Susskind and Susskind (n 35) 276; See also Greenleaf (n 17) 312.

<sup>62</sup> Mireille Hildebrandt, ‘Algorithmic Regulation and the Rule of Law’ (2018) *Phil.Trans.R.Soc.A* 1, 7 <<http://dx.doi.org/10.1098/rsta.2017.0355>>.

<sup>63</sup> Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics’ (n 12) 10.

## 2.6. The Basics of the Rule of Law

The rule of law is one of the four key pillars that helps to ensure our society's political morality – in addition to democracy, human rights, and economic freedom.<sup>64</sup> As per Karen Yeung, „[t]he essential purpose of the rule of law is to provide the basic framework for establishing a society in which strangers can cohabit and cooperate, establishing the foundations for social stability through which the state guarantees security of the person, property and transactions.“<sup>65</sup> It does so by establishing that everyone must obey a system of regulation. This system is created, implemented and enforced by a set of (public) institutions such as parliament, the court system, law enforcement agencies, but also, for example, prosecutors and lawyers.<sup>66</sup> Consequently, there emerges a set of rules which govern the behavior of citizens and other legal subjects, and to the extent laws have been violated, the infringers can be „identified, held to account to the community and, where appropriate, subjected to sanctions that have themselves been imposed in accordance with legally binding rules that condition the lawful implementation and enforcement of law.“<sup>67</sup>

There are many angles from which the rule of law concept can be approached, but in light of the topic of this thesis, the static-dynamic dichotomy of rule of law seems the most pertinent. The static aspect of the rule of law prescribes that the most important value of the rule of law is the promise of legal certainty and creating legal expectations for individuals.<sup>68</sup> This approach ensures that individuals can efficiently predict what they may and may not do, granting them the necessary stability about how their choices affect their future. For example, this explains why laws and court rulings are (generally) publicly available and why they are intended to be resistant to being constantly amended, while being as clear and understandable as feasible. As converged by Waldron: „In F.A. Hayek's theory of the Rule of Law, we value these features for the contribution they make to predictability which Hayek thinks is indispensable for liberty. In Lon Fuller's theory, we value them also for the way they respect human dignity.“<sup>69</sup> By respecting human dignity, Fuller considers that people have a right to self-determination, which is compromised if the individuals' behavior is regulated by rules that are not made available to them.<sup>70</sup>

But the ultimate purpose of the rule of law is not only about creating absolute foreseeability of what is permitted. The rule of law also has a dynamic aspect which, as phrased by McCormick, is the notion of „letting everything that is arguable be argued.“<sup>71</sup> In essence, it accepts the idea that law also has an arguable character. This arguable character is not only a matter of fact, but in itself an important element of the rule of law – it is through the legal debate that takes place in the society amongst its members that the abstract laws are melded into rules that govern specific circumstances. When we accept that law has an arguable character, we accept individuals as moral agents who can exert their right to defend themselves when incriminated and participate in how a certain behavior is to be governed. The dynamic notion of the rule of

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<sup>64</sup> Waldron (n 21) 1.

<sup>65</sup> Yeung (n 13) 4.

<sup>66</sup> See also *ibid.*

<sup>67</sup> *ibid.*

<sup>68</sup> See Friedrich A Hayek, *The Constitution of Liberty* (University of Chicago Press 1960) ch 9 and 10; Waldron (n 21) 2; MacCormick (n 20) 28–31.

<sup>69</sup> Waldron (n 21) 2.

<sup>70</sup> Lon L Fuller, *The Morality of Law* (Yale University Press 1969) 162; See also Waldron (n 21) 2.

<sup>71</sup> MacCormick (n 20) 31.



law is especially relevant in assessing the impact that predicting case outcome with QLP algorithms has on the adjudication process and is analyzed further in Chapter III of the thesis.

Another aspect of the rule of law that is particularly relevant for the discussion to come in this thesis is its role in ensuring legal procedure. The institutions that create, implement, apply or enforce law must themselves respect the values underlying the rule of law by committing to pre-determined rules of procedure. In addition to legal certainty, this helps to safeguard human autonomy and dignity by ensuring that state institution cannot arbitrarily intervene in people's lives. Thus, the process of adjudication respects the rule of law by committing to a due process, which establishes clear rules of procedure and grants litigation parties rights such as the right to a hearing, to representation, to present evidence, to make legal arguments, to have a decision legally justified, to appeal, etc.<sup>72</sup>

In light of the emerging QLP-based technologies, it has been described above how QLP can be utilized for a number of different purposes, some of which have a more direct interference with the rule of law than others. Most notably, it is important to distinguish adoption of QLP-based algorithms used within formal decision-making processes, i.e. in adjudication or other public administration procedures, as opposed to informal decisions.<sup>73</sup> The section below will briefly analyze the rule of law interferences which emerge with adopting QLP within formal decision-making processes.

## **2.7. Replacing Judges with QLP?**

It has been envisioned that as the technology develops, QLP could emerge as basis of court rulings or in rendering administrative decisions by other public institutions. In such occurrence, an automated decision-making system (hereafter referred to as "ADM system"), which utilizes QLP, would replace or augment the conscious implementation of norms by a human official and thereby regulate behavior of the individuals subject to the decision. In the adjudication process, this does not only suggest using QLP for reaching verdicts, but also for secondary decisions, such as deciding which claims to dismiss, assigning priority to cases (i.e. a triage tool), deciding which motions to accept, which evidence to reject or for other particular decisions within the adjudication cycle. A few examples and emerging projects regarding introducing QLP-based technologies into formal adjudication process have emerged over the past couple of years.<sup>74</sup>

There is already a growing amount of literature which explores using automated data-driven algorithms for adopting decisions in court or other state institution, and the rule of law concerns

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<sup>72</sup> See Waldron (n 21) 4.

<sup>73</sup> By informal decisions I refer to the decisions undertaken by litigation parties during and before the adjudication process – most importantly, for deciding whether to litigate or not and whether to settle (seek settlement) or not. In contrast, formal decision-making processes, in the context of this thesis, refer to the binding decision taken about individuals or other private actors within adjudication process, by the court or another administrative authority.

<sup>74</sup> See the examples in footnotes 54 and 55 on how some US courts utilize the Compas tool to assess the likelihood of recidivism of convicted criminals and UK law enforcement agencies using predictive justice tools for assessing whether a suspect should be held in pre-trial detention or not. More intriguingly, Estonia is currently developing an ADM system "that could adjudicate small claims disputes of less than €7,000", although it is yet to be seen to what extent such system derives its conclusions from data-based correlations – see Eric Niiler, 'Can AI Be a Fair Judge in Court? Estonia Thinks So', *Wired Magazine*, 25.03.2019. <<https://www.wired.com/story/can-ai-be-fair-judge-court-estonia-thinks-so/>>

that this might incur.<sup>75</sup> As such, this thesis does not seek to analyze this matter further; however, to provide context, I will explore some of the rule of law implications of QLP-based ADM systems.

ADM systems, most notably, interfere with the rule of law due to their regulatory capacity. As per Emre Bayamlioglu and Ronald Leenes, while ADM systems are more than capable of behavioral modification, they neglect the „internal perspective that deals with checks and balances of the rule of law“ – particular issue being contestability of decisions of ADM system.<sup>76</sup> For example, ADM systems undermine human autonomy if they do not enable individuals to decide whether to follow the norm or not<sup>77</sup> and by not being open to scrutiny, ADM systems lack transparency and moral accountability.<sup>78</sup>

Among else, the authors outline that the normative basis of ADM systems is opaque – rather than being predetermined, the 'norm' „emerges (autonomously) from the (dynamic) data used for training the system.“<sup>79</sup> This has several implications: the role of law as the normative basis within the decision-making process diminishes, rule-makers lose some of the control over whether their (legislative) intentions have been adhered to by the ADM system and the individuals subject to the ADM system's decision are not able to comprehend the reasoning behind the decisions.<sup>80</sup>

Furthermore, data-based ADM systems would effectively replace the causative basis with correlative calculations. It refers to the fact that legal effects *should* be a matter of causation – that is, the notion of the rule of law foresees that a certain behavior of an individual triggers specific legal effects established by law. In contrast, ADM systems create their own data-based correlations which function as the basis for rendering decisions and thereby bring about “the demise of law as the causative enterprise.”<sup>81</sup> As this process would be unintelligible for a litigation party and as the correlation-based decisions cannot essentially be contested by a rational and legal argumentation, this effectively undermines human autonomy.<sup>82</sup>

Thus, even if the technological development would render ADM systems more efficient, objective and fair than the existing adjudication procedure, the adoption of such systems would undermine some of the fundamental values such as human autonomy, transparency and contestability that the adjudication process – and the rule of law – seeks to safeguard. This illustrates that the properties of QLP are largely incompatible with the due process that the rule

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<sup>75</sup> See for example Frank Pasquale, 'A Rule of Persons, Not Machines: The Limits of Legal Automation' (2018) *University of Maryland Francis King Carey School of Law Legal Studies Research Paper* 1–61 <<https://doi.org/10.1016/j.ajog.2007.02.038>>; Bayamlioglu and Leenes (n 18).; Timothy D Robinson, 'A Normative Evaluation of Algorithmic Law' (2017) 23 *Auckland University Law Review* 293. Hildebrandt, 'Algorithmic Regulation and the Rule of Law' (n 62). Thomas Julius Buocz, 'Artificial Intelligence in Court Legitimacy Problems of AI Assistance in the Judiciary' (2018) 2 *Copenhagen Journal of Legal Studies* 41 <<http://courtmanagement.in/paper-detail.php?id=23>>; Tania Sourdin, 'Judge v Robot? Artificial Intelligence and Judicial Decision-Making' (2018) 41 *UNSW Law Journal* 1114 <<http://www.unswlawjournal.unsw.edu.au/article/judge-v-robot-artificial-intelligence-and-judicial-decision-making/>>.

<sup>76</sup> Bayamlioglu and Leenes (n 18) 303-304.

<sup>77</sup> Ibid 309.

<sup>78</sup> Ibid 311.

<sup>79</sup> Ibid 306.

<sup>80</sup> See Ibid 305–307.

<sup>81</sup> Ibid 307.

<sup>82</sup> Ibid 308.

of law requires to be respected within administration of justice. To reach a stage where governance of justice could be trusted to a data-based mechanism will require a significant development of the legal system and the technology as well as gain acceptance by the general public.

## **2.8. QLP and the Informal Litigation Decisions**

Applying QLP-based software by the litigation participants to assist with decisions such as whether to litigate, when to litigate, which motions to submit, which might be the most advantageous venue of adjudication – i.e. the informal litigation decisions – does not necessarily bring about the rule of law implications described above. While the underlying technology of ADM systems used for rendering formal decisions and QLP tools used within informal decision-making processes can be identical, ADM systems have a regulatory capacity – that is, they are used to systematically modify and control the behavior of citizens – which the informal use of the technology lacks. The QLP algorithms subject to this chapter, on the other hand, do not have any formal administrative capacity, nor are they used as a form of behavior regulation by public authorities. Yet, the shift towards data-based decision-making raises some concerns from the rule of law perspective, even when used by litigation parties within their personal decision-making capacity.

There are a number of ways in which the various uses of the QLP algorithms can potentially interfere with the rule of law. For example, Hildebrandt outlines four disruptions which emerge with the shift from law as information to law as computation and may influence the formal and informal decision-making alike: (i) highly efficient QLP-based systems may cause deskilling of legal experts, making it increasingly difficult to actually test the accuracy of the system (ii) increased opacity of the decision-making mechanism renders the decisions inscrutable and incontestable, (iii) shift towards simulation undermines reason and argumentation, and (iv) developing and testing the new system may undermine some of the fundamental rights (e.g. non-discrimination, right to privacy or presumption of innocence).<sup>83</sup>

This is a rather abstract and non-exhaustive list of possible implications of large-scale adoption of data-based decision-making within legal service market. In fact, if opaque correlations begin to provide a more accurate insight into how law applies than the actual knowledge of the law, this may begin to deeply transform our understanding of jurisprudence. However, it is not the level of abstraction that this thesis, going forward, intends to adopt. Rather, I will hereafter analyze two of the most significant application of QLP algorithms within the informal decision-making capacity and the particular manner in which they interfere with the realization of the rule of law.

Firstly, while QLP promises to predict case outcome with a higher accuracy than a lawyer, such prediction is purely rooted in data-based correlations, giving no regard to the law nor the role of adjudication process as such. It promotes the perception of law as something pre-determined, consequently neglecting the idea that adjudication should be seen as a forum where (application

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<sup>83</sup> Hildebrandt, 'Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics' (n 12) 11–12.

of) law can be formed – a process which respects the capacity of litigation party to defend its stance and thereby steer or, at least, participate in forming the outcome.

The second issue concerns the capability of QLP to identify tendencies and peculiarities of judges. As discussed in Section 2.2, judges' decision-making process is influenced by their ideologies, attitudes, emotions, heuristics and other biases. Yet the value proposal of this second functionality of QLP algorithms is, essentially, exploiting the particularities and tendencies of a judge that are rooted in these biases, with the purpose of gaining an advantage in litigation. Such advantage would derive from factors not based on law, raising an issue of fairness of adjudication. The two use-cases are analyzed in detail in Chapters III and IV respectively.

## **2.9. Conclusion**

The law is subject to ambiguities, contradictions and gaps, which makes adjudication unpredictable. There is an element of the law which is not captured by the legal doctrine but possibly can be captured by the quantitative legal prediction models. That is why the current developments in legal AI are moving towards using quantitative models for legal prediction, as opposed to utilizing logic-based systems.

Due to the technical limitations of the QLP-based algorithms, their opaqueness and lack of capability to reason their decisions on the basis of substantive law, they raise a number of issues from the rule of law perspective. Earlier research has already analyzed many of the significant barriers that would make their adoption in the formal decision-making processes difficult in the foreseeable future, such as the lack of contestability of the decision. In context of informal litigation decisions, their impact on the adjudication is more indirect.

Yet, by supplying input otherwise unavailable to the lawyers, they can have significant effect on how the adjudication process is approached. In fact, there emerges two key use-cases of QLP-based algorithm which can significantly affect the realization of the rule of law within the adjudication process: the first relates to QLP's capability to predict case outcomes. The second significant use-case is QLP's capability to identify and exploit patterns of judges to gain an advantage within the adjudication process.

## **CHAPTER III – USING QLP FOR PREDICTING COURT CASE OUTCOMES**

### **3.1. Introduction**

As discussed previously, the applications of QLP can be manifold. The chapter at hand focuses on what could be regarded as the most ambitious function that QLP can have – predicting outcome of court cases and using these predictions as a basis for litigation decisions. I will explore why such use of QLP can have a substantial impact on the adjudication process and argue that its use even as an informal decision-making tool can interfere with the rule of law due to undermining the importance of the adversarial legal argumentation that takes place within the adjudication process.

The QLP-based algorithms subject to this chapter do not have any formal regulatory capacity. Instead, their capability to predict the potential outcome of a particular case can provide litigation parties and their legal counsel the decisive input on whether to litigate or not or whether to settle a case or not. Simultaneously, while a court ruling must be based on law and legal reasoning, a judge or other decision-maker might use this type of QLP-based software for a “sanity check” – that is, QLP can provide feedback, a data-based secondary opinion, about the decision pondered. Such use of QLP by judges would have a mere auxiliary function, whereas the decision rendered would still be reasoned based on law, ensuring the decision’s contestability and other requirements that the due process seeks to safeguard.

The above-described utilization of QLP would be no more binding than whichever other decision a person imposes upon herself. Due to its apparent lack of regulatory impact, using QLP in such manner does not necessarily give rise to rule of law concerns that were raised, for example, by Bayamlioğlu and Leenes, as analyzed in Section 2.7.

However, there nonetheless emerges a distortion on the adjudication process. Based on the analysis below, I argue that reverting to the prediction of predictive justice tools for decisions about whether to adjudicate (or using it to gain secondary input) can undermine the adjudication process and thereby the rule of law. This claim stands on a couple of key premises that are analyzed further in the following sections:

1. Adjudication process is a crucial pillar of the rule of law.
2. Legal prediction and decision-making constitute an important element of the adjudication process.
3. Outcome of the adjudication process is not pre-determined but formed as a result of the adversarial legal argumentation.
4. Reverting to the predictions provided by the QLP tools undermines the importance of adversarial legal argumentation, and thus, the whole adjudication process.

### 3.2. Case Outcome Prediction as a Constituent of the Adjudication Process

The dilemma of QLP is the fact that it may have potential to predict, on average, more accurately than a lawyer while, at the same time, its predictions are not based on legal rules, thereby its use diminishes the role of legal norms in the decision-making process.

The famous American jurist Oliver Wendell Holmes Jr. has previously called for law to be seen from a perspective of a “bad man”<sup>84</sup> – that is an individual subjected to law who does not care about the logic and morality behind the law, but only wants to know what the repercussions for a particular behavior are in order to steer its behavior to avoid negative legal consequences.<sup>85</sup> Herein also lies the rationale of using QLP – it may not base its recommendations on legal rules, but if its predictions have a higher success rate than the predictions of a legal professional, then it is not necessarily relevant for the individual how a QLP tool reaches its conclusions.

Evidently, the freedom of an individual to choose grounds based on which decision are made is part of human autonomy and it applies the same for decisions within adjudication process. Thus, the fact that a person may choose to trust the prediction of QLP-based software over an analysis based on legal rules cannot, in itself, undermine the rule of law. The right to ignore laws itself also constitutes a building block for the legitimacy of law.<sup>86</sup> Therefore, the adoption of QLP for decision-making within adjudication process does not raise concerns with the rule of law on an individual decision-making level. The issue arises on a more abstract level: it is the adjudication process as a fundamental institution for a functioning society that would be undermined by the widespread adoption of QLP-based software.

Adjudication has a special role within our society. Legal rules alone are nothing but abstractions, it is within the adjudication process where citizens experience the applicability and the force of the norms. The adjudication system itself is encountered in the form of human beings: this includes judges and other officials but also – and just as importantly – lawyers. Lawyers provide the support based on which litigation parties are able to make decisions within the adjudication process. Lawyers are uniquely positioned to “bring the law down to earth and make it more just,”<sup>87</sup> enabling effective functioning of the adjudicative process. Legal scholar David Luban even concludes that, for practical purposes, the lawyers are the law.<sup>88</sup> Thus, the advice and decisions by lawyers have an important role in the adjudication process.

Legal prediction constitutes a key element of this advice. As per Holmes, “the business of law is to predict and thereby avoid risk.”<sup>89</sup> In fact, according to Kerr: “[t]he goal of Holmesian prediction is highly pragmatic: lawyers do it to keep their clients out of harm’s way.”<sup>90</sup> In Holmes’ words:

“The primary rights and duties with which jurisprudence busies itself again are nothing but prophecies. [...] [A] legal duty so called is nothing but a prediction that if a man does or omits

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<sup>84</sup> Holmes Jr. (n 11) 459).

<sup>85</sup> For more about the “bad man” theory see Kerr (n 16) 6–9.

<sup>86</sup> See Roger Brownsword, ‘What the World Needs Now: Techno-Regulation, Human Rights and Human Dignity’, *Global Governance and the Quest for Justice, Vol. 4: Human Rights* (Hart Publishing 2004) 210.

<sup>87</sup> David Luban, *Lawyers and Justice: An Ethical Study* (Princeton University Press 1989) ch Introduction.

<sup>88</sup> *ibid.*

<sup>89</sup> Kerr (n 16) 4.

<sup>90</sup> *ibid.*

certain things he will be made to suffer in this or that way by judgment of the court; and so of a legal right.”<sup>91</sup>

The necessity to descend into prediction, rather than being able to logically construct the case outcome, is largely rooted in the characteristics of the legal system analyzed in Section 2.2. – legal rules are ambiguous and inconsistent, and applying them for specific circumstances within the adjudication process goes through the filter that is the judge’s cognitive biases and conditioning.

In some ways the importance of prediction within the adjudication process bodes well for QLP: after all, the promise of QLP is that it can predict case outcomes better than a lawyer, not to mention a self-representing litigant. Its adoption, thus, seemingly raises legal certainty surrounding the litigation decisions. However, if the prediction of lawyers is an important constituent of the adjudication process, then so is the prediction of a QLP tool, provided it is used to replace the existing approach.

This has an interesting implication since there is a fundamental difference between the decision-making process of a lawyer and the prediction of a QLP tool – lawyer’s decision-making process is based on legal argumentation, which is grounded in the idea that the outcome of a case is a question of persuasion. A prediction of QLP tool, on the other hand, purports pre-determination. The section below analyses why this notion of pre-determination undermines the role of adjudication and, thereby, the rule of law.

### **3.3. The Adjudication Process and the Rule of Law**

All legal disputes fall into a spectrum of legal certainty. There are some disputes for which the outcome is basically axiomatic – legal norms provide unambiguous answer to how the dispute should be resolved, supported by the homogeneous case law on the matter. For other disputes, however, the legal rules governing the behavior allow room for interpretation. These include cases which Ronald Dworkin regards as ‘hard cases’.<sup>92</sup> But furthermore, as indicated in Section 2.2 case outcome is not only a question of how the law should be interpreted. Rather, adjudication takes place in conditions where factual circumstances may be unknown and the resources to identify the truth are limited. To capture this reality, I hereafter approach cases from the perspective of obviousness and non-obviousness, with the latter side of this spectrum including ‘hard cases’ as well as cases where knowledge of the facts, availability of evidence and other relevant factors for determining the outcome may be limited.

For lawyers, the extent of predictability of the outcome of any dispute depends on where it falls within the above spectrum. There are many cases where utilizing QLP is not useful since the outcome is obvious. But the fact remains that for a large body of disputes, the outcome is more difficult to predict than one might envision. It is not uncommon that even cases which have seemingly analogical factual circumstances end up with different verdicts in different courts.

The difficulty of predicting case outcomes is exemplified by a study done by Goodman-Delahunty et al. in which litigation attorneys were asked to assess the likelihood of achieving a

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<sup>91</sup> Holmes Jr. (n 11) 458.

<sup>92</sup> Dworkin (n 32) 1.

positive result in a pending case of theirs.<sup>93</sup> Most litigants assessed their chances of winning close to 50%, effectively meaning they had no idea whether they would win or lose the case. Approximately one-fourth of the litigants predicted their chances of achieving minimum goal to be between 0-45%, with the mean prediction of their success being merely 27 %. Interestingly, the actual success rate of this group was 48 %. It thus emerges from this data that the fact a legal counsel deemed it likely that the case would be lost had almost no correlation with the outcome actually being negative. At the same time, the lawyers that were highly confident of winning the case, ended up winning only 68 % of the cases. This well illustrates that lawyers are rather bad at predicting the outcome of their cases.<sup>94</sup>

The fact that legal professionals fail to predict the case outcome with any considerable accuracy, while being experts deeply invested in their case and having all the knowledge that one could reasonably have about the circumstances and the applicable law, empirically implies that case outcome is not pre-determined once it exceeds certain basic obviousness. Effectively, prediction of a case outcome is not within our cognitive capabilities. The notion that a correct answer always emerges from legal norms is, in practice, a fallacy. Of course, there are disputes for which a clear answer can be derived from legal norms and any deviation in such cases would be in conflict with the legal rules. But the disputes that adjudication (and indeed QLP) concerns with are generally cases where no axiomatic solutions exist.

Consequently, this leads us to the importance of the adjudication process. The adjudication process creates an interaction between legal norms and real-life circumstances. As analyzed in the section above, it is through this interaction that law is experienced by the citizens – i.e. what an individual cares about is not necessarily the question ‘what is the legal rule’ but rather ‘how the particular circumstances are governed by the legal rule’. The latter question cannot be solved purely by having knowledge of the existing legal system, but the outcome of a dispute (i.e. how legal rule applies in the particular situation) is created *within* the adjudication process as a result of the adversarial legal argumentation.

Therefore, what the lawyer does in the adjudication process is not just a prediction – the legal arguments it creates and submits are a proposal for regulation of behavior which, if convincing to the court, is materialized into a legal rule.<sup>95</sup> These proposals are not merely lobbying (i.e. what law *ought* to be), but arguments of what law is.<sup>96</sup> That is why Waldron argues that law is an argumentative discipline and MacCormick talks of ‘arguable character’ of law.<sup>97</sup>

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<sup>93</sup> Jane Goodman-Delahunty, Maria Hartwig, and Elizabeth F Loftus, ‘Insightful or Wishful : Lawyers ’ Ability to Predict Case Outcomes’, 2010 <<https://doi.org/10.1037/a0019060>>.

See also an overview by Jessica Hoffman, ‘How Well Can You Predict the Outcome of Your Case?’, Colorado Trial Lawyers Association, 2010. <<http://www.hoffmanbryloconsulting.com/how%20well%20can%20you%20predict%20the%20outcome%20of%20your%20case.pdf>>

<sup>94</sup> Interestingly, the study also outlined that the experience of a lawyer plays no role in the ability to predict the outcome of a case.

<sup>95</sup> This doesn’t hold true only for common law systems. Any time a court reaches a conclusion, it is a form of regulation of behavior, regardless of what the case outcome as a precedent is to the legal system in large.

<sup>96</sup> See Waldron (n 21) 17.

<sup>97</sup> *ibid* 20. See also MacCormick (n 20), p 31 and p 14: “Whatever question or problem is in our mind, if we pose it as a legal question or problem, we seek a solution or answer in terms of a proposition that seems sound as a matter of law, at least arguably sound, though preferably conclusive. To check whether it is sound or genuinely arguable, or perhaps even conclusive, we think through the arguments that could be made for the proposed answer or solution. We can then test the arguments we have developed by constructing all the counter-arguments we can



Subsequently, this leads to a conclusion that in non-obvious cases it is only through the adversarial argumentation that takes place within the adjudication process that the resolution on how the disputed behavior is to be regulated comes into existence.<sup>98</sup>

In this regard, it should not be forgotten that law is a speech act.<sup>99</sup> It is only through the text that a legal rule emerges and obtains its force. But the same applies for legal arguments – it is through the medium of textual or spoken arguments that the conditions which actually determine the case outcome are created. If the outcome is determined by the adjudication process, the conditions based on which the outcome will be made – the adversarial arguments of litigation parties passing through the filter that is the cognitive biases of the judge – will only come into existence once this process takes place. Therefore, at the moment when QLP makes its prediction, these speech acts that determine the outcome are yet to be formed.

QLP purports exactly the opposite – that there is some pre-determined outcome independent of the choices made by the parties within the litigation process and independent of the legal arguments composed and submitted. Hildebrandt mentions in relation to the QLP algorithm developed by Aletras *et al* that it is not “prediction” but rather “describing a historical dataset”.<sup>100</sup> And this is the only value that the prediction of a QLP tool has – it can give an abstract estimation that might get lucky in predicting the case outcome, but it negates the fact that the components that are actually going to determine the outcome are yet to be created – that either side may still achieve a favorable result from the proceedings, as long as the case is non-obvious.

Thus, the data-based prediction of case outcome is not able to actually tap into the adjudication process. This leads us to QLP’s rule of law implications: legal scholar Owen Fiss has stated that it is through the process of adjudication in open court that “judges, acting on behalf of the public, interpret, explicate and give force to the values embodied in authoritative legal texts and bring reality in accordance with them.”<sup>101</sup> Similarly, Karen Yeung argues – based on ideas of legal philosopher John Gardner – that „[w]hen the law calls people to account through the legal process, and in according rights to certain people to bring others to account (the plaintiff in a civil suit, the prosecution in a criminal case) it provides a powerful institutional mechanism through which a structured explanatory dialogue is fairly and publicly conducted.“<sup>102</sup> Both of these claims illustrate the rule of law materializing through the adjudication process. Individuals experience the law not in form of a legal system, but as an interaction between specific circumstances and a legal rule. This interaction is not one-way, but a dialogue that takes place within adjudication, enabling the individual to act as the moral agent with the power to participate in and form how law should govern the disputed behavior. And it is in the form of

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think of.[...] One’s opinion about the strength of a case depends on an evaluation of the rival strength of competing sets of arguments.”

<sup>98</sup> About the rule-making characteristic of legal arguments within the adjudication process see: MacCormick (n 19) 14-31.

<sup>99</sup> Hildebrandt, ‘Algorithmic Regulation and the Rule of Law’ (n 62) 5; Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics’ (n 12) 4–7.

<sup>100</sup> Hildebrandt, ‘Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics’ (n 12) 7.

<sup>101</sup> Owen Fiss, ‘Against Settlement’ (1984) 93 Yale Law Journal 1073, 1085.

<sup>102</sup> Yeung (n 13) 6–7; See Gardner’s argumentation: John Gardner, ‘The Mark of Responsibility’, *Offences and Defences: Selected Essays in the Philosophy of Criminal Law* (Oxford University Press 2007) 189 <<http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199239351.001.0001/acprof-9780199239351-chapter-9>>.

adversarial legal argumentation that this dialogue takes place. By misrepresenting the adjudication process – purporting pre-determination where there is none<sup>103</sup> and failing to give regard to the importance of adversarial argumentation as part of the due process – QLP undermines the adjudication process and thereby the realization of rule of law.

Of course, an individual can always turn to court, regardless of the prediction by QLP tool. But this step towards relying on opaque predictions is also a shift of perception towards what Ian Kerr calls a philosophy of preemption,<sup>104</sup> wherein the approach to making litigation decisions is not legal-critical but becomes a mere risk management process. Its widespread adoption as basis of litigation decisions creates a perception as if the outcome is not in motion, carved by the legal arguments. Rather, it asserts that the faith of the individual is already decided by some kind of bureaucratic creature, which does not give any regard for the thoughts and arguments of the individual, which compromises the image of individual as a moral agent who has a right to participate in steering the process. Furthermore, the dialogue surrounding the values embodied by legal norms becomes eroded, if the decisions on whether to adjudicate or not are filtered by QLP – a mechanism incapable of taking into consideration any of the values that the adjudication process undertakes to promote. For example, there are legal disputes in regard of which the society a whole, or particular communities, have a vested interest in being argued – such as disputes where fundamental rights are at stake. Thus, the adjudication process is not only a place for reaching a conclusion, but functions as a forum where the understanding of the law is debated and formed. The preemptive character of QLP impedes the adjudication process in acting as such an institution.

### 3.4. QLP as Heuristics

Based on the above findings, the blunt outcome prediction of QLP tools should not be regarded as a suitable mechanism for adjudication decisions. However, in the unpredictable environment of adjudication, individuals are susceptible to seeking whatever input available from data analytics tools. While QLP does not make its prediction based on legal argument, the fact remains that its prediction is the only really tangible metric available for assessing case outcome. Furthermore, even though QLP fails to give due regard to the fact that the outcome is formed within the adjudication process, it is still feasible that its correlations based on case metadata, n-grams or otherwise, enable it to predict case outcomes with considerably better track-record than legal professionals. Thus, when in doubt, it can remain a convenient support tool for litigation parties, but potentially also for judges or other decision-makers, to receive a secondary opinion of the case outcome.

In addition to the argumentation above, the problem with using QLP as a support tool is the fact that it is not able to provide any feedback about the quality of the legal arguments. Rather, the user only receives a blunt data-based prediction which due to its opaque nature can either only be blindly trusted or dismissed. The concern is: it is likely to be trusted blindly. Mireille Hildebrandt has said the following:

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<sup>103</sup> As discussed earlier, there are many disputes where the outcome is reasonably foreseeable – therefore, I am not arguing that law is never pre-determined, but the rationale of adopting QLP emerges specifically in *non-obvious* cases where there exists no settled legal practice on the matter that would enable to prognose the outcome to a high degree.

<sup>104</sup> Kerr (n 16) 4.

“Even in the case of decision-support instead of decision-making, human intervention becomes somewhat illusory, because those who decide often do not understand the ‘reasons’ for the proposed decision. This induces compliance with the algorithms, as they are often presented as ‘outperforming’ human expertise.”<sup>105</sup>

She effectively describes what in behavioral psychology is referred to as anchoring heuristics. Put simply, anchoring is a cognitive bias where the person becomes strongly influenced (unconsciously) by an initial piece of data when making its decision.<sup>106</sup> As per Daniel Kahneman, anchoring effect occurs when “people consider a particular value for an unknown quantity before estimating that quantity. [...] Any number that you are asked to consider as a possible solution to an estimated problem will induce an anchoring effect”.<sup>107</sup> This means that the prediction of a QLP tool conditions its user towards believing the prediction provided by the anchor.

Throughout many studies on anchoring effect carried out by Kahneman and others, the results clearly point towards humans being spectacularly susceptible to estimate an answer to a problem based on the number provided by the anchor. The sub-conscious processes of human brain “tries its best to construct a world in which the anchor is true.”<sup>108</sup> Thus, the implications of this effect must not be understated. According to the studies, anchoring affects decisions of experts within their professional activities almost as much as ordinary citizens. As an example, in one of the studies carried out by Kahneman professional real estate agents were asked to assess the value of a house on the market, while half were provided a very high asking price and the other half a very low asking price.<sup>109</sup> The difference in assessing the value of the house between the two set of real estate agents was substantial (the anchoring effect was 41 %).<sup>110</sup> For comparison, when the study was repeated with students that had no real estate experience, their anchoring effect was 48 %, indicating that the professional knowledge and experience of real estate agents had little effect on avoiding the influence of the anchor. What makes anchoring effect especially dangerous is the fact that the person is not able to recognize being conditioned by an anchor. In the above described study, when the real estate agents were asked to explain their assessments, the agents claimed that the asking price did not have any influence on the assessment.<sup>111</sup>

Thus, even when QLP is used as a tool for secondary opinion, rather than the actual decision-making mechanism, there is a dangerous risk of over-reliance on its suggestion that can lead to neglecting objective legal analysis and potentially undermining fairness of adjudication.<sup>112</sup>

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<sup>105</sup> Hildebrandt, ‘Algorithmic Regulation and the Rule of Law’ (n 62) 2.

<sup>106</sup> The science behind anchoring heuristics is most famously theorized by Daniel Kahneman and Amos Tversky, ‘Judgment under Uncertainty: Heuristics and Biases’ (1974) 185 *Science* 1124 <[www.jstor.org/stable/1738360](http://www.jstor.org/stable/1738360)>; See also Daniel Kahneman, *Thinking, Fast and Slow* (Penguin Books 2012).

<sup>107</sup> Kahneman (2012) (n 106) 119–120.

<sup>108</sup> *Ibid.* 123

<sup>109</sup> *Ibid.* 124.

<sup>110</sup> The anchoring effect is measured by dividing the difference between the two assessments provided by the real estate agents with the difference between the two anchors (asking prices) – see Kahneman (2012) 124.

<sup>111</sup> *Ibid.*

<sup>112</sup> Biases influencing fairness of adjudication are further analysed in Chapter IV below.

### 3.5. Conclusion

As such, QLP algorithms which bluntly predict case outcome function as an impediment to the adjudication process. It creates a perception that QLP can predict outcome of the case more accurately than a lawyer, promoting the idea of enabling individuals to manage risks when deciding whether to adjudicate or not. Yet, QLP tools fail to grasp a fundamental pillar of the adjudication process – the contestability of how legal rules are to be applied. It is only through the adversarial legal argumentation that takes place within the adjudication process that the question of how the law applies in particular circumstances can be asked and answered. As indicated by MacCormick, legal argument is the ticket enabling one to travel from the premises to conclusions.<sup>113</sup> This is why legal professionals struggle to predict case outcomes, but the same also means that a predictive justice tool bluntly predicting an outcome is a deception, since it is predicting an answer which is still in motion. By dismissing the role of adversarial legal argumentation, QLP undermines the value of adjudication and thereby the realization of rule of law.

Using QLP as a tool of secondary opinion can similarly lead to distortion of the adjudication process. By being the only tangible metric indicating towards a case outcome, and thus being a strong heuristic, it creates a risk of over-reliance without, simultaneously, having its suggestions rooted in the legal rules.

Does the above mean that predictive justice should not be adopted by legal practitioners and other individuals within the adjudication process? While I argue that QLP tools cannot be adopted to bluntly predict outcome of court cases, the functionalities that they can have are manifold. As explored in Chapter II, QLP can also be used to outline certain patterns of data, based on which one cannot predict case outcome but can infer other useful information within the adjudication process. There is a growing amount of commercialized predictive justice models which seek to identify specific tendencies of courts or particular judges, enabling their exploitation within the adjudication process. The next chapter undertakes to analyze rule of law implications of such application of QLP technology.

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<sup>113</sup>MacCormick (n 20) 19-20. The metaphor was originally used in S. E. Toulmin, *The Uses of Argument* (Cambridge: Cambridge University Press, 1958) pp. 94–145.

## CHAPTER IV: USING QLP FOR PROFILING JUDGES AND ITS RULE OF LAW IMPLICATIONS

### 4.1. Introduction

The highest valued legal tech enterprise in the world today is the US-based legal analytics company LexisNexis.<sup>114</sup> On their website they promote the value of their predictive justice tools as follows:

„Over time, patterns surface in the language a judge uses and in the cases a judge cites. What if you could know the exact language your judge relies on, and use that same language to persuade your judge? And as importantly, know the phrases they detest (...) Reviewing hundreds of different motion types in seconds, and the logic behind the judge’s decision in each case gives you a unique insight into your judge and how you can tailor your argument for maximum effect.“<sup>115</sup>

One of the most significant European legaltech companies, Predictice, is doing something similar.<sup>116</sup> As do Premonition, CourtQuant, Blue J Legal and numerous others.

It was argued in the previous chapter that using QLP for predicting court case outcomes undermines rule of law due to failing to account for the importance of adversarial argumentation within adjudication process. But in addition to being used to identify correlations between certain data and case outcome, the predictive justice tools can also be used to identify certain patterns about how the courts and the judges operate.

There is a large spectrum of data about judges’ behavior that can be identified and analyzed by the QLP-based software. The more basic capabilities include outlining, for example, which are the cases that the judge has cited the most, how it approaches admissibility of evidence, what kind of motions it tends to accept and decline or what is the win rate of the lawyer with a particular judge in specific types of cases. The output of these QLP tools can also be rather complex: based on the historical data about a judge the algorithm can seek to identify what wording to use for arguments with a particular judge, which experts to choose or how to incite the judge to impeach the expert of the opposing side.<sup>117</sup> This data can then be used by the legal counsel to make strategic decisions and tailor the legal arguments within the adjudication process. Importantly, the patterns identified today by the QLP-based software are seemingly just the tip of the iceberg. Developing tools which enable to identify what are the triggers for the judge within adjudication process is speedily developing into a new industry.<sup>118</sup>

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<sup>114</sup> LexisNexis – in addition to their own legal analytics development – has recently merged with two of their competitors in US legal analytics market: Lex Machina and Ravel Law. For more see <https://www.lexisnexis.com/en-us/about-us/about-us.page>.

<sup>115</sup> See LexisNexis: A Buyer’s Guide to Choosing the Right Legal Analytics. <<https://www.lexisnexis.com/pdf/context/lexisnexis-legal-analytics-buyers-guide.pdf>>

<sup>116</sup> See more about Predictice software at <https://predictice.com/>. See also: ‘Litigation Prediction Startup ‘Predictice’ Pilots with Lille Bar in European First’, Artificial Lawyer, 24.01.2017. <<https://www.artificiallawyer.com/2017/01/24/litigation-prediction-startup-predictice-pilots-with-lille-bar-in-european-first/>>

<sup>117</sup> All of the above are examples functionalities of the LexisNexis legal analytics tools.

<sup>118</sup> An overview of the standout legal analytics companies can be found in article by Jnana Settle, ‘Predictive Analytics in the Legal Industry: 10 Companies to Know in 2018’, Disruptor Daily, 28.01.2018. <<https://www.disruptordaily.com/predictive-analytics-legal-industry-10-companies-know-2018/>> Furthermore, According to Forbes the venture capital investments into legal tech companies arose by an incredible 713% between 2017 and 2018. See Valentin Pivovarov, ‘713% Growth: Legal Tech Set An Investment Record In 2018’, Forbes Magazine, 15.01.2019,

The value of such predictive justice tools doesn't necessarily lie in providing insight about the legal rules, but rather in identifying personal tendencies of a particular judge. There is an evident positive effect in such capability – it can identify adjudication patterns otherwise inaccessible to human cognition and thus considerably enhance transparency of adjudication, which is an important value of due process and the rule of law.

Simultaneously, there are some issues that such utilization of QLP raises. For example, the quality of its output is highly dependent on the development choices made in training the software as well as the extent of relevant data available to it. At the same time, the dubious quality of the software's output may be difficult to assess by a lawyer due to the opaque nature of its pattern-recognition process. Furthermore, law is also subject to continuous development, which any algorithm that uses historic patterns for its output fails to capture. Consequently, it is likely that the results of QLP-based tools may at times direct its user on a wrong path and thus actually have a detrimental impact on the efficiency and quality of the adjudication decisions. Yet, based on the success of existing commercialized products, there is a cause to believe that QLP tools, while imperfect, can have a significant influence on the future of litigation.

However, from the rule of law perspective, the principal issue that such application of QLP gives rise to concerns undermining fairness of adjudication. It must be conceded that there exist numerous disparities within adjudication – from court to court, and from judge to judge, legal disputes with comparable circumstances can have considerably different outcomes. This is something that we have grown to accept within our legal system – the solution-determining factors of many disputes go beyond the explicit framework that the legal rules provide, requiring judges to exert their judicial discretion to reach an outcome. The judicial discretion, as already indicated in Section 2.2, is laden with subjective attitudes, ideologies, emotions, heuristics and other biases of the judge, constituting the major reason for the inconsistencies within adjudication. QLP tools which recognize personal patterns of judges might, to an extent, enable the litigation parties to exploit these biases. While we generally accept disparities within adjudication, it is another issue if its conscious exploitation would conform with the principle of fairness, given that such practice essentially seeks to tilt case outcome by engaging factors that are not rooted in law.

To understand how such use of QLP interferes with the adjudication process and the rule of law, this chapter first analyses the role of judicial discretion in the adjudication process and how the QLP tools can in fact increase the transparency related to the judicial discretion. The second part of the chapter explores how judicial discretion is laden with biases and whether recognizing personal patterns of judges might enable to exploit the biases to gain an advantage within the adjudication process. Ultimately, the chapter analyzes whether exploiting personal patterns of judges interferes with fair adjudication and how should the judiciary react to this development.

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<<https://www.forbes.com/sites/valentinpivovarov/2019/01/15/legaltechinvestment2018/#33e2a2767c2b>>. See also the article on the development of legal analytics by the Financial Times: Barney Thompson, 'Big data: legal firms play 'Moneyball'', The Financial Times, 06.02.2019, <<https://www.ft.com/content/ca351ff6-1a4e-11e9-9e64-d150b3105d21>>.

## 4.2. Judicial Discretion and QLP

By the rule of law ideal, legal rules can exclusively determine a case outcome.<sup>119</sup> Be that as it may, it is already established in Chapter II that in reality the adjudication happens in conditions of limited knowledge and finite resources – many relevant circumstances of cases remain unidentified, legal development is often lacking, judge’s mental stamina and prowess is limited, etc. On top of that, one’s sense of justice is not an objective measuring stick – adjudication is not an exact science. Especially considering that law is an open system, which cannot be fully and homogeneously captured with legal rules, legal theory nor rules of interpretation. In fact, any legal debate worthy of notice lies beyond the evident legal knowledge. This indicates why according to Duncan Kennedy there has emerged a consensus on the fact that the naïve version of the rule of law theory doesn’t fully explain the role of judges – legal rules cannot fully determine a case outcome.<sup>120</sup>

In practice, judicial discretion holds a key role in determining outcome of non-obvious cases.<sup>121</sup> It is the freedom of choice given to judges in making certain legal decision. Within the judicial discretion the judge will not decide mechanically, but will “weigh, reflect, gain impressions, test and study”<sup>122</sup> the possible solutions, whereas the resolution it eventually adopts must remain within the constraints of law.

Justice Aharon Barak has outlined three separate elements in which judicial discretion is applied: (i) facts, (ii) applicability of the norm and (iii) the establishment of the norm. Facts refers to the discretion of the judge to choose from among a set of facts it deems necessary for rendering a decision in the conflict.<sup>123</sup> For example, establishing whether a person was present at a certain location at a certain moment of time. In case of conflicting claims by the litigation parties, this is largely a question of which evidence the judge accepts and the value it attributes to a particular piece of evidence. The second element – the applicability of the norm – is the matter of choosing between the several ways that a legal norm can be applied to a given set of facts.<sup>124</sup> For example, whether a person in the particular circumstances should be considered to have acted negligently. The third element relates to the establishment of the norm itself – that means choosing among the normative possibilities the option that the judge deems appropriate.<sup>125</sup> Most typically this is a matter of interpreting the scope of the norm, i.e. whether a norm applies to the particular set of circumstances.<sup>126</sup>

An important conclusion which emerges from Barak’s overview is that it would be incorrect to undermine the role of judicial discretion in civil law systems. While the normative constraints on judge’s discretion may be looser in common law countries, the judicial discretion in deciding which facts are trustworthy, which evidence to accept and decline, how the facts relate to an existing norm, etc., is likewise prevalent in civil law countries.

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<sup>119</sup> See Duncan Kennedy, *A Critique of Adjudication* (Paperback, Harvard University Press 1997) 161–162.

<sup>120</sup> Kennedy (n 119) 162.

<sup>121</sup> As established in Section 3.3., non-obvious cases include the ‘hard cases’ as identified by Dworkin, as well as cases where knowledge of the facts, availability of acceptable evidence and other relevant factors for determining the outcome may be limited.

<sup>122</sup> Aharon Barak, *Judicial Discretion* (Yale University Press 1989) 7  
<<https://www.jstor.org/stable/10.2307/j.ctt211qxt8>>.

<sup>123</sup> Ibid. 13-14.

<sup>124</sup> Ibid. 14-15.

<sup>125</sup> Ibid. 12-13.

<sup>126</sup> Ibid. 15-16.

Judicial discretion is a necessary precondition for adversarial argumentation being purposeful within the adjudication process – the uncertain outcome (subject to judge’s discretion) makes the right to fight for one’s justice within the adjudication process meaningful.<sup>127</sup> However, despite being a key constituent of the adjudication process, the judicial discretion (in conjunction with the adversarial argumentation) constitutes a major reason as to why adjudication is often unpredictable. This unpredictability is well illustrated by the fact that even the council of the litigation parties, while having access to all of the factual and legal knowledge available to the judge, continuously fail to predict case outcome with a high efficiency.<sup>128</sup>

Enter predictive justice: QLP algorithms have the capacity to outline certain patterns of a judge to better understand what are the arguments, cases, types of evidence, etc., that a particular judge likes. Thus, the value proposal of QLP is the promise of a more transparent and predictable adjudication through enabling litigants to assess what the judge likes or dislikes.

Legal scholar F.A. Hayek argues that the values protected by rule of law – such as stability, generality and publicity of legal rules – are important especially for the contribution they make to the predictability of the legal system.<sup>129</sup> This notion implies that certainty and predictability are the most important elements that people seek from the legal system, including adjudication.<sup>130</sup> QLP tools, being able to identify certain patterns of judge, promises to enhance these key values. Indeed, this is also recognized by LexisNexis as they note: “Each time we document a case, release a decision tool or support the development of a legal infrastructure, we’re working to expand the umbrella protection of the rule of law.”<sup>131</sup>

This is an interesting development: while lawyers are focused on the legal rules, the QLP algorithms have the capacity to analyze the decisionmaker and enable to outline patterns which hint towards the approach and attitude a judge adopts in particular circumstances. Yet, there is also an element about the QLP tools which causes uneasiness. I will explore in the rest of the chapter the question of whether the patterns recognized by QLP tools may simultaneously undermine the rule of law by exploiting biases of judges to achieve a favorable case outcome.

### 4.3. Identifying and Exploiting Biases

In applying their judicial discretion, “judges have the job of resolving gaps, conflicts, or ambiguities in the system of legal norms.”<sup>132</sup> Professor Kent Greenawalt has said the following about judicial discretion in the hard cases:

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<sup>127</sup> „Adversarial argumentation provides a powerful institutional mechanism through which a structured explanatory dialogue is fairly and publicly conducted, which is one of the important values protected by rule of law“ – see Yeung (n 13) 6–7 and Section 3.3 of this thesis.

<sup>128</sup> See the study conducted by Jane Goodman-Delahunty, Maria Hartwig, and Elizabeth F Loftus, ‘Insightful or Wishful : Lawyers ’ Ability to Predict Case Outcomes’, 2010 <<https://doi.org/10.1037/a0019060>>. According to the study, most lawyers of litigation parties assessed their chances of winning close to 50%, i.e. they did not have the capacity to possess a significant understanding of whether they might win or lose the case, despite having access to all relevant materials and knowledge about the case.

<sup>129</sup> Hayek (n 68) ch 9 and 10.

<sup>130</sup> See Waldron (n 21) 19.

<sup>131</sup> LexisNexis: The Rule of Law. See <https://www.lexisnexis.com/en-us/rule-of-law/default.page>. A similar argument is made by Ludwig Bell, the CEO of QLP software CourtQuant, see his interview at <https://www.youtube.com/watch?v=94FQMMvylCA&feature=youtu.be>

<sup>132</sup> Kennedy (n 119) 28.



„[W]hen a judge is left to decide among controversial and complex theories of moral and social philosophies, each of which can find some support in our structure of government, all legal profession demands and all the framers of state and constitutional provisions could reasonably expect is that a judge act *reasonably* and *conscientiously* [emphasis added] choosing the theories he thinks soundest. If these two requisites are met, we do not think the judge’s actions merit blame, a typical consequence of a perceived failure to perform a duty, even though we would have acted differently.“<sup>133</sup>

Same circumstances can yield two completely incompatible decisions by judges, with both being in accordance with the law and the judges having acted reasonably and conscientiously.

Chaim Perelman and Lucie Olbrechts-Tyteca consider that it is the level of persuasiveness of arguments put in front of the judge on all legally relevant matters regarding the dispute, and which the judge thereafter weighs based on points of law, that determines the case outcome.<sup>134</sup> While it is true that a judge will weigh the adversarial arguments presented to her and her eventual judgment must remain within the constraints of law, this approach merely postpones the fact that in its nature a judgment is a cognitive process. This cognitive process – we could call it the sense of justice – is forged by judge’s experiences, ideologies, political views, attitudes, emotions, heuristics and many random extraneous factors. Legal rules and the adversarial argumentation in which parties provide suggestions in regard of interpreting those rules can provide the framework for the judge’s decision, but a role for the subjective sense of justice will always remain a key determinant of the outcome, increasingly so in non-obvious cases.

As per Donald Nugent: „Ideally, judges reach their decisions utilizing facts, evidence, and highly constrained legal criteria, while putting aside personal biases, attitudes, emotions, and other individualizing factors.”<sup>135</sup> Yet, in reality this is not the case, as Nugent also notes: “This ideal, however, while appealing to most judges, does not coincide with the findings of behavioral scientists, whose research has shown that human beings rarely, if ever, conform to such idealistic principles.“<sup>136</sup>

The syllogism goes that “all sentient humans have learned, implicit biases, all judges are sentient human beings, ergo, all judges have implicit biases.”<sup>137</sup> There is no ground to suggest that thorough understanding of legal rules, professional nature of the judge, experience or goodwill of the judge make him overcome the biases in the process of reaching a decision within his judicial discretion.

Thus, going beyond the visible, the judicial discretion of the judge is deeply influenced by a large set of biases. For clarification, I will use the term „biases“ in an extended context throughout this chapter by which I mean that it does not only refer to unfair and prejudiced favoring or discrimination of certain group of people or phenomena, but it refers to all factors,

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<sup>133</sup> Kent Greenawalt, ‘Discretion and Judicial Decision: The Elusive Quest for the Fetters That Bind Judges’ (1975) 75 Columbia Law Review 359, 377 <<https://www.jstor.org/stable/1121660?origin=crossref>>.

<sup>134</sup> Chaim Perelman and Lucie Olbrechts-Tyteca, *The New Rhetoric: A Treatise on Argument* (University of Notre Dame Press 1969) 76–86.

<sup>135</sup> Donald C Nugent, ‘Judicial Bias’ (1994) 42 Cleveland State Law Review 1, 4–5 <<https://engagedscholarship.csuohio.edu/clevstrev/vol42/iss4/6>>.

<sup>136</sup> *ibid* 5; See also the research on biases by Kahneman and Tversky (n 106).

<sup>137</sup> James M. Redwine, ‘You’re biased, I’m biased. So what are we judges going to do about it?’, *Judicial Edge*, 2018, <<https://www.judges.org/youre-biased-im-biased-so-what-are-we-judges-going-to-do-about-it/>>

such as emotions, ideologies, attitudes, heuristics and other patterns of thinking that are personal to the judge and which influence judge's decision-making process.<sup>138</sup>

There seems to exist an evident underestimation of how much biases influence case outcomes in the administration of justice (although the legal realism movement enabled to make strides in regard of acknowledging the subjective nature of adjudication). One of the most famous examples about judges' biases is the study carried out in regard of granting parole by Israeli judges.<sup>139</sup> In the particular study parole judges in Israel approved parole to approximately 65 percent of prisoner who appeared before them early in the morning, while by lunch break the rate of parole dropped to nearly zero. Immediately after lunch, the chances of receiving a parole rose to 65 percent again, steadily declining as the day went on. It seems evident that the extraneous factors – namely mental depletion, as the authors cautiously suggest – had a significant impact on the case outcome (as it is easier to make an unfavorable than a favorable decision).<sup>140</sup>

There are thousands of other fallacies and heuristics, which influence human perception. One of such is the gambler's fallacy, which Daniel Chen describes as follows: "If I'm an assigning judge and I assign asylum too many times in a row, I may worry that I'm becoming too lenient. Then I actively try to autocorrect. So, the next time, I'll deny asylum. That's an extraneous influence because how I ruled on the previous case wrongly affects the ruling on the current case."<sup>141</sup> Another study has discovered that presidential election cycles seem to have a strong influence on judge's behavior.<sup>142</sup> Furthermore, extraneous factors such as sport results,<sup>143</sup> good weather,<sup>144</sup> making the judgment on defendant's birthday<sup>145</sup> all seem to have an influence on the outcome.<sup>146</sup>

In criminal cases, there are many studies to show that some judges can be strongly influenced by inadmissible evidence.<sup>147</sup> Other judges are especially vulnerable to hindsight bias – for example, in deciding whether a person acted negligently, the judge might overestimate whether

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<sup>138</sup> I am not claiming that each of these biases are problematic or should be approached equally. Rather, the goal is to show that there are many different types of cognitive factors which influence judge's decision-making.

<sup>139</sup> Shai Danziger, Jonathan Levav and Liora Avnaim-Pesso, 'Extraneous Factors in Judicial Decisions' (2011) 108 Proceedings of the National Academy of Sciences 6889 <<http://www.pnas.org/content/108/17/6889.abstract>>.

<sup>140</sup> As a criticism of the study, A. Glöckner has argued that this pattern might partly be caused by conscious decisions of the judges to look early in the morning the paroles they are likely to grant. However, he also agrees that such conscious choice alone does not explain the emerged pattern, indicating towards extraneous factors playing a role in the decision. See Andreas Glöckner, 'The Irrational Hungry Judge Effect Revisited: Simulations Reveal That the Magnitude of the Effect Is Overestimated' (2016) 11 Judgment and Decision Making 601 <<http://journal.sjdm.org/16/16823/jdm16823.pdf>>.

<sup>141</sup> Angela Chen, 'How artificial intelligence can help us make judges less biased, Interview with Daniel L. Chen', The Verge, 2019, <<https://www.theverge.com/2019/1/17/18186674/daniel-chen-machine-learning-rule-of-law-economics-psychology-judicial-system-policy>>

<sup>142</sup> According to the study, during the election cycle, the number of dissenting opinions of judges in district courts goes up significantly. Carlos Berdejó and Daniel L Chen, 'Electoral Cycles among US Courts of Appeals Judges' (2016) 60 The Journal of Law and Economics 479 <<https://www.journals.uchicago.edu/doi/10.1086/696237>>.

<sup>143</sup> Ozkan Eren and Naci Mocan, 'Emotional Judges and Unlucky Juveniles' (2016) 10 American Economic Journal: Applied Economics 171 <<http://www.nber.org/papers/w22611.pdf>>.

<sup>144</sup> Evelina Bakhturina and others, 'Events Unrelated to Crime Predict Criminal Sentence Length' (2016) SSRN <<http://www.ssrn.com/abstract=2815955>>.

<sup>145</sup> Chen and Philippe (n 25).

<sup>146</sup> See more examples of studies on extraneous factors influencing case outcome: Daniel L Chen, 'Machine Learning and the Rule of Law' (2019) Computational Analysis of Law, Santa Fe Institute Press, ed. M. Livermore and D. Rockmore, Forthcoming 1, 2.

<sup>147</sup> Eyal Peer and Eyal Gamliel, 'Heuristics and Biases in Judicial Decisions' (2013) 49 Court Review 114, 116 <<https://digitalcommons.unl.edu/ajacourtreview/422/>>.

the risk was foreseeable, due to having hindsight knowledge of the risk materializing. Another study detected that in regard to relatively minor offenses, the judges considered some key factors “while neglecting other legally relevant and highly important ones.”<sup>148</sup>

More visible biases are related to the ideologies and political views of the judge. In fact, Kennedy notes that adjudication is a medium saturated with ideology, while the rhetorics of adjudication is to convince that there is no ideology behind the solution adopted by the judge, but rather the outcome was ‘necessary’.<sup>149</sup> Similar notion is mentioned by David Luban, who also points out that while judges’ decisions within the adjudication process must be justified, in reality it is common that a judge reaches a decision as it sees fit (i.e. based on its sense of justice) and only thereafter creates the justification to support whatever decision it wanted to reach (as opposed to reaching a decision by logical deduction from legal arguments).<sup>150</sup>

Acknowledgment of such role of biases explains why knowledge of legal rules often does not provide a lot of predictability in regard of case outcomes. But more importantly: it raises the question of whether the QLP tools can be used to tap into and exploit some of the biases? And if so, does this undermine fairness of the adjudication system? The value of QLP tools that identify patterns of judges effectively rests on the assumption that the patterns identified can be applied in one’s favor. Judge’s hunger, as in the Israeli study, may not be predictable via QLP tool nor exploitable for a litigation party. On the other hand, being able to identify judges that are especially vulnerable to being influenced by non-admissible evidence, have strong hindsight bias or judges who are especially prone to gambler’s fallacy can be key information when constructing the litigation strategy. While the current QLP tools might struggle to identify such heuristics, one would expect capabilities of data analytics to significantly improve with the continuous evolution of machine learning algorithms and the accumulation of (relevant) data.

Before going further with the analysis, it is necessary to remark that the current state-of-the-art QLP algorithms can outline significant patterns specific to judges but such patterns about judges don’t necessarily refer to biases. Let’s consider Premonition as an example – this legaltech company provides a service for enabling to determine which lawyers tends to win with a particular judge. In an interview given to the Above The Law magazine, the CEO of Premonition stated that the judge-attorney pairing has a 30.7 percent influence on the outcome.<sup>151</sup> This is actually a quite significant effect, but even if this correlation is accurate, there is no feasible manner to determine whether the lawyer who often wins with a certain judge is just very good in her trade, only accepts cases that she is likely to win, the high win rate is a coincidence, *or* the judge is actually biased towards that lawyer. Undoubtedly, all of these alternatives are true from case to case. The same applies, for example, in regard of the LexisNexis analytics tool that identifies which expert witnesses a judge likes or dislikes – only part of these findings relate to actual biases of the judge.

Yet, every time a QLP tool *does* connect a strategic decision of litigation party with a bias of the judge, it gives an advantage that isn’t rooted in the legal rules. Of course, this can’t immediately be regarded as problematic in regard of undermining fairness of the adjudication system – it is already established above that biases are prevalent in influencing outcomes

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<sup>148</sup> Ibid 117.

<sup>149</sup> Kennedy (n 119) 1-2.

<sup>150</sup> See Luban (n 87) ch Introduction.

<sup>151</sup> Ed Sohn, ‘alt.legal: The Forecast For Legal Analytics Is Mostly Sunny’, Above the Law Magazine, 2016, <<https://abovethelaw.com/2016/05/alt-legal-the-forecast-for-legal-analytics-is-mostly-sunny/?rf=1>>.

anyway. But regardless of this fact, we still ideally want to keep the biases as far away as possible from having an influence on the case outcome. In contrast, QLP tools are applied to seek the opposite – identification of certain behaviors or personal approaches that a judge holds, with the purpose of using these peculiarities to gain an advantage within the adjudication process.

Let's explore utilizing QLP-based algorithms to enhance the negative effects of forum shopping as an example. Forum shopping, in its essence, is choosing the court and/or jurisdiction which would most likely ensure a favorable outcome.<sup>152</sup> The possibility and extent of such choice is established by law, international treaty or contract.

Forum shopping in itself is often considered “unethical” and “abuse of the adversary system”,<sup>153</sup> and regarded as intuitively troubling due to the fact that the choice of forum can be outcome-determinative.<sup>154</sup> As an example, until recently the patent venue law in United States allowed patent owners very high flexibility in choosing the federal judicial districts in which to file infringement suits, which resulted in identification of certain “hotbeds” where the court was considerably more favorable to patent owners compared to other courts, and which thus had significant effect on dispute outcomes.<sup>155</sup>

While forum shopping does not enable to choose a specific judge, in many instances, the ability to choose the venue of adjudication can likely indicate who will be the judge appointed, due to the fact that specific disciplines of law, such as patent law or tax law, are often designated to one or a few specialized judges within the court. QLP tools can be used to profile and search helpful patterns about these judges. Gita F. Rothschild already described in 1998 that “in a forum with relatively few judges, a database search of the judges’ opinions, political beliefs, personal history, and idiosyncrasies can pay big dividends.”<sup>156</sup> Furthermore, QLP tools can be effectively used to reveal patterns of behavior not only about the judges, but also in regard of courts and regional jurisdictions. Returning to the above example about US patent venue law and its exploitation, it is interesting to note that the first functionality of the Lex Machina (now the flagship predictive justice tool of LexisNexis) also focused on patent infringement proceedings, enabling to identify courts and judges with a certain track record in patent cases.

What QLP thus promises is effectively forum shopping on steroids, because the patterns about judges, courts or jurisdiction that QLP tools can identify provide a significant advantage when having the possibility to choose among several venues of adjudication. As the negative effect of forum shopping is that it enables to exploit the disparity within judiciary, which in itself is considered “unfair”,<sup>157</sup> QLP tools effectively seek to amplify the disparity and, consequently, the unfairness.

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<sup>152</sup> Some scholars consider that for a practice to be forum shopping, there must be an element of unfairness – i.e. unfair exploitation of venue rules to affect lawsuit outcome, see: Markus Petsche, ‘What’s Wrong with Forum Shopping? An Attempt to Identify and Assess the Real Issues of a Controversial Practice’ (2011) 45 *The International Lawyer* 1005, 1008 <<http://www.jstor.org/stable/23827261>>.

<sup>153</sup> Although to an extent it also constitutes a natural part of the adjudication system. See ‘Forum Shopping Reconsidered’ (1990) 103 *Harvard Law Review* 1677, 1677 <<http://www.jstor.org/stable/1341283>>.

<sup>154</sup> Nita Ghei, ‘Forum Shopping and the Evolution of Rules of Choice of Law’ (2011) SSRN 1–2 <<http://www.ssrn.com/abstract=1786715>>.

<sup>155</sup> See Paul J. Cronin, ‘U.S. Supreme Court Halts Forum Shopping In Patent Infringement Cases’, *Lexology Blog*, 2017, <<https://www.lexology.com/library/detail.aspx?g=cefbeca4-ee7d-4494-80c1-101f0c8429bd>>.

<sup>156</sup> Gita F Rothschild, ‘Forum Shopping’ (1998) 24 *Litigation* 40, 42 <<http://www.jstor.org/stable/29759995>>.

<sup>157</sup> See Petsche (n 152) 1010.

As another example, let's consider the three types of ideologically influenced judges that are described by Kennedy: the constrained activist judge, the difference splitting judge and the bipolar judge.<sup>158</sup> The constrained activist judge has a strong position on how certain issues in law should be approached (for example, from the perspective of liberalism-conservatism ideology), as a result of which she pushes towards finding an outcome that meets her view (of course, provided that her interpretation remains within constraints of law).<sup>159</sup> The difference splitting judge always seeks a middle ground in the ideological split. The bipolar judge is a judge who works towards not being identified with a particular ideological position, as a result of which she consciously changes positions from case to case. There are a few effects emerging from such profiling of judges. As analyzed above, it creates an additional layer of transparency, which itself ensures better legal certainty – a fundamental pillar of rule of law.<sup>160</sup> But in a case seeking to pioneer a new approach, there can be an obvious benefit of having a constrained activist judge over a judge who always seeks middle ground. The increasing capability to profile judges in such manner does not only enhance forum shopping but creates a new vicious battleground for dismissing judges and introducing other strategies (e.g. carefully timing the litigation application or presenting the case from a particular angle) to be designated a favorable judge. To the extent these endeavors are successful, it can provide the decisive advantage in how the dispute transpires.

#### **4.4. Exploiting Patterns of Judges and the Rule of Law**

At the crux of judge's decision-making there is always an element of subjectiveness that law cannot reach. Judicial discretion and adversarial argumentation – which is a process for creating an emotional, ideological or intellectual reaction in the judge, and thus, like legal analytics, often rests on the biases of the judge – are both necessary constituents for ensuring effective functioning of adjudication. The biases are thus prevalent for determining the case outcome with or without the QLP tools.

Nonetheless, QLP tools enabling to recognize and, to an extent, exploit patterns about judges does inflict some concerns. Firstly, these tools essentially seek to exploit the disparity within the judiciary, which raises concerns about fairness. Fairness of adjudication is essentially the equal treatment of litigation parties – parties should have level playing field with regard to applicability of laws as well as with regard to other factors which influence the accessibility and convenience of adjudication.<sup>161</sup> Naturally, there is a limit to the equality that the adjudication process can ensure for the litigation parties. The adversarial argumentation is not fully fair, nor are the legal rules themselves. The ever-increasing adoption of data analytics about the judge is not going to render the adjudication from a fair system into an unfair one. But it does introduce an added element of unfairness – if patterns of judges become increasingly visible, the extent to which the biases are exploited will inevitably increase and this will tilt case outcomes by engaging factors that are not rooted in law or the legal system at large. Consequently, “the apparent lack of concern for substantive justice could erode public

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<sup>158</sup> Kennedy (n 119) 180.

<sup>159</sup> Ibid 182.

<sup>160</sup> See Hayek (n 68) Ch 9-10 and Waldron (n 21) 19.

<sup>161</sup> See Petsche (n 152) 1011.



confidence in the adjudication system.”<sup>162</sup> This risk is already evident in light of the current capabilities of commercialized QLP tools despite it being just an emerging market that has started to proliferate only in the last two-three years. The eventual impact is dependent upon the development of machine learning and other artificial intelligence technologies.

There are other concerns, too. A CEPEJ report on cyberjustice issued in 2016 established that “the proceedings at the hearing stage must grant all the parties access to the same tools and guarantee that the technical limits imposed by the IT tool do not adversely affect the parties’ rights and privileges... The judge must at any rate be careful to ensure that no party is placed at a disadvantage as compared with another just because it does not have the resources to access the technology.”<sup>163</sup> If the predictive justice becomes increasingly effective, the unequal access to these tools would enhance the advantage that the wealthier and more powerful litigation parties have over the parties who would not have the possibility to access the QLP tools, which again entails undermining the fairness of adjudication.

Finally, predictive justice is not only about identifying existing biases – there is also a risk that QLP tools create new ones. If it emerges that, for example, 90 % of the judiciary have adopted a similar approach in certain types of cases, will this pressurize or anchor the rest of judges to adopt the same approach? Do we always want the law to be applied the same? Reinforcement of patterns is not necessarily reinforcement of justice. There is certain value also in the unpredictability of adjudication – applying law differently to an existing doctrine is also an important form of legal development. In light of the advancement of QLP tools and its promise to increase transparency about the disparities within the judiciary these are questions that are going to define how the adjudication system develops. It is an emerging debate that the judiciary must embrace.

#### **4.5. The First Steps of Regulating QLP**

The first significant reaction from the legislators to the adoption of QLP within the adjudication process has already emerged – in June 2019, a new French Justice Reform Act entered into force, article 33 of which states that “identity data of magistrates and members of judiciary cannot be reused with the purpose or effect of evaluating, analyzing, comparing or predicting their actual or alleged professional practices.”<sup>164</sup> Effectively, this rule bans the use of QLP for outlining the patterns of judges as well as predicting case outcomes based on prior behavior of the judge, whereas the punishment for the infringement is, staggeringly, imprisonment for up

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<sup>162</sup> Daniel J Dorward, ‘Forum Non Conveniens Doctrine and the Judicial Protection of Multinational Corporations from Forum Shopping Plaintiffs’ (1998) 19 University of Pennsylvania Journal of International Law 141, 152 <<https://scholarship.law.upenn.edu/jil/vol19/iss1/5/>>.

<sup>163</sup> European Commission For The Efficiency Of Justice, Guidelines on How to Drive Change Towards Cyberjustice, 2016 (p. 16) <<https://edoc.coe.int/en/efficiency-of-justice/7501-guidelines-on-how-to-drive-change-towards-cyberjustice-stock-taking-of-tools-deployed-and-summary-of-good-practices.html>>

<sup>164</sup> 4. French Justice Reform Act, LOI n° 2019-222 du 23 mars 2019 de programmation 2018-2022 et de réforme pour la justice, Article 33. <[https://www.legifrance.gouv.fr/eli/loi/2019/3/23/2019-222/lo/article\\_33](https://www.legifrance.gouv.fr/eli/loi/2019/3/23/2019-222/lo/article_33)>. The Translation of the act taken from ‘France Bans Judge Analytics, 5 Years In Prison For Rule Breakers’, Artificial Lawyer Blog, 04.06.2019. <<https://www.artificiallawyer.com/2019/06/04/france-bans-judge-analytics-5-years-in-prison-for-rule-breakers/>>.

to five years. According to the Artificial Lawyer blog this is the first ban of its kind in the world.<sup>165</sup>

This decision by the French legislator indicates that it prioritizes mitigation of the risks that QLP may incur to fairness of the adjudication system and its perception by the public. But this is achieved by essentially introducing censorship: publication of analytics that can be associated with a particular judge is prohibited, which will consequently undermine the transparency gains that QLP is capable of providing. Whether such a solution is justified is debatable. A proactive regulation enables the French legislator to steer the direction in which QLP develops. Indeed, should QLP emerge to increasingly outline disparities within the adjudication process, thereby granting advantage to those with better access to the technology while also undermining the perception of fairness of the adjudication process, its limitation may be justified. It must also be considered that limiting QLP's use would be increasingly complicated after QLP has already been adopted by the legal profession, which is why an argument can be constructed as to why the proactive approach undertaken by the French legislator is justified – it enables the legislator time to assess the possible issues that emerge with the technology prior to its broad adoption by the masses. Simultaneously, however, this approach will create an artificial constraint on the transparency of adjudication and will shackle scrutinizing the judiciary, raising concerns whether such measure, in fact, is itself compatible with the rule of law.

#### **4.6. Conclusion**

Unlike in the last chapter, I don't consider that the capabilities of QLP tools discussed above undermine the rule of law and thus should not be adopted. In the big picture, the QLP tools further the transparency in the adjudication process, which enhances predictability and helps to identify (and rectify) contradictions and other flaws in the adjudication system.

Yet, the amplified exploitation of the biases and disparities of the adjudication system does create a threat for fairness of adjudication and the perception thereof. Judicial discretion, while being constrained by legal rules, is still a deeply subjective process influenced by ideologies, attitudes, emotions, heuristics and many other biases. I believe that in order to mitigate the risks on fairness, the development of QLP tools requires attention and willingness from the judiciary to evolve adjudication in line with the capabilities of these tools. Daniel Chen remarks that „if algorithms can identify the contexts that are likely to give rise to bias, they can also reduce those biases through behavioral nudges and other mechanisms, such as through judicial education.“<sup>166</sup> Yet, the dialogue about the role of biases and the consequential disparity within the adjudication system is seemingly dormant.<sup>167</sup> The emergence of QLP tools requires this attitude to change – admitting to subjectiveness of the judgment and the role of biases therein is a precondition to being able to adequately react to the ways in which QLP tools may be able

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<sup>165</sup> 'France Bans Judge Analytics, 5 Years In Prison For Rule Breakers', Artificial Lawyer Blog, 04.06.2019. <<https://www.artificiallawyer.com/2019/06/04/france-bans-judge-analytics-5-years-in-prison-for-rule-breakers/>>.

<sup>166</sup> Chen (n 146) 3.

<sup>167</sup> As Nugent says: „Judges are expected to be rigorous in excluding personal bias when making decisions; hence, there are few judges who would readily admit that they have biases which interfere with their impartiality. Indeed, judges are typically appalled if their impartiality is called into question.“ This is echoed by Kennedy. See Nugent (n 135) 5 and Kennedy (n 119) 2 and 23-24.

to exploit them. This includes the need to further understand, embrace and develop a theoretical framework about the role of biases within adjudication and provide judicial education on learning to “speak law to the power of statistics”.<sup>168</sup>

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<sup>168</sup> This quote is from Mireille Hildebrandt *Law as Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics* (n 12) 13. She considers that while lawyers don’t have to become statisticians, they should „learn to speak the language of variables, functions, correlations, training sets, hypotheses space, while getting the hang of supervised and unsupervised machine learning algorithms.“



## **CONCLUSION**

### **5.1. Introduction**

With the emergence of QLP as a mechanism for outlining significant patterns within adjudication and providing input for litigation decisions, this thesis raised the following question: what are the principal rule of law implications of adopting QLP-based technologies within the adjudication process?

Quantitative legal prediction seeks to identify data-based correlations from historical patterns of adjudication which enables to infer a model for predicting what a judge or another decisionmaker may do in the future. What QLP thus promises is an augmented insight into what might be the outcome of a particular case, enabling to make smarter decisions related to commencing litigation or in course of the adjudication process. While lawyers' ability to reason far exceeds any algorithm, a human's capacity to sift through thousands of court cases and identify relevant correlations from historic patterns is dwarfed compared to the ability of a machine. Yet, QLP emerges with its own issues – although QLP may become highly capable in solving legal disputes or outlining significant patterns within adjudication, its approach neglects law as the causative basis for making legal decisions, rather purporting the idea that legal conclusions can be drawn from data-based simulations. There are some significant legal concerns arising from this property of QLP.

In consideration of the fact that QLP is unlikely to replace judges within the foreseeable future, due to its technical limitations and legal constraints, the thesis focused particularly on the adoption of QLP-based software by the litigation parties, rather than as a formal decision-making mechanism. Consequently, the thesis distinguished two prime applications of QLP within the adjudication process: (i) predicting case outcomes and using these predictions for making litigation decisions, and (ii) identifying and exploiting peculiarities and tendencies of judges in order to gain an advantage within the adjudication process.

### **5.2. Using QLP to Predict Court Case Outcomes**

Adoption of QLP algorithms to predict case outcome essentially provides individuals a risk management tool when deciding whether to adjudicate or not. This risk management tool can predict a case outcome, on average, with a better accuracy than a lawyer, promising a new era in how litigation decisions are made. Yet, I claim that widespread adoption of QLP for predicting case outcome and using these predictions for making litigation decisions undermines the value of adjudication and thereby the realization of rule of law, as it dismisses the role of adversarial legal argumentation.

The legal disputes for which insight from QLP is sought are presumably cases where no axiomatic solutions exist. Questions of law in such cases cannot be solved purely by having knowledge of the legal system or the existing case law, which is why relying on a data-based prediction tool that has a good track record seems tempting. Yet, such approach misrepresents the adjudication process: I argue that it is the adversarial legal argumentation that takes place within the adjudication process, which forges the result of non-obvious cases. Therefore, the

outcome of a dispute (i.e. how legal rule applies in the particular situation) is created *within* the adjudication process. Consequently, what a lawyer does in the adjudication process is not just a prediction – the legal arguments it creates and submits are proposals for regulation of behavior which, if convincing to the court, are materialized into a legal norm. It is only through this adversarial argumentation that the resolution on how the disputed behavior is to be regulated comes into existence. As such, QLP misrepresents adjudication by purporting pre-determination where there is none.

The principal issue with the above emerges from the fact that the adjudication process carries a fundamental role in safeguarding the realization of rule of law. The rule of law is evidently an elusive concept with a wide array of objectives, but one of its key aspects is treating individuals as moral agents entitled to dignity and respect. The adjudication process ensures such treatment by accepting that law has an arguable character and by providing a procedure where a question of how a certain behavior should be governed is argued. Thus, the adjudication process is not only a place for reaching a conclusion, but functions as a forum where the understanding of the law is debated and formed, and the individual is entitled to participate and influence that procedure. The preemptive character of QLP impedes the adjudication process in acting as such an institution.

### **5.3. Using QLP for Profiling Judges and its Rule of Law Implications**

The second significant rule of law interference explored in the thesis relates to applying QLP technology for identifying and exploiting specific patterns of judges, with the purpose of exploiting these tendencies for one's advantage. The commercialized products that have adopted QLP technology increasingly promise the possibility to outline certain patterns of a judge to better understand what are the arguments, cases, types of evidence, etc., that a particular judge likes, enabling a more insightful prediction on what might be the most fruitful strategy or a set of argumentation for a particular case. The value proposal of such use of QLP is thus a more transparent and predictable adjudication through enabling to identify adjudication patterns otherwise inaccessible to human cognition.

Simultaneously, the adjudication process is riddled with biases and inconsistencies. The more significant the patterns these predictive justice tools are able to identify, the more it enables to exploit the disparities that exist within the judiciary. If patterns of judges become increasingly visible, the extent to which the biases are exploited will inevitably increase, tilting case outcomes by engaging factors that are not rooted in law or the legal system at large. This apparent lack of concern for substantive justice would undermine fair adjudication as well as erode public confidence in the adjudication system.

Joseph Raz states that insufficient regard for the rule of law can lead to uncertainty or it may lead to frustrated and disappointed expectations.<sup>169</sup> Adoption of QLP-based algorithms for identifying patterns of adjudication affects both of these aspects – on one hand it enhances transparency and foreseeability; on the other, it enables unfair exploitation of the system, eroding public confidence and giving rise to frustration about the adjudication process. Reconciliation comes in the form of adequate reaction to the developments enabled by QLP –

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<sup>169</sup> See Raz (n 22) 222.

in order to mitigate the risks on fairness of adjudication and the perception thereof, the emergence of QLP requires attention and willingness from the judiciary to evolve adjudication in line with the capabilities of the QLP technology. This includes the need to further understand, embrace and develop a theoretical framework about the role of biases within adjudication and provide judicial education on understanding significance of the adjudication data extracted by QLP.

#### **5.4. Suggestions for Further Research**

While this thesis undertook to illustrate how QLP will influence how the adjudication process is approached and perceived and, consequently, interferes with the rule of law, the scope of this thesis merely extends to paving an introduction into the implication that adoption of predictive justice will have on the adjudication process in the informal decision-making capacity. Another leap in technological development may lead to a situation where the data-based systems genuinely outperform humans in adjudication fairness, efficiency, uniformity and transparency. Once such leap takes place, all bets are off on how the dispute resolution could be conducted. But, meanwhile, we have to accept that the loopholes, irregularities, contradictions, gaps in the legal system and the biases of the decisionmakers will become increasingly visible and exploitable within the adjudication process due to the capabilities of QLP, which will significantly influence how adjudication is perceived and approached.

Subsequent research is required to further assess the rule of law and other implications of widespread adoption of QLP, especially in the context of QLP's promise to outline biases and disparities within the judiciary and how this influences the functioning of the adjudication. There are several parallel directions that should be explored further:

- 1. Does QLP enable us to draw deeper conclusions about the nature of adjudication?**  
While the claim that application of legal norms is volatile and subject to extraneous factors dates back to legal realism and beyond, QLP promises to empirically prove this notion by outlining the inconsistencies within judiciary. Lee Loevinger indicated already in 1949 that law should be investigated by scientific methods,<sup>170</sup> but what is lacking is “adequate techniques in existence for investigating many of the most important problems in the field of social control or behavior.”<sup>171</sup> QLP, together with digitizing and publishing of litigation data, may provide fuel for a new, perhaps a more pragmatic, wave of discussion on the nature of law and adjudication and the role of judicial discretion within this process.
- 2. How to approach the negative aspects of transparency of adjudication enabled by QLP?** Transparency of adjudication is one of the facets of the rule of law. But if the transparency starts to undermine fairness of adjudication or creates unwarranted distrust in the judicial institutions, it could be argued that partially limiting or steering the development of QLP is justified. On this note, the French ban on judge analytics may provide for an interesting case study as it is the first example of its kind on limiting adjudication transparency in favor of protecting fairness and the perception of uniformity of the judiciary and the adjudication process.

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<sup>170</sup> Loevinger, ‘Jurimetrics: The next Step Forward’ (n 1) 23–27.

<sup>171</sup> *ibid* 27.

3. **What is the potential of adopting QLP as an alternative dispute resolution mechanism?** Should there emerge a trend of using QLP as a fast and cheap mechanism for resolving legal disputes, it involves some concerns that ought to be analyzed further. Notably, in such case, would it be possible to mitigate the rule of law concerns raised in Chapter III of this thesis – ensuring transparency of the decision and the right to justify one’s action and participate in adversarial argumentation? Or, on the contrary, could it be claimed that if disputing parties willingly surrender to the decision of a QLP, these rule of law issues become redundant?

The above can only be taken as a selection of topics which surface as a result of widespread adoption of QLP. With the shift from reason to statistics emerging in the legal sphere, new facets of adjudication will reveal themselves requiring further attention from the judiciary, legislator and the academia alike.

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