

Legal Concerns Regarding the Use of Artificial Intelligence in Tax Proceedings

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Abstract - This study examines the complex legal, ethical and constitutional concerns surrounding the use of artificial intelligence (AI) in tax proceedings. Although the introduction of AI systems significantly increases the efficiency of tax authorities, speeds up administrative procedures and makes risk analysis for tax evasion more accurate, the specific characteristics of the technology pose a serious threat to the cornerstones of the rule of law. The author analyses the main areas of concern by combining systematic literature review with legal dogmatic methodology. She demonstrates in detail how the lack of transparency in decision-making processes (the 'black box' phenomenon) infringes upon the right to a fair hearing, the right to an effective remedy and the obligation to state reasons. The study highlights the conflicts between discrimination arising from historical data and data mining, on the one hand, and the principles of the GDPR, on the other, as well as the lack of clarity regarding the tax authority's liability. Using international examples – the Dutch tax authority scandal and the practices of the US tax authorities – it illustrates the serious social consequences of unregulated algorithms. The study discusses the relevance of the European Union's Artificial Intelligence Act, which classifies profiling by public authorities as a high-risk category. Finally, the author sets out proposals for safeguards, such as the use of explainable AI models, mandatory prior impact assessments, regulation at the statutory level, continuous external auditing, and the strict enforcement of the 'human-in-the-loop' principle.

Keywords: taxation, artificial intelligence, legal concerns, tax procedure, digitalisation

1. INTRODUCTION

The author notes that this study is a review based on a systematic literature search and legal dogmatic methodology. The research was conducted through a multi-stage screening of peer-reviewed material from international databases (e.g. Scopus, Google Scholar). Its aim is to identify gaps (legal loopholes) between technological development and legislation.

Tax authorities possess vast amounts of data, which they process using AI. Whilst the technology increases efficiency and helps detect tax fraud, it may infringe upon an individual's autonomy over their personal data. Building on the definition in the EU's AI Act, the study highlights three main areas of regulatory focus: risk analysis (selection of taxpayers), customer service chatbots and fully automated decision-making. The technology's operation is characterised by the opaque 'black box' phenomenon, which jeopardises several fundamental rights, including, amongst others, the right to a fair hearing, the prohibition of discrimination, and the right to a remedy. Artificial intelligence's voracious appetite for data violates the GDPR's principle of data minimisation. Article 22 of the GDPR prohibits solely automated decision-making; therefore, human involvement is essential. Furthermore, where external developers are involved, tax confidentiality is also put at risk. From a procedural law perspective, there is a risk that the authority will treat statistical probabilities as evidence and unjustifiably reverse the burden of proof through estimation procedures. Furthermore, the allocation of liability for erroneous AI outputs remains unregulated. The study cites two negative cases: the Dutch tax authority's algorithm discriminatorily flagged low-income families, leading to a social disaster and the government's resignation. Meanwhile, the US tax authority's system singled out taxpayers of colour at a higher rate. Under the EU's Artificial Intelligence Act, such tax software may be classified as 'high-risk', which requires strict risk management, continuous monitoring and human oversight. According to the author, a ban is not realistic; instead, a system of safeguards must be established: explainable models must be used, mandatory prior impact assessments must be carried out, the framework rules must be enshrined in law, and the systems must be audited annually by an independent body. In summary, AI should not be used as an infallible oracle, but as a strictly controlled decision-support tool, where ultimate responsibility always lies with humans.

2. METHODOLOGY

This review article is not intended to present primary research data; rather, its aim is to examine legal concerns regarding the use of artificial intelligence in tax proceedings. This study focuses primarily on the accurate presentation, systematisation and critical analysis of the current state of the academic debate on the issue raised. At the same time, in the context of this study, it is essential to integrate dogmatic legal analysis with the literature from the social sciences and natural sciences when dealing with topics bordering on law or of an interdisciplinary nature. On this basis, the methodology employed in this study is founded on a combination of systematic literature review and the dogmatic legal method, which ensures the repeatability, objectivity and transparency of the process. [1]

The precise delineation of the academic problem to be examined and the formulation of the research questions constitute the first step in the research associated with this review study. When defining the research problem, the first question that needed to be answered was: what is the unresolved theoretical or practical issue? Following on from this, precise, answerable questions must be formulated, and the scope of the research must be delineated in terms of time, geographical boundaries, and legal and linguistic constraints.

An overview of the legal framework does not merely involve listing pieces of legislation, but rather a hierarchical and functional analysis of the norms currently in force. At the same time, the abstract text of the legislation is given substance by court decisions (e.g. the Supreme Court, the Court of Justice of the European Union, the European Court of Human Rights); in this regard, we placed particular emphasis during the research on compiling key case law, which forms part of the research methodology. [2]

Subsequently, the collection of academic articles during the research is carried out in accordance with a strict protocol to avoid bias, utilising recognised, professionally peer-reviewed databases such as Scopus, Web of Science, Google Scholar, HeinOnline, EPA and REAL. The inclusion or exclusion of individual studies was based on pre-defined rules, the main criteria being that a study is included if it was published as a peer-reviewed journal article or book chapter in a relevant language within a specified time period. Conversely, a study was excluded from the research if the document in question was a non-peer-reviewed blog post or newspaper article. The hundreds or thousands of results obtained during the search were narrowed down through a multi-stage filtering process, which is analogous to the internationally accepted Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) process.

We then proceeded to integrate law and science in relation to the background research material; this phase constitutes the substantive, creative part of the review article. This is because, in the present study, we do not present the articles one after the other, but rather group the findings according to themes (thematic synthesis) and legal institutions. Within this framework, the study identifies the lines of division found in the literature, presenting them alongside the counter-arguments and the underlying dogmatic reasons. Furthermore, the study also highlights where legislation has failed to keep pace with technological, social or economic developments (legal gaps). [3]

The final element of the methodology is quality assurance, which involves presenting minority academic viewpoints that contrast with mainstream theories. Furthermore, the complete elimination of plagiarism and the accurate citation of the current, valid versions of legislation are fundamental requirements of academic ethics.

This structured procedure ensures that the resulting review article provides genuine added value to the academic community, offering a clear assessment of the current relationship between the law and the issue under examination.

3. THEORETICAL FOUNDATIONS

One of the most defining phenomena of the 21st-century digital revolution is the explosive growth of artificial intelligence and machine learning algorithms. This technological leap has not left public administration untouched, nor, within that, tax administration, which underpins the functioning of public finances. Tax authorities worldwide hold vast amounts of data. Processing, structuring and analysing this data has become virtually impossible using traditional human resources.

The introduction of artificial intelligence into tax procedures theoretically offers significant benefits: it increases efficiency, speeds up administrative processes, makes risk analysis more accurate, and helps to detect the hidden

economy and tax fraud (such as carousel fraud). At the same time, due to the specific nature of law enforcement by the tax authorities – which involves the direct exercise of state coercive power against the property autonomy of individuals and businesses – the use of this technology raises serious legal, ethical and constitutional issues.

The root of the legal concerns lies in the fact that, whilst traditional tax procedures are based on written law, human judgement and transparent, reasoned decisions, the operation of systems based on artificial intelligence is often characterised by the ‘black box’ phenomenon opacity, conclusions based on statistical probabilities and biases inherent in the input data. When an algorithm determines who should be subject to an audit, or what tax base adjustment should be applied on the basis of a specific economic event, the cornerstones of the rule of law – such as the right to a fair hearing, the prohibition of discrimination, the right of appeal and the obligation to state reasons – may be jeopardised. [4]

4. THE CONCEPT OF ARTIFICIAL INTELLIGENCE AND ITS IMPLICATIONS FOR TAX AUTHORITIES

In order to analyse the legal concerns, we must precisely define what we mean by artificial intelligence. The Artificial Intelligence Act, adopted by the European Union and now in force, uses a standardised definition. According to this, an AI system is a machine-based system designed to operate with varying levels of autonomy and which, based on the input data received – in order to achieve explicit or implicit objectives – is capable of generating outputs such as predictions, recommendations or decisions that affect the physical or virtual environment.

In the context of tax procedures, artificial intelligence does not refer to a single, homogeneous piece of software, but rather to a range of technologies, which essentially draw in part on predictive analytics and machine learning (recognising patterns based on historical data to identify tax avoidance behaviour), natural language processing (automated analysis of contracts, comment fields on invoices, and explanatory notes accompanying tax returns), and intelligent elements of robotic process automation (performing routine tasks using decision tree-based or more complex algorithms). [5]

Tax authorities typically apply artificial intelligence in three main areas. The first area is risk analysis and taxpayer selection, during which algorithms filter out which of the millions of VAT and corporation tax returns received show anomalies. This determines which taxpayers are subject to tax audits. Taxpayer services and customer support are the second area in which the tax authority uses artificial intelligence; in this regard, intelligent chatbots and voice-based assistants, which are capable of providing information on tax law, are of particular importance. Although this is less legally binding, the provision of incorrect information raises issues of compensation and legal certainty. The third area where the tax authority and artificial intelligence may intersect is automated decision-making, which is a collective term for simpler procedures where human intervention can be completely ruled out, such as the issuance of certain tax certificates, the automatic imposition of surcharges, or the preliminary scoring of applications for payment deferrals. [6]

5. CONSTITUTIONAL AND FUNDAMENTAL RIGHTS CONCERNS

The rule of law requires the predictability of legal institutions and the pursuit of substantive justice. The use of artificial intelligence by tax authorities creates tensions with fundamental rights charters and constitutional principles on several counts.

5.1. The right to a fair hearing

Article 41 of the Charter of Fundamental Rights of the European Union enshrines the right to a fair administrative procedure, which includes the requirement that the authority handle cases impartially, fairly and within a reasonable time, and that it is obliged to state the reasons for its decisions.

If the preparation of the decision or the decision itself is carried out by an algorithm whose internal logic (weights, neural network connections) remains hidden even from its developers, the taxpayer cannot know why their particular tax return was flagged as suspicious. The right to a fair hearing is infringed if the client does not receive a substantive explanation of the authority’s position, thereby undermining the principle of equality of arms.

5.2. Prohibition of discrimination (Discrimination and bias)

Artificial intelligence-based systems are learning algorithms. If the historical data sets used for training reflect human biases, structural inequalities or past flawed tax authority practices, artificial intelligence will not only replicate these biases but also reinforce them.

One example is where an algorithm learns that tax shortfalls are statistically more common amongst small businesses operating in a particular geographical region or with owners associated with a specific ethnic, cultural or religious background. In such cases, the algorithm may, on the basis of these criteria alone, assign a higher risk score even to taxpayers who are otherwise fully compliant with the law. This violates the requirement of equal treatment. [7]

5.3. Effective exercise of the right to a legal remedy

Decisions by the tax authority may be challenged by means of administrative proceedings or an appeal. An effective remedy requires that the court be able to review both the facts on which the decision is based and the legal conclusions drawn from them.

If the tax authority defends itself in court by arguing that *‘the risk assessment software indicated tax fraud with 98 per cent probability, which is why the proceedings were initiated and why we applied an estimation procedure’*, the court finds itself in a helpless position. If neither the court nor the expert is able to reconstruct the algorithm’s line of reasoning, judicial review becomes a mere formality, and the right to a legal remedy is rendered meaningless.

6. DATA PROTECTION AND INFORMATION SECURITY ISSUES (GDPR COMPLIANCE)

By its very nature, tax administration involves the processing of vast amounts of data. The appetite of AI-based systems for data is in direct conflict with the fundamental principles of the General Data Protection Regulation (GDPR).

Article 22 of the GDPR stipulates that the data subject has the right not to be subject to a decision based solely on automated processing – including profiling – which produces legal effects concerning him or her or similarly significantly affects him or her.

The assessment of tax, the imposition of a tax penalty or the refusal of a tax relief are clearly decisions with significant legal effects. The GDPR allows for exceptions (where permitted by EU or Member State law), but even in such cases, appropriate safeguards must be ensured:

- the data subject’s right to request human intervention,
- the data subject’s right to set out their point of view, and
- the right to challenge the decision.

In tax proceedings, therefore, the so-called *‘human-in-the-loop’* principle must apply. If a tax inspector signs off on a decision generated by an algorithm uncritically, merely as a rubber-stamp, this in fact constitutes prohibited automated decision-making.

Article 5 of the GDPR requires that data processing be purpose-limited and that the amount of data processed be restricted to what is necessary. In contrast, artificial intelligence works best when it receives as much data as possible, including unstructured data (social media profiles, bank transactions, location data, invoice data, partner relationships).

If the tax authority, ‘just to be on the safe side’, feeds every possible digital footprint into its AI-based system without verifying its relevance to the tax category in question, it commits a serious breach of the principle of data minimisation.

Tax legislation in every country strictly protects tax confidentiality. Any data, facts or circumstances that come to the attention of the tax authority are classified as tax secrets.

If the tax authority purchases an artificial intelligence system from an external market participant (a development company) or uses cloud-based infrastructure to analyse data, there is a risk that tax secrecy may be compromised

and made accessible to third parties. The anonymisation or pseudonymisation of data used to train algorithms is essential, but in practice, due to advances in de-anonymisation techniques, this never provides 100 per cent security.

7. SPECIFIC SUBSTANTIVE AND PROCEDURAL ISSUES IN TAX PROCEEDINGS

Tax law is an area of public law based on precise, formal rules. The integration of artificial intelligence into this rigid structure causes numerous operational disruptions. [8]

7.1. The ‘black box’ problem and the duty to state reasons

The tax authority must substantiate any breach of substantive law with facts and evidence. A decision by the tax authority must set out the established facts, the evidence accepted as the basis for those facts, and the legal conclusions drawn from them.

If, on the basis of the weighting matrices of a neural network, it is stated that a given transfer pricing arrangement has an 87 per cent probability of being of a tax-avoidance nature, this does not in itself constitute evidence. Due to the opacity of the algorithm’s internal logic (lack of interpretability), the tax authority is unable to fulfil its obligation to provide reasons if it relies solely on the machine’s output.

7.2. Reversal of the burden of proof and the estimation procedure

In tax law, the general rule is that the burden of proof rests with the tax authority. An exception to this is the estimation procedure, where, if the taxpayer’s records are unsuitable for determining the actual tax base, the authority determines it on the basis of a legal presumption, and the burden of proof shifts to the taxpayer: it is up to them to prove that their income is less than the estimated amount.

There is a risk that the tax authority will automatically interpret ‘statistical anomalies’ flagged by artificial intelligence as evidence of the unreliability of the records, and will initiate assessment procedures without justification. This would lead to a loosening of legal practice, where concrete evidence is replaced by mathematical probabilities.

7.3. The question of the tax authority’s liability for erroneous outputs generated by artificial intelligence

Who is liable if artificial intelligence makes a mistake? If a chatbot gives incorrect tax advice to a taxpayer, who consequently pays less tax, can the taxpayer be exempt from a penalty? (Under the principle of good faith, an error in a state-operated information system cannot be held against the citizen). If, due to an incorrect risk classification by artificial intelligence, a company is barred from VAT refunds for months (causing a liquidity crisis), can the company claim compensation for the damage caused within the scope of administrative law?

The division of liability between the tax authority (as the law enforcer), the software developer (as the manufacturer) and the taxpayer remains an unregulated grey area to this day.

8. INTERNATIONAL PERSPECTIVE

The reality of these theoretical concerns has been painfully confirmed by several international examples in recent years.

One of the most significant cases concerning the use of artificial intelligence in tax administration is that of the Dutch Tax and Customs Administration. The authority used a predictive algorithm called the System Risk Indicator (SyRI) to detect abuse of social benefits and tax relief.

The algorithm identified low-income families with dual nationality as high-risk in a discriminatory manner. As a result, tens of thousands of parents were ordered, entirely without foundation and without justification, to repay huge sums of money, leading to the ruin of families, divorces and suicides.

In 2020, a Dutch court ruled that SyRI violated Article 8 of the European Convention on Human Rights (the right to privacy), and the scandal ultimately led to the resignation of the Dutch government. This case highlighted how the unchecked operation of tax authority algorithms can cause direct social disaster.

The United States Internal Revenue Service (IRS) also makes extensive use of algorithms to audit tax refunds; in this regard, it was subsequently found that the system selected low-income, taxpayers of colour for audit than high-

income, structured entities with more complex tax returns. The reason for this was that it was easier for the software to identify patterns in simpler tax returns than in complex corporate structures, which led to systemic injustice.

9. THE RELEVANCE OF THE ARTIFICIAL INTELLIGENCE ACT (AI ACT) TO TAX PROCEDURES

The EU's AI Act adopts a risk-based approach, classifying AI systems into four categories: unacceptable risk, high risk, limited risk and minimal risk. Although tax software has not automatically been classified as 'prohibited', under Annex III of the AI Act, a significant proportion of systems that support public authority decision-making and affect individuals' fundamental rights and access may be classified as high-risk. This is particularly the case if they are used for profiling, or if they directly affect an individual's creditworthiness or social status – the taxpayer reliability rating (e.g. reliable vs. high-risk taxpayer) falls precisely into this category.

In the event of a high-risk classification, tax authorities, as users of such systems, must comply with extremely stringent requirements; that is, they must establish an appropriate risk management system that continuously monitors the system's operation to filter out any infringements of fundamental rights. Furthermore, within the framework of data governance, the tax authority must ensure that the training data sets are relevant, representative and free from errors (or distortions). Furthermore, the tax authority must guarantee detailed technical documentation – that is, traceability and logging – so that it is possible to verify retrospectively why the machine made a particular decision. At the same time, human oversight must not be neglected, and in this context, interfaces must be designed that enable natural persons to substantively override, halt or modify the operation of the artificial intelligence. [9]

10. PROPOSED SOLUTIONS AND THE ESTABLISHMENT OF A SYSTEM OF SAFEGUARDS

Completely banning artificial intelligence from the tax process is neither a realistic nor a practical option. The aim is to create a regulatory and technological environment (known as a '*regulatory sandbox*' and a 'safeguard network') that combines the benefits of the technology with the minimum standards of the rule of law. During software development, priority must be given to the use of explainable artificial intelligence models. Where possible, more interpretable models (e.g. decision trees, rule-based systems or hybrid models) should be used instead of deep neural networks. Taxpayers have the right to know the key variables underlying a decision and how they are weighted.

Before any artificial intelligence-based risk analysis or decision-support system is put into live operation by the tax authority, an impact assessment carried out by an independent, multidisciplinary panel (comprising lawyers, ethicists and data scientists) must be made mandatory. This assessment is designed to identify any potential discriminatory effects.

It is unacceptable for the tax authority to carry out profiling – which determines the focus of audits – using internal instructions and 'semi-official' algorithms. The main framework for the use of artificial intelligence, the scope of the data used and the procedure for seeking redress must be laid down in the Tax Procedure Act itself, in accordance with the requirements of the enabling legislation.

The algorithms must be audited by an independent external organisation not only at the time of their introduction but also on an ongoing basis (for example, annually) throughout their lifecycle. During this process, test data must be used to check whether 'statistical drift' or hidden discrimination has developed in the system during its operation.

11. CONCLUSION

The use of artificial intelligence in tax proceedings is a double-edged sword. On the one hand, it is in the state's legitimate interest to use state-of-the-art technology to combat tax evaders in order to secure budgetary revenue. [10] On the other hand, such a digital upgrade to the tax authority's arsenal could upset the balance of power between the state and its citizens.

The legal concerns – lack of transparency, the risk of discrimination, a loosening of the burden of proof and conflicts with the GDPR – are not theoretical abstractions, but real threats to the fabric of the rule of law. Future

tax administration cannot do without AI, but the technology must be kept within the framework of the rule of law. This can only be achieved if algorithms are used not as infallible oracles, but as strictly monitored, transparency-bound tools for decision-preparation, where the final say and legal responsibility always rest with the human law enforcement officer.

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