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Used by Tax Administrations on Human Rights

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Table of Contents

List of Abbreviations	iii
1. Introduction	1
2. AI Technologies in Tax Administrations	2
2.1. Definition of AI.....	2
2.2. Disciplines Related to AI.....	4
2.2.1. Algorithms	4
2.2.2. Big Data Analytics	4
2.2.3. Machine Learning	5
2.2.4. Deep Learning	7
2.2.5. Natural Language Processing	8
2.3. The Use of AI in Tax Administration	8
2.3.1. Overview	8
2.3.2. Taxpayer Assistance	10
2.3.3. Tax Fraud and Evasion Detection	11
2.3.4. Tax Policy Evaluation	14
2.3.5. Tax Collection.....	16
3. Impacts of AI Technologies Used by Tax Administrations on Human Rights	16
3.1. Overview.....	16
3.2. Violation of the Prohibition of Discrimination.....	16
3.3. Violation of the Right to a Fair Trial.....	18
3.4. Violation of the Right to Respect for Private Life.....	21
4. Reviewing AI Regulations for the Prevention of Human Rights Violations.....	25
4.1. Hard Law Examples	25
4.1.1. The AI Act	25
4.1.2. The GDPR.....	27
4.2. Soft Law Examples.....	30
4.2.1. European Commission’s Ethics Guidelines for Trustworthy AI.....	31
4.2.2. Council of Europe Recommendation	31
4.2.3. The OECD’s AI Recommendation	33
5. Recommendations to Prevent Human Rights Violations	34
5.1. Bias Mitigation in AI Algorithms	34
5.2. Enhancing Human Oversight and Intervention in AI Systems	35
5.3. Adopting Explainable AI to Enhance Transparency and Accountability	36
5.4. Data Minimization, Anonymization, and Purpose Limitation	38
5.5. Conducting Regular Audits to Assess the Human Rights Impacts	39
5.6. Reevaluating Risk Classifications for AI Systems in Tax Administration	39

6. Conclusion	40
References	42
Abstract	48
Abstrakt	49

List of Abbreviations

AI	Artificial Intelligence
AI Act	European Union Artificial Intelligence Act
AI HLEG	High-Level Expert Group on Artificial Intelligence
ECHR	European Convention on Human Rights
ECtHR	European Court of Human Rights
EU	European Union
GDPR	General Data Protection Regulation
NLP	Natural Language Processing
OECD	Organisation for Economic Co-operation and Development
PIT	Personal Income Tax
STIR	System Teleinformatyczny Izby Rozliczeniowej
SyRI	System Risk Indication
VAT	Value Added Tax
XAI	Explainable Artificial Intelligence

1. Introduction

As Artificial Intelligence (AI) technologies have rapidly integrated into daily life globally, the field of tax administration has followed suit. With a growing focus on boosting efficiency, preventing tax fraud, and ensuring taxpayers follow the rules, AI offers tools that can automate and streamline complicated tasks, helping tax administrations work faster, better, and more effectively. The administrators employ AI applications from risk assessment and fraud detection to taxpayer assistance and tax policy evaluation, and AI can be a very powerful tool for modern tax authorities. However, smarter tax administration with AI also raises many ethical, legal and, societal concerns, especially in relation to human rights.

AI technologies can help analyze vast datasets and even make decisions, which is physically impossible or incredibly time-consuming to make for human tax officials. But this power comes with enormous responsibility. Automation in such a critical area as tax decision-making raises significant questions about transparency, accountability, fairness, and privacy. Some risks to taxpayers associated with AI include its potential to reinforce or amplify existing biases and the lack of transparency in certain AI-driven decisions. These underscore the need for effective legal and regulatory measures to ensure that AI is deployed responsibly and ethically in tax administrations.

This thesis discusses the various human rights impacts of AI technologies used in tax administrations. Starting from the fundamental elements of AI —definitions, associated fields, and use cases in tax systems around the world— the thesis then addresses the impact of AI on three human rights protected by many international covenants including the “European Convention on Human Rights (ECHR)”, namely, “the right to non-discrimination, the right to a fair trial, and the right to respect for private life.” The chapter addressing violations of these human rights will draw on the framework of the ECHR. Through analysis of case studies and real-life examples, this research demonstrates the potential for even the best designed AI systems to breach these rights, if not properly handled.

The increasing importance of AI for tax administrations requires consideration of the applicable regulatory regimes. For this reason, this issue is also addressed in the thesis. In this framework, the “Artificial Intelligence Act (AI Act)”, although not yet fully implemented, stands out as the first major step towards direct AI governance in the “European Union (EU)” and establishes the legal framework for trustworthy AI innovations and applications that respect human rights. Apart from this, the “General Data Protection Regulation (GDPR)” is also an important regulation against possible data breaches, especially in the face of the intensive data use of AI.

In addition to these, although they are not binding, soft law guidelines issued by institutions such as the “Council of Europe”, the “European Commission” and the “Organisation for Economic Cooperation and Development (OECD)” should also be mentioned, which provide important recommendations to ensure that AI applications do not lead to possible human rights violations.

Finally, this thesis concludes with a set of recommendations that could help to reduce the threats associated with AI in taxation. They focus on bias mitigation, increasing human oversight and transparency through explainable AI, robust data protection measures as well as conducting periodic “human rights impact assessments.” This is precisely why tax administrations—as beings of the state, and therefore public authorities—are called to take action on these recommendations, enabling them to gain the benefits of AI, whilst also respecting their duty to protect human rights.

In this context, this thesis aims to contribute to the evolving discourse on AI ethics and human rights by analyzing the ability of AI technologies used as tax administration technologies to impact a range of human rights. Also, the thesis calls for a balanced approach: An approach that ensures that policies and regulations that protect human rights are incorporated into the design of AI systems, while taking full advantage of the potential of AI. As AI reshapes processes and integrates into many areas of our lives and work, it’s crucial to develop and operate these systems within a framework that protects human rights. This helps build public trust and maintain the credibility of tax authorities worldwide.

2. AI Technologies in Tax Administrations

2.1. Definition of AI

AI is a broad topic with many definitions developed over the years, revealing the variety and complexity of the field. It is unclear if there is a universal consensus on what qualifies as AI, since there are wide-ranging technologies and techniques aimed at the goal of mimicking or surpassing human intelligence.

The Dartmouth Summer Research Project on AI, which brought together a group of mathematicians and scientists in 1956, is generally considered the birth of AI as an academic discipline.¹ “The Logic Theorist”², the first AI program to invoke the methods of human logical

¹ Thimira Amaratunga, *Understanding Large Language Models: Learning Their Underlying Concepts and Technologies* (Apress 2023) 11.

² This program is developed by Allen Newell, Herbert A. Simon, and Cliff Shaw.

problem solving, was introduced at the conference, proving theorems from Whitehead and Russell's "Principia Mathematica."³

In 1968, Marvin Minsky provided one of the early definitions of AI: "The science of making machines do things that would require intelligence if done by men."⁴ This definition highlights the goal of replicating human-like intelligence in machines, a theme that has persisted in various forms throughout the development of AI. In 1978, Bellman further refined the definition by describing AI as "the automation of activities that we associate with human thinking, activities such as decision-making, problem solving, learning, creating, game playing, and so on."⁵ This definition underscores the functional aspect of AI, emphasizing its ability to automate tasks traditionally associated with human cognitive processes.

More recently, Nilsson defined AI as "activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment."⁶ This definition introduces the concept of foresight, suggesting that AI systems should not only replicate human intelligence but also anticipate and adapt to future conditions.

Khuram Farooq and Bartosz Jakub Solowiej define AI as "the ability of software systems to carry out tasks that usually require human intelligence, such as vision, speech, language, knowledge, and search."⁷ This definition explains that AI is a type of software, designed to perform tasks requiring intelligence by operating as a program within computer systems.

In addition to these definitions, the concept of AI has now been incorporated into binding legal instruments. According to Article 3 of the AI Act, "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 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."⁸

³ Thimira Amaratunga, *Understanding Large Language Models: Learning Their Underlying Concepts and Technologies* (Apress 2023) 11.

⁴ Marvin L. Minsky, *Semantic Information Processing* (The MIT Press 1968); Michael Aaron Dennis, "Marvin Minsky" *Encyclopedia Britannica* (Britannica, 5 August 2024) <<https://www.britannica.com/biography/Marvin-Lee-Minsky>> accessed 30 October 2024.

⁵ Richard Bellman, *An Introduction to Artificial Intelligence: Can Computers Think?* (Boyd & Fraser 1978) 3.

⁶ Nils J Nilsson, *The Quest for Artificial Intelligence: A History of Ideas and Achievements* (Cambridge University Press 2010).

⁷ Khuram Farooq and Bartosz Jakub Solowiej, *Artificial Intelligence in the Public Sector: Maximizing Opportunities, Managing Risks* (World Bank Group, 2023) 7.

⁸ 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 (Artificial Intelligence Act) [2024] OJ L 1689, art 3.

In conclusion, these definitions reveal multiple dimensions of the AI concept and illustrate the broad and dynamic nature of AI as a field. Thus, it can be concluded that no universally accepted definition of AI exists.

2.2. Disciplines Related to AI

2.2.1. Algorithms

“An algorithm” is a series of instructions that, when followed —particularly by a computer— enable the solution of a given problem.⁹ Algorithms are generally seen as code or computer applications that support human decisions or act autonomously.¹⁰ They range from simple algorithms, used for calculations, sorting data to find patterns, or classifying information, to more complex ones.¹¹

Algorithms are used in many areas of daily life. Search engines like Google rank websites by relevance, ensuring accurate search results. Navigation apps like Google Maps use algorithms to find the fastest routes based on traffic and road conditions. Entertainment platforms like Netflix and Amazon apply collaborative filtering to recommend personalized content, enhancing user experience. Algorithms also play an essential role in tax administration, enhancing both efficiency and the quality of decision-making. Tax authorities use algorithms to automate processes such as fraud detection, identifying suspicious patterns in tax returns or financial transactions.

The concepts of AI and algorithm are sometimes misused. While algorithms are coded instructions for specific tasks, AI involves a network of algorithms that enhance automation.¹² AI learns from data, refines its processes, and generates new algorithms to produce unique solutions.¹³ Unlike fixed algorithmic outputs, AI’s results are designated but adaptive, mimicking human problem-solving abilities.¹⁴

2.2.2. Big Data Analytics

“Big data” describes data sets so extensive that conventional data processing techniques cannot handle them efficiently.¹⁵ In accordance with this, “Big data analytics” involves processing

⁹ Cambridge Dictionary, “Algorithm” (Cambridge) <<https://dictionary.cambridge.org/dictionary/english/algorithm>> accessed 30 October 2024.

¹⁰ Lorna McGregor, Daragh Murray and Vivian Ng, “International Human Rights Law as a Framework for Algorithmic Accountability” (2019) 68(2) *International and Comparative Law Quarterly* 309-343, 315.

¹¹ Ibid.

¹² University of York, “How do algorithms work?” (University of York) <<https://online.york.ac.uk/how-do-algorithms-work/>> accessed 30 October 2024.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ James Alm, “Tax Evasion, Technology, and Inequality” (2021) 22(4) *Economics of Governance* 321-324, 327.

large, complex datasets to uncover trends, patterns, and correlations, enabling data-informed decisions.¹⁶ It helps organizations harness growing data from sources like social media, financial transactions, and smart devices to generate actionable insights through advanced techniques.¹⁷

The key difference between big data analytics and traditional analytics lies in the data and tools used.¹⁸ While traditional analytics primarily handles structured data within relational databases, relying on tools like “Structured Query Language” and statistical methods, big data analytics, in contrast, is equipped to process large, complex datasets in a variety of formats—structured, semi-structured, and unstructured—by leveraging advanced techniques like data mining and machine learning.¹⁹

2.2.3. Machine Learning

“Machine learning” is a critical discipline within the broader field of AI. It distinguishes itself from traditional computer science by enabling computers to program themselves based on experience rather than being manually programmed by humans. The main purpose of machine learning is to adjust to new situations, recognize patterns, and use these patterns to make predictions or decisions when faced with uncertainty.²⁰

In accordance with this, Murphy defines machine learning as “a set of methods that can automatically detect patterns in data, and then use the uncovered patterns to predict future data, or to perform other kinds of decision making under uncertainty”.²¹ Machine learning achieves this through algorithms that learn from data, referred to as “experience.”²² The process involves modifying the computer’s performance based on this data, allowing for more accurate actions and decisions over time.²³ Basically, machine learning is built on a combination of principles from computer science and methods from statistics, probability, and optimization.²⁴

Machine learning encompasses various approaches such as “supervised”, “unsupervised” and “reinforcement learning.” Supervised learning involves providing an algorithm with a training

¹⁶ Tim Mucci and Cole Stryker, *What is Big Data Analytics?* (IBM, 5 April 2024) <<https://www.ibm.com/topics/big-data-analytics>> accessed 30 October 2024.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (Pearson Education Limited 2016) 2.

²¹ Kevin Murphy, *Machine Learning: A Probabilistic Perspective* (MIT Press 2012) 1.

²² Mehryar Mohri, Afshin Rostamizadeh, and Ameet Talwalkar, *Foundations of Machine Learning* (MIT Press 2012) 1.

²³ Stephen Marsland, *Machine Learning: An Algorithmic Perspective* (Chapman & Hall 2015) ch 1.2.1.

²⁴ Mehryar Mohri, Afshin Rostamizadeh, and Ameet Talwalkar, *Foundations of Machine Learning* (MIT Press 2012) 1.

set that includes correct responses, enabling it to generalize and respond accurately to various inputs.²⁵ In supervised learning, an AI model is trained using given inputs and their expected outputs.²⁶ The model creates a mapping equation to predict future labels based on these inputs.²⁷ For example, to create a model that distinguishes between cats and dogs, numerous labeled images of both animals are provided.²⁸ The model learns to associate the images with their corresponding labels, allowing it to accurately identify whether a new, unseen image depicts a cat or a dog after training.²⁹

In unsupervised learning, no correct responses are given; instead, the algorithm identifies similarities among inputs for categorization, a method known as “density estimation.”³⁰ In unsupervised learning, an AI model is trained solely on input data without labels, classifying it into groups based on similar features.³¹ For example, given a collection of red and blue balls, the model identifies distinguishing features to classify them into two clusters—one for blue balls and another for red balls—based on color.³²

Reinforcement learning falls between these two, where the algorithm receives feedback on incorrect answers but must explore different possibilities to find the correct solution.³³ In reinforcement learning, an AI model seeks to choose the optimal action in a given situation to maximize overall reward, learning from feedback on previous outcomes.³⁴ For example, a robot choosing a path between A and B starts without experience, but through feedback on its choices—such as receiving a reward for selecting path B—it learns to make better decisions and choose the rewarding path in similar situations.³⁵

²⁵ Stephen Marsland, *Machine Learning: An Algorithmic Perspective* (Chapman & Hall 2015) ch 1.3.

²⁶ Educative, “Supervised vs. Unsupervised vs. Reinforcement Learning” (Educative) <<https://www.educative.io/answers/supervised-vs-unsupervised-vs-reinforcement-learning>> accessed 30 October 2024.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid.

³⁰ Stephen Marsland, *Machine Learning: An Algorithmic Perspective* (Chapman & Hall 2015) ch 1.3.

³¹ Educative, “Supervised vs. Unsupervised vs. Reinforcement Learning” (Educative) <<https://www.educative.io/answers/supervised-vs-unsupervised-vs-reinforcement-learning>> accessed 30 October 2024.

³² Ibid.

³³ Stephen Marsland, *Machine Learning: An Algorithmic Perspective* (Chapman & Hall 2015) ch 1.3.

³⁴ Educative, “Supervised vs. Unsupervised vs. Reinforcement Learning” (Educative) <<https://www.educative.io/answers/supervised-vs-unsupervised-vs-reinforcement-learning>> accessed 30 October 2024.

³⁵ Ibid.

2.2.4. Deep Learning

“Deep learning”, a specialized subfield of machine learning, leverages artificial “neural networks” to process and analyze complex data.³⁶ It signifies a major progression in the field of AI, enabling computers to perform tasks that were previously impossible or required extensive human intervention. Deep learning is particularly well-suited for scenarios involving large and intricate datasets, as it automates much of the “feature extraction (Turning raw data into useful information)” process, thereby reducing the need for manual data preprocessing.³⁷

The term “deep” in this concept refers to the many layers within a “neural network” involved in sensing complex patterns of information in data.³⁸ A “neural network” is a machine learning model that is inspired by the formation of the human brain that comprises of interconnected nodes or artificial neurons that work in unison to solve complicated problems.³⁹ These networks are built to accommodate large volumes of inputs passing through multiple layers to find hidden patterns and relationships that simpler models would struggle to find.⁴⁰ This enables deep learning models to predict and make decisions even when the data is the most unstructured or multidimensional.

Deep learning is a technology that online companies and consumer technologies use to accomplish an array of tasks. It is used by Facebook to understand text in posts and messages and by companies such as Google and Microsoft to find images via search and to translate languages.⁴¹ Deep learning has also become the standard technology for speech recognition and facial detection in smartphones and digital cameras.⁴²

Another big trend of recent years has been the advent of “Generative AI”, complex deep learning models trained to create content, (e.g., high-quality text and images) based on patterns detected in input data.⁴³ For example, ChatGPT uses this method to create clear and relevant responses to user prompts.⁴⁴

³⁶ John D Kelleher, *Deep Learning* (MIT Press 2019) 1.

³⁷ IBM Data and AI Team, “AI vs. Machine Learning vs. Deep Learning vs. Neural Networks: What’s the Difference?” (IBM, 6 July 2023) <<https://www.ibm.com/think/topics/ai-vs-machine-learning-vs-deep-learning-vs-neural-networks>> accessed 30 October 2024.

³⁸ Ralf T Kreutzer and Marie Sirrenberg, *Understanding Artificial Intelligence* (Springer 2020) 8.

³⁹ Kinza Yasar, “What is a Neural Network?” (TechTarget) <<https://www.techtarget.com/searchenterpriseai/definition/neural-network>> accessed 30 October 2024.

⁴⁰ Ralf T Kreutzer and Marie Sirrenberg, *Understanding Artificial Intelligence* (Springer 2020) 8.

⁴¹ John D Kelleher, *Deep Learning* (MIT Press 2019) 1.

⁴² Ibid.

⁴³ Kim Martineau, “What is Generative AI?” (IBM, 20 April 2023) <<https://research.ibm.com/blog/what-is-generative-ai>> accessed 30 October 2024.

⁴⁴ Ibid.

While deep learning is a subfield of machine learning, it differs from traditional machine learning in the way it processes data and the amount of data it requires. Traditional machine learning algorithms often require significant human intervention to extract features from the data before analysis. In contrast, deep learning bypasses most manual feature extraction, allowing the model to work directly with raw data.⁴⁵ This capability makes deep learning particularly effective for tasks that involve large, unstructured datasets, such as those encountered in fraud detection and virtual assistants.⁴⁶ Moreover, deep learning models typically require more data to perform optimally compared to traditional machine learning models. Although deep learning requires large datasets, its strength lies in its ability to automatically learn and improve as it processes more data, making it highly effective for complex, data-driven tasks.⁴⁷

2.2.5. Natural Language Processing

“Natural Language Processing (NLP)”, a subfield of AI, combines machine learning, computational linguistics, and deep learning to enable computers to recognize, interpret, and generate human language in both text and speech.⁴⁸ It is widely used in search engines, customer service chatbots, voice-activated “Global Positioning System”, and digital assistants.⁴⁹

2.3. The Use of AI in Tax Administration

2.3.1. Overview

Tax is a financial obligation imposed by a government on income, capital, labor, goods, and services.⁵⁰ It applies to individuals and entities within the government’s jurisdiction and is a primary source of national revenue.⁵¹ The task of collecting tax revenue, which helps to pay for public expenditure by governments, is carried out by tax administrations.

The incorporation of AI in tax administrations represents a fusion of management, oversight, and enforcement of tax laws, aiming to enhance efficiency, accuracy, and compliance.⁵² As tax

⁴⁵ IBM Data and AI Team, “AI vs. Machine Learning vs. Deep Learning vs. Neural Networks: What’s the Difference?” (IBM, 6 July 2023) <<https://www.ibm.com/think/topics/ai-vs-machine-learning-vs-deep-learning-vs-neural-networks>> accessed 30 October 2024.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Cole Stryker and Jim Holdsworth, *What is NLP?* (IBM, 11 August 2024) <<https://www.ibm.com/topics/natural-language-processing>> accessed 30 October 2024.

⁴⁹ Ibid.

⁵⁰ Marius-Cristian Frunza, *Value Added Tax Fraud* (Routledge 2018) 1.

⁵¹ Ibid.

⁵² Mohammad Hassan Shakil and Mashiyat Tasnia, “Artificial Intelligence and Tax Administration in Asia and the Pacific” in *Taxation in the Digital Economy* (Routledge 2022) 45.

authorities grapple with the complexities of modern economies, the implementation of AI provides solutions that were previously impossible to achieve using conventional approaches. Nonetheless, this technological advancement introduces a range of challenges and factors that must be considered to ensure the benefits outweigh the risks.

AI's journey in tax administration began in the 1970s in the United States with early applications like the "Taxman" software, which paved the way for AI's role in enforcing tax laws.⁵³ Its role was to assess whether a specific corporate reorganization qualified for an income tax exemption.⁵⁴ Over the decades, the scope of AI in this field has expanded significantly, especially after 2010, with the widespread adoption of sophisticated AI tools for tax compliance and enforcement.⁵⁵ Today, AI is not just a peripheral tool but a core component of tax administrations, influencing various aspects from data collection to risk assessment and decision-making processes.

About half of the tax administrations are already using AI for compliance risk assessment work, according to the OECD Report 2023.⁵⁶ With these technologies, it becomes easier for tax authorities to conduct advanced analysis of big data ranges, allowing them to discern patterns or discrepancies that cannot be found manually or, at the very least, are very challenging to find.

Besides, one important advantage of AI has been the digitalization of tax systems, where many countries today use several AI techniques (like digital assistants, risk management analytical tools, and big data methods) to improve the efficiency of tax administration.⁵⁷ The fact that AI does not need to sleep, absorbs massive amounts of data in seconds, and ultimately learns and improves overtime through the application of machine learning makes it an essential tool for modern tax administrations.⁵⁸

⁵³ United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *The Digitalization of Tax Administrations in Asia and the Pacific: A Manual for Practitioners* (2022) 93.

⁵⁴ Blazej Kuzniacki, "The Marriage of Artificial Intelligence and Tax Law: Past, Present, and Future" (2019) *SSRN Journal* 2–3.

⁵⁵ United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *The Digitalization of Tax Administrations in Asia and the Pacific: A Manual for Practitioners* (2022) 94.

⁵⁶ OECD, *Tax Administration 2023: Comparative Information on OECD and Other Advanced and Emerging Economies* (OECD Publishing 2023) 157-158.

⁵⁷ United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *The Digitalization of Tax Administrations in Asia and the Pacific: A Manual for Practitioners* (2022) 94.

⁵⁸ Patrick Buckley and others, "Artificial Intelligence and the Tax Practitioner" (2023) 7(2) *Journal of Tax Administration* 13.

2.3.2. Taxpayer Assistance

One common tax administration use case for AI is tax assistance and consultations. A significant change in support for taxpayers is the use of AI-powered virtual assistance tools. These tools are specifically used to give taxpayers quick, accurate and interactive answers to their tax-related questions. As an example, in Spain, the tax administration has implemented different virtual assistance tools, supporting taxpayers with their “Personal Income Tax (PIT)”, “Value Added Tax (VAT)”, and other tax obligations.⁵⁹ Such tools enable taxpayers to get answers to frequently asked questions in free-flowing language, simplifying the tax compliance process and minimizing direct human intervention.⁶⁰

In the PIT system, virtual assistant tools could answer basic questions about tax returns, helping taxpayers quickly get accurate information.⁶¹ On the other hand, in the VAT system, virtual assistants help with tasks like creating VAT reports, identifying the type of goods or services provided, and calculating VAT amounts. Such applications of AI help the taxpayer to meet his tax obligations with little misapprehension or errors.⁶²

The deployment of an AI system by the Singapore tax administration to read and analyze incoming customer emails with an NLP mechanism is another example of using AI for taxpayer assistance.⁶³ In this example, AI provides the ability to segment queries by content, enabling more targeted and useful answers for taxpayers.⁶⁴

According to another example, the “Shijingshan District National Taxation Bureau in China” has adopted a type of AI induced robot called “Lingyun” that is used to listen to taxpayer queries, understand the information and quickly respond to the queries raised by the taxpayer.⁶⁵ The system is capable of delivering highly contextualized, accurate responses through advanced technologies like semantic understanding and/or speech recognition, thus showcasing the use of AI in changing the way taxpayer assistance is performed.⁶⁶

AI technologies are also harnessed to manage and respond to taxpayer complaints. One example is the “Dutch Tax and Customs Administration”, which implements NLP algorithms to supply

⁵⁹ Mario Pires, “Artificial Intelligence (AI) in the Field of Tax Administration” (2024) 3(5) *Review of International and European Economic Law*.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

⁶³ OECD, *Advanced Analytics for Better Tax Administration: Putting Data to Work* (OECD Publishing 2016) 27.

⁶⁴ Ibid.

⁶⁵ Zhuowen Huang, “Discussion on the Development of Artificial Intelligence in Taxation” (2018) 8(08) *American Journal of Industrial and Business Management* 1817-1822, 1820.

⁶⁶ Ibid.

automatic responses to a large percentage of incoming complaints.⁶⁷ In this case, AI has been used to resolve about 80% of the 12,000 complaints received every year that can be automatically routed, therefore helping the administration respond faster and more accurately while allowing humans to focus on complicated tasks.⁶⁸ This not only makes tax administration more effective but also makes the taxpayer experience better by providing them with faster solutions to their problems.⁶⁹

Lastly, another critical domain in which AI is exerting significant influence is compliance assistance.⁷⁰ Although it is not mandated by tax authorities, tools like “Turbotax”, which automates various tax compliance tasks, have been widely adopted, and their capabilities are expected to expand in the coming years.⁷¹ These AI-driven tools help taxpayers understand and apply tax laws more effectively⁷², reducing the likelihood of non-compliance and ensuring that tax obligations are met with minimal effort.

2.3.3. Tax Fraud and Evasion Detection

Tax evasion is the illegal act of hiding or ignoring tax obligations, allowing the taxpayer to pay less than required by concealing income or relevant information from tax administrations, while tax fraud is a deliberate form of evasion that involves submitting false statements or creating fake documents, among other deceptive methods.⁷³ Tax fraud and evasion present significant challenges to tax administrations globally. The complexity of tax laws, the vast amount of data involved, and the increasing sophistication of fraudulent schemes necessitate the use of advanced technologies, such as AI, to detect and prevent such activities.

Tax evasion does not only occur within national borders, but can also extend beyond national borders. For example, multinational companies exploit country-specific loopholes in the tax system and transfer profits to low-tax jurisdictions to avoid payment, making tax evasion more difficult to detect and prosecute.⁷⁴ In addition, the high cost and time spent on monitoring and

⁶⁷ Fernando Serrano Antón, “Artificial Intelligence and Tax Administration: Strategy, Applications and Implications, with Special Reference to the Tax Inspection Procedure” (2021) 13(4) *World Tax Journal* 575-608, 601.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *The Digitalization of Tax Administrations in Asia and the Pacific: A Manual for Practitioners* (2022) 103.

⁷¹ Ibid.

⁷² Ibid.

⁷³ European Commission, “Fight against VAT Fraud” (European Commission) <https://taxation-customs.ec.europa.eu/taxation/vat/fight-against-vat-fraud_en> accessed 30 October 2024.

⁷⁴ Mohammad Hassan Shakil and Mashiyat Tasnia, “Artificial Intelligence and Tax Administration in Asia and the Pacific” in *Taxation in the Digital Economy* (Routledge 2022) 45.

verifying tax returns make tax fraud and evasion even more difficult to detect.⁷⁵ These and many other challenges make it increasingly difficult to achieve the goal of detecting and reducing tax evasion using traditional audit and investigation methods.

For reasons such as those mentioned above, tax authorities are increasingly relying on AI as a powerful analytical tool to support their detection and prevention of tax fraud. Transforming tax ecosystems in this way allows tax administrations to automate processes and detect activities engaged by taxpayers more quickly to enhance compliance and reduce tax fraud.⁷⁶ Using AI techniques such as machine learning algorithms, allows for the analysis of vast datasets to detect patterns indicative of fraudulent behavior.⁷⁷

Machine learning models, such as “multilayer perceptron neural networks” are frequently utilized due to their efficiency in processing and analyzing vast amounts of data.⁷⁸ These models can identify anomalies in tax filing, such as inconsistencies in reported income or suspicious patterns of transactions, which may indicate fraudulent activity.

For example, the “System Teleinformatyczny Izby Rozliczeniowej (STIR)” is a machine learning AI system used by tax administrations in Poland.⁷⁹ This system performs risk analysis by processing information from financial institutions and generating risk indicators for entrepreneurs.⁸⁰ The algorithms used, though not disclosed, assess various factors, including customer residence and transactional anomalies, to flag potential fraud cases.⁸¹

There are other examples of AI systems being used to detect tax fraud and evasion. For example, the Spanish tax administration employs AI for risk analysis, using predictive data methods to identify taxpayers at high risk of fraud.⁸² Similarly, in Belgium, AI systems analyze large datasets to identify corporate residence fraud, where companies falsely claim residency in low-tax countries to avoid paying higher taxes.⁸³

Audit selection is one of the key aspects for detecting tax fraud and evasion, deciding who will be audited or scrutinized more closely. Effective risk assessment is at the core of correctly

⁷⁵ Ibid.

⁷⁶ Ibid, 46-47.

⁷⁷ Ibid, 50.

⁷⁸ Ibid, 50.

⁷⁹ Marcin Rojszczak, “Compliance of Automatic Tax Fraud Detection Systems with the Right to Privacy Standards Based on the Polish Experience of the STIR System” (2021) 49(1) *Intertax* 40.

⁸⁰ Ibid.

⁸¹ Aleksandra Bal, “Ruled by Algorithms: The Use of “Black Box” Models in Tax Law” (2019) 95(12) *Tax Notes International*, 1161.

⁸² Mario Pires, “Artificial Intelligence (AI) in the Field of Tax Administration” (2024) 3(5) *Review of International and European Economic Law*.

⁸³ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 42.

selecting taxpayers best suited to detect tax fraud and evasion. Traditionally, audit selection has been a largely manual process where human judgment determines statistically relevant indicators or red flags within tax returns that could indicate a case of non-compliance. However, with the advent of AI, tax administrations worldwide are increasingly adopting automated systems to enhance the accuracy, efficiency, and fairness of audit selection processes.

There are many examples of the use of AI in tax audit selections. For instance, in Norway, the tax administration has developed a predictive tool that employs machine learning to select tax returns for inspection.⁸⁴ By analyzing data from previous audits and taxpayer records, the algorithm identifies key risk factors and assigns scores accordingly.⁸⁵ Tax officials then inspect cases with the highest scores⁸⁶, improving the efficiency and accuracy of audits. The effectiveness of these systems is evident in the doubling of successful audit rates compared to those achieved through traditional methods.⁸⁷

According to another example, the United Kingdom's "His Majesty's Revenue and Customs" has implemented a risk modeling program that employs supervised machine learning to profile United Kingdom citizens based on personal information and lifestyle, predicting which taxpayers are at higher risk of missing filing deadlines and failing to meet their tax obligations.⁸⁸

In addition, Japan's tax administration also started using an AI system to process financial statements and voice recordings to identify possible tax evasions.⁸⁹ Such a system has been proven effective in eliminating suspicious companies and increasing the efficiency of tax audits overall.⁹⁰ Japan's use of AI shows how advanced technology can help humans work more effectively, leading to better results in tax enforcement.

The other issue is the tax audit process. Tax audit processes have traditionally operated on an ex-post basis, where tax administrations conduct an audit of an organization or individual to

⁸⁴ Fernando Serrano Antón, "Artificial Intelligence and Tax Administration: Strategy, Applications and Implications, with Special Reference to the Tax Inspection Procedure" (2021) 13(4) *World Tax Journal* 575-608, 589.

⁸⁵ Alessia Fidelangeli and Federico Galli, "Artificial Intelligence and Tax Law: Perspectives and Challenges" (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 42.

⁸⁶ Ibid.

⁸⁷ Błażej Kuźniacki and others, "Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard" (2022) 14 *World Tax Journal* 573-616, 579.

⁸⁸ Alessia Fidelangeli and Federico Galli, "Artificial Intelligence and Tax Law: Perspectives and Challenges" (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 43.

⁸⁹ Fernando Serrano Antón, "Artificial Intelligence and Tax Administration: Strategy, Applications and Implications, with Special Reference to the Tax Inspection Procedure" (2021) 13(4) *World Tax Journal* 575-608, 603.

⁹⁰ Ibid.

check its tax return for compliance with applicable tax laws.⁹¹ This is a rather labor-intensive process that compares financial data that taxpayers report against pre-established benchmarks to identify differences or potential noncompliance. The adoption of AI, has reshaped audit selection processes in tax administration. AI systems can identify patterns and anomalies that might indicate tax evasion or fraud, using vast datasets that are much more efficient than human capabilities, allowing them to comb through massive data sets much more easily than a human could ever do.

For example, in France, AI data mining systems have been integrated with human tax inspectors to enhance audit outcomes.⁹² In 2019, this combination resulted in the collection of 11 billion euros in taxes, a 30% increase from the previous year.⁹³ The success of these systems has prompted regulatory changes, allowing French tax authorities to leverage publicly available data from social media and online platforms to further enhance their audit selection processes.⁹⁴

2.3.4. Tax Policy Evaluation

AI in tax administration has transformed tax policy design and assessment. The power of AI can provide a range of tools for analyzing large datasets, predicting outcomes, and simulating different scenarios that can put tax authorities and policymakers on the path toward creating efficient and fair tax policies.

Over the last few years, tax administrations have started using AI in an increasing manner to assist operational decision-making, in particular, in estimating tax gaps and forecasting the impact of changes to tax policy.⁹⁵ The “tax gap” refers to the discrepancy between the amount of taxes legally obligated to be paid and the amount actually collected by the tax authority.⁹⁶ AI technology can further enhance tax gap analysis by analyzing large numbers of significant data pertaining to the non-compliance of taxpayers in order to establish the key focus areas, such as geographical locations associated with high incidences of tax evasion and prevailing types of

⁹¹ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 42.

⁹² Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 579.

⁹³ Alfredo Collosa, “Artificial Intelligence Applied to Auditing” (CIAT, 13 October 2020) <<https://www.ciat.org/ciatblog-artificial-intelligence-applied-to-auditing/?lang=en>> accessed 30 September 2024.

⁹⁴ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 579.

⁹⁵ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 44.

⁹⁶ Tax Foundation, “Tax Gap” (Tax Foundation) <<https://taxfoundation.org/taxedu/glossary/tax-gap/>> accessed 30 October 2024.

tax fraud schemes.⁹⁷ This detailed analysis also helps create and implement new tax laws and policies.⁹⁸ For example, by visualizing the most common complex non-compliance issues, authorities can easily target policies to the most sensitive problems, improving the overall efficiency of tax enforcement.

Apart from tax gap measurement, AI is being used to estimate the effects of tax proposals. AI enables predictive analytics that can map out how taxpayers might behave when they are subjected to new rules and regulations, giving policymakers the ability to predict the direction of the impact before any changes are made.⁹⁹ This predictive ability allows for the evolution of more modern, personalized laws for individuals, such that those laws can be stated directly to individual taxpayers, which can lead to increased compliance and reduced enforcement costs.¹⁰⁰

Dynamic tax policy modeling, like the The “AI Economist” employed in the United States, is one of the most influential use-cases of AI for tax policy evaluation. The AI Economist is a simulation and optimization model of tax policies using reinforcement learning algorithms to find optimal policies in a data-driven way.¹⁰¹ It does not make use of any assumed knowledge of the world or allow for any preconceived notions; it learns from observable data, which allows for the creation of tax policy that maximizes equity and productivity.¹⁰²

Through a series of structured economic simulations, the AI Economist works by emulating the behaviors of agents over time, in the presence of various tax policies, in order to learn how dynamic tax policies impact economic outcomes.¹⁰³ This allows the simultaneous optimization of socio-economic objectives, like the minimization of inequity while maintaining or increasing output.¹⁰⁴

Furthermore, the AI Economist is demonstrated to be able to fairly redistribute wealth among different sections of society while increasing total productivity.¹⁰⁵ That dual achievement is especially significant, as it tackles one of the hardest problems in tax policy design: how to reconcile the principles of equity and efficiency.

⁹⁷ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 44.

⁹⁸ *Ibid.*

⁹⁹ *Ibid.*

¹⁰⁰ *Ibid.*

¹⁰¹ Khuram Farooq and Bartosz Jakub Solowiej, *Artificial Intelligence in the Public Sector: Maximizing Opportunities, Managing Risks* (World Bank Group, 2020) 30.

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*

¹⁰⁵ *Ibid.*, 31.

2.3.5. Tax Collection

AI is also being leveraged by some tax administrations to ease the tax collection process. As an example, AI is a key piece of the tax collection process in Finland. AI-based software developed for the Finnish tax administration includes the analysis and monitoring of emails related to tax collection.¹⁰⁶ They may receive between 1,500 and 3,000 of these each month, coming from a number of interested parties, including courts of law and inheritance administrators.¹⁰⁷

The AI algorithms employed by the Finnish tax administration automatically sort and queue these emails for processing through the “GenTax” program, a system that saves nearly two years of manual work by human employees.¹⁰⁸ This efficiency not only accelerates the tax collection process but also frees up human resources to engage in other important work, demonstrating the potential of AI to augment human capabilities in tax administration.

3. Impacts of AI Technologies Used by Tax Administrations on Human Rights

3.1. Overview

While AI’s introduction into tax systems promises efficiency, it simultaneously raises several human rights concerns. The application of AI in tax administration requires careful consideration to ensure that the rights of taxpayers are not infringed.

As will be examined in detail later, the use of AI in tax administrations most frequently impacts human rights, such as “the prohibition of discrimination, the right to a fair trial, and the right to respect private life.”

These human rights are protected by various international treaties and conventions. In fact, they are even enshrined in the constitutions of the majority of countries. As mentioned in the introduction to this thesis, in dealing with violations of these human rights, the perspective of the ECHR will be “as a point of reference”. This will also allow us to invoke the broad case law of the “European Court of Human Rights (ECtHR).”

3.2. Violation of the Prohibition of Discrimination

Article 14 of the ECHR prevents any discrimination in enjoying “the rights and freedoms set forth” by the Convention.¹⁰⁹ It guarantees equality before the law for everybody and prohibition

¹⁰⁶ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 579.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ *Convention for the Protection of Human Rights and Fundamental Freedoms* (European Convention on Human Rights, ECHR) art 14.

for any sort of discrimination based on “race, sex, language, religion, nationality or social origin.”¹¹⁰ This principle means, in tax administration, that taxpayers must not be treated differently, in the application of tax laws, on the basis of characteristics that are not relevant to tax consequences, or are otherwise inappropriate such as race or gender.¹¹¹

AI technology can contribute to the increase of the same inequalities we see today in tax administrations and it creates the possibility of new discriminatory practices introduced to the tax administration system, especially if the data for the algorithms is biased or assumptions that underly its modeling are flawed. AI systems are often trained on historical data that contains societal biases. When not properly mitigated during the design and use of AI systems, these biases can result in unfair outcomes. An AI system that helps make decisions on tax compliance, for example, may identify higher proportions of people from certain demographic groups as high risk and end up applying higher scrutiny and penalties against these groups altogether.

A significant example of AI-induced discrimination in tax administration is the “Dutch childcare benefits scandal”, which revealed extensive racial discrimination affecting tens of thousands of welfare recipients perpetrated by the Dutch tax administration.¹¹² In 2013, the Dutch tax administration introduced an algorithmic fraud detection system called the “risk classification model” to profile childcare benefits applicants at risk of submitting false claims.¹¹³ The tax administration used “nationality” as a risk factor in its algorithm, which flagged non-Dutch nationals with higher risk scores.¹¹⁴ The system led to the suspension and investigation of benefits for parents and caregivers, who struggled to challenge the decisions due to a lack of transparency.¹¹⁵ This resulted in a national scandal where tens of thousands, especially from immigrant and low-income backgrounds, were falsely accused of fraud and their funds were seized.¹¹⁶ This scandal underscores the potential for AI systems to violate human rights if not carefully designed, monitored, and regulated.

Pursuant to the case law of the ECtHR, a distinction in treatment is classified as discriminatory under Article 14 if it lacks “objective and reasonable justification”, thereby indicating that it

¹¹⁰ Ibid.

¹¹¹ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP (Ottobre-Dicembre)* 24-58, 48.

¹¹² Amnesty International, “Dutch Childcare Benefit Scandal an Urgent Wake-Up Call to Ban Racist Algorithms” (Amnesty, 25 October 2021) <<https://www.amnesty.org/en/latest/news/2021/10/xenophobic-machines-dutch-child-benefit-scandal/>> accessed 30 September 2024.

¹¹³ Amnesty International, *Xenophobic Machines: Discrimination Through Unregulated Use of Algorithms in the Dutch Childcare Benefits Scandal* (2021) 5.

¹¹⁴ Ibid 6.

¹¹⁵ Ibid.

¹¹⁶ Ibid.

either does not pursue a legitimate aim or fails to demonstrate proportionality between the means employed and the objective sought.¹¹⁷ While states enjoy a “margin of appreciation” in assessing such differences, compelling justifications are necessary to justify treatment based solely on nationality under the Convention.¹¹⁸ For instance, states may take nationality into account when determining access to welfare, as financial aid is reserved for individuals with close ties to the state.¹¹⁹ In such cases, nationality can justify assessing the required connection for benefits applications.¹²⁰ However, nationality cannot be justified as a risk factor in AI systems that aim to identify potential fraud or criminal behavior.¹²¹ Because using nationality in risk-scoring assumes certain nationalities are more prone to crime and targets societal groups based on shared cultural traits, resulting in differential treatment based on ethnicity.¹²²

However, the ECtHR has generally been reluctant to recognize discriminatory tax treatment as a violation of Article 14. In most cases, the ECtHR has afforded states a wide “margin of appreciation” in tax matters, acknowledging the complexities and discretionary nature of tax policy.¹²³ This deference to state sovereignty in tax matters creates a significant challenge for individuals seeking to challenge AI-driven decisions that may result in discriminatory outcomes.

3.3. Violation of the Right to a Fair Trial

“The right to a fair trial”, enshrined in Article 6 of the ECHR, guarantees that “everyone is entitled to a fair and public hearing within a reasonable time by an independent and impartial tribunal.”¹²⁴

Article 6 generally does not apply to “ordinary tax proceedings” because these are considered administrative in nature and do not carry a criminal connotation.¹²⁵ The ECtHR viewed tax matters as part of public authority prerogatives.¹²⁶

¹¹⁷ *Gaygusuz v Austria* App no 17371/90 (ECtHR, 16 September 1996) para 42.

¹¹⁸ *Ibid.*

¹¹⁹ *C-299/14 Vestische Arbeit Jobcenter Kreis Recklinghausen v Jovanna García-Nieto and Others* (CJEU, 25 February 2016).

¹²⁰ *C-20/12 Elodie Giersch and Others v État du Grand-Duché de Luxembourg* (CJEU, 20 June 2013) para 37.

¹²¹ Amnesty International, *Xenophobic Machines: Discrimination Through Unregulated Use of Algorithms in the Dutch Childcare Benefits Scandal* (2021) 20.

¹²² *Ibid.*

¹²³ Philip Baker, “Years of the European Convention on Human Rights and Taxation” (2021) 61 *European Taxation* 529.

¹²⁴ *Convention for the Protection of Human Rights and Fundamental Freedoms* (European Convention on Human Rights, ECHR) art 6.

¹²⁵ *Ferrazzini v Italy* App no 44759/98 (ECtHR, 12 July 2001).

¹²⁶ *Ibid.*, para 29.

However, the ECtHR has held that Article 6 can apply to “tax surcharge proceedings.”¹²⁷ This is because tax surcharges often serve a punitive and deterrent purpose, aligning them more closely with criminal penalties. In *Bendenoun v France*, the ECtHR assessed whether the criminal limb of Article 6 applied by considering several factors: the penalty law applied to all citizens as taxpayers, the surcharge was punitive and aimed at deterring reoffending, and the surcharge was significant in amount.¹²⁸

The right to a fair trial includes “equality of arms, the right of defense, and the presumption of innocence.”¹²⁹ Equality of arms ensures both parties have a fair chance to present their case without disadvantage.¹³⁰ The ECtHR has determined that restricting an accused individual’s access to their case file or related documents may violate “the principle of equality of arms.”¹³¹ Therefore, unrestricted access to the case file is essential for a fair trial.¹³² On the other hand, the opacity of AI systems can prevent individuals from examining and contesting the reasoning behind algorithmic decisions, thereby interfering with this right.¹³³ Besides these, the right of defense includes being promptly informed of the charges¹³⁴ and given enough information to challenge the evidence and oppose its use.¹³⁵

However, AI systems, often characterized by their complexity and lack of transparency, can make decisions that significantly affect taxpayers without providing them with sufficient explanation or opportunity to challenge those decisions. For instance, the Polish STIR, which uses secretive algorithms to detect and prevent VAT fraud, raises significant issues under Article 6. The STIR involves punitive measures and falls under the right to a fair trial. But, as the risk-scoring algorithms stay secret, so does the detail needed for the accused to properly understand the charges against him or her. The lack of transparency in the process behind the system gives no explanation in regards to why a particular taxpayer is facing punitive measures including account freezes or surcharges that never went reported on the person accused.¹³⁶ This

¹²⁷ European Court of Human Rights, *Guide on Article 6 of the European Convention on Human Rights: Right to a Fair Trial (Criminal Limb)* (31 August 2022) 13.

¹²⁸ *Bendenoun v France* App no 12547/86 (ECtHR, 24 February 1994) para 47.

¹²⁹ Aleksandra Bal, “Ruled by Algorithms: The Use of “Black Box” Models in Tax Law” (2019) 95(12) *Tax Notes International*, 1163.

¹³⁰ *Ibid.*

¹³¹ *Matyjek v Poland* App no 38184/03 (ECtHR, 2007).

¹³² Aleksandra Bal, “Ruled by Algorithms: The Use of “Black Box” Models in Tax Law” (2019) 95(12) *Tax Notes International*, 1164.

¹³³ David Leslie and others, *Artificial Intelligence, Human Rights, Democracy, and the Rule of Law: A Primer* (Council of Europe, 2021) 15.

¹³⁴ *Mattoccia v Italy* App no 23969/94 (ECtHR, 2000).

¹³⁵ Aleksandra Bal, “Ruled by Algorithms: The Use of “Black Box” Models in Tax Law” (2019) 95(12) *Tax Notes International*, 1164.

¹³⁶ *Ibid.*

results in a gross imbalance of power as between the state and the individual, and is in clear violation of “the principles of equality of arms”, and “the right of defense”, the very cornerstones of a fair trial.¹³⁷ These principles are severely undermined in the context of AI, where the decisions made by algorithms are often hidden from the individuals affected.

The opacity of AI systems and their inner workings often prevents taxpayers from understanding how their data is processed and incorporated into decision-making processes.¹³⁸ Even when information is provided, the complexity of these systems means that affected individuals might not possess the technical expertise to comprehend the implications of AI-driven decisions.¹³⁹ The decision-making processes of AI systems, particularly those using machine learning and deep learning, are difficult even for experts to understand, which is why they are often referred to as “black boxes”.¹⁴⁰ This opacity is compounded in tax contexts by the secrecy that often surrounds tax authorities’ operations. The combination of complex mathematical models and big data makes it challenging to understand how AI systems reach their decisions, raising serious concerns about the ability of taxpayers to challenge these decisions effectively.¹⁴¹ The lack of transparency, driven by black boxes, can negatively impact taxpayers, particularly if these processes involve mistakes or unjust decisions.¹⁴² The fact that it is not easy to understand how these decisions were reached undermines the right to a fair trial.

The STIR mentioned above is a black-box model designed to detect VAT fraud by analyzing data from bank accounts and transactions.¹⁴³ Banks report this data to a clearing house that assesses a risk indicator for each taxpayer using secret algorithms; if a taxpayer is flagged as high-risk, the “National Revenue Administration” may implement severe measures, such as blocking bank accounts or canceling VAT registrations, without disclosing the rationale behind these decisions.¹⁴⁴

The lack of transparency in the STIR’s decision-making process raises substantial legal concerns under both data protection and human rights laws. GDPR mandates the right to an explanation, which requires that individuals subjected to automated decision-making be

¹³⁷ Ibid.

¹³⁸ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 592.

¹³⁹ Ibid, 593.

¹⁴⁰ Ibid, 575.

¹⁴¹ Ibid, 575.

¹⁴² Cristina Cacaio Rio de Oliveira Araújo, “Explainable AI: Taxpayers’ Rights and System of Checks and Balances” in Svitlana Buriak and Annika Streicher (eds), *Tax and Technology* (Linde Verlag GmbH 2023) 545.

¹⁴³ Aleksandra Bal, “Black-Box Models as a Tool to Fight VAT Fraud” in B Custers and E Fosch-Villaronga (eds), *Law and Artificial Intelligence* (Information Technology and Law Series, vol 35, TMC Asser Press, The Hague 2022) 229.

¹⁴⁴ Ibid.

informed about the logic behind these decisions.¹⁴⁵ The STIR, however, does not provide this transparency, nor does it allow taxpayers to challenge the decisions or understand the criteria used in risk assessments, conflicting with this right.¹⁴⁶

The secretive nature of the risk assessment process means that individuals cannot adequately defend themselves or contest the decisions made against them, creating an imbalance between the taxpayer and the tax authorities.¹⁴⁷ While measures such as blocking bank accounts serve a legitimate public interest in combating VAT fraud, they must be proportionate and provide for procedural fairness, which the STIR currently lacks.¹⁴⁸

The lack of transparency in AI systems used in tax administration not only affects the right to a fair trial but also undermines trust in public institutions. AI systems used by the French and German tax administrations for automating risk assessments, such as evaluating tax returns for audit purposes, are concealed from taxpayers due to tax secrecy.¹⁴⁹ This secrecy can lead to a lack of accountability and exacerbate inequalities, as wealthier taxpayers can afford to reverse-engineer these systems through expensive consultancy services, while others cannot.¹⁵⁰

3.4. Violation of the Right to Respect for Private Life

Article 8 of the ECHR protects “the right to respect for private and family life.”¹⁵¹ Under this article, data protection is one of the most important aspects for ensuring “the right to respect for private life” and public availability of information does not necessarily negate this protection.¹⁵² This Article grants a right to informational self-determination, enabling individuals to claim privacy over data, even if neutral, when it is collected, used, processed or shared in ways that may impact their Article 8 rights.¹⁵³ Concerns regarding privacy arise when personal data is used, processed, or shared beyond what is reasonably foreseeable.¹⁵⁴

This right is especially significant in the context of AI applications in tax administrations, where large volumes of personal data are often processed and analyzed without the individual’s

¹⁴⁵ Ibid, 232.

¹⁴⁶ Ibid, 232-233.

¹⁴⁷ Ibid, 234-235.

¹⁴⁸ Ibid, 235.

¹⁴⁹ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 586.

¹⁵⁰ Ibid.

¹⁵¹ *Convention for the Protection of Human Rights and Fundamental Freedoms* (European Convention on Human Rights, ECHR) art 8.

¹⁵² *Satakunnan Markkinapörssi Oy and Satamedia Oy v Finland* App no 931/13 (ECtHR, 27 June 2017) paras 133–134.

¹⁵³ European Court of Human Rights, *Guide on Article 8 of the European Convention on Human Rights: Right to Respect for Private and Family Life, Home and Correspondence* (31 August 2022) 56.

¹⁵⁴ Ibid.

explicit consent or knowledge. The use of AI technologies in tax administration, such as data analytics, machine learning models, and risk assessment algorithms, involves extensive processing of taxpayers' personal data. AI systems require vast datasets to operate effectively, frequently encompassing sensitive information about taxpayers. AI applications such as predictive analytics and generative AI tools are capable of identifying patterns and inferring behaviors from these datasets, which can lead to violations of privacy rights if not properly regulated. The challenge consists of balancing the advantages of AI in tax enforcement with the imperative to uphold taxpayer privacy, as mandated by applicable data protection laws, including the GDPR.¹⁵⁵

In addition to those mentioned, generative AI tools, for example, can inadvertently expose sensitive information through data breaches or insufficient anonymization practices.¹⁵⁶ If such tools access and use personal data for the purposes of training, there is a risk of re-identification and unauthorized disclosure of confidential information.¹⁵⁷ Furthermore, inadequate data retention and deletion policies increase the possibility of misuse or unauthorized access to personal data, which can lead to severe privacy violations for taxpayers.¹⁵⁸ Moreover, the capability of AI systems to extract insights from extensive datasets means that even anonymized data could potentially be traced back to individuals, leading to unintended consequences such as profiling and discrimination.

The application of AI in tax systems, exemplified by the “System Risk Indication (SyRI)” in the Netherlands, has highlighted these issues significantly. In the SyRI case, the Dutch government used AI to identify individuals at risk of committing welfare fraud by analyzing vast amounts of personal data, including tax data.¹⁵⁹

SyRI is a government tool to combat fraud in labor laws, social security, and tax, with the government claiming that it anonymizes data before secure analysis to generate risk reports and that its decisions are based on objective criteria with privacy infringements limited to what is strictly necessary.¹⁶⁰

¹⁵⁵ Alessia Fidelangeli and Federico Galli, “Artificial Intelligence and Tax Law: Perspectives and Challenges” (2021) 4 *CERIDAP* (Ottobre-Dicembre) 24-58, 45.

¹⁵⁶ Benjamin Alarie and Rory McCreight, “The Ethics of Generative AI in Tax Practice” (2023) *Tax Notes Federal* 785-793, 788.

¹⁵⁷ *Ibid.*

¹⁵⁸ *Ibid.*

¹⁵⁹ Błażej Kuźniacki and others, “Requirements for Tax XAI Under Constitutional Principles and Human Rights” in *International Workshop on Explainable, Transparent Autonomous Agents and Multi-Agent Systems* (Springer International Publishing, May 2022) 221-238, 227.

¹⁶⁰ The Hague District Court, Judgment of 5 February 2020, Case No C-09-550982-HA ZA 18-388, ECLI:NL:RBDHA:2020:865.

However, the SyRI has been taken to court on the grounds that it leads to human rights violations. The Hague District Court acknowledges the importance of combating social security fraud but stresses that transparency in new technologies is essential to maintain public trust.¹⁶¹ It finds that SyRI fails to balance technological benefits with privacy rights under Article 8 of the ECHR, rendering it incompatible with Article 8(2) as neither necessary nor proportionate in a democratic society.¹⁶² In the case, the claimant argues that SyRI uses deep learning and large datasets for profiling, while the State asserts it only employs decision trees.¹⁶³ Due to the secrecy surrounding SyRI, the Court cannot fully assess its operations but finds the legislation unclear and not necessary or proportionate under Article 8(2) of the ECHR, citing transparency, purpose limitation, and data minimization principles.¹⁶⁴

The implications of AI on the right to respect for private life extend beyond the SyRI case. In many tax systems, AI technologies are used to monitor, analyze, and predict taxpayer behavior. These systems often involve extensive data collection and analysis, sometimes without adequate safeguards to ensure that the data is used appropriately and within the bounds of the law. The ECtHR has consistently held that “any interference with the right to respect for private life must be lawful, necessary in a democratic society, and proportionate to the legitimate aims pursued.”¹⁶⁵ However, when AI systems operate as “black boxes”, it becomes challenging to ensure that these principles are upheld, especially when people are unaware of how their data is being used or have no means to challenge AI-driven decisions.

The previously mentioned STIR is another example in this regard. This system is an advanced analytical tool that continuously receives data from Polish financial institutions on entrepreneurs’ bank accounts, indirectly collecting information about individuals despite primarily focusing on businesses.¹⁶⁶ The initial statutory provisions for the STIR were introduced in 2017 as part of a legal package designed to enhance tax efficiency and combat VAT fraud.¹⁶⁷ The STIR raises significant concerns regarding compliance with the right to privacy. In evaluating this, the fundamental issue is whether the system itself constitutes interference with privacy.¹⁶⁸

¹⁶¹ Ibid.

¹⁶² Ibid.

¹⁶³ Ibid.

¹⁶⁴ Ibid.

¹⁶⁵ European Court of Human Rights, Guide on Article 8 of the European Convention on Human Rights: Right to Respect for Private and Family Life, Home and Correspondence (31 August 2022).

¹⁶⁶ Marcin Rojszczak, “Compliance of Automatic Tax Fraud Detection Systems with the Right to Privacy Standards Based on the Polish Experience of the STIR System” (2021) 49(1) *Intertax*, 40.

¹⁶⁷ Ibid, 41.

¹⁶⁸ *Kopp v Switzerland* App no 13/1997/797/1000 (ECtHR, 25 March 1998) para 53.

Interference with a person's rights under Article 8 is allowed under its second paragraph only if it is in "accordance with the law, pursues legitimate aims, and is deemed necessary in a democratic society."¹⁶⁹

The phrase "in accordance with the law" requires that the measure be based on domestic law and aligned with "the rule of law", as outlined in the ECHR's Preamble.¹⁷⁰ Additionally, domestic law must be "clear, foreseeable, and adequately accessible."¹⁷¹ But the STIR lacks clear limits on how and when collected data may be used, and individuals cannot reasonably predict when their data might be collected or used by the system.¹⁷² The interference is, therefore, not foreseeable.

In order for the interference to be deemed "necessary in a democratic society", it must be demonstrated that it aligns with a "pressing social need", that the justifications provided by the national authorities are both "relevant and sufficient", and that they are "proportionate to the legitimate aim being pursued."¹⁷³ ECtHR considers the margin of appreciation for State authorities, which must demonstrate this pressing social need.¹⁷⁴ This margin varies based on the issues and interests at stake.¹⁷⁵ It should also be mentioned that the concept of "necessary" is not as flexible as terms like "useful" or "desirable".¹⁷⁶

One of the most important principles used by the ECtHR in assessing democratic necessity is "the principle of proportionality." This principle stipulates that there must be a reasonable relationship between the objective sought and the means employed to attain that objective.¹⁷⁷ Although this principle is not explicitly referenced in the ECHR, it has a fundamental role in the ECtHR's interpretation of the Convention.¹⁷⁸ Therefore, even when an action pursues a legitimate objective, it remains unacceptable if the methods used are arbitrary, disproportionate, or unjust.¹⁷⁹

¹⁶⁹ *Big Brother Watch and Others v The United Kingdom* App no 58170/13, 62322/14 and 24960/15 (ECtHR, 25 May 2021) para 332.

¹⁷⁰ *Ibid.*

¹⁷¹ European Court of Human Rights, *Guide on Article 8 of the European Convention on Human Rights: Right to Respect for Private and Family Life, Home and Correspondence* (31 August 2022) 10.

¹⁷² Marcin Rojszczak, "Compliance of Automatic Tax Fraud Detection Systems with the Right to Privacy Standards Based on the Polish Experience of the STIR System" (2021) 49(1) *Intertax*, 47.

¹⁷³ *National Federation of Sportspersons' Associations and Unions (FNASS) and Others v France* App nos 48151/11 and 77769/13 (ECtHR, 18 January 2018) para 167.

¹⁷⁴ *Piechowicz v Poland* App no 20071/07 (ECtHR, 17 April 2012) para 212.

¹⁷⁵ *Strand Lobben and Others v Norway* App no 37283/13 (ECtHR, 10 September 2019) para 211.

¹⁷⁶ *Svyato-Mykhaylivska Parafiya v Ukraine* App no 77703/01 (ECtHR, 14 June 2007) para 116.

¹⁷⁷ Richard Clayton and Hugh Tomlinson, *The Law of Human Rights* (Oxford 2000) 278.

¹⁷⁸ Council of Europe, "Articles 8–11" (Council of Europe) <<https://www.coe.int/en/web/echr-toolkit/les-articles-8-a-11>> accessed 30 October 2024.

¹⁷⁹ *Ibid.*

On the other hand, STIR legislation allows for extensive data collection without restrictions on time periods or specific groups, undermining its intended purpose of combating crime.¹⁸⁰ This disconnection is evident, particularly concerning transactions by individuals, as there is no link between tax crime prevention and the collection of data on citizens' health or political views.¹⁸¹ Furthermore, aggregating donations to non-governmental organizations critical of the government is not necessary for fighting tax fraud.¹⁸² While such information might occasionally be useful, in the context of STIR, the overall approach fails to justify the extensive data collection.¹⁸³ In a democratic state, authorities should not assume all citizens are potential criminals, making broad data collection unjustified.¹⁸⁴

Consequently, the STIR's design and operation interfere with the right to respect for private life and fail to meet the proportionality and necessity standards established by the ECtHR.

4. Reviewing AI Regulations for the Prevention of Human Rights Violations

4.1. Hard Law Examples

The growing use of AI systems, including tax administration, requires robust regulations to balance innovation and fundamental rights. The EU has addressed this through binding legislative measures like the AI Act, a new and groundbreaking framework. Similarly, the GDPR, although not specific to AI, remains a crucial regulatory instrument, as AI systems heavily rely on data processing. Together, these regulations aim to create a harmonized and ethical environment for AI deployment in the EU.

4.1.1. The AI Act

The AI Act, officially designated as Regulation (EU) 2024/1689¹⁸⁵, represents a foundational legislation intended to establish uniform rules for the development, marketing, and application of AI technologies within the EU. Adopted on 13 June 2024 and effective as of 1 August 2024, the AI Act serves as a regulatory framework with the goal of preserving innovation while also protecting human rights, including privacy, fair trial and non-discrimination. The requirements

¹⁸⁰ Marcin Rojszczak, "Compliance of Automatic Tax Fraud Detection Systems with the Right to Privacy Standards Based on the Polish Experience of the STIR System" (2021) 49(1) *Intertax*, 46.

¹⁸¹ *Ibid.*

¹⁸² *Ibid.*

¹⁸³ *Ibid.*

¹⁸⁴ *Ibid.*

¹⁸⁵ 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 (Artificial Intelligence Act) [2024] OJ L 1689.

of the act will be gradually implemented over time, starting with the implementation of bans on certain specific AI systems from February 2025.

The Act not only seeks to harmonize rules on AI but also modifies existing legislative acts within the EU, demonstrating the EU's proactive approach to adapting its legal framework to the evolving technological landscape.¹⁸⁶ This act applies to various entities involved with AI systems in the EU, including “providers, deployers, importers, distributors, product manufacturers, and authorized representatives.”¹⁸⁷ It also covers entities outside the EU if their AI systems' output is used within the EU and applies to affected persons within the EU.¹⁸⁸

One of the purposes of the AI Act is “to promote the uptake of human-centric and trustworthy AI.”¹⁸⁹ “Human-centric” implies that AI systems should function as tools designed to enhance human well-being.¹⁹⁰ It seeks to ensure that AI technologies adhere to EU values and fundamental rights.¹⁹¹ This is particularly relevant in the context of tax administration, where AI systems should support public interest objectives, such as reducing tax evasion without infringing on the rights of taxpayers.

The AI Act is designed to classify AI systems based on risk classification¹⁹², with the highest level being “unacceptable risk”, which includes systems (e.g. AI systems using social scoring for unfair treatment, exploiting vulnerabilities, or assessing criminal risk solely through profiling) that are strictly prohibited.¹⁹³ In contrast, systems categorized as “high-risk” (e.g. AI systems used by law enforcement or for influencing elections) must meet strict requirements, such as “risk management, data governance, documentation, record-keeping, transparency, human oversight, and cybersecurity”, to be implemented.¹⁹⁴ Finally, AI systems classified as “limited risk” (e.g. chatbots, deepfakes) face transparency requirements to inform users they are interacting with AI¹⁹⁵, while “minimal risk” systems (e.g. spam filters and video games) are

¹⁸⁶ Mario Pires, “Artificial Intelligence (AI) in the Field of Tax Administration” (2024) *Review of International and European Economic Law*.

¹⁸⁷ 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 (Artificial Intelligence Act) [2024] OJ L 1689, art 2(1).

¹⁸⁸ Ibid.

¹⁸⁹ Ibid, art 1.

¹⁹⁰ Ibid, rec 6.

¹⁹¹ Ibid, rec 1.

¹⁹² European Commission, “AI Act” (European Commission, 8 August 2024) <<https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>> accessed 30 September 2024.

¹⁹³ 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 (Artificial Intelligence Act) [2024] OJ L 1689, art 5.

¹⁹⁴ Ibid, arts 6-15.

¹⁹⁵ European Commission, “AI Act” (European Commission, 8 August 2024) <<https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>> accessed 30 September 2024.

permitted without restrictions.¹⁹⁶ This approach allows for differentiated regulatory requirements based on the potential harm that the AI system could pose to individuals and society.

The AI Act emphasizes the protection of human rights, specifically in relation to “privacy, non-discrimination, and fair trial.” Protection of these rights is especially important in the context of tax administrations, where AI systems directly affect individuals by making decisions about tax compliance, assessments, and penalties.

One of the most debated parts of the AI Act is how it handles AI systems in tax administration. Recital 59 of this Act states that AI systems meant for administrative tasks by tax authorities should not be classified as high-risk like those used by law enforcement to prevent, detect, investigate, or prosecute crimes.¹⁹⁷

The rationale underlying this exclusion is rooted in the legal distinction between administrative and criminal proceedings. The AI Act contends that AI systems deployed by tax authorities within the scope of administrative proceedings do not pose the same level of risk to fundamental rights as those used in criminal proceedings. However, this distinction between administrative and criminal AI applications is problematic, as both can impact fundamental rights, particularly when AI is used for profiling or risk assessments.¹⁹⁸

Lastly, it must be noted that this Act is very new, and its full implementation has not yet begun. Therefore, in the coming years, the effectiveness of this Act in preventing the violation of human rights by AI will be more clearly realized.

4.1.2. The GDPR

The GDPR serves as the cornerstone of data protection law in the EU, providing a comprehensive framework governing the processing of personal data. The EU adopted the GDPR on 27 April 2016, requiring Member States to fully implement it by 25 May 2018.¹⁹⁹ This Regulation establishes rules for protecting natural persons in relation to the processing and

¹⁹⁶ European Commission, “AI Act” (European Commission, 8 August 2024) <<https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>> accessed 30 September 2024.

¹⁹⁷ 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 (Artificial Intelligence Act) [2024] OJ L 1689, rec 59.

¹⁹⁸ Bruno Peeters, “European Law Restrictions on Tax Authorities’ Use of Artificial Intelligence Systems: Reflections on Some Recent Developments” (2024) 33(2) *EC Tax Review* 57.

¹⁹⁹ European Data Protection Supervisor, “History of the General Data Protection Regulation” (European Data Protection Supervisor) <https://www.edps.europa.eu/data-protection/data-protection/legislation/history-general-data-protection-regulation_en> accessed 30 October 2024.

free movement of personal data, safeguarding their fundamental rights, particularly the right to data protection.²⁰⁰ Data protection is also directly related to the right to respect for private life.

Its relevance in the context of AI technologies used by tax administrations is profound, as these systems increasingly rely on large-scale data processing, often involving sensitive personal information.

With modern AI systems becoming more common in aiding tax administration, the GDPR is particularly important to ensure that used technologies do not breach the rights of individuals. The GDPR's scope is comprehensive, applying to all natural persons, and it imposes strict obligations on "data controllers" and "processors" to protect the rights of data subjects.²⁰¹

A fundamental principle of the GDPR is "purpose limitation". This principle means "personal data should only be collected for clear, specific, and lawful reasons, and it shouldn't be used in ways that don't fit those reasons."²⁰² However, the nature of big data—collecting and analyzing as much information as possible to uncover correlations and unexpected information—stands in stark contrast to this principle.²⁰³

The GDPR stresses the principle of "data minimization" in Article 5(1)(c), meaning personal data should only include what is necessary, relevant, and sufficient for its intended purpose.²⁰⁴ The risk with big data, especially when coupled with AI, is that vast amounts of data, potentially unnecessary and irrelevant, are collected, stored, and analyzed.²⁰⁵ This practice not only violates the principle of data minimization but also increases the likelihood of data being used beyond its original intent.

One of the GDPR's significant contributions to the governance of AI systems is the emphasis on transparency and the right to an explanation. Although the GDPR does not explicitly establish a "right to explanation", this concept can be inferred from Articles 13 to 15, which

²⁰⁰ 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 (General Data Protection Regulation) [2016] OJ L119/1, art 1.

²⁰¹ Alessia Fidelangeli and Federico Galli, "Artificial Intelligence and Tax Law: Perspectives and Challenges" (2021) 4 *CERIDAP* (Ottobre-Dicembre) 24-58, 44-45.

²⁰² 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 (General Data Protection Regulation) [2016] OJ L119/1, art 5(1)(b).

²⁰³ Gianluca Mazzoni, "(Re)defining the Balance between Tax Transparency and Tax Privacy in Big Data Analytics" (2018) *Bulletin for International Taxation* 661.

²⁰⁴ 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 (General Data Protection Regulation) [2016] OJ L119/1, art 5(1)(c).

²⁰⁵ Gianluca Mazzoni, "(Re)defining the Balance between Tax Transparency and Tax Privacy in Big Data Analytics" (2018) *Bulletin for International Taxation* 662.

mandate that individuals be given “meaningful information about the logic” behind automated decision-making processes.²⁰⁶

In the context of tax administration, the right to explanation is vital. AI systems employed by tax authorities must be able to provide clear and comprehensible reasons for their decisions, particularly when these decisions affect taxpayers’ rights and obligations. For example, when an AI system flags a taxpayer for an audit based on patterns detected in their financial data, the taxpayer should have the right to understand the reasoning behind this decision, including the data points considered and the logic used by the AI system.

Such transparency is essential not only to enable taxpayers to effectively contest decisions they deem inaccurate but also to sustain public confidence in the application of AI by tax authorities. Without adequate transparency, there is a potential risk that AI systems may be regarded as “black boxes”, making decisions that are inscrutable and potentially unjust.²⁰⁷

In practice, however, balancing the need for efficient tax administration with the protection of personal data is fraught with significant challenges. The use of big data analytics in tax administration, particularly when it involves profiling, can lead to decisions being made solely on automated processing, which has significant legal and personal impacts on taxpayers.²⁰⁸ While Article 22 of the GDPR provides for safeguards, such as “the right to human intervention” and “the right to contest decisions”²⁰⁹, these measures may not fully mitigate the risks posed by the widespread use of AI in tax administration.

Apart from these, Article 22 of the GDPR provides individuals with the right not to be subject to decisions based solely on automated processing, including profiling, if such decisions have legal effects or significantly affect them.²¹⁰ This protection is not absolute; it allows for certain exemptions.²¹¹ For instance, processing-based decision-making, including profiling, is allowed for purposes such as monitoring fraud or tax evasion, if authorized by EU or Member State

²⁰⁶ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 604; 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 (General Data Protection Regulation) [2016] OJ L 119/1, arts 13–15.

²⁰⁷ Aleksandra Bal, “Ruled by Algorithms: The Use of “Black Box” Models in Tax Law” (2019) 95(12) *Tax Notes International*, 1163.

²⁰⁸ Gianluca Mazzoni, “(Re)defining the Balance between Tax Transparency and Tax Privacy in Big Data Analytics” (2018) *Bulletin for International Taxation* 662.

²⁰⁹ 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 (General Data Protection Regulation) [2016] OJ L119/1, art 22.

²¹⁰ *Ibid*, art 22(1).

²¹¹ *Ibid*, art 22(2).

law.²¹² Nevertheless, such processing must include safeguards, including the right to human intervention, an explanation of the decision, and the ability to challenge it.²¹³

Furthermore, it should be noted that the GDPR permits certain exceptions where data processing is necessary for purposes of public interest, including matters related to taxation. Article 23(1)(e) of the GDPR permits Member States to restrict the scope of obligations and rights provided under the GDPR (Articles 12 to 22 and Article 34) when necessary for important objectives of general public interest, including taxation.²¹⁴ But still, these restrictions must respect “fundamental rights” and be “necessary and proportionate in a democratic society.”²¹⁵

Consequently, the GDPR establishes a robust legal framework for safeguarding personal data in the use of AI technologies by tax administrations. Its provisions on transparency, automated decision-making, and the rights of data subjects are essential for ensuring that the deployment of AI systems respects fundamental rights and upholds the principles of fairness, accountability, and proportionality.

4.2. Soft Law Examples

Internationally, various intergovernmental organizations and commissions, including the “European Commission”, the “Council of Europe” and the “OECD” have recognized the importance of establishing a regulatory framework for AI.²¹⁶ Although the recommendations and guidelines from these organizations are not legally binding, they have gained significant recognition in judicial proceedings.²¹⁷

These non-binding guidelines and recommendations, known as “soft law”, serve as essential tools for lawmakers and the judiciary in interpreting and developing “hard law” and are particularly suited to the fast-paced evolution of AI systems due to their adaptability.²¹⁸ As scholars argue, soft law allows states to adjust regulatory approaches in response to AI’s changing landscape, and as these standards prove effective, they may gradually evolve into binding hard law regulations.²¹⁹

²¹² Ibid, art 22 and rec 71.

²¹³ Ibid, rec 71.

²¹⁴ Ibid, art 23(1)(e).

²¹⁵ Ibid, art 23(1).

²¹⁶ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 611.

²¹⁷ Ibid.

²¹⁸ Ibid.

²¹⁹ Ibid.

4.2.1. European Commission’s Ethics Guidelines for Trustworthy AI

“The Ethics Guidelines for Trustworthy AI”, created by the “High-Level Expert Group on Artificial Intelligence (AI HLEG)” for the European Commission, aim to ensure AI systems are lawful, ethical, and robust.²²⁰ AI HLEG was created by the “European Commission” in June 2018 as an independent expert group. This expert group published the initial draft of the relevant guidelines in December 2018. The document was released to the public on 8 April 2019.

The guidelines, centered on ethical and reliable AI, provide a framework for implementing ethical principles. Chapter I of the document highlights the importance of respecting human autonomy, preventing harm, ensuring fairness, and promoting explicability, particularly for vulnerable groups, and addresses potential risks such as threats to democracy and justice.²²¹ Chapter II of the document outlines seven essential requirements for AI: “human oversight, technical robustness, privacy, transparency, fairness, societal well-being, and accountability.”²²² These should be implemented through technical and non-technical methods, with stakeholder involvement, traceability, and education in AI ethics.²²³ Chapter III of the document provides an adaptable assessment list to ensure these requirements are met, stressing continuous evaluation and stakeholder input.²²⁴

As can be concluded, the Guidelines emphasize key principles like “human autonomy, prevention of harm, fairness, transparency, and accountability”, all critical in AI applications for tax governance. These guidelines address how AI systems should respect privacy, ensure fairness, and involve continuous evaluation to avoid biased or unjust decisions. They highlight the need for sector-specific approaches and stakeholder involvement to safeguard human rights, such as the right to respect for private life and non-discrimination when AI is used by tax authorities.

4.2.2. Council of Europe Recommendation

On 8 April 2020, “the Council of Europe” adopted “Recommendation CM/Rec(2020)1”, advising Member States on “the human rights impacts of algorithmic systems.”²²⁵ The

²²⁰ European Commission, Directorate-General for Communications Networks, Content and Technology, *Ethics Guidelines for Trustworthy AI* (Publications Office 2019).

²²¹ Ibid, ch 1.

²²² Ibid, ch 2.

²²³ Ibid, ch 2.

²²⁴ Ibid, ch 3.

²²⁵ Council of Europe, “Recommendation CM/Rec(2020)1 of the Committee of Ministers to Member States on the Human Rights Impacts of Algorithmic Systems” (2020).

Recommendation provides guidance for States and public and private entities on the design, development, and use of such systems.

According to the Recommendation:

- Algorithmic systems should be transparent, with ongoing human rights assessments throughout their lifecycle;
- States should foster public awareness critical for democratic engagement, develop frameworks to ensure these systems align with rights standards, and preserve individuals' control over personal data with transparency in data use;
- States should monitor data quality and biases carefully, require "human rights impact assessments" before significant computational experiments, and embed privacy, security, and data protection safeguards by design;
- Regular testing and audits should be conducted, with attention to context and potential discriminatory impacts;
- High-risk algorithmic decision-making should be clearly identified, and contestation rights should be accessible to enable affected individuals to challenge decisions effectively;
- Transparent oversight and independent remedies must be maintained;
- States should encourage technology that advances rights and support research prioritizing marginalized groups' interests, fostering human-centric innovation in line with labor standards.²²⁶

One of the most important aspects addressed in the Recommendation is the explainability of the processes and outputs produced by algorithmic systems, a concept closely related to the broader principles of transparency and contestability. This requirement is directly applicable to AI systems employed by tax administrations, which must be designed to ensure that their decisions can be understood and challenged by those affected. The Recommendation underscores that the guidelines apply to both public and private sector actors, including tax authorities.²²⁷ It explicitly states that AI systems used by tax authorities must possess both technical and legal explainability.²²⁸

²²⁶ Ibid, 6-11.

²²⁷ Błażej Kuźniacki and others, "Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard" (2022) 14 *World Tax Journal* 573-616, 612.

²²⁸ Ibid.

The importance of the explainability issue has been illustrated in judicial contexts, notably by the “Slovak Constitutional Court” in its ruling on the “eKasa” case.²²⁹ In this case, the Court broadly referenced the Recommendation to establish a set of legal rules concerning the explainability of AI systems used in tax administration.²³⁰ The Court’s ruling emphasized the necessity of applying the principles of explainability and transparency to AI systems within the field of taxation.²³¹

Moreover, the Recommendation states that AI systems employed in decision-making processes with high human rights risks —such as those used in tax fraud detection— must adhere to high standards of explainability.²³² This safeguard is essential for protecting the right to a fair trial, as it allows individuals to understand and contest decisions made by AI systems.²³³

Lastly, the Recommendation addresses the potential conflict between making AI systems understandable and the protection of intellectual property and trade secrecy. The Recommendation clearly states that laws governing intellectual property and trade secrecy should not undermine the explainability of AI systems.²³⁴ This is a crucial point for ensuring that the inner workings of AI systems can be scrutinized and understood, even when such systems are protected by trade secrecy or intellectual property laws.²³⁵

4.2.3. The OECD’s AI Recommendation

“The Recommendation of the Council on AI” was adopted by the OECD Council on 22 May 2019, based on a proposal from the Digital Policy Committee.²³⁶

This recommendation outlines the core principles of responsible governance of AI systems. It highlights that the development of AI technologies must promote “inclusive growth, sustainable development, and general well-being”, by augmenting human capabilities and closing social and economic divides.²³⁷

AI stakeholders are required to comply with the rule of law, respect human rights and promote democratic values while guaranteeing fairness, privacy and non-discrimination throughout the

²²⁹ Ibid, 613.

²³⁰ Ibid, 613.

²³¹ Ibid, 613.

²³² Ibid, 613.

²³³ Ibid, 613.

²³⁴ Ibid, 613.

²³⁵ Ibid, 613.

²³⁶ OECD, *Recommendation of the Council on Artificial Intelligence* (OECD/LEGAL/0449, 2024).

²³⁷ Ibid.

AI lifecycle.²³⁸ Also, they have to reduce the risks of abuse of AI and disinformation.²³⁹ Transparency and explainability are also core to these principles, meaning that everyone involved with AI must report relevant information about AI systems and their outputs in a clear and understandable way.²⁴⁰

Moreover, AI systems should also be robust, safe and secure, with appropriate mechanisms to ensure that any negative consequences, including non-intended deviations from the goals, will be mitigated and remedial action can be taken, where appropriate.²⁴¹ Accountability is a cornerstone, as AI stakeholders are required to ensure traceability and risk management throughout the development, implementation, and operation phases of AI systems.²⁴²

In conclusion, this Recommendation outlines key principles that need to be adhered to for tax administrations to ensure that AI systems are trustworthy, addressing fairness, transparency, privacy and human rights. Also, in order to promote inclusiveness and reduce inequalities, tax compliance supported by AI should be bias-free. Transparency and accountability are of paramount importance, where taxpayers should be able to see how decisions are made and how they can appeal AI-driven decisions. In addition, systems need to be in place to enable the prevention of abuse and/or risk mitigation, but still allow for sufficient traceability for auditing/reviewing. These would be the principles to guarantee that AI tax systems would abide by democratic values and protect the rights of taxpayers.

5. Recommendations to Prevent Human Rights Violations

Tax administrations around the world are increasingly implementing AI, and there is an urgent need to ensure that these technologies respect human rights. It becomes critical to offer specific recommendations to reduce the detrimental effects of AI on human rights in tax administration.

Based on the conclusions from the previous chapters, the following recommendations should be considered to prevent discrimination and ensure the rights to respect for private life and a fair trial.

5.1. Bias Mitigation in AI Algorithms

In AI algorithms, especially for tax administrations, bias mitigation is especially critical to prevent discrimination and promote fairness. First and foremost, it is necessary to consider biased historical data. If not properly addressed, training datasets can become implicit

²³⁸ Ibid.

²³⁹ Ibid.

²⁴⁰ Ibid.

²⁴¹ Ibid.

²⁴² Ibid.

promoters of socially-based inequity. In turn, datasets must be audited and scrubbed of variables related to sensitive characteristics, including race, gender, and religion. Furthermore, tax administrations need to filter datasets for biased trends and apply fairness algorithms to avoid discriminatory consequences. It is also important that AI systems are trained on diverse and representative data sources.

Additionally, fairness and inclusivity should come first when creating AI systems. For example, AI-based tax systems should be designed to avoid unfairly impacting low-income individuals or minority groups and avoid disproportionately flagging certain classes of taxpayers for audits or fraud investigations. Prioritizing fairness in the design of AI systems ensures equal treatment of all taxpayers, regardless of their characteristics, and prevents discrimination.

5.2. Enhancing Human Oversight and Intervention in AI Systems

AI should be seen as a tool for human empowerment. AI systems should be developed to complement human abilities, supporting rather than replacing human judgment. In tax administrations, AI can assist tax officials in making better, smarter decisions, but human oversight is essential, particularly when AI systems make decisions with significant legal or financial implications for taxpayers.

In addition to these, a “human-in-the-loop” approach must be followed; AI can be used to automate routine tasks, but when it comes to making decisions that lead to taxation penalties or questionable fraud cases, human intervention must be put in place. This ensures that AI-driven decisions are fair and aligned with human rights principles. Human oversight is one of the main demands of the “AI Act”²⁴³, the “Ethic Guidelines for Trustworthy AI”²⁴⁴ and “Recommendation CM/Rec(2020)1”²⁴⁵ for AI, as mentioned before. Tax administrations should develop systems that keep humans in control of final decisions. AI systems should never be allowed to autonomously make decisions with huge legal or financial implications, such as in the case of an automated tax assessment or audit, without imminent human review.

Moreover, designing and deploying AI systems in tax administrations should begin with striking a balance between automation and human rights. Putting humans at the center of technology helps mitigate AI-induced bias. As specified in Article 22 of the GDPR, when

²⁴³ 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 (Artificial Intelligence Act) [2024] OJ L 1689, art 15.

²⁴⁴ European Commission, Directorate-General for Communications Networks, Content and Technology, *Ethics Guidelines for Trustworthy AI* (Publications Office 2019) ch 2.

²⁴⁵ Council of Europe, “Recommendation CM/Rec(2020)1 of the Committee of Ministers to Member States on the Human Rights Impacts of Algorithmic Systems” (2020).

automated decision-making is used (particularly when it is of a profiling nature, or has significant impacts), “the right of individuals to obtain human intervention and challenge” such decision-making is the standard approach.²⁴⁶ According to this, taxpayers should have the right to contest AI-driven decisions, with the possibility of human intervention.

Finally, tax administrations should create human oversight mechanisms, such as oversight committees, units or teams, to ensure that an AI system is making decisions in a fair manner. Mechanisms like these can ensure that AI systems do not operate entirely on their own and that decisions are made in a fair and appropriate manner. This is because under such mechanisms, even if the AI’s decision is unlawful, it can be corrected by the humans.

5.3. Adopting Explainable AI to Enhance Transparency and Accountability

Taxpayers must have the right to understand and challenge the reasoning behind AI-driven decisions. The explainability of AI decisions is crucial, as transparency helps identify potential sources of bias and discrimination, enabling individuals to contest decisions based on flawed assumptions. To enhance this transparency, “Explainable Artificial Intelligence (XAI)” systems should be implemented in tax administration. XAI frameworks allow taxpayers to understand how AI models arrive at their decisions, which is essential in cases like the STIR that uses AI to detect VAT fraud. XAI is the capability of AI systems to deliver transparent and comprehensible explanations for their actions and decisions.²⁴⁷ XAI technologies are essential to uphold the effectiveness of constitutional rights in the context of AI applications in tax law.²⁴⁸ This is because the mere disclosure of information is not enough; individuals need a form of explanation that they can comprehend.²⁴⁹ Lack of transparency can undermine the right to a fair trial, so adopting XAI frameworks ensures compliance with both the GDPR and ECHR.

Moreover, clear and accessible explanations are necessary. AI systems should provide detailed yet comprehensible reasons for decisions, such as account freezes or penalties, making them understandable not only to AI experts but also to the general public. Moreover, tax administrations should adopt the open algorithm standard, which means that AI systems are

²⁴⁶ 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 (General Data Protection Regulation) [2016] OJ L119/1, art 22.

²⁴⁷ European Data Protection Supervisor, Vítor Bernardo, “TechDispatch: Explainable Artificial Intelligence” in Massimo Attoresi, Xabier Lareo, and Luis Velasco (eds), (Publications Office of the European Union 2023) 3.

²⁴⁸ Błażej Kuźniacki and others, “Towards Explainable Artificial Intelligence (XAI) in Tax Law: The Need for a Minimum Legal Standard” (2022) 14 *World Tax Journal* 573-616, 593.

²⁴⁹ *Ibid.*

transparent and made available for public review. It reduces the view of AI as being “black boxes” and makes processes of decision-making more accountable.

In addition to these, taxpayers should be able to access case files pertaining to an AI decision. “The principle of equality of arms” guarantees both parties in a litigation access to relevant case information. If the AI marked a taxpayer as high-risk, the taxpayer should know what data and what logic led there. Article 15 and Article 16 of the GDPR outline rights related to data access and rectification, and taxpayers should also have fair, accessible reviews and the right to rectify information gathered about them, including the unreasonable decisions stemming from AI.

Furthermore, full disclosure of all relevant data is essential, especially in matters where criminal implications, such as fraud or tax evasion, are alleged. Taxpayers are entitled to timely notice of the evidence against them and enough information to be able to contest it. Tax administrations must disclose the algorithms they use to conduct risk assessments or fraud detection to prevent unwarranted privacy violations, especially when using systems such as STIR and SyRI.

To further enhance transparency, tax administrations need to better explain to individuals what data is being used and provide details about how their data is being processed, the reasons why it is being collected, and how this data will be used by AI systems. This is in accordance with “the right to contest” enshrined under Article 22 of the GDPR, which gives them the right to appeal decisions made due to AI and get acquainted with the rationale. This also enables traceability of AI systems, such that any and every stakeholder can track the rationale behind how a decision was made and identify the system responsible for a decision.

It is also essential to disclose data sources, especially when big data or unconventional data sources like social media are used. Such disclosures maintain transparency and build trust by informing taxpayers of the origins and uses of their personal information. Clear and accessible privacy policies must be developed, detailing how big data is analyzed with AI, what data is collected, and its intended purposes.

Finally, it is necessary to ensure that intellectual property protection, tax and trade secrecy laws do not hinder the explainability of AI systems. Tax administrations might use legal protections as a way to avoid disclosing details about the AI systems they use, including withholding explanations from taxpayers affected by AI-driven decisions. They may argue that sharing such information could violate tax secrecy, particularly if it involves revealing details about third parties’ tax obligations. Additionally, disclosing how an AI system works could potentially infringe on intellectual property rights or expose trade secrets. Therefore, a legislative

framework is required to appropriately balance the protection of intellectual property rights, tax and trade secrecy with the principle of transparency.

5.4. Data Minimization, Anonymization, and Purpose Limitation

According to Article 5(1)(c) of the GDPR, the principle of “data minimization” requires AI systems to collect only data limited to what is “adequate, relevant and necessary in relation to the purposes.”²⁵⁰ In the context of tax administration, this means restricting data collection to financial information directly related to tax compliance and limiting profiling to situations essential for detecting specific tax evasion behaviors. Broad profiling based on irrelevant data, such as social media activity, health information, and political views, should be avoided to prevent biased or unfair outcomes. Tax administrations should also respect the taxpayer’s privacy and not overreach in surveillance practices, such as monitoring non-tax-related online or offline behavior, tracking internet browsing habits, or biometric surveillance unless directly related to a tax audit. This not only ensures that individuals can maintain their privacy, but also minimizes the chances of any misuse or breach of data.

Data retention and deletion policies are also vital for protecting taxpayer privacy. Personal data processed by AI systems must not be retained beyond the period necessary to fulfill its intended purpose. Robust policies should be established to ensure the timely deletion of such data upon purpose completion, thereby mitigating the risk of unauthorized access or data breaches.

Specifically, “purpose limitation” rule in Article 5(1)(b) of the GDPR, requires that “personal data are only collected for specific, explicit and legitimate purposes.”²⁵¹ They should not rely on personal data for secondary purposes such as large-scale profiling or predicting behavior if not strictly necessary and legally justified. AI systems designed for tax administrations should strictly limit their scope of operation to tax compliance and financial and economic issues and should not designate people for monitoring or analysis of the content of their social media activity or expression, unless the monitoring of social media is directly related to the subject of the investigation.

Furthermore, where possible, stronger anonymization techniques should be used to protect taxpayer privacy better. “Anonymization” is the process of removing any identifying information from data records or messages sourced from a computer, which would make it

²⁵⁰ 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 (General Data Protection Regulation) [2016] OJ L119/1, art 5(1)(c).

²⁵¹ Ibid, art 5(1)(b).

possible to identify a specific individual.²⁵² AI systems should use personal data in tax administration only where individuals are never capable of being re-identified from the data used. Anonymization enables tax administrations to use extensive datasets for enforcement purposes, while ensuring taxpayer identity is protected.

Finally, tax administrations should also adopt appropriate data security measures, such as “encryption, access controls, and regular security updates”, to prohibit unauthorized access to taxpayer data.

5.5. Conducting Regular Audits to Assess the Human Rights Impacts

Tax administrations should establish ethical and legal review frameworks to ensure that AI systems operate lawfully and ethically. This includes conducting “human rights impact assessments”, as outlined in “Recommendation CM/Rec(2020)1” of “the Council of Europe.” States and partnering private actors should conduct regular “human rights impact assessments” at key stages (before procurement, during development, and throughout deployment) to identify risks to rights without confidentiality or trade secrets limiting this process.²⁵³

Regular audits are essential to conducting regular “human rights impact assessments”, and they are especially crucial for AI systems used in sensitive areas like tax compliance and fraud detection, as they help ensure that these systems function fairly, transparently, and accountably while also safeguarding against human rights infringements or unintended negative outcomes.

In addition, audits need to be independent. Assigning independent external audit units rather than internal audit units will provide a more effective audit. In addition, the relevant audit units should employ people who are knowledgeable in AI, tax and human rights. Because no matter how experienced the Auditor is, if he/she is not familiar with these concepts, he/she will not be able to do more than a traditional audit that is not effective.

As a result, regular auditing is thus important for making sure AI systems with tax administration purposes are fair, explainable and compliant with ethical and legal requirements, upholding taxpayers’ rights and trust in AI-based processes.

5.6. Reevaluating Risk Classifications for AI Systems in Tax Administration

The risk categories for AI systems in tax administrations should be revised. As an example mentioned before, Recital 59 of the AI Act states that AI systems meant for administrative

²⁵² Cambridge Dictionary, “Anonymization” (Cambridge) <<https://dictionary.cambridge.org/dictionary/english/anonymization>> accessed 30 October 2024.

²⁵³ Council of Europe, “Recommendation CM/Rec(2020)1 of the Committee of Ministers to Member States on the Human Rights Impacts of Algorithmic Systems” (2020).

proceedings by tax authorities should not be classified as high-risk like those used by law enforcement to prevent, detect, investigate, or prosecute crimes.”²⁵⁴ However, this may not be suitable considering the immense potential of AI to influence human rights, where the underlying process involves tax decisions. AI systems used in tax administration that involve profiling or carry a high risk of human rights abuses should be categorized as high-risk to ensure they receive the appropriate level of caution and safeguards.

While tax-related AI systems might not formally constitute high-risk systems, tax authorities should apply the high-risk procedures where required. Such procedures must ensure appropriate human oversight, transparency, and accountability against taxpayers’ rights so that AI systems operate in a fair and equitable manner.

6. Conclusion

The increasing deployment of AI technologies in tax administrations globally constitutes a significant paradigm shift, providing unique opportunities to enhance administrative efficiency, strengthen fraud detection, and facilitate taxpayer assistance. Nonetheless, as this thesis has explored, the deployment of AI in this field presents significant hurdles and risks, especially in the area of human rights.

One of the issues is the risk of discrimination as a result of algorithmic bias. AI systems are often trained on historical data that reflect systemic biases in our society, and thus, there is a risk of these biases being replicated and even reinforced, affecting certain demographic groups more than others. This emphasizes the need for bias mitigation techniques and the necessity of representative and inclusive data when creating AI models.

Moreover, the right to a fair trial is confronted with a challenge in the context of AI systems, considering that many AI systems are perceived as black boxes. These black box models, often free of well-defined rationale, are of little help in informing taxpayers whether or not they can contest the decision-making about them, which impacts the important principles of transparency, equality of arms and accountability of the technology used. Tax administration decisions involving AI must be fair and uphold principles of justice.

In addition, AI applications that require massive data collection and profiling put the right to respect for private life at risk. The ability of AI to sift through massive amounts of individual

²⁵⁴ 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 (Artificial Intelligence Act) [2024] OJ L 1689, rec 59.

data highlights the need for strong protections, as outlined in the GDPR, to restrict unnecessary data collection and to prevent access or abuse.

Though high-profile regulation is just beginning to come into play, international and regional regulations like the AI Act and GDPR, as well as non-binding guidance from “the Council of Europe”, the “European Commission” and the “OECD”, attempt to alleviate these concerns. Nevertheless, these frameworks are still evolving and require continuous iterations to keep pace with the fast-moving technological landscape.

In view of these concerns, this thesis proposes a variety of solutions for the protection of human rights in an AI-based tax administration, such as implementing appropriate bias-mitigation measures, human supervision, employing XAI systems, ensuring data minimization, and regularly auditing AI human rights impact. Finally, the AI regulations should revise existing risk classifications in particular for applications in tax, where the harm potential could be significant and the system used should therefore be subject to meaningful safeguards.

In conclusion, while administrative AI has great potential to modernize tax administration, it is important to ensure that its deployment is accompanied by the protection of human rights. Finding this balance will require cooperation between policymakers, technologists, and human rights advocates to design AI systems that are efficient and effective while also being equitable, transparent, and rights-respecting.

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Abstract

The integration of AI technologies into tax administration offers significant opportunities for enhancing efficiency, detecting fraud, and improving taxpayer compliance. However, these advancements come with significant ethical and legal challenges, especially regarding human rights. This thesis investigates AI's applications in tax systems, exploring their impacts on non-discrimination, the right to a fair trial and the right to respect for private life. Through global case studies, it highlights risks posed by opaque algorithms, potential biases, and extensive data processing, which can undermine taxpayers' rights. Furthermore, this thesis examines regulatory frameworks, focusing on the AI Act and the GDPR, alongside soft law guidelines from the Council of Europe, the European Commission, and the OECD, as mechanisms to mitigate these risks. The research concludes with recommendations for ethical AI deployment, emphasizing bias mitigation, human oversight, transparency through explainable AI, data protection, regular audits and reevaluating risk classifications. This thesis advocates a balanced approach, ensuring that AI technologies in tax administration uphold human rights while enhancing administrative capabilities.

Abstrakt

Die Integration von KI-Technologien in die Steuerverwaltung bietet bedeutende Möglichkeiten zur Steigerung der Effizienz, zur Aufdeckung von Betrug und zur Verbesserung der Steuerpflichtigen-Compliance. Diese Fortschritte gehen jedoch mit erheblichen ethischen und rechtlichen Herausforderungen einher, insbesondere im Hinblick auf die Menschenrechte. Diese Arbeit untersucht die Anwendung von KI in Steuersystemen und beleuchtet deren Auswirkungen auf das Diskriminierungsverbot, das Recht auf ein faires Verfahren und das Recht auf Achtung des Privatlebens. Anhand globaler Fallstudien werden die Risiken durch intransparente Algorithmen, potenzielle Verzerrungen und umfangreiche Datenverarbeitung aufgezeigt, die die Rechte der Steuerpflichtigen gefährden können. Zudem werden regulatorische Rahmenbedingungen untersucht, mit Fokus auf die KI-Verordnung und die DSGVO sowie auf Soft-Law-Richtlinien des Europarats, der Europäischen Kommission und der OECD als Mechanismen zur Risikominderung. Die Arbeit schließt mit Empfehlungen für eine ethische KI-Nutzung, wobei die Verringerung von Verzerrungen, menschliche Aufsicht, Transparenz durch erklärbare KI, Datenschutz, regelmäßige Prüfungen und die Neubewertung von Risikoklassifikationen im Vordergrund stehen. Diese Arbeit plädiert für einen ausgewogenen Ansatz, der sicherstellt, dass KI-Technologien in der Steuerverwaltung die Menschenrechte wahren und gleichzeitig die administrativen Fähigkeiten verbessern.