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How constitutional principles pave the way to eXplainable AI in tax law

B?a?ej Ku?niacki (PwC Netherlands, Lazarski University and Singapore Management University) · Friday, February 11th, 2022

1   AI and XAI in tax law   [1][2]

Artificial intelligence (AI) systems are becoming increasingly central in the global economy. According to PWC estimates, they may provide boosts of up to 26% to local economies, which could lead to an increase of USD 15.7 trillion to global GDP. They are also gaining relevance in the context of taxation. AI systems may be used in many different ways by tax teams, both in the private and public sector to boost the efficiency and accuracy of their work, e.g. robotic process automation (RPA) to the automatization of invoice payments (automatically locating, zipping, and uploading files), machine-learning techniques to accelerate the process of analysing tax documentation (identifying the sender and defining the useful information), the performance of benchmarking for transfer pricing purposes (automatic estimation of the extent to which one company or transaction is similar to another one), and forecasting tax risks via adaptive learning (neural networks, deep and reinforcement learning, natural language processing, speech recognition, optical character recognition).

Although AI systems can significantly increase the efficiency and accuracy of tax people, both in private and public sectors, they also trigger high stake risks, since, as the famous adage says: "With great power comes great responsibility". Indeed, the use of AI in many public domains such as healthcare, criminal justice, public education, and taxation has resulted in numerous problems, causing serious damages prompted by lengthy and costly litigations. A high-profile report of Amnesty International highlighted the increasingly important problem of the lack of explainability of algorithmic decision-making systems (including AI systems) in the public domain related to the tax sphere. This report was prompted by the infamous "childcare benefits" (NL: *toeslagenaffaire*) scandal and the SyRI (NL: Systeem Risico Indicatie) case about a digital welfare fraud detection system used by the Dutch tax authorities for risk profiling purposes. The Hague District Court in SyRi case (linked to a similar AI system that the one in *toeslagenaffaire*) concluded that the use of the AI system by the Dutch tax authorities for risk profiling purposes was incompatible with Article 8(2) of the ECHR (i.e., the limitations to the right to respect of private and family life), as the SyRI legislation did not allow for the explainability of the functioning of that system, i.e. did not indicate which objective factual data could justifiably lead to the conclusion that there was an increased risk and that it was also salient in respect of the risk model, the type of algorithm used in the model, and the risk analysis method (§§ 6.87 and 6.106). This case is a powerful illustration that disputes in AI tax-related cases may be solved by the courts against the use of non-explainable

AI systems due to the principles of fundamental values, such as those enshrined in the ECHR or in many constitutions. Certainly, AI systems that automate governmental tasks may continue to cause serious problems, unless the proper actions are taken at the appropriate time by the entities involved in the design, deployment, application and supervision of AI systems to ensure that they may be applied only in a responsible way (responsible AI systems).

The research shows that one of the most fundamental principles of responsible AI is explainability. In fact, most of the currently released scientific and governmental guides on AI indicate explainability as a crucial component of AI. In short, given a certain audience, the explainability of an AI system refers to the details and reasons an eXplainable AI (XAI) system gives to "make its functioning clear or easy to understand."

The literature distinguishes between interpretable (transparent) models and model interpretability techniques (post-hoc explainability). This duality pertains to the explainability methods used to solve the transparent box design (how to design an AI system to be interpretable/transparent by design) against the methods explaining the black box (how to design an AI system to explain another AI opaque system). That is to say, for black box AI systems, the creation of a standalone XAI system is needed (a kind of post-hoc explainability), while XAI is an inherent feature of white box AI systems. Still, as clarified above, in some instances even white box AI systems require additional explanations if the stakeholders are unable to understand them in a meaningful way, i.e. a way understandable to them considering their prior knowledge, experiences, and mental processes.

Of course, much more could be written about the technical side of XAI, but the above paragraphs appear to be sufficient for the purposes of this piece. Everything said above is also relevant to XAI in tax law. Given that different explanations are likely to serve different purposes and are therefore likely to be appropriate for different stakeholders, the XAI in tax law mainly differ in comparison to other XAI in that it aims to generate explanations relevant to the three groups of target stakeholders – taxpayers and their advisors, tax officers and tax judges. Special emphasis should be put on taxpayers, since they are the most vulnerable stakeholders in the world of AI in tax law, i.e. they may be subject to tax and even criminal liability (the detection of tax frauds) as a result of the application of AI systems.

The remainder of this piece focuses on the constitutional requirements for the explainability of AI systems in tax law. This issue is not obvious, as the discussion about the legal requirements of XAI in law, including tax law, usually narrows down to the General Data Protection Regulation (GDPR) – the right to an explanation (Articles 12, 14 and 15) and the right of human intervention (Article 22), and the European Convention on Human Rights (ECHR) – the right to a fair trial (Article 6) and the prohibition on discrimination in conjunction with the protection of property (Article 14 in conjunction with Article 1 of the additional Protocol No. 1 to the ECHR). With this short contribution, I attempt to ignite a discussion on the constitutional aspects of XAI in tax law, more specifically in light of the requirements of certainty and predictability in tax law.

2   How constitutional principles pave the way to XAI in tax law

On a very fundamental level, every constitution ensures the principle of "no taxation without representation", which arises out of the rule of law in the area of taxation. For example, Article 34 of the French Constitution states that "Statutes shall determine the rules concerning the base, rates and methods of collection of all types of taxes; the issuing of currency." Similarly, Article 217 of

the Polish Constitution stipulates that "The imposition of taxes, other public levies, the determination of entities, subjects of taxation and tax rates, as well as the rules for granting reliefs and remissions and the categories of entities exempted from taxes shall be effected by statute." These constitutional provisions explicitly require statutory provisions for the imposition, calculation and levying of any tax. As a result, the legislators have sole authority not only to determine the general principles of tax law, but also to decide on every detail of tax collection. This means that the executive power, including agencies such as tax administrations, have almost no authority over tax law, apart from executing the tax law made by the legislators. In addition, in light of constitutional principles, tax provisions and their execution have to be clear, precise, accessible and reasonably intelligible to all users, as well as being amenable to disputes in public courts. Tax provisions and their execution must also be at least subject to express and clear legal safeguards to protect taxpayer rights, meaning that civil servants will have to be shorn of any discretionary powers related to tax provisions.

These constitutional requirements for tax provisions and their application are universal and arise from the constitutional principles of legal certainty and predictability. At the level of applying tax provisions, the tax authorities must be accountable. This accountability manifests, among other things, by applying the tax provisions in accordance with the constitutional principles that require administrative decisions of tax authorities to be understandable by the taxpayers, i.e. the decisions of tax authorities must be sufficiently clear, precise, and predictable as regards their effects on taxpayers (similar requirements follow from the principle of legal certainty sanctioned under EU law in the CJEU case law). This means that there is an explicit link between XAI and the accountability of tax decisions generated by AI systems used by the tax authorities to automate their decisions – only explainable AI systems are capable of ensuring responsible decision making by the tax authorities. At the end of the day, the tax provisions that regulate the use of AI systems by tax administrations are not immune to them, which means that the tax administration is constitutionally responsible for miscalculations of taxes or the misidentification of tax risks resulting from their use. Such mistakes may follow from coding errors (bugs) that are inevitable parts of coding lines of every AI system.

Coding errors that produce incorrect or unexpected results in software systems may be non-negligible, i.e. "about 1–25 errors per 1000 lines of code." At the same time, finding bugs in AI systems related to taxation is extremely time-consuming and expensive, because it requires close interaction between tax experts and programmers in order to properly test such systems. In addition, testing AI systems can be effective at identifying bugs, but it is hopelessly inadequate for showing their absence. Even in AI systems that have been tested very well, various kinds of error in their software can occur at the empirically observed average rate of about one error per hundred lines of code. Bearing in mind that some software have millions or even billions of lines of code, the risk of a miscalculation of taxes or a misidentification of tax risks by the tax administrations with the use of AI systems is very high. Of course, such a risk is not tolerable under the constitutional requirements concerning the sphere of taxation, which demand that all details of taxation are as transparent as possible, as well as being precise and predictable both at the level of statutory law and its execution.

Such observations have recently gained a strong jurisprudential support; namely, the Slovak Constitutional Court in its judgment of 17 December 2021 in eKasa case implicitly supported the need for explainability of AI systems in light of constitutional principles by stating that "[t]he law restricting fundamental rights must be specific enough to make its application predictable" (§122) and that "[t]he application of technological progress in public administration cannot result in an

impersonal state whose decisions are inexplicable, unexplained and at the same time no one is responsible for them" (§127). The Slovak Constitutional Court also emphasised that the AI systems used by tax administrations must be ex-ante (pre-implementation) and ex-post (post-implementation) effectively supervised, including the access to inputs or assessment criteria, access to the logic of the decision or individual assessment and whether the automated assessment uses patterns, models or other databases that lead to a particular decision (§§ 137-138). Clearly, the effective supervision of AI systems is impossible without their explainability.

In light of the above constitutional considerations, it appears that an essential feature of an AI system related to taxation must be its explainability. Only a sufficient level of explainability of an AI system may ensure that its use is compatible with constitutional principles. From a purely legal perspective, it follows from the fact that the execution of tax law must be as transparent and precise as possible for taxpayers. Even if the transparency and precision of the execution of tax law must sometimes be compromised for the sake of effectiveness in preventing tax frauds, this compromise must be well justified, and the justification must be proportional to the goals pursued (striking a balance between various interests of tax authorities and taxpayers). From a technological point of view, the more explainable an AI system is, the easier, cheaper, faster and more accurate it is to identify and eliminate bugs in the software used to run the system. Building XAI may have a severe impact on velocity early on in the process, but also saves time by identifying bugs that would not normally be identified until a later point in time, thereby causing more severe and irreversible consequences to various stakeholders, including society as a whole. For example, Amnesty International reported on the use of an AI system (the risk classification model, SyRI) by the Dutch tax authorities that led to discriminatory results, leaving many people "with mental health issues and stress on their personal relationships, leading to divorces and broken homes." Clearly, sufficient explainability appears to be an essential feature of all constitutionally compliant AI systems in the tax domain.

B?a?ej Ku?niacki, Assistant Professor in Tax & Technology at the Amsterdam Centre for Tax Law, School of Law, University of Amsterdam (Amsterdam, the Netherlands); Research Assistant Professor at Lazarski University (Warsaw, Poland) and Deputy Director for Strategic Tax Advice and Dispute Resolution at PwC Poland and Member of PwC Global Tax Policy Team.

[2] This post was originally published at the blog "Digital Constitutionalist: The Future of Constitutionalism" (https://digi-con.org/how-constitutional-principles-pave-the-way-to-explainable-ai-in-tax-law) and is reposted here with the permission of its co-founder Marco Almada.

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