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AI systems and a risk of discrimination in creditworthiness assessments - The role of the Artificial Intelligence Act in safeguarding the right to non-discrimination

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Abstract

This thesis deals with one of the most prominent risks stemming from the use of AI systems – the risk of discrimination. It focuses on the risk of discrimination posed by AI systems used for the purpose of assessing creditworthiness. This area of AI systems’ deployment is sensitive from the perspective of fundamental rights, as it impacts lives of individuals to a great extent. The aim of this thesis is to assess the existing legal framework that safeguards the right to non-discrimination in credit scoring assessments conducted with the use of AI systems. The thesis first analyses the legal framework consisting of the European non-discrimination laws, the General Data Protection Regulation (GDPR), together with two judgements of the Court of Justice of the European Union (CJEU) and the 2023 Consumer Credit Directive. Secondly, this dissertation assesses how the Artificial Intelligence Act (AI Act) complements this legal framework. The AI Act qualifies AI systems used for assessing creditworthiness as high-risk. Consequently, the providers and deployers of these systems are required to comply with certain requirements. This thesis is narrowed down to the analysis of the provisions of the AI Act that are most relevant for mitigating the risk of discrimination, including a provision dealing with the Fundamental Rights Impact Assessment (Article 27 of the AI Act), human oversight (Article 14 of the AI Act), bias mitigation and monitoring (Article 10(5) of the AI Act) and individual-level rights (Articles 86 and 85 of the AI Act). The prominent goal of the thesis is to understand the role of the AI Act and its added value to the existing legal framework safeguarding individuals’ right to non-discrimination in creditworthiness assessment. In addition, this thesis discusses whether the systems used by traditional credit agencies, such as SCHUFA fall within the scope of the AI Act. The thesis also touches upon the challenges that AI systems pose to the European non-discrimination laws and it contributes to the debate on the existence of the right to explanation in the GDPR.

Keywords: Artificial Intelligence, Artificial Intelligence Act, credit scoring, GDPR, bias, non-discrimination, personal data, automated decision making, right to explanation, fundamental rights impact assessment, EU law, consumer credit

Deutscher Abstract

Die vorliegende Arbeit befasst sich mit einem der größten Risiken, das sich aus dem Einsatz von KI-Systemen ergibt - dem Risiko der Diskriminierung. Sie untersucht insbesondere das Risiko der Diskriminierung bei KI-Systemen, die zum Zwecke des Zugangs zur Kreditwürdigkeit eingesetzt werden. Ziel der Arbeit ist es, den bestehenden Rechtsrahmen zu bewerten, der das Recht auf Nichtdiskriminierung bei der Kreditwürdigkeitsprüfung mit Hilfe von KI-Systemen gewährleistet. Zunächst wird der rechtliche Rahmen analysiert, welcher sich aus den europäischen Nichtdiskriminierungsgesetzen, der Datenschutz-Grundverordnung, zwei Urteilen des Gerichtshofs der Europäischen Union (EuGH) und der Verbraucherkreditrichtlinie aus 2023 zusammensetzt. Sodann wird untersucht, wie die neue Verordnung über Künstliche Intelligenz (KI-VO) diesen Rechtsrahmen ergänzt. Die KI-VO stuft KI-Systeme, die zur Kreditwürdigkeitsprüfung eingesetzt werden, als Hochrisiko-Systeme ein. Folglich müssen die Anbieter und Betreiber dieser Systeme bestimmte Anforderungen erfüllen. Die Arbeit konzentriert sich auf diejenigen Vorschriften der KI-VO, die für eine Verringerung des Diskriminierungsrisikos am relevantesten sind. Im Fokus stehen demnach die Vorschriften zur Grundrechte-Folgenabschätzung (Artikel 27 KI-VO), zur menschlichen Aufsicht (Artikel 14 KI-VO), zur Erkennung und Korrektur von Verzerrungen (Artikel 10(5) KI-VO) sowie die vorgesehenen Rechtsbehelfe auf individueller Ebene (Artikel 85 und 86 KI-VO). Das Hauptziel ist es, die Rolle der KI-VO und ihren Mehrwert gegenüber dem bestehenden Rechtsrahmen zu verstehen. Darüber hinaus wird erörtert, ob die von traditionellen Auskunftsteilen wie der SCHUFA genutzten Systeme in den Anwendungsbereich der KI-VO fallen und dementsprechend ihren Bestimmungen unterliegen. Weiterhin werden die Herausforderungen für das europäische Antidiskriminierungsrecht, die durch KI-Systeme entstehen, herausgearbeitet sowie ein Beitrag zur Debatte um die Existenz eines Rechts auf Erklärung aus der DSGVO geleistet.

Schlagwörter:

Künstliche Intelligenz, KI-VO, Kreditwürdigkeitsprüfung, DSGVO, Voreingenommenheit, Diskriminierung, personenbezogene Daten, automatisierte Entscheidungsfindung, Recht auf Erklärung, Grundrechtsfolgenabschätzung, EU-Recht

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List of Abbreviations

AI	Artificial Intelligence
CCD1	the 2008 Consumer Credit Directive
CCD2	the 2023 Consumer Credit Directive
CJEU	the Court of Justice of the European Union
CRF	the Charter of Fundamental Rights of the European Union
ECHR	the European Convention on Human Rights
ECtHR	the European Court of Human Rights
EU	the European Union
ELI	European Law Institute
FRIA	Fundamental Rights Impact Assessment
GDPR	the General Data Protection Regulation
ML	Machine learning
OECD	the Organisation for Economic Co-operation and Development
TEU	the Treaty on European Union
TFEU	the Treaty on the Functioning of the European Union
US	the United States

Chapter 1: Introduction

1.1 Background and problem statement

The increased deployment of Artificial Intelligence (AI) systems in decision-making has offered a false hope that this technology can produce objective outcomes, free from biases present in human decision-making.¹ Cases observed in recent years, in both the public and private sectors, have revealed that AI systems are just as prone to bias as humans. One of the most prominent examples of an AI system that was found to exhibit racial biases is the COMPAS software, frequently utilized by the courts in the United States (US) to estimate the likelihood of recidivism.² Alarmingly, studies conducted on this tool have shown that it tends to be biased against Black offenders.³ In Europe, a notable example in the employment sector is a system used by the Austrian Public Employment Service (AMS) to estimate job seekers' likelihood of securing a job.⁴ The system classified job seekers into three categories based on their chances in the labour market.⁵ According to the research conducted by an external party, the AMS system was found to give women and people with disabilities a negative weight and assign them to the 'unemployable' category.⁶ These cases would likely fall within the scope of the European Union's (EU) non-discrimination law. However, the application of non-discrimination laws to cases involving AI systems is challenging. There is an ongoing debate in the literature regarding whether the current EU non-discrimination legal framework is an appropriate tool to address the potential discriminatory effects of AI systems.⁷ The primary concern raised by scholars is that, due to the complexity and opacity of AI systems, those affected by discrimination may not be able to even recognize it.⁸ Additionally, due to a limited

¹ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurra-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), 320.

² Bart van der Sloot, Linnet Taylor and Merel Noorman, 'AI technologies and discrimination from a non-domination perspective' in Bart van der Sloot, Giorgio Monti and F. Bostoen (eds) 'Regulating Human Behaviour to Regulating Data' (forthcoming, Tilburg University), 230.

³ Christoph Engel et al., 'Code is law: how COMPAS affects the way the judiciary handles the risk of recidivism' (2024) *Artificial Intelligence and Law*, 10.

⁴ Paola Lopez, 'Reinforcing Intersectional Inequality via the AMS Algorithm in Austria' (STS Conference Graz 2019 <<https://diglib.tugraz.at/download.php?id=5e29a88e0e34f&location=medra>> accessed 19 March 2025, 289.

⁵ *ibid.*

⁶ Nicolas Kayser-Bril, 'Austria's employment agency rolls out discriminatory algorithm, sees no problem' (Algorithm watch 21 August 2020) <<https://algorithmwatch.org/en/austrias-employment-agency-ams-rolls-out-discriminatory-algorithm/>> accessed 19 March 2025.

⁷ Frederik Zuiderveen Borgesius, 'Discrimination, artificial intelligence, and algorithmic decision-making' (2018) Report for Council of Europe Directorate General of Democracy, <<https://rm.coe.int/discrimination-artificial-intelligence-and-algorithmic-decision-making/1680925d73>> accessed 19 March 2025, 6.

⁸ Luca Deck and others, 'Implications of the AI Act for Non-Discrimination Law and Algorithmic Fairness' (2024) 1 *ACM Journal on Responsible Computing* <<http://arxiv.org/abs/2403.20089>> accessed 21 March 2025, 2.

access to AI systems' models, it is almost impossible for affected individuals to meet the requirements of a burden of proof that rests with the claimant.⁹

Examples of sectors in which AI is being deployed to enhance efficiency are endless. Therefore, it is not surprising that AI is increasingly adopted in finance.¹⁰ From a fundamental rights perspective, the most significant area of interest in this sector is the use of AI systems to assess individuals' creditworthiness. A credit score is a crucial factor in determining the creditworthiness of consumers, as it informs lenders how likely the person is to repay a loan.¹¹ It must be noted that being denied credit is not just about losing access to a loan, it can also have long-term effects on important areas of life, such as education, housing, medical care or even one's career.¹² Creditworthiness assessments have been performed with the use of technologies based on mathematical and statistical methods since the 1950s.¹³ However, developments in the AI field allowed credit scoring institutions to adopt more sophisticated methods. Like in the case of employment and access to justice, AI systems used in creditworthiness assessments also perpetuate biases and their use can result in discriminatory outcomes.¹⁴ This thesis exclusively focuses on this area of application of AI systems.

The potential of AI technologies to discriminate has been acknowledged by the EU legislator in the Artificial Intelligence Act (AI Act),¹⁵ which was adopted in August 2024. Even though the AI Act is primarily a product safety regulation aimed at fostering the functioning of the EU internal market,¹⁶ its goal is also to protect fundamental rights, including the right to non-discrimination.¹⁷ Thanks to the European Parliament's human-centric approach to AI regulation

⁹ *ibid.*

¹⁰ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 328.

¹¹ Shweta Arya, Catherine Eckel, Colin Wichman, 'Anatomy of the credit score' (2013) 95 *Journal of Economic Behaviour & Organisation* 175, 175.

¹² *ibid.*

¹³ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 *Law and Financial Markets Review* 239, 241.

¹⁴ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 328.

¹⁵ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) [2024] OJ L, 2024/1689.

¹⁶ Artificial Intelligence Act, recital 1.

¹⁷ *ibid.*, recital 4a.

during the legislative process,¹⁸ the AI Act includes provisions, which could be relevant in safeguarding individuals' right to non-discrimination, such as an obligation to conduct a Fundamental Rights Impact Assessment (FRIA)¹⁹ or a provision on bias detection and mitigation.²⁰ The AI Act is indeed a landmark regulation on AI that aims to achieve laudable objectives. However, the question arises what added value the AI Act brings to the already existing European legal framework on non-discrimination.

It is important to consider that the legal framework protecting individuals from the discriminatory effects of AI systems in credit scoring is not only limited to non-discrimination laws. The General Data Protection Regulation (GDPR)²¹ is also applicable due to the involvement of personal data processing by AI systems. The GDPR includes a crucial provision on automated data processing,²² which pursuant to the Court of Justice of the European Union (CJEU)'s judgement in SCHUFA case, applies to credit scoring agencies.²³ Furthermore, there exists European sectoral legislation regulating consumer credits – the 2023 Consumer Credit Directive.²⁴ This Directive includes an extensive provision on automated creditworthiness assessments.²⁵ Assessing how these two legislations, along with European non-discrimination laws regulate the use of AI systems in credit scoring and the potential discriminatory effects of the use of AI systems is an important step in understanding the AI Act's role in the existing legal landscape.

Past works on the AI Act and discrimination were conducted on the proposal of the Act, and they mostly focused on a particular form of discrimination, such as gender-based discrimination.²⁶ This thesis goes beyond the general analysis of the relationship between the AI Act and non-discrimination law, as it focuses on a specific field - creditworthiness

¹⁸ Alessandro Mantelero, 'The Fundamental Rights Impact Assessment (FRIA) in the AI Act: Roots, Legal Obligations and Key Elements for a Model Template' (2024) 54 Computer Law & Security Review 1, 6.

¹⁹ *ibid*, art. 27.

²⁰ *ibid*, art.10(5).

²¹ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119.

²² General Data Protection Regulation, art. 22.

²³ Case C-634/21, OQ v Land Hessen [2023], ECLI:EU:C:2023:957

²⁴ Directive (EU) 2023/2225 of the European Parliament and of the Council of 18 October 2023 on credit agreements for consumers and repealing Directive 2008/48/EC [2023] OJ L, 2023/2225.

²⁵ Directive 2023/2225, art. 18(8).

²⁶ Fabian Lütz, 'The AI Act, gender equality and non-discrimination: what role for the AI office?' (2024) ERA Forum 25 < <https://link-springer-com.tilburguniversity.idm.oclc.org/article/10.1007/s12027-024-00785-w>> accessed 25 March 2025.

assessment. In addition, the thesis first analyses the existing legal framework on creditworthiness assessment and discrimination, and then assesses the role of the AI Act in this framework. The thesis contributes to the current policy and academic debate by explaining how the AI Act safeguards the right to non-discrimination in relation to high-risk AI systems used for credit scoring.

1.2 Research question and sub-questions

Safeguarding a right to non-discrimination is not the sole goal of the AI Act, as it is primarily a product safety regulation. Nonetheless, the AI Act undertakes the challenge to ensure that individuals' rights are protected. Additionally, the AI Act acknowledges the potential of AI systems to generate biased outputs.²⁷ This thesis aims to understand the role of the AI Act in safeguarding individuals' right to non-discrimination and mitigating risks of discrimination in creditworthiness assessments. It does so by attempting to answer the following research questions:

How does the Artificial Intelligence Act contribute to the existing European Union's legal framework safeguarding individuals' right to non-discrimination in creditworthiness assessments conducted with the use of AI systems?

The following sub-questions will guide the answer to the main research question:

- I. What are possible risks to the right to non-discrimination posed by the use of high-risk AI systems in creditworthiness assessments?
- II. What is the current existing framework that safeguards individuals' right to non-discrimination in creditworthiness assessment?
- III. How does AI challenge current EU non-discrimination laws?
- IV. What is the added value of the Artificial Intelligence Act in addressing the risk of discrimination stemming from the use of AI systems in creditworthiness assessment?

²⁷ Artificial Intelligence Act, recital 61.

1.3 Thesis structure

The first chapter includes a background and a problem statement (section 1.1). It also presents the main research question that will be addressed in the thesis, along with the relevant sub-questions (section 1.2).

The second chapter focuses on defining AI, and it analyses the definition of an AI system included under Article 3(1) of the AI Act (section 2.2). Additionally, the chapter discusses whether systems currently used by credit scoring institutions fall within the scope of the AI Act's definition. Furthermore, the chapter presents different types of AI systems, focusing on machine learning and knowledge-based systems (section 2.3). Lastly, the chapter analyses the general characteristics of AI decision-making and challenges they might create to non-discrimination law (section 2.4).

The third chapter aims to address the first research question on how the use of AI systems in credit scoring might threaten individuals' right to non-discrimination (section 3.4). This chapter also explains in more detail the concept of creditworthiness assessment (section 3.1).

The fourth chapter analyses the existing legal framework on non-discrimination and credit scoring to address the second sub-question of the thesis. The chapter first provides an overview of non-discrimination laws in the EU (section 4.1). This part is followed by a reflection on how non-discrimination laws in the EU are challenged by AI decision-making (section 4.1.6). Secondly, the chapter deals with the analysis of the General Data Protection Regulation (section 4.2), and two CJEU judgements that are significant for credit scoring. Lastly, the chapter focuses on the analysis of the 2023 Consumer Credit Directive and its importance in protecting consumers from discriminatory outcomes of AI systems (section 4.3).

The fifth chapter moves to the analysis of the AI Act and compares it with the legal framework discussed in chapter 4. Its main goal is to answer the fourth sub-question of the thesis. The AI Act analysis is limited to the discussion on its scope, risk-based approach, and obligations of deployers, including an obligation to conduct a Fundamental Rights Impact assessment. The chapter deals in detail with Articles 10 and 14, as well as discusses individual-level rights established by the Act.

The sixth chapter concludes the thesis by summarizing the main arguments and providing an answer to the main research question.

Chapter 2: AI systems and discrimination

Before proceeding to the analysis of the legal framework governing AI systems used in credit scoring, it is important to outline key definitions that are central to the topic of this thesis. Firstly, this chapter discusses the concept of Artificial Intelligence (AI). Secondly, it analyses the definition of an AI system included in Article 3(1) of the AI Act. Thirdly, the chapter briefly presents two types of technical approaches to AI. Lastly, the chapter focuses on discussing the characteristics of AI systems and the challenges these characteristics might pose.

2.1 Artificial Intelligence vs an algorithm

The definition of an algorithm, in contrast to the one of AI, is relatively straightforward. The term ‘algorithm’ is frequently used in the field of machine learning and AI.²⁸ Additionally, AI is described by some scholars as an algorithmic system.²⁹ Therefore, it can be stated that algorithms create a root of the current debate on AI. However, algorithms themselves are not AI.³⁰ An algorithm might be perceived as similar to a recipe in baking.³¹ From an information technology perspective, algorithms are defined as “fundamental, formalized, and precisely specified computational rules or sequences of commands designed to perform a specific task”.³²

2.2 Artificial Intelligence – definition

There exist many misconceptions and myths resembling science fiction about what AI is.³³ Even though, the topic of AI gathered significant attention in the past years, it is not a novel field of research, as it has existed since the 1940s.³⁴ It can be stated that there is no universal definition of AI, despite the efforts of international organizations and expert groups to formulate

²⁸ European Union’s Agency for Fundamental Rights, ‘Bias in Algorithms – Artificial Intelligence and Discrimination’, (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p. 16.

²⁹ Christiane Wendehorst, ‘The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective’ (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p.39

³⁰ Joanna J Bryson, ‘The Artificial Intelligence of the Ethics of Artificial Intelligence: An Introductory Overview for Law and Regulation’ in Markus D Dubber, Frank Pasquale and Sunit Das (eds), *The Oxford Handbook of Ethics of AI* (Oxford University Press 2020) < <https://academic-oup-com.tilburguniversity.idm.oclc.org/edited-volume/34287> > accessed 19 March 2025, 4.

³¹ *ibid.*

³² Carsten Orwat, ‘Risks of Discrimination through the Use of Algorithms’ (2020) Federal Anti-Discrimination Agency < <https://publikationen.bibliothek.kit.edu/1000123477> > accessed 15 March 2025, 4.

³³ European Union’s Agency for Fundamental Rights, *Getting the future right – Artificial Intelligence and Fundamental Rights*, (Publications Office of the European Union 2020) <<https://fra.europa.eu/en/publication/2020>> accessed 10 March 2025, p. 19.

³⁴ *ibid.*, 12.

one.³⁵ First, it is essential to not perceive AI as a type of algorithm, but rather as an entire field of computer science that utilizes, inter alia, algorithms.³⁶ Secondly, the term AI encompasses a wide range of current technological developments, and it does not refer to a specific object.³⁷ On the other hand, AI practitioners use the term ‘AI’ to refer to technical objects (like chatbots), technical approaches (such as machine learning), as well as to the whole discipline of research.³⁸

In the past, AI was defined by one of its pioneers, John McCarthy as “the science and engineering of making intelligent machines”.³⁹

When it comes to definitions developed by international organizations, the most relevant one is the definition provided by the Organisation for Economic Co-operation and Development (OECD). OECD defines an AI system as follows:

“An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments”.⁴⁰

This definition is a result of an update made to the previous OECD definition in 2023.⁴¹ It served as an inspiration for the AI Act’s definition.⁴² The recently enacted AI Act provides for the following definition of an AI system:

“AI system means a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit

³⁵High-Level Expert Group on Artificial Intelligence, ‘A definition of AI: Main capabilities and scientific disciplines’ (2018) European Commission <https://ec.europa.eu/futurium/en/system/> accessed 10 February 2025, p. 2.

³⁶ European Union’s Agency for Fundamental Rights, ‘Bias in Algorithms – Artificial Intelligence and Discrimination’, (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p.18.

³⁷ *ibid.*

³⁸ Marco Almada and Nicolas Petit, ‘The EU AI Act: Between the Rock of Product Safety and the Hard Place of Fundamental Rights’ (2025) 62 Common Market Law Review 85, 87.

³⁹ Christopher Manning, ‘Human-Center Artificial Intelligence, Artificial Intelligence Definitions’ (Stanford HAI September 2020) <<https://hai.stanford.edu/>> accessed 2 January 2025, 1.

⁴⁰ OECD, ‘Explanatory Memorandum on the updated OECD definition of an AI system’ (2024) OECD Publishing <<https://www.oecd.org/en/publications/explanatory-memorandum->> accessed 20 March 2025, p. 4.

⁴¹ *ibid.*

⁴² Lukas Feiler & Beat König ‘Article 3 Definitions’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 57.

objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.”⁴³

According to Recital 12 of the AI Act, the definition of an AI system should be in line with the work of international organizations specializing in AI. Additionally, the phrasing of the provisions should be flexible enough to accommodate AI systems that will be developed in the future.⁴⁴ This explains why the definition provided by the lawmakers is so vague. On the other hand, it is positive that the lawmaker did not refer to any specific AI technique as it would significantly narrow its scope. However, this broad definition is problematic when it comes to legal certainty.⁴⁵

2.2.1 Artificial Intelligence definition under Article 3(1) AI Act - analysis

For the purposes of this thesis, the definition of an AI system provided in the AI Act in Article 3(1) will serve as the primary reference. The definition of an AI system included in the AI Act has been a debated topic ever since the text of the first proposal was published.⁴⁶ This debate is understandable considering the significance of the provision in deciding what systems fall within the AI Act’s scope.⁴⁷ To determine which systems may be included within this definition, it is essential to examine its seven main elements.

Firstly, the definition underlines that an AI system is “machine-based”, without mentioning terms such as software, as was the case in the first Commission’s proposal.⁴⁸ The Act does not define what is meant by the term “machine” which already makes the definition ambiguous. According to the non-binding Commission’s guidelines, this element covers many

⁴³ Artificial Intelligence Act, Article 3(1).

⁴⁴ Artificial Intelligence Act, recital 12.

⁴⁵ Martin Ebers et al., ‘The European Commission’s Proposal for an Artificial Intelligence Act—A Critical Assessment by Members of the Robotics and AI Law Society (RAILS)’ (2021) 4 J 589, 590.

⁴⁶ Tervel Bobev, ‘Defining AI in the AI Act: Pin the Tail on the System’ (KU Leuven Center for IT & IP Law, 2 April 2024) <<https://www.law.kuleuven.be/citip/blog/defining-ai-in-the-ai-act-pin-the-tail-on-the-system/>> accessed 31 March 2025.

⁴⁷ David Fernández-Llorca and others, ‘An Interdisciplinary Account of the Terminological Choices by EU Policymakers Ahead of the Final Agreement on the AI Act: AI System, General Purpose AI System, Foundation Model, and Generative AI’ (2024) Artificial Intelligence and Law 1, 3.

⁴⁸ *ibid*, 4.

computational systems.⁴⁹ However, the Commission refrained from providing a concrete list of systems that qualify as AI.⁵⁰

Another element of the definition under Article 3(1) is that a machine-based system can only be classified as an AI system if it is designed to operate with a “varying level of autonomy”. Recital 12 specifies that “autonomy” means that an AI system is independent of human intervention. Therefore, it is possible to interpret the term “varying” in a broad sense and as also encompassing a ‘zero’ level of autonomy.⁵¹ However, the Commission’s guidelines specify that systems that are designed to operate with a full level of human involvement do not fall within the scope of Article 3(1) of the AI Act.⁵²

Thirdly, according to Article 3(1) AI system “may exhibit adaptiveness after deployment”. Recital 12 specifies that the term ‘adaptiveness’ refers to “self-learning capabilities, allowing the system to change while in use”. The word “may” indicates that it is an optional requirement.⁵³ This optionality significantly broadens the scope of the AI Act’s definition, as most of the existing machine-learning models cannot self-learn from data.⁵⁴

Fourth, the definition refers to “explicit and implicit objectives” for which AI is capable of inferring from outputs. The meaning of “explicit and implicit” in this context is somewhat vague. It must be mentioned that a system itself is not aware either of explicit or implicit objectives, and whether an objective is explicit or implicit depends on a human’s perspective.⁵⁵ If the term “objectives” refers to the objectives that are set by the deployers or designers of the

⁴⁹ European Commission, ‘Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act)’ (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 13.

⁵⁰ European Law Institute, What Key Factors are Relevant in Delineating AI Systems for the Purpose of the AI Act? (19 February 2025), < <https://youtu.be/y-tO2TWRgxM> > accessed 19 March 2025.

⁵¹ European Law Institute, ‘Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute’ (2024) <<https://www.europeanlawinstitute.eu/>> accessed 20 January 2024, p. 11.

⁵² European Commission, ‘Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act)’ (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 17.

⁵³ European Commission, ‘Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act)’ (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 23.

⁵⁴ European Law Institute, ‘Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute’ (2024) <<https://www.europeanlawinstitute.eu/>> accessed 20 January 2024, p. 14.

⁵⁵ *ibid.*, p. 15.

system, this element fails to limit the scope of the AI system definition, as most AI systems are developed to pursue a certain objective.⁵⁶

Another element of the definition states that “the system infers, from the input it receives, how to generate outputs”.⁵⁷ Recital 12 underlines that the “capability to infer” is one of the most important characteristics of an AI system and states that techniques which are capable of inferring include machine learning and logic and knowledge-based approaches. According to the Commission’s guidelines, the term ‘inference’ should be understood in the context of the building phase of an AI system.⁵⁸

The definition also refers to AI systems’ capability to generate output in the form of predictions, content, recommendations, or decisions. OECD Explanatory memorandum indicates that each of these terms has different meanings and is characterised by various levels of human involvement.⁵⁹ When it comes to decision, this term can be interpreted very broadly, as covering both legal decisions, such as a decision to reject one’s job application, and factual decisions.⁶⁰ This element of the definition suggests that for a system to be classified as an AI system it must be able to perform tasks and solve problems without a formal definition of the solution.⁶¹

The last element of the definition states that the output produced by an AI system must “influence physical or virtual environments”. In general, this element is illustrative, and it does not serve as a criterion for distinguishing between AI systems and other IT systems.⁶²

To conclude, all the elements included in the definition create ambiguity and do not manage to provide concrete guidance on how to draw a line between AI systems and other IT systems.⁶³ Unfortunately, the Commission’s guidelines are as vague as the definition and fail to provide

⁵⁶ *ibid.*

⁵⁷ Artificial Intelligence Act, art. 3(1).

⁵⁸ European Commission, ‘Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act)’ (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para 30.

⁵⁹ OECD, ‘Explanatory Memorandum on the updated OECD definition of an AI system’ (2024) OECD Publishing <<https://www.oecd.org/en/publications/explanatory-memorandum->> accessed 20 March 2025, p. 9.

⁶⁰ European Law Institute, ‘Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute’ (2024) <<https://www.europeanlawinstitute.eu/>> accessed 20 January 2024, p. 16.

⁶¹ *ibid.*

⁶² *ibid.*

⁶³ *ibid.*, p. 19.

long-awaited clarifications.⁶⁴ Most of the criteria in the definition are descriptive and can be interpreted in a broad sense.⁶⁵ Indeed, the goal of the EU legislator was to create a future-proof definition, capable of encompassing various systems.⁶⁶ However, it has resulted in a definition which might confuse both lawyers and technical experts.⁶⁷ The definition included in Article 3(1) AI Act undeniably asks for more clarification and further guidance. The approach to interpreting the AI Act definition provided by the European Law Institute (ELI) as a response to the Commission’s public consultation brings more clarity. The ELI introduced a “Three-Factor Approach” which can be used for identifying AI systems based on the “(1) the amount of data or domain-specific empirical knowledge that went into the development and maintenance of the system; (2) the extent to which new know-how is created during the system’s operation; and (3) the formal indeterminacy of outputs, i.e. whether the task at hand is one in which a human would exercise discretion”.⁶⁸ This approach provides for a clear methodology helpful in qualifying systems as AI systems. According to the approach suggested by the ELI, applications such as navigation systems, timetable generators and spelling and grammar checkers would not fall within the scope of the definition.⁶⁹ Additionally, credit score applications, such as the ones used by scoring agencies like Austrian KSV and German SCHUFA would be regarded as AI systems.⁷⁰ However, it must be noted that the classification performed by the authors was based on the assumed characteristics of the systems, rather than factual detail on the systems due to lack of publicly available information on the systems analysed.⁷¹ There is still a possibility that the systems used by SCHUFA or KSV, as they are based on heuristics would fall outside the scope of Article 3(1) of the AI Act.⁷² At the same time, the EU Commission expressed a view that it deems systems like SCHUFA to be covered by the AI Act.⁷³

⁶⁴ Peter Church, ‘EU – Guidance on “AI systems”. Does an elephantine definition matter?’ (Linklaters, 12 February 2025) < <https://www.linklaters.com/en/insights/blogs/digilinks> > accessed 26 March 2025.

⁶⁵ Lukas Feiler & Beat König ‘Article 3 Definitions’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 59.

⁶⁶ European Law Institute, What Key Factors are Relevant in Delineating AI Systems for the Purpose of the AI Act? (19 February 2025) < <https://youtu.be/y-tO2TWRgxM> > accessed 19 March 2025

⁶⁷ *ibid.*

⁶⁸ The European Law Institute, ‘Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute’ (2024) < <https://www.europeanlawinstitute.eu/> > accessed 20 January 2024, p. 26.

⁶⁹ *ibid.*, p. 27.

⁷⁰ *ibid.*

⁷¹ *ibid.*

⁷² European Commission, Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025) < <https://ec.europa.eu/newsroom/> > accessed 10 March 2025, para 48.

⁷³ European Law Institute, ‘What Key Factors are Relevant in Delineating AI Systems for the Purpose of the AI Act?’ (19 February 2025) < <https://youtu.be/y-tO2TWRgxM> > accessed 19 March 2025

2.3 Types of AI

As stated before, AI is a field of computer science. It is also possible to view it as a set of technological approaches developed through research in both academia and the private sector.⁷⁴ In general, it is possible to distinguish two categories of technical approaches: (i) machine learning (ML) and (ii) logical rules and knowledge representation.⁷⁵ This division is also mentioned in Recital 12 of the AI Act.⁷⁶

2.3.1 Machine learning

Machine learning systems, as the name suggests can autonomously learn and adapt.⁷⁷ The term ‘learning’ refers to a system’s ability to improve its performance on a specific task over time by analysing more data and identifying new patterns.⁷⁸ ML systems can identify new patterns using various techniques, such as classification, clustering, regression, and association.⁷⁹ The development of ML was driven not only by theoretical advancements in machine learning methods but also by a significant increase in the volume of available data.⁸⁰

It is possible to further divide the machine learning approach.⁸¹ First, there is supervised learning. In this approach, the system learns from labelled data that it receives.⁸² A label indicates that specific data falls within a certain category or class, for instance, that an email qualifies as spam.⁸³ Then, new data is provided into the system, which then recognizes patterns in newly added data.⁸⁴ The programmer that provides labels to the system acts as a teacher, that supervises the work of the system.⁸⁵

⁷⁴ Harry Surden, ‘Artificial Intelligence and Law: An Overview’ (2019) 35 Georgia State University Law Review 1306, 1310.

⁷⁵ *ibid.*

⁷⁶ European Commission, Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para 31.

⁷⁷ Anthony Elliott, *The Routledge Social Science Handbook of AI* (Routledge 2021), p. 5.

⁷⁸ Janneke Gerards and Raphaële Xenidis, ‘Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law’ (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 34

⁷⁹ *ibid.*

⁸⁰ Nikita Aggarwal, ‘The Norms of Algorithmic Credit Scoring’ (2021) 80(1) Cambridge Law Journal 42, 43.

⁸¹ European Commission, Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 32.

⁸² *ibid.*

⁸³ Harry Surden, ‘Artificial Intelligence and Law: An Overview’ (2019) 35 Georgia State University Law Review 1306, 1311.

⁸⁴ *ibid.*

⁸⁵ Andreas Häuselmann, ‘Disciplines of AI: An Overview of Approaches and Techniques’ in Bart Custers and

Secondly, there is unsupervised learning that is used to uncover hidden patterns in datasets without predefining a specific outcome.⁸⁶ AI systems based on unsupervised learning do not learn from labelled data, but rather from discovered patterns.⁸⁷ They can autonomously generate predictions, for instance, the next word in a sentence.⁸⁸ Because it is only possible to assess the output generated by the system, rather than the process of pattern discovery, systems trained through unsupervised learning are often referred to as ‘black box’ AI systems.⁸⁹ This characteristic, inter alia, differs machine learning from traditional statistical methods.⁹⁰

Thirdly, it is possible to distinguish reinforcement learning.⁹¹ Through this technique, the system finds rules and correlations by receiving positive feedback for correct predictions, and negative feedback for errors.⁹² In contrast to the AI systems based on supervised learning that learns from labelled data, reinforcement learning uses trial and error to learn.⁹³ This process allows the system to adjust and improve over time until it reliably recognizes relevant patterns.⁹⁴

2.3.2 Logical rules and knowledge representation

Logical rules and knowledge representation model processes are present in the real world so that computer systems can operate on them.⁹⁵ To achieve it, computer programmers must

Eduard Fosch-Villaronga (eds.) *Law and Artificial Intelligence Regulating AI and Applying AI in Legal Practice* (T.M.C Asser Press 2022), p. 48.

⁸⁶ European Union’s Agency for Fundamental Rights, *Getting the future right – Artificial Intelligence and Fundamental Rights*, (Publications Office of the European Union 2020) <<https://fra.europa.eu/en/publication/2020>> accessed 10 March 2025, p. 20.

⁸⁷ European Commission, *Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025)* <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 35.

⁸⁸ Christopher Manning, ‘Human-Center Artificial Intelligence, Artificial Intelligence Definitions’ (Stanford HAI September 2020) <<https://hai.stanford.edu/>> accessed 2 January 2025.

⁸⁹ Angèle Christin, ‘The ethnographer and the algorithm: beyond the black box’ (2020) 49 *Theory and Society*, 897, 891.

⁹⁰ European Union’s Agency for Fundamental Rights, *Getting the future right – Artificial Intelligence and Fundamental Rights*, (Publications Office of the European Union 2020) <<https://fra.europa.eu/en/publication/2020>> accessed 10 March 2025, p. 20.

⁹¹ European Commission, *Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025)* <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 37.

⁹² Janneke Gerards and Raphaële Xenidis, ‘Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law’ (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 February 2025 p. 35.

⁹³ European Commission, *Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025)* <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para. 37.

⁹⁴ Philip Boucher, ‘Artificial intelligence: How does it work, why does it matter, and what can we do about it?’ (2020), European Parliament, <<https://www.europarl.europa.eu/thinktank/>> accessed 19 March 2025, p. 7.

⁹⁵ Harry Surden, ‘Artificial Intelligence and Law: An Overview’ (2019) 35 *Georgia State University Law Review* 1306, 1311.

program a fixed set of instructions, rules, and variables into a computer.⁹⁶ Consequently, logic- and knowledge-based AI systems might be used to automate tasks traditionally done by humans, such as medical diagnosis.⁹⁷ The use of these systems has several benefits such as a reduction of errors that humans are likely to make during repetitive tasks and an increase in the overall efficiency of the decision-making process.⁹⁸

2.3.2.1 Expert systems

Knowledge representation has been instrumental in the creation of expert systems.⁹⁹ An expert system is a computational system designed to replicate the decision-making capabilities of a human expert.¹⁰⁰ The knowledge of experts, such as medical or legal specialists is encoded into the system as an if-then rule.¹⁰¹ A notable example of a legal expert system is the tax preparation software TurboTax.¹⁰² In its development, software engineers collaborated with tax attorneys and other experts in personal income tax law to convert the principles and logic of tax provisions into formal rules that can be processed by a computer.¹⁰³ The expert systems' objective is to provide recommendations to humans.¹⁰⁴

2.4 Characteristics of AI systems and the challenges they pose

Despite differences in functioning and training methods, AI systems share some characteristics that are relevant for legal analysis, especially when it comes to understanding risks that the systems pose to EU non-discrimination law. The aim of this section is to show what makes discrimination of AI systems nuanced.

⁹⁶ibid.

⁹⁷ European Commission, Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, para 39.

⁹⁸ Janneke Gerards and Raphaële Xenidis, 'Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law' (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 32.

⁹⁹ Harry Surden, 'Artificial Intelligence and Law: An Overview' (2019) 35 Georgia State University Law Review 1306, 1312.

¹⁰⁰ ibid.

¹⁰¹ Crina Grosan and Ajith Abraham 'Rule-Based Expert Systems' in *Intelligent Systems* (Springer 2011), p. 149.

¹⁰² Harry Surden, 'Artificial Intelligence and Law: An Overview' (2019) 35 Georgia State University Law Review 1306, 1317.

¹⁰³ ibid.

¹⁰⁴ European Law Institute, 'Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute' (2024), <<https://www.europeanlawinstitute.eu/>> accessed 20 January 2024, p. 18.

Firstly, an issue of biases remains. Despite the common view that AI systems in decision-making might help minimize biases¹⁰⁵ by reducing human involvement, the role of humans in developing these systems should not be overlooked.¹⁰⁶ It might seem that systems based on machine learning operate independently and for this reason are free from human biases. However, the role of humans is essential during the training of AI models, as well as in the monitoring and evaluation stages of an AI system's development.¹⁰⁷ The involvement of humans in the development of AI systems might be also seen as a positive.¹⁰⁸ The so-called 'human-in-the-loop' approach is commonly used in research and was incorporated into the EU ethics guidelines for trustworthy AI,¹⁰⁹ as well as in the AI Act.¹¹⁰ However, human involvement in this process might also have negative consequences from a non-discrimination perspective, as human reasoning is very often flawed and influenced by stereotypes.¹¹¹ AI system developers may unintentionally or deliberately embed their personal biases into the systems they create.¹¹² Undeniably, algorithms are the reflection of the society and beliefs of the ones who designed them.¹¹³ It should be noted that biases are "rooted in psychological, social and cultural dynamics and hence reflected in the data and texts that are used for developing AI models".¹¹⁴ Additionally, even if humans without biases are involved in the decision-making process, there is an issue of a so-called 'automation bias'.¹¹⁵ An automation

¹⁰⁵ Jorge L Contreras *The Equality Machine: Harnessing Digital Technology for a Brighter, More Inclusive Future* by Orly Lobel (2023) 31 International Journal of Law and Technology 276, 278.

¹⁰⁶ Janneke Gerards and Raphaële Xenidis, 'Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law' (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 47.

¹⁰⁷ *ibid.*

¹⁰⁸ Ross P Buckley et al., 'Regulating Artificial Intelligence in Finance: Putting the Human in the Loop' (2021) 43(1) Sydney Law Review 43, 66.

¹⁰⁹ Therese Enarsson, Lena Enqvist and Markus Naarttijärvi, 'Approaching the Human in the Loop – Legal Perspectives on Hybrid Human/Algorithmic Decision-Making in Three Contexts' (2022) 31 Information & Communications Technology Law 123, 126.

¹¹⁰ Artificial Intelligence Act, art. 14.

¹¹¹ Janneke Gerards and Raphaële Xenidis, 'Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law' (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 42.

¹¹² Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 324.

¹¹³ Jon Klienbergh and others, 'Discrimination in the Age of Algorithms' (2018) 10 Journal of Legal Analysis 113, 161.

¹¹⁴ European Union's Agency for Fundamental Rights, 'Bias in Algorithms – Artificial Intelligence and Discrimination', (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p. 18.

¹¹⁵ Saar Alon-Barkat and Madalina Busuioc, 'Human-AI Interactions in Public Sector Decision Making: "Automation Bias" and "Selective Adherence" to Algorithmic Advice' (2023) 33(1) Journal of Public Administration Research and Theory 153, 164.

bias can be defined as a tendency of humans to overly trust outputs generated by a computational system.¹¹⁶ Combined with the issue of biases encoded in data, the automation bias can also become a risk to a right to non-discrimination.¹¹⁷

Secondly, there is an issue of data quality and accuracy.¹¹⁸ As has been outlined in the previous section, AI systems' outputs heavily depend on the quality of input data provided to them.¹¹⁹ In the credit scoring domain, it has been observed that scores generated for applicants with lower incomes and those from minority backgrounds are ten per cent less accurate compared to scores for high-income applicants.¹²⁰ In general, financial institutions experience a problem of data quality and accessibility, often caused by the lack of possibility to process certain categories of data.¹²¹ What is especially interesting is that, according to some experts, the flaws in credit scoring relate to the fact that financial institutions are not able to apply scoring factors such as gender or ethnicity for a non-discrimination reason.¹²² Paradoxically, lack of access to these categories of data, in European legislation considered a 'special category of data',¹²³ might lead to discriminatory results.¹²⁴ This issue will be further analysed in Chapter 5 when discussing Article 10 of the AI Act. Another example illustrating inaccurate algorithmic outputs caused by a general underrepresentation of a group is a facial recognition software designed for a research purpose,¹²⁵ which turned out to "perform better on lighter faces than darker faces".¹²⁶ Facial recognition technologies do not fall within the scope of this paper, nonetheless, this

¹¹⁶ *ibid.*

¹¹⁷ *ibid.*

¹¹⁸ Janneke Gerards and Raphaële Xenidis, 'Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law' (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 42.

¹¹⁹ *ibid.*

¹²⁰ Edmund L. Andrews, 'How Flawed Data Aggravates Inequality in Credit' (Stanford HAI August 6 2021) <<https://hai.stanford.edu/news/how-flawed-data-aggravates-inequality-credit>> accessed 20 March 2025.

¹²¹ M. Konrad Borowicz, 'The data quality problem (in the European Financial Data Space)' (2024) 32(1) International Journal of Law and Information Technology, 1.

¹²² Edmund L. Andrews, 'How Flawed Data Aggravates Inequality in Credit' (Stanford HAI August 6 2021) <<https://hai.stanford.edu/news/how-flawed-data-aggravates-inequality-credit>> accessed 12 November 2024.

¹²³ General Data Protection Regulation, art. 9.

¹²⁴ Marvin van Bekkum and Frederik Zuiderveen Borgesius, 'Using Sensitive Data to Prevent Discrimination by Artificial Intelligence: Does the GDPR Need a New Exception?' (2022) 48 Computer Law and Security Review, <<https://www.sciencedirect.com/science/article/pii/S0267364922001133?via%3Dihub>> accessed 12 March 2025, p. 3

¹²⁵ Joy Buolamwini and Timnit Gebru, 'Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification' (2018) Proceedings of Machine Learning Research 81:1–15 Conference on Fairness, Accountability and Transparency, p. 5.

¹²⁶ *ibid.*, p. 8.

example serves as a good illustration of a general problem of how biases might result due to an unrepresentative pool of training data.¹²⁷

Another challenge in AI decision-making can be described as the challenge of proxies. A proxy in this context is a piece of information, which at first might seem objective and not related to characteristics such as gender or ethnic origin.¹²⁸ However, since AI systems can detect patterns, they can easily find correlations between this seemingly neutral information and a protected characteristic.¹²⁹ An example of a proxy is a zip code, which can be an indicator of ethnicity.¹³⁰ Therefore, if algorithms detect proxy variables, there is a risk of discriminatory outcomes.¹³¹ This issue will be further explored in Chapter 4. However, it must be already mentioned that the proxy challenge is especially relevant when it comes to indirect discrimination.¹³²

Lastly, one of the most prevailing characteristics of AI systems is their opaqueness.¹³³ The opaqueness of AI systems makes it difficult to identify instances of discrimination.¹³⁴ Furthermore, some AI systems, especially the ones based on unsupervised learning operate with a high degree of autonomy, and how they generate outputs is often unclear and untransparent.¹³⁵ Consequently, due to a lack of transparency, it is exceptionally challenging for humans to spot

¹²⁷ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 326.

¹²⁸ European Union's Agency for Fundamental Rights, 'Bias in Algorithms – Artificial Intelligence and Discrimination', (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p. 24.

¹²⁹ Janneke Gerards and Frederik Zuiderveen Borgesius, 'Protected Grounds and the System of Non-Discrimination Law in the Context of Algorithmic Decision-Making and Artificial Intelligence' (Social Science Research Network, 2 November 2020) <<https://papers.ssrn.com/abstract=3723873>> accessed 15 February 2025, p. 61.

¹³⁰ European Union's Agency for Fundamental Rights, 'Bias in Algorithms – Artificial Intelligence and Discrimination', (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p. 24.

¹³¹ *ibid.*

¹³² Sandra Wachter, Brent Mittelstadt and Chris Russell, 'Bias Preservation in Machine Learning: The Legality of Fairness Metrics Under EU Non-Discrimination Law' (2021) 123 *West Virginia Law Review* 1, 15.

¹³³ Frederik J Zuiderveen Borgesius, 'Strengthening Legal Protection against Discrimination by Algorithms and Artificial Intelligence' (2020) 24 *The International Journal of Human Rights* 1572, 1583.

¹³⁴ *ibid.*

¹³⁵ Janneke Gerards and Raphaële Xenidis, 'Algorithmic Discrimination in Europe: Challenges and Opportunities for Gender Equality and Non-Discrimination Law' (2021) European Commission <<https://op.europa.eu/en/publication-detail/-/publication/082f1dbc-821d-11eb-9ac9-01aa75ed71a1>> accessed 10 March, p. 45.

biases and evaluate decisions produced by algorithms.¹³⁶ In particular, it is difficult to assess whether discrimination based on a characteristic such as race or gender took place, or whether discrimination was caused by a proxy.¹³⁷

To conclude, AI systems create risks to the right to non-discrimination because of their opacity, and biases encoded in data and proxies. The next chapter will deal with risks that might arise when AI systems are specifically used in the domain of credit scoring.

Chapter 3: AI systems and credit scoring

The previous chapter served as an introduction to the concept of AI and the definition of an AI system under Article 3(1) of the AI Act. This chapter centres the discussion on a specific area of AI systems' deployment relevant to this thesis – credit scoring. Credit scoring is a key area where AI technology is applied in the financial sector.¹³⁸ The domain of credit scoring is inherently sensitive as it directly influences citizens' financial opportunities and consequently also their life quality.¹³⁹ Additionally, automated creditworthiness assessment has been extensively debated both in academia and in case law. In December 2023, the Court of Justice of the European Union (CJEU) held that German credit scoring agency SCHUFA was engaged in automated individual decision-making under Article 22 of the GDPR.¹⁴⁰ With this decision, the CJEU questioned the entire business model of credit-scoring agencies.¹⁴¹ Credit scoring agencies, including SCHUFA, argued that credit scoring decision itself does not equal negative credit decision, and stated that it is only a “preparatory act”.¹⁴² However, the CJEU stated that preparatory acts fall within the scope of a “decision” as per Article 22(1) of the GDPR.¹⁴³ Consequently, CJEU prohibited SCHUFA, as well as other credit scoring agencies, from

¹³⁶ Frederik Zuiderveen Borgesius, ‘Discrimination, artificial intelligence, and algorithmic decision-making’. Council of Europe, Directorate General of Democracy, (2018) < <https://rm.coe.int/discrimination-artificial-intelligence-and-algorithmic-decision-making/1680925d73> > accessed 1 December 2024, p. 13.

¹³⁷ Tal Zarsky, ‘The Trouble with Algorithmic Decisions: An Analytic Road Map to Examine Efficiency and Fairness in Automated and Opaque Decision Making’ (2016) 41 Science, Technology, & Human Values 118, 127.

¹³⁸ Minesh Tanna and William Dunning, ‘Bias and discrimination in the use of AI in the financial sector’ in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 328.

¹³⁹ Ellena Falleti and Chiara Gallese, ‘Credit scoring and transparency between the AI Act and the Court of Justice of the European Union’, < <https://ceur-ws.org/Vol-3744/paper7.pdf> > accessed 27 January 2025, p. 2.

¹⁴⁰ Case C-634/21, OQ v Land Hessen [2023], ECLI:EU:C:2023:957

¹⁴¹ noyb, ‘CJEU landmark rulings on “credit ranking” and review of DPAs’ (noyb, 7 December 2023) < <https://noyb.eu/en/cjeu-landmark-rulings-credit-ranking-and-review-dpas> > accessed 10 January 2025.

¹⁴² Nils Lölting and Ruth Boardman, ‘CJEU confirms preparatory acts can be automated individual decisions: the SCHUFA cases’ (Bird&Bird, 19 December 2023) < <https://www.twobirds.com/en/insights/2023/global/key-takeaways-from-the-schufa-case-of-the-cjeu> > accessed 10 March 2025.

¹⁴³ *ibid.*

conducting automated credit scoring unless the explicit consent of a data subject is given.¹⁴⁴ This decision, together with Article 22 of the GDPR, is further analysed in section 4.2 of Chapter 4.

The AI Act qualifies AI systems intended to be used to evaluate the creditworthiness of a natural person or for the purpose of establishing their credit score as high-risk AI systems.¹⁴⁵ The fact that AI systems used for assessing creditworthiness are regarded as high-risk systems is a positive development. The question remains whether the introduced obligations manage to respond to risks that the use of AI systems in credit scoring poses to individuals' right to non-discrimination and whether these obligations can be realistically met by the deployers in the financial sector. Additionally, it is necessary to establish what is the added value of provisions introduced in the AI Act in regard to non-discrimination.

This chapter presents how the use of AI systems in credit scoring might lead to an infringement of individuals' right to non-discrimination. First, the chapter provides a definition of credit scoring and discusses the types of data that are used by credit scoring agencies for this purpose. Lastly, the chapter discusses what risks might arise from the use of AI systems in this domain.

3.1 Credit scoring and creditworthiness

In general, credit score is a type of score that helps financial institutions, usually banks and credit bureaus, in deciding whether an individual should be granted credit.¹⁴⁶ Credit scoring is a crucial tool in financial markets that is designed to evaluate the creditworthiness of individuals applying for loans or other financial services.¹⁴⁷

In the past, lenders made loan decisions based on a combination of measurable data and their subjective judgments, often relying on intuition to balance quantitative and qualitative information.¹⁴⁸ This approach was marked by cognitive errors and biases arising from the

¹⁴⁴ noyb, 'CJEU landmark rulings on "credit ranking" and review of DPAs' (noyb, 7 December 2023) <<https://noyb.eu/en/cjeu-landmark-rulings-credit-ranking-and-review-dpas>> accessed 10 January 2025.

¹⁴⁵ Artificial Intelligence Act, art 6 (2) and Annex III (5)(b).

¹⁴⁶ Mariana Pincovsky et al., 'Machine Learning applied to credit analysis: a Systematic Literature Review' (2021) 16th Iberian Conference on Information Systems and Technologies < <https://ieeexplore-ieee.org/tilburguniversity.idm.oclc.org/document/9476350> > accessed 20 March 2025, p. 10.

¹⁴⁷ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 Law and Financial Markets Review 239, 239.

¹⁴⁸ Katja Langenbucher, 'Responsible A.I.-Based Credit Scoring – A Legal Framework' (2020) 31 European Business Law Review 527, 532.

subjective judgments.¹⁴⁹ In the 1950s, with advancements in statistical computing, credit scoring began to rely on statistical data.¹⁵⁰ The type of data used for this purpose was very limited and it involved categories such as income, stability of residence and information on the history of past loan repayment.¹⁵¹ Currently, the range of data used for creditworthiness assessment has drastically evolved. An increasing amount of data from outside the financial sector, such as social media profiles, preferences in food or music, the number of friends (and their creditworthiness), or time spent on specific websites, is being utilized.¹⁵²

Credit scoring is not only used by financial institutions in deciding whether the applicant should be granted a loan but also in insurance policies, employment and in the real estate industry.¹⁵³ Performance of creditworthiness assessments is a requirement under Article 18 of the New Consumer Credit Directive.¹⁵⁴ The relevance of this provision is examined in section 4.1 of Chapter 4. However, it should already be stated that the process of creditworthiness assessment must be conducted in consumers' interest, to protect them from irresponsible lending practices and over-indebtedness.¹⁵⁵

3.2 AI Systems used in credit scoring

The use of algorithms in credit scoring is not a novelty as the application of algorithms in credit scoring has been common since the 1950s when statistical and mathematical approaches were adopted to assist with the assessments.¹⁵⁶ However, the use of machine learning in credit scoring has been a major step in qualitative analysis.¹⁵⁷ The use of AI in credit scoring plays a

¹⁴⁹ *ibid.*

¹⁵⁰ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 Law and Financial Markets Review 239, 242.

¹⁵¹ Katja Langenbucher, 'Responsible A.I.-based Credit Scoring – A Legal Framework' (2020) European 31(4) Business Law Review 527, 531.

¹⁵² *ibid.*

¹⁵³ Claude Castelluccia and Daniel Le Métayer, 'Understanding algorithmic decision making: Opportunities and challenges' (European Parliament Scientific Foresight Unit (STOA) 2019) <[https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261)> accessed 10 December 2024, p. 8.

¹⁵⁴ Directive (EU) 2023/2225 of the European Parliament and of the Council of 18 October 2023 on credit agreements for consumers and repealing Directive 2008/48/EC [2023] OJ L, 2023/2225.

¹⁵⁵ The New Consumer Credit Directive, article 18(1).

¹⁵⁶ Nydia Remolina, 'The Role of Financial Regulators in the Governance of Algorithmic Credit Scoring' (2020) SMU Centre for AI & Data Governance Research Paper No. 2/2022 <<https://papers.ssrn.com/abstract=4057986>> accessed 20 March 2025, p. 6.

¹⁵⁷ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 Law and Financial Markets Review 239, 252.

key role in improving the identification of patterns due to its capability to learn from mistakes and faulty predictions.¹⁵⁸

Traditionally, systems used for creditworthiness assessments, such as the already mentioned German SHUFA or Austrian KSV, do not rely on machine learning. These systems rather use rules that were manually programmed based on experts' statements or based on statistical data.¹⁵⁹ However, it is difficult to assess the logic behind SCHUFA's system as the algorithm is protected by a trade secret.¹⁶⁰ Even though the rules that these systems rely on might be considered simple, they still qualify as AI systems according to the definition in Article 3(1) of the AI Act.¹⁶¹ The issue of whether traditional credit scoring systems fall within the scope of the AI Act is further discussed under section 5.2.

3.3 Risks of AI decision making adopted in creditworthiness

3.3.1 Biased data and discrimination

It has been already explained that the use of AI in any sort of assessment creates room for a risk of discrimination. Especially in the credit scoring domain, the likelihood of biased data being present in the system is high, as the selection of reference categories can significantly impact the outcome.¹⁶² In addition, the issue of proxies comes into play. It is possible that indicators such as place of residence could work for a disadvantage of an individual's credit score.¹⁶³ Even if ethnic origin is not directly considered in the credit scoring, other indicators such as postcodes, might serve as a proxy for it.¹⁶⁴ Consequently, AI systems that rely in their decision-

¹⁵⁸ *ibid.*

¹⁵⁹ European Law Institute, 'Commission Guidelines on the Application of the Definition of an AI System and the Prohibited AI Practices Established in the AI Act – Response of the European Law Institute' (2024) <<https://www.europeanlawinstitute.eu/>> accessed 20 January 2024, p. 26.

¹⁶⁰ Algorithm Watch, 'OpenSCHUFA – shedding light on Germany's opaque credit scoring' (22 May 2018), <<https://algorithmwatch.org/en/openschufa-shedding-light-on-germanys-opaque-credit-scoring->> accessed 22 March 2025; Walter Palmetshofer, 'We crack the Schufa, the German credit scoring' (*Open Knowledge*, 22 February 2018) <<https://blog.okfn.org/2018/02/22/we-crack-the-schufa-the-german-credit-scoring>> accessed 22 March 2025.

¹⁶¹ European Law Institute, 'What Key Factors are Relevant in Delineating AI Systems for the Purpose of the AI Act?' (19 February 2025), <<https://youtu.be/y-tO2TWrgxM>> accessed 19 March 2025

¹⁶² Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 *Law and Financial Markets Review* 239, 241.

¹⁶³ European Union's Agency for Fundamental Rights, 'Bias in Algorithms – Artificial Intelligence and Discrimination', (Publications Office of the European Union 2022) <<https://fra.europa.eu/en/publication/2022/>> accessed 10 March 2025, p. 6

¹⁶⁴ *ibid.*

making on factors that are not based on protected characteristics might still indirectly discriminate.¹⁶⁵

In addition, there is an issue of granularity of data which is of importance for the outcome of a credit assessment.¹⁶⁶ The high degree of granularity leads to more accurate results and predictions of AI-operated credit scoring, whereas fine-grained data might cause false negatives.¹⁶⁷

Discrimination is one of the most prominent risks when it comes to AI decision-making. In the EU secondary law, direct and indirect discrimination can be distinguished.¹⁶⁸ There exists evidence that AI decision-making can cause discrimination, which is usually a consequence of biases in training data caused by existing societal biases or inadequate training data.¹⁶⁹ Section 4.1 of the next chapter focuses on EU non-discrimination laws and describes discrimination in more detail. The area of credit scoring has been studied extensively regarding discrimination, as it has the potential to largely affect individuals' lives.¹⁷⁰

In the financial sector, the use of AI systems might lead to further propagation of existing social and economic imbalances.¹⁷¹ One of the examples is the case of Upstart, the US credit scoring company, which makes it possible for individuals with limited credit or work history to receive a credit or a credit on better terms.¹⁷² In the US, there is a clear correlation between education

¹⁶⁵ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 Law and Financial Markets Review 239, 241.

¹⁶⁶ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), 330.

¹⁶⁷ *ibid.*

¹⁶⁸ Evelyn Ellis and Philippa Watson, *EU Anti-Discrimination Law* (2nd edn, Oxford University Press 2012), p. 142.

¹⁶⁹ Minesh Tanna and William Dunning, 'Bias and discrimination in the use of AI in the financial sector' in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), p. 328

¹⁷⁰ Claude Castelluccia and Daniel Le Métayer, 'Understanding algorithmic decision making: Opportunities and challenges' (2019) European Parliamentary Research Service Scientific Foresight Unit (STOA) PE 624.261 <[https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261)> accessed 10 December 2024, 41.

¹⁷¹ Anat Keller, Clara Martins Pereira, and Martinho Lucas Pires, 'The European Union's Approach to Artificial Intelligence and the Challenge of Financial Systemic Risk' in Pompeu Casanovas and Giovanni Sartor (eds.) *Multidisciplinary Perspectives on Artificial Intelligence and the Law* (Springer 2022), p. 418

¹⁷² Upstart, 'Request for an no action letter' <https://files.consumerfinance.gov/f/documents/201709_cfbp_upstart-no-action-letter-request.pdf> accessed 20 March 2025, 1.

level and race.¹⁷³ According to a report from 2015, only 23% of Black people and 16% of Hispanic people have completed education at a bachelor's degree level.¹⁷⁴ According to the report published by the Student Borrower Protection Center (SBPC), a non-profit organisation advocating for borrowers' rights and economic justice,¹⁷⁵ Upstart's use of alternative data resulted in "penalizing borrowers who attended minority-serving institutions".¹⁷⁶ To conclude, the problem in this case was not related to the faulty system or incomplete data, but to biases embedded in data. This issue has been acknowledged by the EU legislator in the AI Act.¹⁷⁷ Article 10(5) is especially relevant as it introduces a legal basis for the processing of sensitive data for bias monitoring and mitigation. This provision will be further analysed in chapter 5 of the thesis.

3.3.2 Lack of transparency

Additionally, the origin of data processed by an AI system might be opaque to the individual being affected by the decision.¹⁷⁸ In some cases, the source of data might not be disclosed at all. On the other hand, even if data is disclosed, it is unlikely that an average consumer would be able to understand errors which could be embedded in it.¹⁷⁹ Therefore, it is essential that an individual receives information about how the score was constructed and can contest the decision if it finds that it was based on a faulty score.

3.3.3 Lack of accountability

Accountability is strongly related to transparency, but these two concepts are separate. The principle of accountability is an important principle which is present in various legal disciplines and is also incorporated in the GDPR.¹⁸⁰ In general, this principle includes an obligation to

¹⁷³ Katja Langenbucher and Patrick Corcoran, 'Responsible AI Credit Scoring – A Lesson from Upstart.com' in Emiliós Avgouleas and Heikki Marjosola (eds) *Digital Finance in Europe: Law, Regulation, and Governance* (De Gruyter, 2022), p. 151.

¹⁷⁴ *ibid.*

¹⁷⁵ Student Borrower Protection Center (SBPC), 'About Us' <<https://protectborrowers.org/who-we-are/>> accessed 15 October 2024.

¹⁷⁶ Katherine Welbeck and Ben Kaufman, 'Fintech Lenders' Responses to Senate Probe Heighten Fears of Educational Redlining' (Student Borrower Protection Center 2020) <<https://protectborrowers.org/fintech-lenders-response-to-senate-probe-heightens-fears-of-educational-redlining/>> accessed 15 October 2024.

¹⁷⁷ Artificial Intelligence Act, recitals 67, 75.

¹⁷⁸ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 Law and Financial Markets Review 239, 242.

¹⁷⁹ *ibid.*

¹⁸⁰ European Data Protection Supervisor, 'Accountability' <https://www.edps.europa.eu/data-protection/our-work/subjects/accountability_en> accessed 20 January 2025.

justify.¹⁸¹ In the case of credit scoring, the lenders should be under an obligation to justify their decisions.¹⁸² It is also connected to the possibility of facing sanctions in case the provided justifications are insufficient.¹⁸³ The importance of the principle of accountability in AI governance has been already acknowledged by the AI High-Level Expert Group.¹⁸⁴

As described in section 3.4.1, the use of AI systems in credit scoring might indirectly lead to discriminatory outcomes. Due to the opaqueness and unpredictability of outcomes produced by AI systems, assessing accountability for these outcomes is problematic.¹⁸⁵ In addition, in the process of AI decision-making, it is impossible to place a responsibility on a single individual, which might lead to an accountability gap.¹⁸⁶

Chapter 4: Regulatory Landscape before the AI Act

Consumer credit scoring and its inherent risks, including discrimination, are regulated by the European Union law. However, the existing framework is fragmented. Before the adoption of the AI Act, credit scoring was regulated under the General Data Protection Regulation (GDPR)¹⁸⁷ and a very relevant CJEU judgement for the credit scoring industry in SCHUFA case.¹⁸⁸ Regarding discriminatory creditworthiness assessments, European secondary antidiscrimination laws are to be considered. Therefore, the GDPR and the European secondary non-discrimination law can be considered as a legal framework preceding the AI Act. This Chapter is titled as “Regulatory Landscape before the AI Act”. However, it also analysis an

¹⁸¹ *ibid.*

¹⁸² Minesh Tanna and William Dunning, ‘Bias and discrimination in the use of AI in the financial sector’ in Nydia Remolina and Aurelio Gurrea-Martinez (eds), *Artificial Intelligence in Finance. Challenges, Opportunities and Regulatory Developments* (Edward Elgar Publishing 2023), 343.

¹⁸³ Claude Castelluccia and Daniel Le Métayer, ‘Understanding algorithmic decision making: Opportunities and challenges’ (European Parliament Scientific Foresight Unit 2019) <[https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261)> accessed 10 February 2025, 30.

¹⁸⁴ High-Level Expert Group on Artificial Intelligence, ‘A definition of AI: Main capabilities and scientific disciplines’ (2018) European Commission <https://ec.europa.eu/futurium/en/system/> accessed 10 February 2025, p. 2.

¹⁸⁵ Claudio Novelli, Mariarosaria Taddeo and Luciano Floridi, ‘Accountability in Artificial Intelligence: What It Is and How It Works’ (2024) 39 AI & SOCIETY 1871, 1873.

¹⁸⁶ Klaus Heine and Alberto Quintavalla, ‘Bridging the accountability gap of artificial intelligence – what can be learned from Roman law?’ (2019) 44 (1) Legal Studies < <https://doi.org/10.1017/lst.2022.51> > accessed 22 March 2025 65, 70-71.

¹⁸⁷ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) OJ L 119.

¹⁸⁸ Case C-634/21, OQ v Land Hessen [2023] ECLI:EU:C:2023:957.

important piece of legislation - the 2023 Consumer Credit Directive,¹⁸⁹ which entered into force in November 2023. Therefore, the legislative process on the 2023 Consumer Credit Directive took place in parallel with the AI Act's. Since the Directive was adopted earlier than the AI Act, the thesis also regards the Consumer Credit Directive as part of the regulatory framework "before the AI Act". However, the author is aware that the legislative process was conducted simultaneously and the use of the phrase "before the AI Act" is a simplification used for the purpose of this thesis.

This chapter will analyse each of these legislations to provide an overview of the existing legal framework and identify its possible shortcomings. First, the European antidiscrimination legal framework is addressed (section 4.1). Secondly, the chapter moves to the analysis of the GDPR, and the CJEU judgements in SCHUFA and *CK v Dun & Bradstreet Austria*¹⁹⁰ cases. Thirdly, the New Consumer Credit Directive is discussed. The next chapter of the thesis will focus on how the AI Act complements the existing framework governing credit assessments regarding safeguarding individuals' right to non-discrimination.

4.1 European Union's non-discrimination law

This section provides an overview of the European anti-discrimination legal framework. The goal of this section is not to provide an in-depth analysis of the anti-discrimination legislation, but rather, to analyse how anti-discrimination laws relate to the domain of credit scoring. This analysis is followed by a reflection on how automated decision-making challenges the existing anti-discrimination law and its rationale.

4.1.1 Introduction

One of the main ideas behind the anti-discrimination laws is that individuals should only be judged based on actions that they can control.¹⁹¹ Many theories underlying anti-discrimination law stem from three main families of theories: egalitarian, libertarian, and dignitarian, which in general share a consensus that roots of non-discrimination law lay in "the ideas of equality, fairness, and justice".¹⁹²

¹⁸⁹ Directive (EU) of the European Parliament and of the Council of 18 October 2023 on credit agreements for consumers and repealing Directive 2008/48/EC.

¹⁹⁰ Case C-203/22 *CK v Dun & Bradstreet Austria* ECLI:EU:C:2024:745 [2024].

¹⁹¹ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 *Tulane Law Review*, 46.

¹⁹² *ibid*, p. 34.

The term “European anti-discrimination or non-discrimination law” might suggest that one comprehensive set of rules relating to non-discrimination exists within the European Union’s law, which is not the case.¹⁹³ The European non-discrimination law is built on multiple legal acts, both primary and secondary, as well as the case law of the CJEU and remains fragmented.¹⁹⁴ Non-discrimination law aims to promote equality in various areas of life.¹⁹⁵ In addition, it is possible to distinguish another anti-discrimination law system, which is based on the Council of Europe’s European Convention on Human Rights (ECHR), and the case law of the European Court of Human Rights (ECtHR). Article 14 of the ECHR establishes the prohibition of discrimination, ensuring equal treatment in the enjoyment of the rights outlined in the Convention.

Although both systems function independently, they are interconnected in many ways.¹⁹⁶ Both CJEU and ECtHR refer to each other’s case law, and in Article 6(3) of the TEU, there is an explicit mention of the ECHR serving as an inspiration for the development of fundamental rights in the EU.¹⁹⁷ The following sections focus on the non-discrimination law developed by the European Union; however, it is important to acknowledge the role that the Council of Europe plays in the creation of non-discrimination law.

The Treaty of European Union incorporates non-discrimination as a general principle and it is one of the fundamental values of the EU.¹⁹⁸ In addition, the EU has set a goal to combat discrimination based on sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation in its implementing policies and activities.¹⁹⁹ These characteristics are considered to be grounds protected against discrimination according to Article 19 TFEU and are referred to as protected grounds or protected characteristics. According to Article 21 of the EU Charter of Fundamental Rights:

¹⁹³European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 11.

¹⁹⁴ Jan Wouters and Michal Ovádek, *The European Union and Human Rights: Analysis, Cases, and Materials* (Oxford University Press 2021), p. 389.

¹⁹⁵ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 11

¹⁹⁶ *ibid.*

¹⁹⁷ *ibid.*

¹⁹⁸ Consolidated Version of the Treaty on European Union [2008] OJ C115/13, arts 2 and 3(3).

¹⁹⁹ Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C 326, art 10.

“Any discrimination based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation shall be prohibited.”

Therefore, the Charter covers grounds other than only the six protected grounds under the TFEU. It mentions also that any discrimination based on nationality shall be prohibited.²⁰⁰ According to the CJEU, the principle of equal treatment is a fundamental principle of EU law, as set out in Article 20 of the Charter. The principle of non-discrimination, enshrined in Article 21(1) of the Charter, is a specific expression of this overarching principle.²⁰¹

4.1.2 Anti-discrimination directives

The primary law provisions mentioned above gave rise to various secondary law instruments. In 2000, the Employment Equality Directive (Directive 2000/78/EC)²⁰² prohibiting discrimination based on sexual orientation, religion or belief, age and disability, in the area of employment was adopted, as well as the Racial Equality Directive (Directive 2000/43/EC).²⁰³ The latter prohibits discrimination based on race or ethnicity and its material scope reaches beyond the prohibition of discrimination in the context of employment, as it also covers discrimination in access to social welfare, and access to and supply of goods and services.²⁰⁴ In contrast, Directive 2000/78/EC protects the grounds of religion or belief, disability, age and sexual orientation against discrimination in employment.²⁰⁵ Consequently, discrimination based on these grounds remains unaddressed in areas such as education, social security, and access to goods and services, including healthcare, housing, advertising, and the media. This issue is deemed by legal scholars and practitioners as creating an “undue hierarchy of grounds in EU non-discrimination law.”²⁰⁶

²⁰⁰ Charter of Fundamental Rights of the European Union [2012] OJ C 326.

²⁰¹ CJEU, C-356/12, Wolfgang Glatzel v. Freistaat Bayern ECLI:EU:C:2014:350, para. 43.

²⁰² Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation [2000] OJ L 303.

²⁰³ Council Directive 2000/43/EC of 29 June 2000 implementing the principle of equal treatment between persons irrespective of racial or ethnic origin [2000], OJ L 180.

²⁰⁴ *ibid*, art. 3(1).

²⁰⁵ Council Directive 2000/78/EC, art. 3(1).

²⁰⁶ Lisa Waddington and Mark Bell, ‘More equal than others: distinguishing European Union equality directives’ (2001) 38 Common Market Law Review 587, 580.

Examples of secondary law pertaining to equality between men and women include the so-called Gender Recast Directive (2006/54/EC)²⁰⁷ and the Equal Treatment in Goods and Services Directive (2004/113/EC).²⁰⁸ Still, the protection against discrimination on the grounds of sex does not correlate with the protection granted in the Racial Equality Directive, as the Gender Recast Directive focuses on equal treatment in relation to social security.

4.1.3 Protected grounds

A protected ground refers to an individual's characteristic that should not be considered relevant when determining differential treatment or access to a specific benefit.²⁰⁹ As stated in the subsections above, the list of protected grounds included in the EU non-discrimination directives is a fixed list consisting of six grounds: sex, sexual orientation, disability, age, religion or belief and racial or ethnic origin. Generally, groups can only enjoy protection if a clear link to a protected ground can be demonstrated.²¹⁰ The existing case law of the CJEU demonstrates that it is extremely challenging for an individual to prove discrimination based on characteristics that are not considered protected under European anti-discrimination law.²¹¹ The CJEU has been reluctant to grant protection based on grounds other than the ones listed in the non-discrimination directives and the EU primary law. One of the examples is *Kaltoft case*,²¹² in which the new ground for discrimination based on obesity was refused. A similar conclusion was reached by the Court in *Coleman case*,²¹³ relating to discrimination against an employee due to her child's disability, in which the Court also ruled that the list of categories in the directives is exclusive.²¹⁴

²⁰⁷ Directive 2006/54/EC of the European Parliament and of the Council of 5 July 2006 on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation (recast), [2006] OJ L 204.

²⁰⁸ Council Directive 2004/113/EC of 13 December 2004 implementing the principle of equal treatment between men and women in the access to and supply of goods and services [2004] OJ L 373.

²⁰⁹ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/> > accessed 16 February 2025, p. 161.

²¹⁰ *ibid.*

²¹¹ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 *Tulane Law Review*, 13.

²¹² Case C-354/13 *Fag og Arbejde (FOA) v Kommunernes Landsforening (KL)* [2014] ECLI:EU:C:2014:2463.

²¹³ Case C-303/06, *S. Coleman v Attridge Law and Steve Law* [2008] ECLI:EU:C:2008:415.

²¹⁴ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 *Tulane Law Review*, 25.

4.1.4 Different forms of discrimination under EU law

When talking about anti-discrimination law, it is necessary to mention one of the most foundational concepts in this area of law, being a distinction between direct and indirect discrimination. In addition, it is possible to distinguish intersectional and multiple discrimination.

4.1.4.1 Direct discrimination

According to the EU law, direct discrimination occurs when ‘one person is treated less favourably than another is, has been or would be treated in a comparable situation’ based on one of the protected grounds defined in the relevant directives.²¹⁵ Therefore, direct discrimination occurs when an individual is treated less favourably than others, who in a similar situation would have been treated differently. In addition, a reason for such a treatment is a characteristic that an individual holds that qualifies as a protected ground, and this treatment results in a disadvantage for the individual or group associated with that characteristic.²¹⁶

To establish whether an individual received less favourable treatment, for instance, if he or she was refused a social security payment, it is necessary to identify a suitable ‘comparator’. A comparator is used to refer to a person in materially similar circumstances but without characteristics related to one of the protected grounds.²¹⁷ This process is quite challenging in ‘traditional’ discrimination, but in the context of AI decision-making finding an adequate comparator might be impossible.²¹⁸ The issue of challenges that AI decision-making poses to the EU non-discrimination law is further discussed in section 4.4 of this chapter. To establish direct discrimination, an identifiable complainant who suffered from discrimination is not necessary.²¹⁹

For direct discrimination to take place, next to less favourable treatment, there is a need for causation between such a treatment and a protected ground (discussed in section 4.3.3). It is,

²¹⁵ Directive 2000/43/EC, art. 2(2)(a); Directive 2000/78/EC, art. 2(2)(a); Directive 2004/113/EC, art. 2(a); Directive 2006/54/EC, art. 2(1) (a)

²¹⁶ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 40

²¹⁷ *ibid*, p. 44.

²¹⁸ Sandra Wachter, ‘The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law’ (2022) 97 *Tulane Law Review*, 38.

²¹⁹ Case C-54/07, *Centrum voor gelijkheid van kansen en voor racismebestrijding v. Firma Feryn* [2008] ECLI:EU:C:2008:397

therefore, necessary to assess whether a person who has been treated less favourably would receive the same treatment if they were in a reverse position under any of the protected grounds.²²⁰ Notably, less favourable treatment does not have to explicitly reference a protected ground but can be linked to a characteristic that is inseparable from it, such as a homosexual couple who is not able to get married.²²¹ Here, the inability to get married is connected to a person's sexual orientation. Direct discrimination can also occur if the person who is affected by a less favourable treatment does not hold protected characteristics themselves. In these scenarios, we are dealing with discrimination by association.²²²

4.1.4.2 Indirect discrimination

The Racial Equality Directive states that indirect discrimination takes place “where a neutral provision, criterion or practice would put persons of a racial or ethnic origin at a particular disadvantage compared to other persons.”²²³ According to the 2004/113/EC Directive, we can speak of indirect discrimination where “an apparently neutral provision, criterion or practice would put persons of one sex at a particular disadvantage compared with persons of the other sex (...)”. Therefore, both Directives provide almost identical definition of indirect discrimination in which three main elements can be distinguished: (1) there must exist a seemingly neutral criterion or practice, (2) that has an effect on a group defined by a protected ground in a way which is significantly more negative, (3) when compared with others in a similar situation. Both kinds of discrimination result in a difference in treatment in comparable situations. Direct discrimination would take place if an employer was not willing to hire women, whereas indirect discrimination would take place if there were certain criteria in place that women could not meet. However, in most of the cases it is challenging to draw a clear line between these two types of discrimination and this distinction is mostly a theoretical one.²²⁴

²²⁰ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 45.

²²¹ Case C-267/06, Tadao Maruko v. Versorgungsanstalt der deutschen Bühnen [GC] [2008] ECLI:EU:C:2008:179.

²²² European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 51

²²³ Racial Equality Directive, ar. 2(2)(b).

²²⁴ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 54.

Like in the case of direct discrimination, a court must identify a comparator to assess whether a specific rule, criterion, or practice has a significantly more negative impact than that experienced by others in a comparable situation.²²⁵ In the case of indirect discrimination, it is required to find two groups: an advantaged one and a disadvantaged one. The disadvantaged group does not always consist solely of individuals with protected characteristics. In contrast to direct discrimination, the advantaged group, which is used as a comparator, is not necessarily a group that does not hold protected characteristics.

4.1.4.3 Multiple and intersectional discrimination

A concept of multiple discrimination arose from the idea that groups that are characterized by a specific protected ground are not homogenous and that it is impossible to adequately address the unequal treatment that individuals face by relying on a single protected ground. The terms multiple and intersectional discrimination, as well as cumulative discrimination, are often used interchangeably. However, they do have slightly different meanings. The key difference between multiple and intersectional discrimination is that in multiple discrimination, the grounds for discrimination are distinct and separable, whereas in intersectional discrimination, they are interconnected and inseparable.²²⁶

Intersectional discrimination has been acknowledged in Recital 14 of the Racial Equality Directive, which recognizes that women are usually victims of multiple discrimination, as well as in Recital of the Employment Equality Directive. However, this approach has not been so far reflected in the CJEU case law.²²⁷ While the list of protected grounds under Article 21 of the Charter is non-exhaustive, the grounds listed in EU secondary law are exhaustive. As already mentioned in subsection 4.3.3, the CJEU has repeatedly stated that it is not competent to expand this list and that there could be no new categories of grounds created, which is a combination of two already existing grounds.²²⁸

²²⁵ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 Tulane Law Review, 38.

²²⁶ *ibid*, p. 60.

²²⁷ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 Tulane Law Review, 14.

²²⁸ Case C-443/15, David L. Parris v. Trinity College Dublin and Others [2016] ECLI:EU:C:2016:897.

4.1.5 EU non-discrimination laws and credit

In the context of credit scoring, discrimination can refer to acts of denying credit or establishing interest rates that are discriminatory for certain groups.²²⁹ Credit scoring is by nature a process that focuses on selection.²³⁰ When assessing the creditworthiness of individuals, credit scoring agencies essentially divide them into two groups: bad and good candidates for repaying a loan.²³¹ This process is necessary also from the perspective of consumer protection and is needed to uphold financial stability.²³² However, this process becomes problematic from the perspective of non-discrimination law if a decision to grant a credit is based on one of the protected grounds.

None of the anti-discrimination directives explicitly mention credit and credit scoring, however, credit is not explicitly excluded from their scope. When it comes to credit assessment in consumer credit, the Racial Equality Directive and the Gender Equality Access to Goods and Services Directive 2004/113/EC might be applicable. The material scope of these directives includes “access to and supply of goods and services which are available to the public (...)”.²³³ Even though Directives do not explicitly refer to consumer credit, Recital 18 of the 2004/113/EC Directive refers to “actuarial factors”. According to the CJEU ruling in the *Test-Achats* case²³⁴, the 2004/113/EC Directive also covers insurance and other financial services.²³⁵ In the realm of consumer credit, the CJEU ruling in *Test-Achats* had implications for payment protection insurance (PPI), also referred to as credit protection insurance, commonly provided to consumers in conjunction with various types of loans, including those backed by mortgages.²³⁶ The court held that using statistical data on gender differences, such as life expectancy or job prospects, in credit risk assessments for this type of insurance is prohibited.²³⁷ Because of the principle of equal treatment that Directive 2004 is based on, creditors are not

²²⁹ Katja Langenbucher, ‘Responsible A.I.-Based Credit Scoring – A Legal Framework’ (2020) 31 *European Business Law Review* 527, 544.

²³⁰ Katja Langenbucher, ‘Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law’ (2022) *European Corporate Governance Institute - Law Working Paper No. 663/2022* <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4275723> accessed 15 February 2025

²³¹ *ibid.*

²³² *ibid.*

²³³ Racial Equality Directive, art 3(1)(h).

²³⁴ Case C-236/09 *Association Belge des Consommateurs Test-Achats ASBL v Conseil des ministres* [2011] ECLI:EU:C:2011:100.

²³⁵ *ibid.*, para 30.

²³⁶ Olha O. Cherednychenko, ‘The EU Charter of Fundamental Rights and Consumer’ in H. Collins (ed.) *European Contract Law and the Charter of Fundamental Rights* (Cambridge Intersentia 2017), 10.

²³⁷ Jan Wouters and Michal Ovádek, *The European Union and Human Rights: Analysis, Cases, and Materials* (Oxford University Press 2021), p. 414.

allowed to assume that a young woman of childbearing age is automatically a bad candidate for repaying a loan in comparison to a man who is the same age.²³⁸ Therefore, it is possible that the directive would apply to consumer credit since the Court mentioned that the scope also covers financial services. However, this assumption does not create a strong basis to claim that credit is a good or service available to the public.

The Directive 2004/113/EC scope covers access to and supply of goods and services within the public and private sectors.²³⁹ Being a good or service available to the public is the main requirement for the Directive to apply to credits. It cannot be stated unequivocally that credit qualifies as a good or service available to the public.²⁴⁰

There are types of credits that are available only to a limited group of individuals, for instance, to those who meet a certain high-income threshold. An example would be a credit agreement for immovable property or an investment. On the other hand, the wording “available to the general public” is sufficiently broad, that some of the credits will fall within its scope. This might be the case for consumer credits, meaning credits “provided for personal, household or domestic purposes”.²⁴¹ In addition, the online marketplace makes credit easily and quickly accessible to many consumers, usually in the form of small-value loans. Therefore, these types of loans, including payday loans and interest-free credit that are offered by a third party, can qualify as a service available to the public. Whether a credit is a good or service available to the public depends on the type of credit. It can be concluded that consumer credits are generally available to the public.

However, the distinction between a credit that qualifies as a “good or service available to the general public” and one that does not might be problematic and would require statistical analysis. In addition, even if Directive 2004/113/EC and the Racial Equality directive would apply to credits, the protection against discrimination would be limited. The Directive 2004/113/EC only combats discrimination based on gender, whereas the Racial Equality Directive prohibits discrimination on grounds of race and ethnic origin. Therefore, other

²³⁸ *ibid.*

²³⁹ Gender Equal Access to Goods and Services Directive, art. 3(1).

²⁴⁰ Katja Langenbucher, ‘Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law’ (2022) European Corporate Governance Institute - Law Working Paper No. 663/2022 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4275723> accessed 15 February 2025, 6.

²⁴¹ Olha. O. Cherednychenko, ‘On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive’ (2024) 47 Journal of Consumer Policy 241, 243.

protected characteristics such as sexual orientation, disability, age or belief would remain not covered by the EU secondary law in access to credit. For this reason, the New Consumer Credit Directive is essential when it comes to harmonization of rules on creditworthiness assessments. The fact that the non-discrimination provision in the Credit Directive²⁴² refers to the list of protected grounds under Article 21 is also a positive development, as this list is much more extensive than the usual list of protected grounds in non-discrimination directives. Nonetheless, since there is no existing case law concerning this provision yet, it is difficult to predict how the Court will interpret it. In addition, the provision is not clear whether it also covers indirect discrimination. By contrast, all EU anti-discrimination directives explicitly cover both direct and indirect discrimination. The New Consumer Credit Directive and its implication for discriminatory practices in consumer credit are dealt with under section 4.3 of this Chapter.

4.1.6 How does AI challenge non-discrimination law?

The section above dealt with the applicability of the Race Equality Directive and the Gender Equal Access to Goods and Services Directive to credit. This thesis focuses on credit scoring that relies on AI decision-making. While the implications of algorithmic and AI decision-making for non-discrimination law constitute a distinct research area, I will briefly highlight its main implications and challenges for contextual completeness.

AI can produce outputs which are more beneficial to one group than to the other. However, the main task of AI is to derive decision-making rules by analysing large amounts of data and identifying correlations that are not easily, or sometimes not at all, recognized by humans.²⁴³ Therefore, in its decision-making, AI might rely on unintuitive criteria and non-traditional data. It can identify correlations between desirable characteristics—such as the ability to repay a loan or succeed in medical school—and seemingly unrelated data, such as online shopping habits and smartphone usage.²⁴⁴ A well-documented example illustrating that AI decision-making processes often rely on factors that may be irrelevant from a human perspective is the so-called 'wolf versus husky' challenge.²⁴⁵ The AI system was tasked with distinguishing between husky dogs and actual wolves. Unexpectedly, its predictions were based not on the animals'

²⁴² The New Consumer Credit Directive, art. 6.

²⁴³ Sandra Wachter, 'The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law' (2022) 97 Tulane Law Review, 20

²⁴⁴ *ibid.*

²⁴⁵ Marco Tulio Ribeiro, Sameer Singh and Carlos Guestrin, "'Why Should I Trust You?': Explaining the Predictions of Any Classifier' (The 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, San Francisco, 2016) < <https://arxiv.org/abs/1602.04938> > accessed 18 February 2025, 8.

characteristics but on the presence of snow in the images.²⁴⁶ It has been shown that the time spent reading the terms and conditions for a loan on a website, as well as number of spelling mistakes made in an online application form, can impact the outcome of a creditworthiness assessment.²⁴⁷ Another factor used is whether an applicant has used a work computer or their private device for filling in an application.²⁴⁸ A private German company granting credits called Kreditech admitted that in its assessments it relies on over eight thousand data points.²⁴⁹ This trend is not considered problematic in the lens of anti-discrimination law. In contrast, these opaque characteristics might be considered fairer. It is because in these cases, decisions are not based on protected characteristics, which is desirable from the perspective of anti-discrimination law. However, processing data from social media channels for creditworthiness assessment is not permitted according to Article 18(8) of the New Consumer Credit Directive. Therefore, such a processing would not be lawful in the current legal landscape. This shows that sector-specific laws might be more effective in addressing discrimination risks stemming from AI decision-making, than general European non-discrimination laws.

As outlined in the preceding sections, discrimination occurs when a rule or practice directly or indirectly relates to one of the protected grounds recognized under EU non-discrimination law. It is indeed possible that seemingly neutral information processed by AI relates to these protected characteristics because of biases in historical data. However, AI can base its decision not only on “existing legally protected groups or proxies thereof but also on the non-protected but human-understandable groups”.²⁵⁰ This second scenario is also very problematic, as the CJEU repeatedly stated that the list of protected grounds is exhausted, and it is almost impossible to expand it. Thirdly, as explained in the above paragraph, AI bases its decisions on groups defined by incomprehensible or unknown characteristics to humans.²⁵¹ Such a differentiation does not harm people with protected characteristics but is still unfair and might result in similar harm as discrimination, for instance, an inability to gain access to goods or

²⁴⁶ *ibid.*

²⁴⁷ Katie Lobosco, ‘Facebook friends could change your credit score’, CNN Business (New York, 27 August 2023) <https://money.cnn.com/2013/08/26/technology/social/facebook-credit-score/index.html?section=money_pf> accessed 14 February 2025.

²⁴⁸ *ibid.*

²⁴⁹ *ibid.*

²⁵⁰ Sandra Wachter, ‘The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law’ (2022) 97 *Tulane Law Review*, 9.

²⁵¹ *ibid.*

services.²⁵² However, it does not fall within the scope of the current European non-discrimination legal framework.

Another problematic aspect is the aspect of causality that, as showed in the proceeding sections, is crucial in proving discrimination. It is necessary to show that it was a certain action that led to differential treatment. However, decision-making actors often do not wish to show a causal relationship between given decision criteria and predictable variables, which makes it difficult to establish how much of an impact a given criterion had on a decision.²⁵³ In general, AI and data science are not driven by causality.²⁵⁴ Therefore, it would be extremely difficult to prove that discrimination occurred due to a certain criterion. Since anti-discrimination law does not include a right to rational decision-making, the question of whether a decision produced by an AI system is “fair” does not fall within the scope of anti-discrimination law.

Additionally, the fact that AI relies on factors which are not always understandable to humans renders its decision-making incredibly untransparent. One of the reasons for transparency in decision-making processes is that it allows individuals to plan and adjust their life choices and actions accordingly to fulfil their goals.²⁵⁵ Because of AI, decision-making cannot be transparent anymore and therefore, individuals are not able to tailor their life choices around the knowledge.²⁵⁶ However, granting more transparency in the AI decision-making process is not the solution. Obtaining information about the involvement of AI in decision-making, or even on the logic behind the decision-making might be a powerful tool, but in most cases, it does not correspond with the level of individuals’ comprehensibility.²⁵⁷ The mere fact that individuals would be aware of the processes which they are not able to control would not bring a lot of change.²⁵⁸ Therefore, it is essential that transparency obligation is not treated as a main measure, but rather that affected individuals are granted more powers and rights in relation to the AI decision-making processes.²⁵⁹ The next section will address how the GDPR addresses

²⁵² *ibid.*

²⁵³ Sandra Wachter, ‘The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law’ (2022) 97 *Tulane Law Review*, 46

²⁵⁴ *ibid.*

²⁵⁵ *ibid.*, p. 45.

²⁵⁶ *ibid.*

²⁵⁷ Gianclaudio Malgieri and Giovanni Comandé, ‘Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation’ (2017) 7 (4) *International Data Privacy Law* 243, 245.

²⁵⁸ Sandra Wachter, ‘The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law’ (2022) 97 *Tulane Law Review*, 9.

²⁵⁹ *ibid.*

automated credit scoring and what rights it grants to data subjects. It will also tackle the issue of a right to explanation in the GDPR.

4.2 General Data Protection Regulation and SCHUFA judgement

It is essential to introduce the concept of automated individual decision-making when discussing credit scoring. The notion of automated processing of personal data appears also in the 2023 Consumer Credit Directive. However, this concept is not novel as it already appeared in the predecessor of the GDPR, the 1995 Data Protection Directive.²⁶⁰

According to the GDPR, both traditional credit scoring agencies and the newest Fintech platforms are considered data processors.²⁶¹ Under the GDPR personal data processing is only lawful if it is justified based on one of the grounds mentioned in Article 6(1). It might seem intuitive that most processors would rely on the data subject's consent when carrying out a processing of data.²⁶² However, as the requirements for a valid consent in the GDPR are strict and the consent can be revoked, processors seek to rely on different justificatory grounds for processing personal data.²⁶³ Another ground requires data processors to ask for a request from a data subject before entering into a contract.²⁶⁴ It is also possible for data processors to rely on the legitimate interest of the lender. If a credit scoring agency processes sensitive data such as data on racial origin or political opinions, a data subject must give explicit consent to such processing.²⁶⁵ When the processing is done by fully automated means, Article 22 of the GDPR might be applicable. Article 22 is a key provision when it comes to regulating automated decision-making. The rationale behind this provision is that decisions based on automated means might negatively impact human dignity and undermine accountability of human decision-making.²⁶⁶ This is also acknowledged in Recital 71, which recognizes discrimination as a risk stemming from automated data processing.

²⁶⁰ Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, OJ L 281.

²⁶¹ Katja Langenbucher, 'Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law' (2022) European Corporate Governance Institute - Law Working Paper No. 663/2022 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4275723> accessed 15 February 2025, 20.

²⁶² *ibid.*

²⁶³ *ibid.*

²⁶⁴ General Data Protection Regulation, art. 6(b).

²⁶⁵ *ibid.*, art. 9(2)(a).

²⁶⁶ Francesca Palmiotto, 'When Is a Decision Automated? A Taxonomy for a Fundamental Rights Analysis' (2024) 25 German Law Journal 210, 213.

4.2.1 Article 22 of the GDPR

Even though the GDPR does not provide an explicit definition of “automated decision making”, it is clear from the provision that it refers to a decision based on the processing of personal data solely by automated means and without any human intervention.²⁶⁷ Consequently, Article 22 applies to decisions based on a calculation of factors previously established by a human but reached without any human involvement.²⁶⁸

The meaning of the term “decision” also remains open to interpretation. The most plausible interpretation is that it pertains to decisions having legal effects,²⁶⁹ such as a decision on access to services or a decision to grant a loan. Indeed, in the SCHUFA case, the Court confirmed this assumption stating that a credit score qualifies as a decision under Article 22(1) and that the notion of a decision shall be interpreted in broad terms.²⁷⁰ The Court added that for a credit score to fall within the scope of the “decision” a third party must “draw strongly” on it.²⁷¹ SCHUFA previously argued that it only engaged in “preparatory acts” and that it was a lender who was responsible for reaching a decision.²⁷² The Court rejected this argument and stated that SCHUFA itself performed automated individual decision-making and, as a credit reference agency, it is obliged to comply with Article 22.²⁷³

Furthermore, the Court underlined that for Article 22 to apply, three cumulative criteria must be fulfilled. Firstly, “there must be a decision, secondly, that that decision must be ‘based solely on automated processing, including profiling’, and, thirdly, that it must produce ‘legal effects concerning [the interested party]’ or ‘similarly significantly [affect] him or her’”.²⁷⁴ According to the reasoning of the Court, in the case at hand, all three conditions were met. Private credit scoring agencies, such as SCHUFA, might still rely on automated individual decision-making, however only in three scenarios: when it is necessary for entering (or performance) of a

²⁶⁷ European Union Agency for Fundamental Rights, European Court of Human Rights, and Council of Europe (Strasbourg) *Handbook on European Non-Discrimination Law* (Publications Office of the European Union 2018) < <https://op.europa.eu/en/publication-detail/-/publication/>> accessed 16 February 2025, p. 220 ; Case C-634/21, OQ v Land Hessen [2023] ECLI:EU:C:2023:957.

²⁶⁸ *ibid.*

²⁶⁹ Christiane Wendehorst, ‘The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective’ (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 53.

²⁷⁰ Case C-634/21, OQ v Land Hessen [2023], ECLI:EU:C:2023:957, paras. 45-46.

²⁷¹ *ibid.*, para. 73.

²⁷² Nils Löfling and Ruth Boardman, ‘CJEU confirms preparatory acts can be automated individual decisions: the SCHUFA cases’ (Bird&Bird, 19 December 2023) <<https://www.twobirds.com/en/insights/2023/global/key-takeaways-from-the-schufa-case-of-the-cjeu>> accessed 10 March 2025.

²⁷³ Case C-634/21, OQ v Land Hessen [2023], ECLI:EU:C:2023:957, para 61.

²⁷⁴ *ibid.*, para. 43.

contract, if there is authorization by EU's or national laws or if the data subject has given its explicit consent, as in the case of processing of sensitive personal data. When it comes to the first and third scenarios (performance of a contract and data subject's consent), the data controller is obliged to implement measures which are suitable to safeguard the data subject rights and freedoms, at least the right to obtain human intervention on the part of the controller, to express his or her point of view and to contest the decision.²⁷⁵ By granting this right to affected individuals, it seems that the GDPR attempts to go beyond mere transparency requirements. It can be observed that Art. 18(8) of the New Consumer Directive includes almost the same wording. Therefore, the right to human intervention introduced in the New Consumer Directive (analysed in section 4.3.3) is in line with the wording of Art. 22. Furthermore, controllers must not base their decisions on the processing of special categories of personal data, unless explicit consent is given by a data subject.²⁷⁶ A reason for this might be to reduce the possible discriminatory effects of a fully automated decision.²⁷⁷ However, it must be kept in mind that this right is granted to individuals only when a fully automated decision, without any meaningful human intervention, occurs that produces legal effects.²⁷⁸

4.2.2 Information duties and the right to access under the GDPR

It is worth mentioning that the right to human intervention included in Art. 22 should be read through the lens of information duties imposed on data controllers included in Articles 13, and 14, and a data subject's right to access under Art. 15 GDPR.²⁷⁹ In case of a direct collection of data from a data subject, information duties under Article 13 apply. Article 14 becomes applicable if personal data have not been obtained from a data subject. According to Article 15, data subjects can request concrete information from a controller on inter alia the purpose of the processing of their personal data,²⁸⁰ categories of personal data concerned²⁸¹ and the existence of automated decision-making as per Article 22(1) and (4).²⁸² When providing information on the existence of automated decision-making, a controller must also provide "meaningful

²⁷⁵ General Data Protection Regulation, art. 22(3).

²⁷⁶ General Data Protection Regulation, art. 22(4).

²⁷⁷ Francesca Palmiotto, 'When Is a Decision Automated? A Taxonomy for a Fundamental Rights Analysis' (2024) 25 German Law Journal 210, 213.

²⁷⁸ Christiane Wendehorst, 'The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective' (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 56.

²⁷⁹ *ibid.*

²⁸⁰ General Data Protection Regulation, art. 15(1)(a)

²⁸¹ *ibid.*, art. 15(1)(b).

²⁸² *ibid.*, art. 15(1)(h).

information about the logic involved, as well as the significance and the envisaged consequences of such data processing for the data subject”.²⁸³ The information rights of the data subject thus also apply in the context of automated decision-making.

4.2.3 CK v Dun & Bradstreet Austria judgement

The scope of the right to access in the context of automated processing has been widely disputed by legal scholars, especially the meaning of a ‘meaningful interpretation about the logic involved’ that must be provided to a data subject. The ruling of the CJEU in CK v Dun & Bradstreet Austria²⁸⁴ provided more clarity on this issue. The case arose when an individual was denied a contract by an Austrian mobile phone operator due to insufficient financial creditworthiness.²⁸⁵ It is worth mentioning that the contract would have involved a monthly payment of 10 EUR.²⁸⁶ The credit assessment was conducted by automated means by a private credit assessment agency.²⁸⁷ The applicant wished to receive information on how the credit score was established and consequently contacted the company that carried out the assessment (Dun & Bradstreet Austria) to exercise her right under Article 15(1)(h) GDPR.²⁸⁸ The information that the applicant received clearly indicated that her credit score was high and that the decision reached by the mobile operator contradicted that score.²⁸⁹ This contradiction made the Austrian Administrative Court question whether the information provided to the applicant was accurate.²⁹⁰ The case was directed to the CJEU for a preliminary ruling to answer the question of how to interpret the controller’s obligation to provide ‘meaningful information about the logic involved’ in automated decision-making established in article 15(1)(h) GDPR and to what extent can the controller rely on the protection of freedom of others, such as the protection of trade secret as a basis for limiting access to the information to which the data subject is entitled.²⁹¹ The Court agreed with the Advocate General’s reasoning and stated that, under GDPR Article 15(1)(h), ‘meaningful information about the logic involved’ in automated

²⁸³ Case C-634/21, OQ v Land Hessen [2023], ECLI:EU:C:2023:957, para 56.

²⁸⁴ Case, C-203/22 CK v Dun & Bradstreet Austria [2024] ECLI:EU:C:2024:745

²⁸⁵ *ibid*, para.16.

²⁸⁶ Kätliin Kelder, ‘CK v Dun & Bradstreet Austria (C-203/22) – the Case That Ends the GDPR Right to Explanation Debate?’ The Digital Constitutionalist (6 November 2024) < <https://digi-con.org/ck-v-dun-bradstreet-austria-c-203-22-the-case-that-ends-the-gdpr-right-to-explanation-debate/> > accessed 3 March 2025

²⁸⁷ Case C-203/22, CK v Dun & Bradstreet Austria ECLI:EU:C:2024:745 [2024], para.16

²⁸⁸ Kätliin Kelder, ‘CK v Dun & Bradstreet Austria (C-203/22) – the Case That Ends the GDPR Right to Explanation Debate?’ The Digital Constitutionalist (6 November 2024) < <https://digi-con.org/ck-v-dun-bradstreet-austria-c-203-22-the-case-that-ends-the-gdpr-right-to-explanation-debate/> > accessed 3 March 2025

²⁸⁹ *ibid*.

²⁹⁰ *ibid*, para. 11.

²⁹¹ Case, C-203/22 CK v Dun & Bradstreet Austria [2024] ECLI:EU:C:2024:745, paras. 1-3.

decision-making should be understood as the right to an explanation of the procedure and principles actually applied to reach a result, such as a credit profile.²⁹² Such information must be provided to the data subject “by means of relevant information and in concise transparent, intelligible and easily accessible form”.²⁹³ The Court specified that neither the disclosure of an algorithm nor a detailed description of the steps in the automated decision-making process qualifies as a sufficiently concise and intelligible explanation.²⁹⁴ In addition, the controller is not required to provide an explanation of complex algorithms used in a decision-making process or to disclose a full algorithm to a data subject.²⁹⁵ The Court explained that disclosing an algorithm would not amount to a fulfilment of the controller’s obligation to explain.²⁹⁶ On the other hand, information on the extent to which a variation in the personal data considered would have led to a different result qualifies as transparent and intelligible.²⁹⁷ In addressing whether a trade secret can justify denying a data subject access to information, the Court ruled that the controller must provide the allegedly protected information to the competent supervisory authority or court.²⁹⁸ This competent supervisory authority must balance the rights and interests at issue to determine the extent of the data subject’s right of access provided for in Article 15 of the GDPR. Therefore, the controller cannot simply deny access to information claiming that it could lead to trademark violation.

This ruling, to a certain extent, clarified what is understood as “meaningful information”.²⁹⁹ The Court provided key characteristics that render information meaningful. Nonetheless, these characteristics seem to be vague, and it might still not be obvious for data controllers which information they are required to disclose and which not. What is known is that disclosure of the whole algorithm is not necessary. It is questionable whether this conclusion is satisfactory. On the one hand, an average data subject might indeed find the algorithm incomprehensible, and the Court is right in its reasoning that it would not contribute to a data subject receiving meaningful information. In addition, it takes the burden from data controllers to disclose algorithms that they rely on in their decision-making. On the other hand, this judgement could

²⁹² *ibid.*, para. 58.

²⁹³ *ibid.*

²⁹⁴ *ibid.*

²⁹⁵ *ibid.* paras. 59-60.

²⁹⁶ *ibid.*

²⁹⁷ *ibid.*, para. 62.

²⁹⁸ *ibid.*, para. 67.

²⁹⁹ Kätlin Kelder, ‘CK v Dun & Bradstreet Austria (C-203/22) – the Case That Ends the GDPR Right to Explanation Debate?’ *The Digital Constitutionalist* (6 November 2024) < <https://digi-con.org/ck-v-dun-bradstreet-austria-c-203-22-the-case-that-ends-the-gdpr-right-to-explanation-debate/> > accessed 3 March 2025.

have been a good opportunity to require data controllers to provide details on the logic behind the automated decision-making, including a disclosure of an algorithm.

4.2.4 The right to obtain explanation in the GDPR

The judgment also touches upon an important topic in the academic debate,³⁰⁰ being the existence of a right to explanation in the GDPR.³⁰¹ Recital 71 goes beyond the rights provided for in the Regulation and mentions that safeguards for data subjects should include a “right to obtain an explanation of the decision”. Some scholars have argued that indeed there exists a right to explanation and that it stems from general principles of transparency and accountability in the GDPR.³⁰² Other scholars argued that such a right does not exist in the current form of the GDPR, and we can rather speak of a ‘limited right to be informed’.³⁰³ A distinction can be made between an ex-ante and an ex-post explanation when considering the right to obtain an explanation.³⁰⁴ An ex-ante explanation in an automated credit scoring system would refer to information on system functionality given to the data subject before the decision is made.³⁰⁵ Information on the functionality of the system can also be provided to the data subject after the decision has been made (ex-post), but in this case, the data subject can also receive an explanation of the logic of the decision pertaining to them.³⁰⁶ In the *CV v Dun and Bradstreet Austria* judgement the Court essentially affirmed that a data subject has “a genuine right to an explanation as to the functioning of the mechanism involved in automated decision-making of which that person was the subject and of the result of that decision”.³⁰⁷ The Court also specified that the right derives from a combination of the right to access established in Article 15 of the GDPR(1)(h) GDPR and Article 22 of the GDPR. Furthermore, the Court ascertained that the scope of this right covers both ex-ante and ex-post explanation, as the explanation provided must relate to both the functionality of the system and to the specific result, such as the credit

³⁰⁰ Maja Brkan & Hana Palcic Vilfan ‘Article 86 Right to Explanation of Individual Decision-Making’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 1197.

³⁰¹ Cecilia Panigutti and others, ‘The Role of Explainable AI in the Context of the AI Act’ (2023) ACM Conference on Fairness, Accountability, and Transparency <<https://dl.acm.org/doi/10.1145/3593013.3594069>> accessed 3 March 2025 1139, 1141.

³⁰² Francesca Palmiotto, ‘When Is a Decision Automated? A Taxonomy for a Fundamental Rights Analysis’ (2024) 25 *German Law Journal* 210, 214.

³⁰³ Sandra Wachter, Brent Mittelstadt and Luciano Floridi, ‘Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation’ (2017) 7(2) *International Data Privacy Law* 76, 80.

³⁰⁴ *ibid.*

³⁰⁵ *ibid.*

³⁰⁶ *ibid.*

³⁰⁷ Case, C-203/22 *CK v Dun & Bradstreet Austria* [2024] ECLI:EU:C:2024:745, para. 57.

score.³⁰⁸ The ruling has significantly strengthened the rights of data subjects and it seems that it has concluded the long-standing debate in legal circles on whether the right to explanation exists.³⁰⁹ The fact that data subjects have a right to receive information on the extent to which a variation in the personal data considered would have led to a different result might allow data subjects to see whether the decision was based on discriminatory factors. If, for instance, a change in a data subject's address would result in a high credit score, it could suggest that a system associated the data subject's address with a low chance of repaying a loan. Consequently, this could suggest that the system relies on biased data. However, this remains a weak assumption, as the observed effect alone is not sufficient to conclusively establish that the system relies on biased data. Determining whether the system relied on biased data is impossible without gaining technical insights into its operation, which, according to the *CK v Dun & Bradstreet Austria* judgement, does not have to be provided to data subjects.³¹⁰

4.2.5 Reflections on Article 22 of the GDPR

The GDPR is a data-focused regulation,³¹¹ not a regulation focused on algorithmic decision-making. Article 22 focuses on how data is processed - by automated methods, rather than on the type of data and its protection.³¹² Issues related to automated individual decision-making are not only tied to the types and amount of processed data but are rather linked to how decisions are made and the logic behind them. Some scholars argue that it is impossible to effectively address this issue by legislation which adopts a data-focused point of view, like the GDPR.³¹³ In rare cases, automated decision-making can occur without processing personal data, which would consequently exclude the application of the GDPR.³¹⁴ Therefore, it would be more beneficial if rules on algorithmic decision-making were included in the AI Act.³¹⁵ The AI Act does not refer to the concept of automated decision-making, other than acknowledging in

³⁰⁸ *ibid.*

³⁰⁹ Kätliin Kelder, 'CK v Dun & Bradstreet Austria (C-203/22) – the Case That Ends the GDPR Right to Explanation Debate?' *The Digital Constitutionalist* (6 November 2024) <<https://digi-con.org/ck-v-dun-bradstreet-austria-c-203-22-the-case-that-ends-the-gdpr-right-to-explanation-debate/>> accessed 3 March 2025.

³¹⁰ Case, C-203/22 *CK v Dun & Bradstreet Austria* [2024] ECLI:EU:C:2024:745, paras 59-60.

³¹¹ Christiane Wendehorst, 'The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective' (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 56.

³¹² *ibid.*

³¹³ *ibid.*

³¹⁴ *ibid.*

³¹⁵ Christiane Wendehorst, 'The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective' (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 56.

Recital 10 that data subjects' rights established in the GDPR continue to be applicable. The AI Act does not include a provision on algorithmic decision-making that could address legal gaps for systems that do not qualify as AI under Article 3(1) of the Act, such as mathematical and statistical methods used by credit information agencies. However, it includes a right to explanation of individual decision-making³¹⁶ but this right has a limited scope as it only applies to high-risk AI systems. Therefore, it still does not provide a solution for systems which are not considered AI, which could be the case for systems currently used by credit scoring agencies and intermediaries. According to Article 86 of the AI Act, "a person subject to a decision taken by the deployer based on the output of a high-risk AI system, which produces legal effects or has an adverse impact on their health, safety or fundamental rights has the right to obtain from the deployer clear and meaningful explanations of the role of the AI system in the decision-making procedure and the main elements of the decision taken". This provision entered the final draft of the AI Act with little attention in the public debate.³¹⁷ A right to receive an explanation for automated decision-making has been sought for a long time in the GDPR (as explained in section 4.2.4). In the last three years, more clarity as to the existence of this right has been given in case law and the non-binding opinion of Advocates General.³¹⁸ Provided that we acknowledge that the GDPR grants a right to explanation, as was clarified by the ruling in *CK v Dun and Bradstreet Austria*, the added value of the new provision in the AI Act becomes debatable. The right to explanation in the GDPR would not only apply to fully automated decisions but also, as stated by the CJEU in *SCHUFA* case, to fully automated parts of the decision if such a part is essential to the decision.³¹⁹ The right in the AI Act, on the other hand, applies only to decisions taken by high-risk AI systems.³²⁰ Therefore, arguably, the right included in the AI Act does not add much to the protection of individuals affected by automated decision-making. However, the right in the AI Act might be useful in situations in which GDPR does not apply, for instance when data processed is anonymous.³²¹ In these circumstances, individuals might still wish to receive information about the AI system affecting them. This would, however, not be the case in systems used for creditworthiness assessment as they must

³¹⁶ Artificial Intelligence Act, art. 86.

³¹⁷ Kätliin Kelder, 'On the Relative Importance of the AI Act Right to Explanation' *The Digital Constitutionalist* (24 April 2024) < <https://digi-con.org/on-the-relative-importance-of-the-ai-act-right-to-explanation/> > accessed 3 March 2025.

³¹⁸ Case, C-203/22 *CK v Dun & Bradstreet Austria* [2024] ECLI:EU:C:2024:745, Opinion of AG de la Tour.

³¹⁹ Case C-634/21, *OQ v Land Hessen* [2023] ECLI:EU:C:2023:957, para. 58.

³²⁰ Artificial Intelligence Act, art. 86(1).

³²¹ Kätliin Kelder, 'On the Relative Importance of the AI Act Right to Explanation' *The Digital Constitutionalist* (24 April 2024) < <https://digi-con.org/on-the-relative-importance-of-the-ai-act-right-to-explanation/> > accessed 3 March 2025.

process the personal data of individuals to create personalized credit scores. The extent to which the AI Act complements the existing framework or fails to do so will be further analysed in Chapter 5 of this thesis.

4.3 The 2023 Consumer Credit Directive

The sections above showed that the application of the existing European non-discrimination Directives to credit scoring is not obvious. It is because not all credits qualify as a ‘good or service available to the public’ within the meaning of the Racial Equality Directive and Directive 2004/113/EC, as is the case with credits granted to immovable properties or for investments. On the other hand, the CJEU decision ascertained that the obligations set under Article 22 of the GDPR apply to credit scoring agencies and that a decision is considered to fall within the scope of the provision even if only parts of it are automated. Therefore, individuals affected by automated creditworthiness assessments enjoy a right to receive human intervention. In addition, credit assessment agencies cannot process their sensitive data unless explicit consent is given. Furthermore, the judgment in the *CV v Dun and Bradstreet Austria* indicates that data subjects are entitled to receive a genuine explanation in a form that is concise, transparent, intelligible, and easily accessible.³²² Disclosure of a full algorithm or explanation of steps used in the decision-making process does not qualify as intelligible and transparent, and controllers are not obliged to do so. Even though the GDPR offers data subjects many safeguards when it comes to automated decision-making, its focus is limited to data and aside from setting stricter conditions for processing sensitive categories of data and acknowledging that automated decision-making might create discriminatory results, the legislation does not directly provide for many measures that could protect individuals from discrimination. The thesis will now move to the analysis of a significant piece of legislation that is devoted to consumer credit.

4.3.1 Objectives and scope of the 2023 Consumer Credit Directive

The 2008 Consumer Credit Directive³²³ (CCD1) was revised in 2023 and is now replaced by the New Consumer Credit Directive, often referred to as the Second Consumer Credit Directive (CCD2). The CCD2 will become effective in November 2026. One of the reasons for the revision of the CCD1 is that it was no longer fit for purpose, considering rapid technological

³²² Case, C-203/22 *CK v Dun & Bradstreet Austria* [2024] ECLI:EU:C:2024:745, para. 16.

³²³ Directive 2008/48/EC of the European Parliament and of the Council of 23 April 2008 on credit agreements for consumers and repealing Council Directive 87/102/EEC [2008] OJ L 133.

developments and the fact that consumer lending now takes place on the digital market.³²⁴ Therefore, the overarching goal of the CCD2 directive was to address the shortcomings of its predecessor. It introduces inter alia stricter rules on the consumer creditworthiness assessment. The objective of the CCD2 is to protect consumers against overindebtedness in a digital age and provide measures to fight so-called irresponsible lending practices.³²⁵ It also seems that the EU legislators have taken seriously the risks stemming from automated processing in creditworthiness assessments, which has resulted in the inclusion of stricter requirements for creditworthiness assessment and a new right to consumers in Article 18. The scope of the new directive has been broadened and it now applies also to unsecured credit loans up to EUR 100 000.³²⁶ This is one of the key changes, as the CCD1 covered only loans between EUR 200 and 75,000³²⁷, and therefore consumers who take loans smaller than EUR 200 were not protected. However, often small value loans are the ones that might cause the most harm to consumers.³²⁸

To ensure responsible credit lending in a digital environment, the New Consumer Credit Directive introduces changes that provide greater protection for consumer borrowers. Of greatest interest to this thesis is Article 18 of the New Consumer Directive, which outlines the requirements for lenders regarding creditworthiness assessments, particularly point 8 of this provision, which addresses automated data processing. In addition, Article 6 which explicitly refers to the principle of non-discrimination is of relevance.

4.3.2 Stricter requirements for creditworthiness assessment

Article 18(1) underlines that creditworthiness assessment must be performed “in the interest of the consumer, to prevent irresponsible lending practices and over-indebtedness”. The provision clearly focuses on protecting consumers from irresponsible lending practices, rather than solely focusing on discriminatory practices. Irresponsible lending practices, as defined in the literature, refer to lenders’ actions that result in consumers’ detriment either by failing to conduct an adequate creditworthiness assessment or by neglecting to evaluate the suitability of

³²⁴ Olha O. Cherednychenko, ‘On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive’ (2024) 47 Journal of Consumer Policy 241, 265

³²⁵ *ibid*, 264.

³²⁶ The New Consumer Credit Directive, art. 2(2) c.

³²⁷ Olha O. Cherednychenko, ‘On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive’ (2024) 47 Journal of Consumer Policy 241, 263.

³²⁸ Olha O Cherednychenko, ‘On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive’ (2024) 47 Journal of Consumer Policy 241, 244.

a credit-related product before proceeding with a credit transaction.³²⁹ The credit assessment process is aimed at serving the consumer, and it places a clear obligation on lenders to act in the consumer's interest.³³⁰ The provision further underlines the proportionality, accuracy and relevance of information used for the assessment.³³¹ The types of information regarded as proportionate and accurate include, for instance, data on income, financial assets and liabilities, and other financial commitments. Therefore, information used for the creditworthiness assessment should be limited to financial data. Most importantly, the processing of data regarded as sensitive under Article 9(1) of the GDPR, such as pertaining to the consumer's sexual orientation, health or religion is prohibited.³³² However, the creditor cannot base its assessment solely on the consumer credit's history.³³³ All the information used for credit assessment must come from relevant internal and external sources, excluding social media platforms. Therefore, the practice of scanning social media profiles of consumer borrowers and their networks mentioned in section 3.1 of this thesis is not allowed under the Directive. Some scholars consider this method of acquiring data to be innovative and beneficial for consumers who do not have a consistent credit history.³³⁴ However, from the perspective of European law, such information should not be processed. This may be due to difficulties in verifying these channels of information and the fact that such processing is neither necessary nor proportionate. Additionally, processing this type of information is intrusive and could further lead to discriminatory results stemming from biases. Furthermore, if the credit scoring agency adopts AI systems trained based on machine learning in their assessments, there is a risk that the system might find a correlation between different data points that are incomprehensible to humans. This is connected to a very well-known 'black-box' problem exemplified by the 'wolf versus husky' challenge, discussed in section 4.1.6 of this chapter. It is uncertain whether the lawmakers considered the potential risks associated with the use of AI systems in credit assessment, as this provision does not explicitly mention AI systems, and that the consumer has a right to obtain human intervention from the creditor when these systems are used.

³²⁹ Olha O Cherednychenko and Jesse M Meindertsma, 'Irresponsible Lending in the Post-Crisis Era: Is the EU Consumer Credit Directive Fit for Its Purpose?' (2019) 42 *Journal of Consumer Policy* 483, 487.

³³⁰ Esther Arroyo Amayuelas, 'A Third Directive on Consumer Credit' (2024) 20 *European Review of Contract Law* 1, 10.

³³¹ The New Consumer Credit Directive, art. 18(3).

³³² *ibid.*

³³³ The New Consumer Credit Directive, art. 18(9).

³³⁴ Katja Langenbucher, 'Responsible A.I.-Based Credit Scoring – A Legal Framework' (2020) 31 *European Business Law Review* 569, 528-530.

It has been stated in the CJEU case law, that the creditor must prove that he has fulfilled these obligations under the Directive and that no sensitive data has been processed.³³⁵ Therefore, the burden of proof does not rest with the consumer.³³⁶

4.3.3 Automated data processing and a right to obtain human intervention

When it comes to automated data processing for creditworthiness assessments, Article 18(8) grants consumers a new right to request and obtain human intervention from the creditor. This right encompasses three additional rights. Firstly, the right to request and obtain a clear and comprehensible explanation of the assessment.³³⁷ Secondly, a right to express the consumer's point of view in the assessment³³⁸ and a right to submit a request to review a creditworthiness assessment with a decision on the granting of the credit.³³⁹ Most likely this right was introduced to protect consumers from biased outcomes of automated decision making and discrimination when assessment is conducted by AI systems.³⁴⁰

Even though the inclusion of a new right to human intervention is a positive development, it is not a sufficient measure in combating structural asymmetries between creditors and consumers in the digital sphere.³⁴¹ The use of AI by creditors must also be regulated. The fact that AI systems used for creditworthiness assessments are regarded as high-risk AI systems³⁴² is a positive development and provides an opportunity to overcome the asymmetries in powers between consumers and lenders. The AI Act thus might complement the New Consumer Credit Directive in regulating the use of AI in credit scoring by creditors and in protecting consumers from the risks associated with the system's use. It is necessary to establish a positive obligation for lenders rather than merely relying on the introduction of new consumer rights.

When it comes to the right to request and obtain a clear and comprehensible explanation of the assessment, the provision is not sufficiently clear on what type of information consumers can receive from creditors, and whether this information is essentially the same as 'meaningful

³³⁵Case C-449/13 *CA Consumer Finance SA v Ingrid Bakkaus* [2014] ECLI:EU:C:2014:2464, para. 22.

³³⁶ Olha O. Cherednychenko, 'On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive' (2024) 47 *Journal of Consumer Policy* 241, 253

³³⁷ The New Credit Consumer Directive, art. 18(8)(a)

³³⁸ *ibid*, art. 18(8)(b).

³³⁹ *ibid*, art. 18(8)(c).

³⁴⁰ Olha O. Cherednychenko, 'On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive' (2024) 47 *Journal of Consumer Policy* 241, 253.

³⁴¹ *ibid*.

³⁴² Artificial Intelligence Act, Annex III (5)(b).

information' that data subjects are entitled to receive under Article 15(1)(h). This would be logical, as to be able to express their point of view, the consumers must know what data was used and the importance of specific categories of data in establishing a score in comparison to other categories.³⁴³ By receiving this information, consumers would also be able to identify any errors or biases. Consequently, credit scoring institutions and intermediaries must be ready to explain the complexity of the systems they use in assessing creditworthiness. A question may arise: what would happen if the creditor were unable to provide such an explanation due to the 'black-box' problem?³⁴⁴ In the author's view this n the author's view, this should raise doubts about whether such systems can even be used for this purpose.

Article 18(9) entitles consumers to have their creditworthiness reviewed in situations when their credit application has been rejected. It is not clear whether the procedure is the same as in the case of requesting a review of the assessment under Article 18(8) when the processing took place under automated means. The Directive does not specify how the review process should look like and whether it should rely on new categories of data in the revised assessment.³⁴⁵

4.3.4 A general duty of care

As it is impossible to predict all the issues that consumers might face in the future with respect to irresponsible lending, Article 32(1) of the CCD2 introduces a new general duty of care. This duty obliges creditors, as well as credit intermediaries, to "act honestly, fairly, transparently and professionally and take account of the rights and interests of the consumers"³⁴⁶ within the whole cycle of a credit product. This provision is included under Chapter X that pertains to the conduct of business obligations and requirements of staff and is included specifically in relation to the remuneration of staff. However, as the duty covers not only the implementation phase but also the credit development phase, provisions on creditworthiness assessment can be seen as an expression of this duty.³⁴⁷ This duty was likely introduced in the Directive to align with other financial regulations, such as the Mortgage Credit Directive,³⁴⁸ which includes a similar

³⁴³ Esther Arroyo Amayuelas, 'A Third Directive on Consumer Credit' (2024) 20 *European Review of Contract Law* 1, 12.

³⁴⁴ *ibid.*

³⁴⁵ *ibid.*

³⁴⁶ The New Credit Consumer Directive, art. 32(1).

³⁴⁷ Olha O. Cherednychenko, 'On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive' (2024) 47 *Journal of Consumer Policy* 241, 257.

³⁴⁸ Directive 2014/17/EU of the European Parliament and of the Council of 4 February 2014 on credit agreements for consumers relating to residential immovable property and amending Directives 2008/48/EC and 2013/36/EU and Regulation (EU) No 1093/2010 Text with EEA relevance [2014] OJ L 60.

duty.³⁴⁹ The relevance of this duty for the protection of consumers from discriminatory practices is questionable, as the most important provision on the topic is Article 6. However, despite its very general wording, this duty adds another layer of protection for consumers by placing a positive obligation on creditors to essentially act in good faith. Nonetheless, this duty might have little relevance if the creditworthiness assessment is done by AI systems. In these cases, creditors might have little control over the actual transparency and fairness of the system. According to Article 14 of the AI Act, AI systems must be developed in such a way that the person to whom human oversight is assigned, and the limitations of the high-risk AI systems. This provision might be very relevant for the deployers of AI systems used in creditworthiness assessment. The added value of the provision and its shortcomings will be analysed in more detail in chapter 5 of this thesis.

4.3.5 Non-discrimination provision

The CCD2 explicitly refers to the principle of non-discrimination in Article 6. This article places an obligation on Member States to ensure that conditions for granting credit do not discriminate against consumers on any ground referred to in Article 21 of the Charter of Fundamental Rights of the EU. The list of protected grounds included in Article 21 of the CFR is more extensive than any list included in the EU secondary law, as it includes categories such as sexual orientation, disability or age. In this way, discriminatory lending practices are explicitly prohibited. The provision is, however, quite vague when it comes to what types of discrimination are covered. It does not specify whether it extends also to indirect discriminatory practices.³⁵⁰ In creditworthiness assessment, direct discrimination would mean that a person is denied credit based on one of the protected characteristics. This type of discrimination is, however, very unlikely to occur in practice.³⁵¹ In credit scoring, it is indirect discrimination that occurs more often. For example, a credit assessment could be based on criteria that are closely linked to a protected characteristic, such as relying on first names that may be associated with a particular ethnic origin.³⁵² However, as already discussed in section 4.1.4.2 of this chapter, the fact that a variable correlates with a protected characteristic does not automatically trigger

³⁴⁹ Olha O. Cherednychenko, 'On the Bumpy Road to Responsible Lending in the Digital Marketplace: The New EU Consumer Credit Directive' (2024) 47 Journal of Consumer Policy 241, 257.

³⁵⁰ Katja Langenbucher, 'Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law' (2022) European Corporate Governance Institute - Law Working Paper No. 663/2022 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4275723> accessed 15 February 2025, p. 32.

³⁵¹ Katja Langenbucher, 'Responsible A.I.-Based Credit Scoring – A Legal Framework' (2020) 31 European Business Law Review 527, 569.

³⁵² *ibid.*

indirect discrimination. It also must be shown that using this seemingly neutral variable results in a group with a protected characteristic being denied credit.³⁵³ Therefore, it would make more sense if the Article mentioned explicitly that both direct and indirect discrimination are prohibited, as this would also align with the approach used in non-discrimination directives. However, it can be assumed that the regulators were aware of the fact that indirect discrimination is more common in credit worthiness assessment and therefore saw no need to specify that this type of discrimination is covered.³⁵⁴

Additionally, the second paragraph of this provision raises certain doubts. The Article essentially provides for an exception to the prohibition of discrimination, when different conditions for credit are ‘duly justified by objective criteria’.³⁵⁵ Such an exception also appears in the non-discrimination directives. The Racial Equality Directive states that indirect discrimination is prohibited “criterion or practice is objectively justified by a legitimate aim and the means of achieving that aim are appropriate and necessary”.³⁵⁶ In contrast, Article 6 of the CCD2 only refers to objective criteria and does not require these criteria to be “appropriate and necessary”.

Nonetheless, this provision is a very needed addition and together with a right to human intervention established in Article 18(8) adds a lot to the protection of consumers against discriminatory effects of the use of AI systems in creditworthiness assessment. It is especially relevant since the AI Act does not include such a provision.

4.3.6 Conclusion

The 2023 Consumer Credit Directive brought a couple of significant changes. Firstly, the importance of creditworthiness assessment was acknowledged and therefore, the legislation introduced an obligation for lenders to conduct this assessment in the consumer’s interest. When carrying out assessments, creditors must adhere to conditions regarding which data can be processed. The conditions appear to only allow processing of data related to consumers’ financial situation, which must be obtained from relevant internal and external sources,

³⁵³ Katja Langenbucher, ‘Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law’ (2022) European Corporate Governance Institute - Law Working Paper No. 663/2022 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4275723> accessed 15 February 2025, 6.

³⁵⁴ *ibid*, 32.

³⁵⁵ The New Consumer Credit Directive, art. 6 para. 2.

³⁵⁶ Racial Equality Directive, art. 2(b).

excluding social networks. These stringent conditions significantly limit the possibility for direct discriminatory outcomes to arise. However, it remains to be seen what exact categories of data could be processed, and whether the list of examples mentioned in the provision is exhaustive.

A second positive development is the introduction of a right to human intervention when the processing involves automated processing of personal data under Article 18(8). However, this provision might overlap with Articles 15(1)(h) and 22 of the GDPR. It is especially unclear what exact information must be provided to the consumer, and whether it is identical with a ‘meaningful information about the logic involved’ mentioned in Article 15(1)(h) GDPR. Setting aside the fact that some aspects of the provision could have been more precise, it remains a highly valuable provision that can also cover systems not classified as AI under the AI Act.

Thirdly, the Directive obliges Member States to ensure that conditions for being awarded a credit do not discriminate against consumers. The fact that the legislators decided to devote a separate provision on this issue, rather than discreetly including it in recitals or as a part of Article 18, indicates that the topic of non-discrimination is taken by them seriously. Laws adopted in the future by the EU will likely follow this approach.³⁵⁷ As mentioned in section 4.3.4, it is unclear why the provision does not explicitly state that it applies to both indirect and direct discrimination. It remains to be seen how Member States will interpret the provision and ensure in practice that creditworthiness assessments are free from discriminatory conditions.

Chapter 5: The AI Act analysis

The previous chapter presented how the issue of discrimination in credit scoring is tackled in European Law. The New Consumer Credit Directive provides for improved protection for the individuals affected by decisions. This chapter aims to assess how the provisions in the AI Act contribute to the existing legal framework. It will address whether the AI Act offers better a protection against discrimination to individuals affected by AI systems used in creditworthiness assessment or whether the obligations included in the legislation are redundant in this context.

³⁵⁷ Christiane Wendehorst, ‘The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective’ (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 37.

Consequently, the Chapter examines provisions of the AI Act regarding AI systems used for credit scoring and obligations applicable to deployers and providers of these systems. Even though the current systems used by traditional credit scoring institutions, such as the system used by SCHUFA, seem to not qualify as AI in the light of the definition in Article 3(1), it is very likely that in the future credit institutions will employ more sophisticated systems. For this reason, it is necessary to analyse the added value of the AI Act.

First, the chapter introduces the scope and objectives of the AI Act. Secondly, the risk-based approach adopted in the Act is discussed. Thirdly, the chapter moves to a general analysis of deployers' obligations and especially focuses on the fundamental rights impact assessment (FRIA). Fourth, the chapter analyses selected obligations of providers of AI systems in the AI Act to establish what impact they have on systems used for credit scoring assessment. Fifth, the chapter discusses the significance of individual rights introduced in the final version of the AI Act. The chapter ends with concluding remarks.

5.1 Relevance of the AI Act for creditworthiness assessment

The AI Act has been a long-awaited legislation that carried a lot of expectations. Indisputably, the AI Act is a landmark piece of law on AI. It has many implications for credit scoring agencies and institutions using AI systems in assessing consumers' creditworthiness since these systems qualify as high-risk systems according to Article 6(2) of the AI Act. However, as shown in the last chapter, discrimination in credit scoring is partially regulated in EU non-discrimination directives, including Directive 2000/43/EC and Directive 2004/113/EC, as well as the GDPR and the 2023 Consumer Credit Directive (CCD2). The last legislation is especially relevant as it includes a provision dealing with automated creditworthiness assessments³⁵⁸ and a provision explicitly addressing non-discrimination.³⁵⁹

This chapter will deal with the provisions that are the most relevant for protection of individuals' right to non-discrimination in credit scoring, including Article 14, Article 27 and Article 10 of the AI Act. The aim of this Chapter is to examine what is the added value of the AI Act in regard to safeguarding individuals' right to non-discrimination.

³⁵⁸ The New Consumer Credit Directive, art. 18(8).

³⁵⁹ *ibid*, art. 6.

5.2 Objectives and scope of the AI Act

The AI Act is primarily a product safety legislation, whose purpose is to improve the functioning of the internal market.³⁶⁰ The aim of the legislation is also to promote the development of trustworthy artificial intelligence and it acknowledges that AI systems might pose risks to health and fundamental rights.³⁶¹ Fundamental rights provide for an essential part of this regulation and are used to determine which AI systems qualify as high-risk systems.³⁶² This approach led to the AI Act being a product safety regulation that is phrased in fundamental rights language.³⁶³ In contrast to the New Consumer Credit Directive, the AI Act does not include a provision that explicitly addresses non-discrimination. This term appears in the legislation only in the recitals.³⁶⁴ While it is laudable that the potential of AI systems to discriminate has been recognized, it is disappointing that the lawmakers have not decided to include an explicit provision dealing with non-discrimination, along the lines of Article 6 included in the CCD2 in the binding part of the regulation. Additionally, the AI Act does not specify what is a standard for establishing that a certain treatment qualifies as discrimination.³⁶⁵ This choice was likely made to avoid overlaps with existing EU non-discrimination laws.³⁶⁶

Regarding the personal scope of the Act, it applies to a natural person, public authority or agency which is either a provider or a deployer of an AI system.³⁶⁷ The former is an entity that develops an AI system, places it on the market or puts it into service under its name,³⁶⁸ whereas the latter uses an AI system in the course of a professional activity.³⁶⁹ The Act also applies to importers and distributors of AI systems,³⁷⁰ but obligations applicable to them are not of interest to this thesis.

³⁶⁰ Artificial Intelligence Act, art. 1(1).

³⁶¹ *ibid.*

³⁶² Francesca Palmiotto, 'The AI Act Roller Coaster: The Evolution of Fundamental Rights Protection in the Legislative Process and the Future of the Regulation' (2025) *European Journal of Risk Regulation* 1, 8.

³⁶³ Marco Almada and Nicolas Petit, 'The EU AI Act: Between the Rock of Product Safety and the Hard Place of Fundamental Rights' (2025) 62 *Common Market Law Review* 85, 104.

³⁶⁴ Artificial Intelligence Act, recitals 27, 28, 31, 45.

³⁶⁵ Luca Deck and others, 'Implications of the AI Act for Non-Discrimination Law and Algorithmic Fairness' (2024) 1(2) *ACM Journal on Responsible Computing* <<http://arxiv.org/abs/2403.20089>> accessed 21 March 2025, 3.

³⁶⁶ Christiane Wendehorst, 'The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective' (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 38.

³⁶⁷ Artificial Intelligence Act, art. 1(1).

³⁶⁸ Artificial Intelligence Act, art. 3(3).

³⁶⁹ *ibid.*, art. 3(4).

³⁷⁰ *ibid.* art. 2(1)(d).

The material scope of the regulation is limited to AI systems and general-purpose models. There are some exceptions, including AI systems used for national security purposes,³⁷¹ research purposes³⁷² and open-source models.³⁷³ In essence, the AI Act is only applicable to systems that fulfil criteria set under Article 3(1). This definition was already analysed in detail in section 2.2.1 of chapter 2, but it is worth restating some aspects. Even though the definition under Article 3(1) is quite broad, there is a risk that systems currently used by credit scoring agencies like SCHUFA do not fall within the scope of the definition. According to the EU Commission's guidelines on an AI system definition, machine-based systems that can perform tasks using "basic statistical learning rule" or "classical heuristics techniques" are excluded from the definition of an AI system.³⁷⁴ The systems used by traditional credit scoring agencies rely on automated data processing but are largely based on classical heuristics techniques, which in the understanding of the Commission's guidelines would exclude them from the scope of the AI definition. However, it must be pointed out that the EU Commission does not consider systems such as the one used by SCHUFA to be simple heuristics,³⁷⁵ which would imply that this system, as well as other credit scoring systems, might fall within the scope of the AI Act definition. Lastly, it is very likely that in the future credit scoring agencies will move to more sophisticated models and for this reason, the analysis of the AI Act is necessary.

5.3 Risk-based approach

The AI Act horizontally regulates AI systems by adopting a risk-based approach. In general, the Act divides AI systems into three main categories based on the risk they pose to the health, safety and fundamental rights of persons.³⁷⁶ In this framework, many AI systems are subject to minimal or no regulatory obligations. Systems identified as high-risk are mandated to adhere to a list of compliance requirements. The following paragraph provides an overview of this classification system, along with examples of AI systems that qualify as those systems. The provisions that prescribe criteria for qualifying AI systems as high-risk - Article 6, together

³⁷¹ *ibid.*, art. 2(3).

³⁷² *ibid.*, art. 2(6).

³⁷³ *ibid.*, art. 2(12).

³⁷⁴ European Commission, Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act) (2025) <<https://ec.europa.eu/newsroom/>> accessed 10 March 2025, paras. 48-49.

³⁷⁵ European Law Institute, What Key Factors are Relevant in Delineating AI Systems for the Purpose of the AI Act? (19 February 2025), <<https://youtu.be/y-tO2TWRgxM>> accessed 19 March 2025.

³⁷⁶ Artificial Intelligence Act, art. 6.

with Articles 2 and 3(1) of the AI Act, form the backbone of the legislation as the applicability of the AI Act and its obligations is dependent on them.

Systems which pose unacceptable risks, such as social scoring or “real-time” remote biometric identification are considered prohibited.³⁷⁷ Prohibited AI systems are deemed to contravene the EU’s values.³⁷⁸ Nonetheless, there are exceptions to the ban, which can be seen as alarming. The fact that the legislators decided to include the national security “blanket” exception to the prohibition of AI systems using real-time remote biometric identification received a lot of criticism from civil society.³⁷⁹ Representatives of the civil society expressed a concern that governments might apply this exception without being obliged to conduct the FRIA. In addition, these systems largely influence not only the right to non-discrimination but also other rights, such as freedom of speech, privacy and the right to assembly.³⁸⁰

When it comes to high-risk AI systems, the AI Act provides for two categories of high-risk applications. Firstly, an AI system that is a safety component of a product, or an AI system that itself is a product, which is covered by EU law in Annex I and is required to undergo a third-party conformity assessment under these EU laws.³⁸¹ Examples of these AI systems include medical devices or toys.³⁸² Secondly, the Act includes a list of eight additional high-risk AI systems which are listed in Annex III. High-risk AI systems might be placed on the market and later deployed, provided that they comply with ex-ante rules included in Section 2 of the Act.

The use of AI systems for the performance of creditworthiness assessments is included under point (b) of Article 5 of Annex III which falls within the broader category of AI systems used in “access to and enjoyment of essential private services and essential public services and benefits”.³⁸³ On a side note, the assessment of risks concerning granting health insurance is included under point c of Article 5 in Annex III. It is a positive development, as previous drafts

³⁷⁷ Artificial Intelligence Act, art. 5 (1)(c) and 5(1)(h)

³⁷⁸ *ibid*, recital 31.

³⁷⁹ European Digital Rights and AI coalition partners, ‘EU’s AI Act fails to set gold standard for human rights’ (3 April 2024) <<https://edri.org/wp-content/uploads/2024/04/EUs-AI-Act-fails-to-set-gold-standard-for-human-rights.pdf>> accessed 14 March 2025.

³⁸⁰ Sandra Wachter, ‘Limitations and Loopholes in the EU AI Act and AI Liability Directives: What This Means for the European Union, the United States, and Beyond’ (2024) 26 YALE J.L. & TECH. 671, 681.

³⁸¹ Artificial Intelligence Act, article 6(1)(a).

³⁸² *ibid*, Annex I.

³⁸³ *ibid*, Annex II, 5.

of the Act did not properly acknowledge the fact that other criteria for evaluation might have a similar effect as creditworthiness assessments.³⁸⁴

In addition, the final version of the AI Act introduces a so-called “filter”, a pre-market risk assessment which is to be conducted by the AI providers themselves. The inclusion of the filter criteria further provides an opportunity to narrow down the range of high-risk AI systems. According to Article 6(3), AI systems should not be considered high-risk if they do not “materially influence the outcome of decision making”. This is the case for systems designed to perform a “narrow procedural task”,³⁸⁵ improve humans’ work,³⁸⁶ detect patterns in the decision-making, but without replacing assessments completed by humans,³⁸⁷ and lastly to “perform a preparatory task to an assessment relevant for the use cases listed in Annex III”.³⁸⁸ To avoid qualifying as high-risk, it is enough that an AI system meets only one of the mentioned conditions. In case of credit scoring, the last condition could be relevant. However, it is not fully clear what is meant by a “preparatory task”. According to Recital 53 AI systems used for file organising, text and speech processing and translation should be viewed as intended to perform preparatory tasks. In light of the examples mentioned in Recital 53, AI systems used for calculating a credit score would not meet this criterion. What is interesting to point out here, is that in the CJEU case SCHUFA attempted to argue that by calculating a credit score, it only engaged in a preparatory act, and not in the decision itself. The court rejected this argument and ruled that a credit score is itself a decision and not a mere preparatory act. The meaning of a ‘decision’ in the GDPR and the AI Act is different, as in the former it is understood as a decision producing legal effects, and in the latter rather as an output of an AI system. Nonetheless, a correlation might be observed.

The obligations that providers of high-risk AI systems must fulfil before placing a system on the market are provided in Chapter III of the Act. The AI Act adopts a widely recognized approach from EU product safety law to ensure the safety of AI systems, relying on quality and risk management systems to manage and reduce risks associated with AI usage.³⁸⁹ These duties

³⁸⁴ Sandra Wachter, ‘Limitations and Loopholes in the EU AI Act and AI Liability Directives: What This Means for the European Union, the United States, and Beyond’ (2024) 26 YALE J.L. & TECH. 671, 681.

³⁸⁵ Artificial Intelligence Act, art. 6(3)(a).

³⁸⁶ *ibid.*, art. 6(3)(b).

³⁸⁷ *ibid.*, art. 6(3)(c).

³⁸⁸ *ibid.*, art. 6(3)(d).

³⁸⁹ Gerald Spindler, ‘Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive’ (2021) 15 Law and Financial Markets Review 239, 244.

include introducing a risk management system, establishing data governance, drawing up technical documentation, and maintaining transparency, human oversight, accuracy, cybersecurity and robustness.³⁹⁰ The AI Act requires all high-risk systems to be registered in a public database.³⁹¹ Obligations of the providers of AI systems are very extensive and they appear to be mostly bureaucratic. For the purposes of this thesis, the two most relevant obligations from the perspective of non-discrimination will be analysed – Article 14 on human oversight and Article 10 pertaining to data governance. By way of contrast, deployers have relatively limited obligations focusing primarily on ensuring human oversight, keeping records, and fulfilling monitoring duties.³⁹² In addition, some deployers are required to conduct fundamental rights impact assessments³⁹³ and comply with registration requirements.³⁹⁴ In general, the obligation to conduct a fundamental rights impact assessment under Article 27 of the AI Act applies to public bodies deploying AI systems or private entities providing public services. However, this obligation also extends to deployers of high-risk AI systems used for creditworthiness assessments and risk assessment in life and health insurance regardless of whether they are public or private entities.³⁹⁵ Regrettably, the obligation does not apply to all high-risk AI systems used by private bodies, and it is not fully clear why the legislator decided to extend the requirement only to those specific high-risk AI systems.

5.4. Obligations of the deployers

The section above briefly introduced the obligations of deployers of AI systems in the AI Act. The list of obligations that deployers must comply with is more limited than that of providers and is included under Article 26 of the AI Act. This provision briefly introduces the responsibilities of AI deployers, such as a requirement to introduce technical and organisational measures³⁹⁶, provide for human oversight³⁹⁷ and inform employees about the fact that they will be subject to the use of an AI system³⁹⁸. In addition, when a high-risk AI system is used to make decisions about individuals, deployers should effectively inform them about the fact that they are subjected to a high-risk AI system.³⁹⁹ These requirements are indeed valuable. However,

³⁹⁰ Artificial Intelligence Act, arts. 9-15.

³⁹¹ *ibid.*, arts. 72, 74-76.

³⁹² *ibid.*, art. 26.

³⁹³ *ibid.*, art. 27.

³⁹⁴ *ibid.*, art. 49(3).

³⁹⁵ *ibid.*, art. 27(1).

³⁹⁶ *ibid.*, art. 26(1).

³⁹⁷ *ibid.*, art. 26(2).

³⁹⁸ *ibid.*, art. 26 (7).

³⁹⁹ *ibid.*, art. 26(7).

they do not significantly strengthen the protection of individuals against the discriminatory effects of AI systems.

5.5 Fundamental Rights Impact Assessment in the AI Act

According to Article 27, deployers of AI systems that are intended to be used in creditworthiness assessments must conduct fundamental rights impact assessment (FRIA). In general, this provision applies to public bodies or private entities providing public services.⁴⁰⁰ Therefore, it is positive that the legislator decided to extend this requirement also to deployers of high-risk AI systems used in credit scoring, regardless of whether they are public or private actors. The relevance of conducting FRIA stems from the acknowledgement that the use of AI systems can have negative consequences for the enjoyment of individuals' fundamental rights.⁴⁰¹ This assessment must be performed before the initial deployment of an AI system, but the assessment should be reviewed in case some changes occur, for instance to the type of data process or if new risks arise.⁴⁰² In carrying out the assessment, deployers must consider potential risks that could result in harm to fundamental rights,⁴⁰³ assess the implementation of adopted human oversight measures,⁴⁰⁴ and outline the actions to be taken should the identified risks materialize.⁴⁰⁵ After conducting the assessment, deployers must communicate the results to the relevant market supervisory authority.⁴⁰⁶ No obligation requires deployers to make FRIAs publicly available.⁴⁰⁷

This provision is very ambitious but is also formulated in quite abstract terms. Unfortunately, there is a risk that conducting the FRIA will become a 'tick box exercise'. Considering the high level of protection of fundamental rights established in the CFR, FRIA should not be treated by deployers as yet another compliance obligation, with no real impact on AI systems' design.⁴⁰⁸

⁴⁰⁰ Artificial Intelligence Act, art. 27.

⁴⁰¹ Anna Thomaïdou and Konstantinos Limniotis, 'Navigating Through Human Rights in AI: Exploring the Interplay Between GDPR and Fundamental Rights Impact Assessment' (2025) 5(1) *Journal of Cybersecurity and Privacy* 7, 8.

⁴⁰² Artificial Intelligence Act, art. 27(2).

⁴⁰³ *ibid.*, art. 27 (1)(d).

⁴⁰⁴ *ibid.*, art. 27 (1)(e).

⁴⁰⁵ *ibid.*, art. 27(1)(f).

⁴⁰⁶ *ibid.*, art. 27(3).

⁴⁰⁷ Tünde Fülöp & Philipp Poindl 'Article 27 Fundamental Rights Impact Assessment for High-Risk AI Systems' in Ceyhan Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 567.

⁴⁰⁸ Alessandro Mantelero, 'The Fundamental Rights Impact Assessment (FRIA) in the AI Act: Roots, Legal Obligations and Key Elements for a Model Template' (2024) 54 *Computer Law & Security Review* 1, 8.

The central FRIA's role is the identification of risks to fundamental rights and the implementation of appropriate mitigation measures. Examples of such measures could include creating redress mechanisms⁴⁰⁹, or introducing additional oversight measures⁴¹⁰. However, the AI Act does not specify what these mitigation measures should at minimum entail, other than providing general examples in Recital 96.⁴¹¹ The proposed version of the AI Act crafted by the European Parliament used to be much more detailed, and it included a mitigation plan,⁴¹² as well as a reference to the participation of representatives of persons likely to be affected in the assessment.⁴¹³ The exclusion of these elements makes the final version of FRIA less effective in safeguarding fundamental rights.⁴¹⁴ The consultation with relevant stakeholders, such as civil society organisations, is only mentioned in Recital 96.⁴¹⁵ Deployers will likely end up describing risks to fundamental rights in general terms and proposing mitigation measures without explaining their adequacy and effectiveness.⁴¹⁶

Additionally, in order to successfully complete FRIA, deployers need to receive information from the providers.⁴¹⁷ However, the provision does not explicitly state how the information flow between providers and deployers should look concerning the assessment.⁴¹⁸ Article 27(2) only states that in similar cases, deployers can rely on assessments previously conducted by the providers. Including a clear obligation on disclosure of information would contribute to more effective risk management.⁴¹⁹

⁴⁰⁹ *ibid*, recital 96.

⁴¹⁰ Anna Thomaidou and Konstantinos Limniotis, 'Navigating Through Human Rights in AI: Exploring the Interplay Between GDPR and Fundamental Rights Impact Assessment' (2025) 5 *Journal of Cybersecurity and Privacy* 8.

⁴¹¹ Tünde Fülöp & Philipp Poindl 'Article 27 Fundamental Rights Impact Assessment for High-Risk AI Systems' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 570.

⁴¹² Proposal for a Regulation of the European Parliament and of the Council laying down harmonized rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts 2021/0106(COD), art. 29a(1)(h).

⁴¹³ *ibid*, art. 29a(4).

⁴¹⁴ Alessandro Mantelero, 'The Fundamental Rights Impact Assessment (FRIA) in the AI Act: Roots, Legal Obligations and Key Elements for a Model Template' (2024) 54 *Computer Law & Security Review* 1, 8.

⁴¹⁵ Tünde Fülöp & Philipp Poindl 'Article 27 Fundamental Rights Impact Assessment for High-Risk AI Systems' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), 567.

⁴¹⁶ Alessandro Mantelero, 'The Fundamental Rights Impact Assessment (FRIA) in the AI Act: Roots, Legal Obligations and Key Elements for a Model Template' (2024) 54 *Computer Law & Security Review* 1, 9.

⁴¹⁷ Tünde Fülöp & Philipp Poindl 'Article 27 Fundamental Rights Impact Assessment for High-Risk AI Systems' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 568.

⁴¹⁸ Alessandro Mantelero, 'The Fundamental Rights Impact Assessment (FRIA) in the AI Act: Roots, Legal Obligations and Key Elements for a Model Template' (2024) 54 *Computer Law & Security Review* 1, 6.

⁴¹⁹ *ibid*.

To conclude, this provision is a very positive step in reducing risks of harm to the right to non-discrimination and is certainly of added value. However, in its current form, the provision is far from being clear. Therefore, ensuring effective compliance will be challenging. A lot will depend on the template for the assessment that is to be prepared by the AI Office.⁴²⁰

5.6 Human oversight

Article 14 of the AI Act is an interesting provision which is directed at both providers and deployers of high-risk AI systems. The provision is a reflection of one of the aims of the AI Act to promote a safe and trustworthy AI.⁴²¹ The provision requires AI systems to be designed and developed in a way, which enables the systems to be “effectively overseen by natural persons during the period in which they are in use”.⁴²² This human oversight aims to reduce risks to fundamental rights, including the right to non-discrimination.⁴²³ Providers of AI systems are responsible for identifying measures and either building them into the AI system⁴²⁴ or designing them appropriately so they can be implemented by a deployer.⁴²⁵ A natural person, who human oversight is assigned must, inter alia, be able to comprehend the capacities and limitations of an AI system,⁴²⁶ be aware of a so-called automation bias,⁴²⁷ correctly interpret an AI system’s output⁴²⁸ and be able to decide to override the system’s input.⁴²⁹

This provision implements the “human-in-the-loop” approach,⁴³⁰ which is rooted in the idea that involvement in the AI life cycle enhances the trust and transparency of an AI system.⁴³¹ By adopting this approach, the EU legislator gives a testimony of its belief that humans can

⁴²⁰ Artificial Intelligence Act, art. 27(5).

⁴²¹ Argyri Paneziin ‘Article 14 Human Oversight’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 359.

⁴²² Artificial Intelligence Act, art. 14(1).

⁴²³ Argyri Paneziin ‘Article 14 Human Oversight’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 358.

⁴²⁴ Artificial Intelligence Act, art. 14(3)(a).

⁴²⁵ *ibid.*, art. 14(3)(b).

⁴²⁶ *ibid.*, art. 14(4)(a).

⁴²⁷ *ibid.*, art. 14(4)(b).

⁴²⁸ *ibid.*, art. 14(4)(c).

⁴²⁹ *ibid.*, art. 14(4)(d).

⁴³⁰ Argyri Paneziin ‘Article 14 Human Oversight’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 365.

⁴³¹ Stuart E Middleton and others, ‘Trust, Regulation, and Human-in-the-Loop AI: Within the European Region’ (2022) 65 Commun. ACM 64 <<https://cacm.acm.org/research/trust-regulation-and-human-in-the-loop-ai/>> accessed 23 March 2025, 66.

effectively oversee the work of AI systems.⁴³² In addition, it can be assumed that the provision aims to address the "black box" problem, as it requires providers to develop AI systems in a way that allows deployers to understand the system's outputs. This provision is especially crucial for decisions with significant legal effects. In credit scoring, it would be preferable that consumers know that there is a person who verifies the AI system's outputs that can change their lives. It is usually the case when the amount of credit a consumer applies for is significant, or the purpose of the credit is, for instance, to invest in one's business or buy a property. There is a view in legal scholarship that humans are incapable of verifying and correcting outputs produced by AI systems because they cannot fully comprehend all the data the AI system relies on to generate the output.⁴³³ Consequently, there exists a risk that human oversight prescribed in Article 14 might be reduced to a simple "rubber stamp exercise".⁴³⁴ Additionally, a vast majority of empirical research shows that humans cannot properly provide for oversight of AI systems and that the human oversight policy is inherently flawed.⁴³⁵ On the other hand, it can be reasonably expected from entities deploying high-risk AI systems to properly train a staff member responsible for human oversight or to hire a person with relevant expertise to effectively comply with Article 14, and also their obligation under Article 26 to provide necessary training and support to a person responsible for human oversight. This provision can contribute to reducing the risk of discrimination. If a person responsible for human oversight observes that a certain output might result from biased data, they could correct it. However, it is very unlikely that a person would be able to spot a discriminatory output. As was discussed in section 4.1.6, the correlations that AI can find between different data points are not always comprehensible for humans. Furthermore, the possibility that a human will rely on their own biases when interpreting data should not be overlooked.⁴³⁶ The provision in the AI Act specifically addressing bias prevention and mitigation is Article 10(5) which will be discussed in the next section.

It must also be noted that the CCD2 provides for a right to human intervention in Article 18(8). This right differs from the content of Article 14, as it focuses on the fact that a consumer must

⁴³² Argyri Paneziin 'Article 14 Human Oversight' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 364.

⁴³³ Gerald Spindler, 'Algorithms, Credit Scoring, and the New Proposals of the EU for an AI Act and on a Consumer Credit Directive' (2021) 15 *Law and Financial Markets Review* 239, 253.

⁴³⁴ *ibid.*

⁴³⁵ Ben Green, 'The Flaws of Policies Requiring Human Oversight of Government Algorithms' (2022) 45 *Computer Law & Security Review*, 12-16.

⁴³⁶ *ibid.*

be able to receive an explanation of the decision and it does not explicitly require a human to be able to correct the outputs of the system. However, according to Article 18(8)(c), a consumer might request a review of the assessment of the creditworthiness and the decision, which means that a human must be able to verify an outcome of automated data processing. Therefore, Article 18(8) also provides for some form of human oversight in creditworthiness assessment. The provision in the AI Act dealing with human oversight is still broader, as it places a positive obligation on deployers to understand the system they use and correctly interpret its outputs, rather than merely explaining when requested by a consumer.

It is interesting to also consider the relationship between Article 14 of the AI Act and Article 22 of the GDPR. The scope of Article 14 of the AI Act is somewhat broader than that of Article 22 of the GDPR, as it encompasses all AI systems, regardless of the extent to which a human was involved in their deployment.⁴³⁷ Therefore, in general, there is no overlap between the provisions. In the context of credit scoring, the situation is different because of the ruling in SCHUFA case, which established that Article 22 of the GDPR also applies if a decision to grant a credit is based on an automatically generated credit score. Therefore, in credit scoring, there is a slight overlap between the two provisions.

To conclude, Article 14 of the AI Act is a positive step forward in ensuring transparency in AI systems. It is possible to find benefits in the provision for preventing discrimination, however, assessing its effectiveness in this regard is difficult. Additionally, Article 14 AI Act offers protection to individuals in situations, in which Article 22 of the GDPR is not applicable. However, in the context of credit scoring, its added value is not so significant considering the judgement in SCHUFA case. The reference to automation bias is a positive development, however, it remains to be seen how exactly will deployers effectively “remain aware” of the automation bias.

5.7 Data and data governance

The AI Act contains an extensive provision regarding data and data governance, namely Article 10 that applies exclusively to high-risk AI systems.⁴³⁸ This provision lists several practices that

⁴³⁷ Christiane Wendehorst, ‘The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective’ (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 58.

⁴³⁸ Artificial Intelligence Act, art. 10(1).

apply to training, validation and testing data.⁴³⁹ One of the practices requires data to be examined given possible biases that could lead to discrimination⁴⁴⁰ and the adoption of measures needed to “detect, prevent and mitigate biases”.⁴⁴¹ Inclusion of these measures explicitly addressed to prevent discrimination is a very positive development and the standards introduced by the provision are justifiable.⁴⁴² However, the AI Act is silent on how these practices can be effectively put into action.⁴⁴³

Article 10 is especially interesting as it provides a new legal basis for processing sensitive data.⁴⁴⁴ Under Article 9 of the GDPR, processing of data classifying as “special category data” is only allowed under strict conditions, for instance, if a data subject explicitly consents to such processing.⁴⁴⁵ Both the European Data Protection Board and European Data Protection Supervisor expressed their concern in relation to the first proposal, stating that the provision is not sufficiently linked to the GDPR to constitute a new legal basis.⁴⁴⁶ During the negotiations on the proposal, this Article sparked significant controversy. At the first glimpse, this provision might raise concerns as it appears to create room for discrimination. However, paradoxically, processing sensitive data can also promote non-discrimination practices as it is necessary for bias detection and mitigation.⁴⁴⁷ Processing of special categories of data based on Article 10 of the AI Act to combat discrimination is in line with a ‘substantial public interest ground’ under Article 9(2) of the GDPR.⁴⁴⁸

While the inclusion of this provision is very positive, there is a high chance that it is still insufficient to effectively combat biases, especially since the provision only applies to high-risk AI systems. Therefore, AI systems that do not classify as high-risk cannot process sensitive

⁴³⁹ *ibid*, art. 10(a).

⁴⁴⁰ *ibid*, art. 10(2)(e).

⁴⁴¹ *ibid*, art. 10(2)(f).

⁴⁴² Sandra Wachter, ‘Limitations and Loopholes in the EU AI Act and AI Liability Directives: What This Means for the European Union, the United States, and Beyond’ (2024) 26 YALE J.L. & TECH. 671, 688.

⁴⁴³ *ibid*.

⁴⁴⁴ Artificial Intelligence Act, article 10(5).

⁴⁴⁵ General Data Protection Regulation, art. 9(2)(a).

⁴⁴⁶ European Data Protection Board and European Data Protection Supervisor, ‘EDPB-EDPS Joint Opinion 5/2021 on the proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) (2021) <https://www.edpb.europa.eu/our-work-tools/our-documents/edpb-edps-joint-opinion/edpb-edps-joint-opinion-52021-proposal_en> accessed 10 March 2025, para. 73.

⁴⁴⁷ *o*, 3.

⁴⁴⁸ Stefano De Luca with Marina Federico, ‘Algorithmic discrimination under the AI Act and the GDPR’ (2025) European Parliamentary Research Service <<https://www.europarl.europa.eu/thinktank/>> accessed 23 March 2025, p. 2.

data based on a legal basis established under Article 10(5) of the AI Act for the purpose of bias mitigation unless strict requirements under Article 9(2) of the GDPR are met. It is worth mentioning that the AI Act does not provide for a definition of a bias, nor does it prescribe how it should be measured.⁴⁴⁹ It creates issues as the term ‘bias’ might have different meanings depending on a context or a field of study, for instance, the meaning of the term is different in law and statistics.⁴⁵⁰ What is also problematic is that the provision does not specify what should be done if biases cannot be detected.⁴⁵¹ Surprisingly, the EU legislator did not specify how biases should be measured, taking into account the wide range of research that was conducted on this topic, including projects on how to effectively mitigate and measure bias.⁴⁵² Lastly, most of the fairness metrics for measuring bias come from the United States, a State whose anti-discrimination laws significantly differ from the European.⁴⁵³ Therefore, there might be a risk that the adopted bias tests would not be in line with European standards.⁴⁵⁴ It has been suggested in academic debate, that to guarantee that systems used are free from biases, a reversed burden of proof should be adopted.⁴⁵⁵ However, the AI Act is silent on this matter.

5.8 Inclusion of individual-level rights

Even though the AI Act is far from being free from loopholes and ambiguities, it contains a very positive development that was introduced in its adopted version – individuals’ rights. Individual-level rights were not included in the first proposal of the AI Act.⁴⁵⁶ The fact that these rights have been added to the final draft seems to slightly shift the regulation’s focus beyond just product safety, and it provides for the strengthening of individuals’ protection. None of the rights entitle individuals to receive a fair decision. In case lawmakers had decided to include a right to a fair decision in the AI Act, it would mean that they would also have to

⁴⁴⁹ Sandra Wachter, ‘Limitations and Loopholes in the EU AI Act and AI Liability Directives: What This Means for the European Union, the United States, and Beyond’ (2024) 26 YALE J.L. & TECH. 671, 688.

⁴⁵⁰ Katerina Yordanova ‘Article 10 Data and Data Governance’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 273.

⁴⁵¹ *ibid.*

⁴⁵² Sandra Wachter, Brent Mittelstadt and Chris Russell, ‘Bias Preservation in Machine Learning: The Legality of Fairness Metrics Under EU Non-Discrimination Law’ (2021) *West Virginia Law Review* 123; M. Hort et al., ‘Bias mitigation for machine learning classifiers: A comprehensive survey’ (2024) 1(2) *ACM Journal on Responsible Computing*.

⁴⁵³ Sandra Wachter, ‘Limitations and Loopholes in the EU AI Act and AI Liability Directives: What This Means for the European Union, the United States, and Beyond’ (2024) 26 YALE J.L. & TECH. 671, 689.

⁴⁵⁴ *ibid.*

⁴⁵⁵ *ibid.*

⁴⁵⁶ Maja Brkan & Hana Palcic Vilfan ‘Article 86 Right to Explanation of Individual Decision-Making’ in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 1197.

provide for a definition of fairness.⁴⁵⁷ This would consequently lead to challenging debates on how fairness should be measured, which is problematic considering that understanding of ‘fairness’ is very much dependent on the context in which the decision is made.⁴⁵⁸ Additionally, it would be disproportionate to expect deployers of AI systems to prove each time they decide that it is a fair one.⁴⁵⁹ In addition, fairness is very much dependent on the context of a decision. Therefore, relying on a right to an explanation of individual-making seems to be more appropriate. Lastly, it can be argued that if decisions taken by AI systems violate non-discrimination laws, it would lead to such laws being applicable.⁴⁶⁰ However, as has been argued in section 4.1.5 of the previous chapter, the applicability of these laws to credit is not always straightforward.

The inclusion of the right to an explanation of individual decision-making established in Article 86 of the AI Act is undeniably a positive development, even though its scope captures only decisions made with the use of high-risk AI systems.⁴⁶¹ This right has already been addressed in this thesis in section 4.2.2.2 of the previous chapter while discussing automated decision-making in the GDPR. It can be only added that the inclusion of this right indirectly requires deployers of AI systems to possess sufficient information on the functioning of the system to be able to provide sufficient explanation. The obligation to provide an explanation does not apply to providers of AI systems.⁴⁶² Therefore, there is a risk that deployers of AI systems might lack the knowledge to effectively comply with this right.⁴⁶³ In section 4.2.2.2 of this dissertation, it has been concluded that in light of the current case law on the right to explanation in the GDPR, the inclusion of this right is not ground-breaking.

In addition, the relation between this right and the right to receive ‘meaningful information about the logic involved in the decision-making under Article 15(1)(h) and Article 22 is

⁴⁵⁷ Christiane Wendehorst, ‘The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective’ (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, 132.

⁴⁵⁸ *ibid.*

⁴⁵⁹ *ibid.*, 139.

⁴⁶⁰ *ibid.*

⁴⁶¹ Bjørn Aslak Juliussen, ‘The Right to an Explanation Under the GDPR and the AI Act’ (International Conference on MultiMedia Modeling 2025) <https://link.springer.com/chapter/10.1007/978-981-96-2071-5_14> accessed 25 March 2025 184, 189.

⁴⁶² Maja Brkan & Hana Palčić Vilfan ‘Article 86 Right to Explanation of Individual Decision-Making’ in Ceyhan Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 1198.

⁴⁶³ *ibid.*

intricate and not fully clear.⁴⁶⁴ Article 86(3) of the AI Act specifies that the right to explanation only applies “to the extent” that the right is not covered under Union law. Therefore, if a data subject has the right to receive meaningful information about the logic involved in automated individual decision-making under Article 15(1)(h) of the GDPR, then the right to an explanation under Article 86 of the AI Act does not apply. While the inclusion of this right is welcomed, it seems to not add much to the protection of individuals affected by automated decisions. On the other hand, Article 86 of the AI Act complements the protection granted in Article 22 of the GDPR, as it is not limited to fully automated decisions. On the other hand, the right included in the AI Act only relates to decisions taken by high-risk AI systems. In the credit scoring context, this impact remains limited, as, according to the CJEU judgement in SCHUFA, Article 22 is also applicable to credit scoring decisions. It can be even stated that the scope of Article 22 in the GDPR is broader, as it is not limited to systems that are considered high-risk AI systems.⁴⁶⁵ To conclude, it is necessary to see how in the future the Court will interpret the exact scope of the rights to explanation in the AI Act.

Additionally, Article 18(8) of the New Consumer Credit Directive also grants individuals the right to obtain a “clear and comprehensible” explanation of the creditworthiness assessment and the logic and risks in the automated data processing. In the context of creditworthiness assessment, in which already significant safeguards are present and a right to explanation exists, the right in Article 86 of the AI Act does not add much to the existing legal framework.

When it comes to a right to complain to a market surveillance authority, the provision prescribing this right is rather brief. According to Article 85 of the AI Act, any natural or legal person can bring a complaint if they believe that there has been an infringement of provisions of the AI Act. Providing for the right to complain to a relevant authority is not a new development and it exists also in the GDPR.⁴⁶⁶ The inclusion of the provision is welcomed, but it constitutes a minimum protection that lawmakers could offer to the affected individuals.

5.9 Conclusion

While the AI Act includes provisions that are relevant for safeguarding individuals’ right to non-discrimination, such as Article 14, Article 10, Article 27 and Article 86. The fact that the

⁴⁶⁴ *ibid*, p. 1212.

⁴⁶⁵ *ibid*, p. 1210.

⁴⁶⁶ General Data Protection Regulation, art. 77.

provisions are drafted vaguely significantly impacts their added value. It seems that the lawmakers wished to grant some sort of protection to the individuals, without explicitly referencing anti-discrimination practices.⁴⁶⁷ The provision dealing with human oversight (Article 14 of the AI Act) is of value for credit decisions that have significant effects on individuals' lives. However, the premise of the provision is inherently based on the belief that humans are capable of overseeing AI systems.⁴⁶⁸ When it comes to Article 10 of the AI Act, it provides reasonable standards, however, the fact that lawmakers did not provide concrete solutions for bias mitigation is disappointing. The FRIA prescribed under Article 27 of the AI Act is a positive step forward and seems to be an ambitious provision. At the same time, when comparing its current form, with a version included in the proposal of EP, it is difficult not to notice that its added value has decreased. Lastly, inclusion of individual-level rights in the AI Act is a very positive development. On the other hand, it could have been reasonably expected from the lawmakers that they introduce such rights, taking into account their focus on individuals' fundamental rights. Nonetheless, in the context of creditworthiness assessment, these rights are not ground-breaking, as the CCD2 already provides for additional rights to explanation and human intervention to consumers affected by automated decision-making.

Chapter 6: Conclusion

The use of AI in creditworthiness assessments enables increased efficiency and more precise results. However, if an AI system contains biases encoded in data that are not properly mitigated, there is a risk that an individual might suffer from indirect discrimination. The area of creditworthiness assessment is inherently sensitive, as the outcomes of the assessments have a significant impact on individuals' lives. This thesis presented specific risks that are associated with the use of AI systems in creditworthiness assessments (chapter 3) and focused on discrimination. This dissertation also dealt with the question of whether systems currently used by credit scoring agencies fall within the scope of the definition of an AI system under Article 3(1) of the AI Act (chapter 2). The definition of an AI system in the AI Act is broad and was designed to be future proof. Based on the EU Commission's guidelines published in February 2025, it can be deduced that systems based on classical heuristics, which is the case for a system used by SCHUFA, are not considered to be AI systems. On the other hand, the Commission

⁴⁶⁷ Christiane Wendehorst, 'The Proposal for an Artificial Intelligence Act COM(2021) 206 from a Consumer Policy Perspective' (2021) Study commissioned by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection <<https://papers.ssrn.com/sol3/>> accessed 22 March 2025, p. 38.

⁴⁶⁸ Argyri Paneziin 'Article 14 Human Oversight' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 367.

explicitly stated in one of the discussion panels that a system used by SCHUFA is covered by the AI Act's definition. Therefore, it seems that the Commission intended to include SCHUFA's systems in the scope of the AI Act. It is crucial to bear in mind that the Commission's guidelines are not legally binding, and their purpose is to only assist in interpreting the definition. It remains to be seen how the CJEU will interpret the meaning of Article 3(1) of the AI Act. Now, it can be stated that systems used by traditional credit scoring agencies might fall within the scope of the definition. Furthermore, it is almost certain that in the future, credit scoring agencies will start to deploy more sophisticated AI systems.

It can be concluded that AI systems used in creditworthiness pose risks to the individuals' right to non-discrimination due to their inherent characteristics, such as opaqueness and biases encoded in data. In addition, the lack of sufficient representation of some groups, such as people of colour in data might lead to discriminatory results. However, the main issue with discrimination in AI lies in the fact that it is difficult for individuals to recognize potential discrimination. Current EU non-discrimination law fails to sufficiently protect individuals from potential discrimination of AI systems. Individuals affected by AI decision-making might not recognize that they are being discriminated against. Additionally, to prove discrimination, a suitable comparator must be identified, which is challenging in AI-decision making. Finally, AI systems can find correlations between data points that are not comprehensible to humans. These correlations might not be related to protected grounds included in EU non-discrimination directives but could still result in unfavourable treatment. Concerning creditworthiness assessments, the Racial Equality Directive and the Equal Treatment in Goods and Services Directive are the most relevant since they apply to access to and supply of goods and services available to the public. However, the application of these directives to the credit scoring domain is problematic, as not all types of credit are classified as "services available to the public".

This thesis has not only dealt with non-discrimination law, but it has also discussed two legislations as being relevant for the protection of individuals from discrimination in the domain of credit scoring – the GDPR and the 2023 Consumer Credit Directive. The GDPR continues to be fundamental in safeguarding individuals' rights, including the right to non-discrimination. Article 22 of the GDPR, which according to the CJEU's judgement in SCHUFA case also applies to credit scoring agencies, prohibits a fully automated processing of personal data. Automated decisions cannot be based on data concerning *inter alia* ethnic origin, religious beliefs or sexual orientation, which correlate with protected grounds included in Article 21 of

the CFR unless they comply with strict safeguards. This provision offers quite a strong protection, even though it only applies to fully automated decisions. Furthermore, according to a recent CJEU judgment in *CK v Dun & Bradstreet Austria* case, it is possible to distinguish a right to explanation, which derives from a combination of the right to access established in Article 15 of the GDPR(1)(h) GDPR and Article 22 of the GDPR. This decision constitutes a significant development, as it allows individuals to request an explanation of automated individual decision-making. This right is essential for individuals also from the perspective of non-discrimination. Knowing and understanding the logic behind an automated decision enables individuals to recognize potential discrimination. A similar right is included in Article 18(8) of the 2023 Consumer Credit Directive. To summarize, provisions included in the Directive significantly strengthen the protection of consumers when it comes to discrimination of AI systems. The Directive regulates the procedure of creditworthiness assessments, and it only allows for the processing of “relevant and accurate information”, pursuant to Article 18(3). Additionally, the Directive includes a separate provision on non-discrimination – Article 6. Even though the provision could benefit from further specification, such as reference to indirect discrimination, it is undeniably a positive development. Overall, the legal framework governing risks to the individuals’ right to non-discrimination comprised of the GDPR and the 2023 Consumer Credit Directive offers significant safeguards to the individuals. Even though these legislations do not explicitly refer to AI decision-making, considering the CJEU ruling in *SCHUFA* case, they can be also applied to automated decision-making in credit scoring. However, safeguards included in the discussed legal framework might not apply to decisions made by AI systems with a significant human involvement.

Chapter 5 of the thesis has critically examined selected provisions of the AI Act to answer the main research question. The chapter has focused on four aspects of the AI Act – the FRIA (Article 27), human oversight (Article 14), bias mitigation and monitoring (Article 10(5)) and individual-level rights (Articles 85 and 86). To conclude, although the inclusion of the provisions aimed at mitigating risks of discrimination is laudable, the before-mentioned provisions do not meaningfully enhance the existing legal framework.

The obligation to conduct FRIA had the potential of strengthening the protection of individuals, however, due to a lack of precise suggestions on risk mitigation, it is possible that in practice the assessment will be reduced to a “tick-box” exercise. Article 14, which deals with human oversight, is structured based on the premise that humans are capable of overseeing AI systems’

work and outputs. In creditworthiness assessments, the fact that the human is obliged to review the outputs of an AI system is very positive, especially in credits that involve significant sums. Nonetheless, there is a risk that humans are not able to effectively oversee AI systems' outputs. This provision could offer solid protection against discrimination only if deployers invested resources into educating their staff - not only on the functioning of AI systems and automation biases but also on non-discrimination. When it comes to Article 10(5) dealing with data governance, it can be concluded that the introduction of a new ground for processing sensitive categories of data to monitor and mitigate biases is an important step forward in combating discrimination. Nonetheless, the fact that the provision only applies to high-risk AI systems is disappointing. Additionally, the AI Act fails to provide a definition of a bias and include guidelines on bias mitigation techniques. Taking into account the importance of this provision, its general character fails to provide sufficient protection against discrimination. Concerning, the inclusion of individual-level rights, this development is needed, and it makes EU legislator seem more credible when it comes to fulfilling the goal of fundamental rights protection. Especially, the introduction of the right to individual decision-making is a commendable improvement to the first version of the AI Act, which did not include such a right. Even though the use of "black-box" AI systems is not explicitly prohibited by the AI Act, it seems that to comply with the right to explanation, deployers cannot deploy opaque systems.⁴⁶⁹ The inclusion of this right significantly strengthens the protection of individuals affected by AI decision-making. However, in the area of credit scoring, individuals are already empowered by the 2023 Credit Consumer Directive, which grants them a right to obtain a clear and comprehensible explanation of the decision to grant a loan from a creditor.

Finally, it can be stated that despite its promises and the inclusion of some relevant provisions, such as four Articles discussed above, the AI Act's added value to the protection of individuals from discrimination in creditworthiness assessments is limited. It is due to the fact that the existing legal framework comprised of the GDPR, and the 2023 Consumer Credit Directive already provides for strong safeguards. Additionally, provisions included in the AI Act suffer from vagueness.

⁴⁶⁹ Maja Brkan & Hana Palcic Vilfan 'Article 86 Right to Explanation of Individual Decision-Making' in Ceyhun Necati Pehlivan, Nikolaus Forgó, Peggy Valcke (eds.) *The EU Artificial Intelligence (AI) Act: A Commentary* (Wolters Kluwer 2025), p. 1208.

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