O uso da inteligência artificial na fiscalização tributária e a opacidade algorítmica: o caso do Sistema de Seleção Aduaneira por Aprendizado de Máquina – SISAM[*]

The use of artificial intelligence in tax auditaction and algorithmic opacity: the case of the Customs Selection System Through Machine Learning – SISAM

El uso de la Inteligencia Artificial en la fiscalización tributaria y la opacidad algorítmica: el caso del sistema de selección aduanera por aprendizaje de máquina – SISAM

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Resumo

O presente artigo traz reflexões sobre o tema da opacidade algorítmica nos sistemas de inteligência artificial – IA utilizadas pela Administração Tributária Brasileira por meio da análise do caso concreto do Sistema de Seleção Aduaneira por Aprendizado de Máquina – Sisam, em uso pela Receita Federal do Brasil desde o ano de 2014. Os temas centrais debatidos são o conceito de Administração Tributária, sua relação com o Princípio da Eficiência Administrativa e a aplicação massiva do Direito Tributário; os conceitos básicos da IA e o funcionamento do Sisam; a problemática da opacidade algorítmica, por parte da Administração Tributária, defronte aos princípios constitucionais brasileiros atinentes à transparência administrativa e, por fim, a verificação, no caso elegido para análise, do respeito às garantias constitucionais no que tange à referida Transparência, essencial no âmbito do Estado Democrático de Direito. Utiliza-se, para tanto, o método dedutivo, tratando-se de uma pesquisa aplicada, qualitativa e exploratória, tendo por *corpus* a pesquisa bibliográfica e documental, com estudo de caso. A hipótese de trabalho é que a falta de transparência absoluta do funcionamento dos algoritmos do Sisam não ofende, *a priori*, garantias dos contribuintes, pela necessidade de resguardo de sigilo acerca de critérios fiscalizatórios.

Palavras-chave: direito tributário, tecnologia, eficiência administrativa, inteligência artificial, administração tributária, opacidade algorítmica.

Abstract

This article brings reflections on the topic of algorithmic opacity in artificial intelligence systems - AI used by the Brazilian Tax Administration through the analysis of the specific case of the Customs Selection System through Machine Learning – SISAM, in use by the Brazilian Federal Revenue Office since 2014. The central topics discussed are the concept of Tax Administration, its relationship with the Principle of Administrative Efficiency and the massive application of Tax Law; the basic concepts of AI and the functioning of SISAM; the problem of algorithmic opacity, on the part of the Tax Administration, in face of the Brazilian constitutional principles regarding Administrative Transparency and, finally, the verification, in the case chosen for analysis, of the respect for constitutional guarantees

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regarding the aforementioned Transparency, essential in the scope of the Democratic Rule of Law. For this purpose, the deductive method is used, with an applied, qualitative and exploratory research, having as a corpus the bibliographic and documentary research, with a case study. The hypothesis of this article is that the lack of absolute transparency in the functioning of the SISAM algorithms does not, a priori, offend the taxpayers' guarantees, due to the need to protect the confidentiality of tax audit action criteria.

Keywords: *tax law, technology, administrative efficiency, artificial intelligence, tax administration, algorithmic opacity.*

Resumen

El presente artículo trae reflexiones sobre el tema de la opacidad algorítmica de los sistemas de inteligencia artificial – IA utilizadas por la Administración Tributaria Brasileña por medio del análisis del caso específico del Sistema de Selección Aduanera por Aprendizaje de Máquinas – SISAM, usado por la Agencia Tributaria de Brasil (Receita Federal) desde el año de 2014. Los temas centrales debatidos son el concepto de Administración Tributaria, su relación con el Principio de la Eficiencia Administrativa y la aplicación masiva del Derecho Tributario; los conceptos básicos de la IA y el funcionamiento del SISAM; la problemática de la opacidad algorítmica, por parte de la Administración Tributaria, delante de los principios constitucionales brasileños relacionados a la Transparencia Administrativa y, por fin, la verificación, en el caso elegido para análisis, del respeto a las garantías constitucionales a lo que se refiere a la Transparencia, esencial en el ámbito del Estado Democrático de Derecho. Se utiliza, para tanto, el método deductivo, tratándose de una investigación aplicada, cualitativa y exploratoria, teniendo por corpus la búsqueda bibliográfica y documental, con estudio de caso. La hipótesis de trabajo es que la falta de transparencia absoluta del funcionamiento de los algoritmos del SISAM no ofende, a priori, garantías de los contribuyentes, por la necesidad de resguardo de confidencialidad acerca de criterios de fiscalización.

Palabras clave: *derecho tributario, tecnología, eficiencia administrativa, inteligencia artificial, administración tributaria, opacidad algorítmica.*

1 Introduction

In the context of the so-called fourth industrial revolution (Schwab, 2019), the use of artificial intelligence (AI) as a tool in various fields of human activity has become common, including in the legal field (Doneda *et al*., 2018). As a result, the use of the expression "artificial intelligence" became fashionable (Casadei; Pietropali, 2021), a *buzzword*, with its entry into the daily lexicon with approximate meanings and, sometimes, incorrectly, especially at the conceptual level (Casadei; Pietropali, 2021, p. 219).

In the context of Tax Law, this is not the case: there is great potential for the use of AI as an instrument of efficient tax inspection, with the intensification of its use by the tax administrations of many countries (Faundez-Ugalde, Mellado-Silva; Aldunate-Lizana, 2020, p. 2-4), including Brazil.

The issues raised by the transformations related to information technologies no longer represent an area limited to specific sectors of study, such as, for example, the so-called Digital Law (Pinheiro, 2016); because in a society characterized by the ubiquity of the digital and technology, reflections emerge, on the one hand, on the impacts on the living conditions of individuals and on intersubjective and social relations and, on the other hand, on the activities and functioning of institutions. This situation raises very interesting questions, whether in a philosophical, political, ethical, cultural, or legal dogmatic approach (Corchia, 2013). Its implications for the application of the Law are still something to be unveiled,

especially when compared with the guarantees that the legal system grants to taxpayers in the tax legal relationship. The development of new technologies is today, without a doubt, one of the elements with the greatest impact in the incessant process of changes in Law. In general, "technique" introduces new forms of enjoyment of rights that, thus, bring to light new profiles of freedoms that have already been consolidated or also give rise to new rights (Scagliarini, 2021, p. 3). One of the points to deserve careful scientific reflection refers to the so-called algorithmic opacity. In fact, it is not uncommon for the operation of the algorithms involved in AI processing to be deliberately concealed by the State, for example, by confidentiality agreements in relation to software developers, or even for such operation not to be fully understood by the Tax Administration itself, in the face of correlations and deductions carried out through the so-called *machine learning* that are unattainable – to human comprehension –, machine learning that is becoming increasingly common (Faúndez-Ugalde; Mellado-Silva; Aldunate-Lizana, 2020, p. 6).

Be it one case or the other, there is a clear deficit of transparency that seems, at first, not to be consistent with the principles that are vectors of the Democratic Rule of Law (Corchia, 2013). As an appropriate case for reflection, there is the Customs Selection System by Machine Learning – Sisam, adopted by the Federal Revenue of Brazil (RFB) as a tool in the scope of customs inspection, which presents as a paradigm in the country the use of AI with machine learning resulting from data mining – *data mining* – by the Tax Administration, due to its wide use in the last eight years (Jambeiro Filho, 2015, p. 24; Köche, 2021, p. 189).

Analyzing this paradigm case, the objective of this study is to reflect on the limits that our legal system imposes on algorithmic opacity in the scope of tax inspection, analyzing the specific case of Sisam: the algorithm makes it possible to supply the necessary motivation of administrative acts, having a Transparent and controllable operation?

To achieve this general objective, we have divided this article into sections in which the following will be analyzed: (i) the concept of Tax Administration and its relationship with the Principle of Administrative Efficiency and the massive application of Tax Law; (ii) the basic concepts of AI and the functioning of Sisam; (iii) under the general aspect, the problem of algorithmic opacity, on the part of the Tax Administration, in the face of the Brazilian constitutional principles related to administrative transparency; (iv), finally, the verification, in the case chosen for analysis, of respect for constitutional guarantees with regard to said Transparency, essential within the scope of the Democratic Rule of Law.

To this end, we will use the deductive as a method of approach, being an applied, qualitative and exploratory research that will use as a *corpus* the bibliographic and documentary research, with a case study, according to the classification of research methods recommended by Gil (2020).

As hypotheses to be verified in the scope of this research, there is the possible incompatibility of the algorithmic opacity of Sisam with the dictates of the Brazilian legal system

or its adequacy, due to the need to safeguard the inspection criteria regarding the use of AI by the Tax Administration.

2 Tax Administration, Administrative Efficiency and Mass Law

The Tax Administration, the portion of the Public Administration focused on the management of taxation is, in the words of Schier (2016, p. 61), essential "for the functioning of the State", to which item XXII of article 37 of the Constitution of the Republic of 1988 expressly alludes, in view of its importance in the collection of "resources to fund the activities necessary for the due fulfillment" of the State's objectives (Bacelar Filho, 2008, p. 80).

The prominent role that the Constitution gave to the Tax Administration and its essentiality seem to stem "from the fact that, through its activity, there will be financing from the State, from the Public Administration, as a state apparatus, but also from the activities that should be carried out by the State" (Schier, 2016, p. 59).

Obviously, in view of the choice of the federative form of State, the existence of "one" Tax Administration in Brazil could not be affirmed, in view of the multiplicity of bodies of the Union, Member States, Municipalities and the Federal District that have such a function (Cunha, 2021, p. 232), although, obviously, there is great normative harmonization and joint and collaborative action (Schier, 2016, p. 61).

As it is part of the state apparatus, there does not seem to be any doubt that it is up to the Tax Administration to observe the Principle of Administrative Efficiency, enshrined in the *caput* of article 37 of the Federal Constitution. It should be noted, however, that the study of the Principle of Administrative Efficiency, in the tax field, is not very in-depth by the national doctrine (Cunha, 2021, p. 237), even though it has been an essential concern of economics, since at least Adam Smith (1996, p. 262-264). As Caliendo (2009, p. 70) states, "[...] Efficiency is the process that produces the greatest amount of results with the least use of means." In this sense, several authors who have focused on the subject identify the correct interpretation of "administrative efficiency" in the tax area with the notion of "good administration" predicated by scholars of Brazilian Administrative Law, based on the Italian doctrine (Martins, 2006, p. 31-32; Pasin, 2006, p. 180; Rodrigues, 2006, p. 107), which requires not only productivity, but full compliance with constitutional principles and taxpayer guarantees[1].

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[1] Here it should be noted that the principle of "good administration" is found in Article 97, paragraph 2, of the Italian Constitution: "Public offices shall be organized in accordance with the provisions of the law, so as to ensure the smooth running and impartiality of the administration." This principle is understood as an expression of the "progress of the Public Administration". For a deeper understanding of the relationship between the principles of good administration and reasonableness in administrative law, as well as their development linked to the impartiality of the administration and administrative efficiency, as opposed to the excess of power, see: Stamille [in press].

Be that as it may, if, on the one hand, with regard to the Tax Administration, efficiency and the best service to citizens are sought, on the other hand, the "'financial and fiscal health' of the State" is sought, with extreme relevance to fiscal balance, of which Complementary Law No. 101/2000, the Fiscal Responsibility Law – LRF (Bacellar Filho, 2008, p. 90-91; Cunha, 2021, p. 231-233). In this context, the activities carried out by civil servants working in tax collection are integrated, in the managerialist view, in the list of "exclusive activities of the State" (Bacellar Filho, 2008, p. 98; Cunha, 2021, p. 231-233), including, therefore, within the so-called main activities of the State, to be exercised by it directly, by its servants, within the institutional framework the so-called Managerial Reform of the State (Bresser-Pereira, 1998, p. 182; Cunha, 2021, p. 231-233; Lima Junior, 1998, p. 95-103).

The tax reality, however, brings interesting challenges, since the Tax Administration needs to apply tax rules to thousands or millions of cases per year – depending on the sphere of government – in a context of limited resources – be it time, personnel, financial, *etc*.

It is no coincidence that for a considerable time the doctrine of Tax Law has indicated, as one of the characteristics of this legal area, the fact that it is a "mass right" – *massenrecht* – (Nabais, 2004, p. 336-337; Novoa, 2006, p. 331; Velloso, 2007, p. 2; Velloso, 2010, p. 263), in the sense that it is a legal area in which the State needs to apply the law, in a perennial way, to thousands or millions of analogous situations, which challenges the State's capacity to apply general and abstract rules to a multiplicity of similar cases, with intense stress on the inspection system than the German doctrine, initially replicated in Brazil by Derzi (2007), he agreed to call it a "state of administrative necessity", which would be one of the justifications for the use of tax practicability techniques (Cunha, 2021, p. 347; Derzi, 2007, p. 338-339).

This reality of massive application of legal rules requires, on the part of the Tax Administration, an equally massive action, generating the ideal context for the wide use of artificial intelligence – AI, which, without doubt, becomes a tool for greater efficiency in the performance of the Tax Administration (Bichara; Montenegro, 2020, p. 283-284).

After all, since the large number of calculations that an AI can do is superior to that of human beings, its use brings, also in the tax area, a greater number of *outputs* with less use of resources, which is, by definition, an efficient performance, as it performs "infinitely more complex analyses and at a speed unfeasible for human cognition" (Lietz, 2021, p. 68).

It is, however, necessary to inquire about the negative externalities resulting from its use, with regard to the guarantees granted by the Brazilian legal system to taxpayers. After all, the technological revolution has determined the emergence of new subjectivities in the network, the renewal of Public Administration, and an impact on the world of work that, thus, undergoes transformations that we can define as structural (Vantini, 2021, p. 91). Multiple decisions, in different contexts, are increasingly delegated to algorithmic procedures: for this purpose, a distinction is made between (i) decisions *based* on algorithms, that is, decisions

that are totally human, but based, in whole or in part, on algorithmic calculations; (ii) decisions *guided* by algorithms, situations in which there is human intervention, but which are made mainly based on algorithmic procedures; and (iii) decisions *determined* by algorithms, that is, those taken automatically based on the results of algorithmic procedures, without any human intervention (Vantini, 2021, p. 91 *et seq.*), the so-called "automated decisions". In this way, an algorithmic governance or an "algocracy" is outlined, which can potentially subordinate the State to the dictates of technique or technology (Danaher et al., 2017).

To this end, let us first analyze a concrete case of use of AI by the Federal Tax Administration Brazilian: Sisam.

3 The Customs Selection System by Machine Learning – Sisam: example of the use of artificial intelligence with the application of *machine learning* by the Brazilian Tax Administration

Around the world, the Tax Administration has used various technological resources to fulfill its functions related to tax inspection (Caliendo, 2020a, p. 465; I got married; Pietropaoli, 2021), including AI tools, a situation that is also notable in the case of Brazil (Lietz, 2021, p. 60-65), considered one of the countries with the most advanced tax technology in the world (Köche, 2021, p. 187).

The term artificial intelligence appeared for the first time in 1956, at the conference, "The Dartmouth College Artificial Intelligence Conference", in the sense of understanding whether or not learning mechanisms can be described precisely enough so that they can be formalized, making it possible to build a machine capable of simulating them (Casadei; Pietropaoli, 2021, p. 219 *et seq.*).

As Bigaton (2021, p. 27-31) points out, despite dating back to Alan Turing's investigations in the mid-19th century, In the last century, there is no unanimity regarding the concept of AI among experts, and there is even a ambiguous use of such an expression with the term "algorithm". To establish a semantic pact, we can adopt McCarthy's concept (2007, p. 2):

> AI is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI is not confined to methods that are biologically observable.[2]

AI is composed of algorithms and other computer applications, also having data as

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2 Author's free translation. Original version: "*AI is the science and engineering of making intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable*".

inputs (Bigaton, 2021, p. 55). Artificial intelligence has three levels of basic uses, namely: data organization, decision-making aid, and decision automation (Bigaton, 2021, p. 45-46).

It cannot be forgotten that when talking about the use of such technology today, we are dealing with the so-called "weak AI", in which machines act as if they were intelligent (Lietz, 2021, p. 57; Russell; Norving, 2013) and specific or restricted, related to application in a specific field or problem (Bigaton, 2021, p. 47; Lietz, 2021, p. 58).

The notions of machine learning, *data* science, *data mining, and big* data are *very present concepts in the use and development of AI*.

Machine learning, which has been made possible by the continuous development of processors, is a subfield of AI; it is a technique that "would aim to provide computers with the ability to learn without having been programmed" (Bigaton, 2021, p. 56), in a kind of self-programming that has three categories: supervised learning, unsupervised learning, and reinforcement learning (Bigaton, 2021, p. 58). Data science "aims to extract meaningful and useful patterns from data sets", through the technique called "data mining", in a context of enormous data processable by computerized systems, composing what is called *big data* (Bigaton, 2021, p. 63).

As mentioned, the Brazilian Tax Administration has been using AI for a long time, as a way to optimize the inspection activity, with several examples (Jarude, 2020, p. 79-92; Lietz, 2021, p. 65). Among them, the case of the Customs Selection System by Machine Learning – Sisam stands out, which uses the elements listed above of *machine learning*, *big data* and *data mining*.

Sisam, "is the first artificial intelligence of widespread use in the RFB" (Jambeiro Filho, 2015, p. 24; Köche, 2021, p. 189), being "an intelligent cognitive system [...] applied in the inspection of the entry and exit of commercial goods in ports and airports" (Abraham; Catarino, 2019, p. 201).

Sisam's machine learning system is fed by the large RFB database, formed by the history of import declarations – DIs, such as their releases by tax auditors and their rectifications presented by importers (Jambeiro Filho, 2015, p. 19; Machado Segundo, 2020, p. 66).

It is noted, therefore, that the existing data, since at least 1997 in the Integrated Foreign Trade System – Siscomex (Lietz, 2021, p. 71), serve as a basis – an impressive example of *big data* – for SISAM's continuous learning. As stated by Jarude (2020, p. 89), "[t]he system learns from the history of declarations and estimates the probability of about 30 types of errors that may be present in each new declaration submitted".

It is interesting to note that Sisam not only serves as a support for human decisions, made by the RFB's tax auditors, but also has the ability to select, on its own, DIs for verification, making automatic decisions that are less precise than human decisions, but with greater quantity, in addition to being able to create an interactive mesh system with the taxpayer (Jambeiro Filho,

2015, p. 42), which is why it is denoted that it acts not only by organizing data, but also assisting human decision-making with the ability to make automated decisions, reaching all levels of basic uses of AI.

As Lietz (2021, p. 72) explains, "Sisam, in summary, analyzes in real time each item of all import declarations registered in Brazil and detects typical customs clearance infractions".

It should be noted that, as in other cases within the scope of the administrative tax procedure, the import declaration is submitted by the importer and must be subject to analysis by the Tax Administration. As the analysis capacity of this is never sufficient for detailed verification of all the statements – and

It can be said that the cost for individualized analysis of *all* of them would be unfeasible and more expensive than the amount to be collected – historically a sample inspection is used, with some selection criteria that may indicate problematic cases, as also occurs, for example, in the so-called Income Tax Tax Mesh.

Computerization, which has been occurring gradually, has allowed the increasingly improved cross-referencing of data – accumulated year by year. The step taken by the use of Sisam is impressive because it allows the continuous learning of AI with the uninterrupted entry of data and decisions made by tax auditors to achieve the possibility of an automated screening of cases to deserve detailed analysis.

And it is this possibility of automated administrative decisions rendered through an AI system with machine learning that brings very interesting legal issues to deserve scientific reflection.

4 Algorithmic opacity and administrative transparency

4.1 The use of AI in the face of the duty of administrative transparency

The use of AI in the legal field brings relevant and interesting jusphilosophical and pragmatic questions, as it allows "the automation of decision-making in various complex situations, performing tasks that we were used to considering as human prerogatives derived from intelligence" (Doneda *et al*., 2018, p. 2). The face of the Public Administration, one of the protagonists of society's reference processes, is changing. The profound impact of new technologies on people's lives and on organizations in general is at the origin of the evolution of Public Administration, which is essential to respond effectively to the needs expressed by society.

And, as seen, it is noted that Tax Law, with its aforementioned nature of mass law, is a privileged field for the good – or bad – use of automated decisions, which make it possible to reduce the pressure of applying tax legislation to a large universe of taxpayers and cases –

which undoubtedly meets the aforementioned efficiency. Therefore, there is the perfect scenario for the wide use of AI technologies to support the Tax Administration (Souza and Siqueira, 2020, p. 22)

One of the relevant aspects for legal reflection – and ethics in general – when it comes to the use of AI is the problem arising from algorithmic opacity (Fiorigio, 2021). This question can be broken down into levels.

Initially, even if it is an AI whose algorithms are fully known by its programmers and by the user Tax Administration, there may be a situation in which the algorithms and the way they work in data processing are deliberately hidden by the State due to, for example, existing confidentiality agreements with the developers of the program (Faúndez-Ugalde; Mellado-Silva; Aldunate-Lizana, 2020, p. 6; Fioriglio, 2021).

There is a deeper and more worrying level of opacity, however, especially when it comes to the state's use of AI. In cases of present machine learning capacity, there may be a situation in which the functioning of the algorithms is not fully understood by the Tax Administration itself, in the face of correlations and deductions made by the machine in the context of machine learning that are unattainable – to human comprehension (Faúndez-Ugalde; Mellado-Silva; Aldunate-Lizana, 2020, p. 6; Fioriglio, 2021). This is the case of the so-called *black box*, the "black box of optimization", considering that the "algorithm is fed with certain data to achieve a result, without perfectly understanding how the computer reached the conclusion it reached" (Peixoto; Silva, 2019, p. 100).

The situation is made more serious by the lack of transparency when there are automated decisions, a situation in which not even programmers can adequately explain how the decisions were made (Faúndez-Ugalde; Mellado-Silva; Aldunate-Lizana, 2020, p. 6; Fioriglio, 2021).

There seems to be no doubt about the potential problems that algorithmic opacity brings to values dear to our constitutional system. The lack of precise knowledge about how AI reasoning works and the possibility of errors and biases inherent in automated decisions (Faúndez-Ugalde; Mellado-Silva; Aldunate- Lizana, 2020, p. 6) do not seem to be in line, *prima facie*, with the constitutional guarantees of full defense and adversarial proceedings, with an eventual deficit to due process; administrative decisions, eventually taken on the basis of algorithmic black boxes, also do not seem to reconcile well with the necessary motivation of administrative acts; finally, the very notion of administrative transparency seems to be opposed to secrecy especially when referring to acts that potentially lead to the attainment of property private taxation, as is the case with taxation.

It is known that the concept of transparency is vague and flexible, although it can be understood, in the scope of Administrative Law, as the right of citizens to see how a public choice is made, its necessary elements, as well as its motivations (Andresani; Stamile, 2018,

p. 458-460).

Administrative transparency is a requirement of the notion of republic. An action of administrative opacity is, *prima facie*, incompatible with the democratic rule of law. As Canhadas (2018, p. 137) states:

> Thus, it can be said that the principle of transparency is a logical corollary of the republican principle. It is from the latter that transparency derives directly, with an umbilical and inseparable link between the two principles. And although hierarchically inferior, transparency works as one of the greatest guarantees of the republican principle, giving it effectiveness and concreteness. In fact, there is no true republic without transparency, there is no need to speak of a republican form of government that does not excel in administrative transparency.

Such transparency is an integral part of the notion of due process of law, when dealing with administrative proceedings. After all, in Bottallo's (2006, p. 42) summary, due process of law encompasses the "right to be heard and the right to offer and produce evidence". Being heard encompasses the right to know (publicity), in addition to the opportunity to express reasons before and after the decision (double degree of judgment), the duty of reasoned decisions and the right to be represented by a qualified professional (Bottallo, 2006, p. 42).

In this sense, for Justen Filho (2005, p. 225), the principle of administrative publicity prohibits secret activities, with exceptions, and the exercise of power is accessible to general knowledge, even for verifying the fairness of acts, an order of ideas also defended by Mello (2013, p. 117).

As a prerequisite for the control of the legality of administrative acts and for the effective exercise of the full defense and adversarial procedure, there is the principle of motivation of administrative acts, which "implies for the Administration the duty to justify its acts, pointing out the legal and factual foundations" (Mello, 2013, p. 115).

As a corollary of that order of principles, it seems to follow from the very nature of the public activity carried out by the Tax Administration and the need to concretely guarantee means for a full defence and the adversarial procedure, the need for transparency regarding the criteria and procedures used by AI in the context of automated decisions.

Thus, the evolution of digital Public Administration is based on and is based on some pillars: transparency, openness, and data protection (Faini, 2021, p. 17). It is no coincidence that the European Union (2018/2019) considers that its transparency is a requirement for a solid AI, as Lietz (2021, p. 112) also recalls. And this requirement is also part of the Judiciary's policy for the use of AI, as can be seen from the provision of article 11 of Resolution No. 332, of August 21, 2020, of the National Council of Justice – CNJ, which

requires wide publicity on the use of such tools: "Article 11. The National Council of Justice will publish, in its own area of its website on the world wide web, the list of Artificial Intelligence models developed or used by the bodies of the Judiciary".

More precisely on the subject of algorithmic opacity, the aforementioned Resolution provides:

> Art. 8 For the purposes of this Resolution, transparency consists of: [...]
> VI – provision of a satisfactory and auditable explanation by human authority regarding any proposal for a decision presented by the Artificial Intelligence model, especially when it is of a judicial nature.
> Article 19. Computer systems that use artificial intelligence models as an auxiliary tool for the preparation of judicial decisions will observe, as a preponderant criterion to define the technique used, the explanation of the steps that led to the result.

It is noteworthy the CNJ's commendable concern with the transparency of the functioning of algorithms in the context of the use of AI by the Judiciary, with the establishment of ethical premises that try to prevent the emergence of *black boxes*. There is, to date, no similar regulation applicable to Brazilian tax administrations, But the *ratio* provided for partially automated judicial decisions seems to be completely replicable to fully or partially automated administrative decisions.

And it is in this sense that the provision of article 20 of Federal Law No. 13,709, of August 14, 2018, the General Data Protection Law – LGPD (Brazil, 2018), is in this sense:

> Article 20. The data subject has the right to request the review of decisions made solely on the basis of automated processing of personal data that affect his or her interests, including decisions aimed at defining his or her personal, professional, consumer and credit profile or aspects of his or her personality.
> Paragraph 1 - The controller shall provide, whenever requested, clear and adequate information regarding the criteria and procedures used for the automated decision, observing commercial and industrial secrets.
> Paragraph 2 - In case of failure to provide the information referred to in paragraph 1 of this article based on the observance of commercial and industrial secrets, the national authority may carry out an audit to verify discriminatory aspects in the automated processing of personal data.

This provision, in the view of Pinheiro (2021, p. 111) clearly refers to the use of robots in decision-making in data processing, ensuring that, if such a tool has been used, a form of review of decisions and knowledge of its criteria must be guaranteed.

There is, *a priori*, no reason to rule out the application of such a provision of the LGPD to administrative decisions in which there is automated processing of data from individuals. It should be noted, however, that such a duty of algorithmic transparency is not absolute, and there is an explicit exception in paragraph 2, final part, of article 20 of the LGPD and, at least, one case in which, due to the dictates of our legal system and the peculiarities of the state's inspection activity, it can be said that there is an implicit exception.

Let us deepen the analysis of such exceptional cases.

4.2 Commercial and industrial secrecy as an express exception to full algorithmic transparency

The LGPD expressly provides that the data controller has the duty, when so requested, to provide clear and adequate information about the criteria and procedures used for automated decisions, as can be seen from the provision of paragraph 1 of article 20 of the law, which results in a duty of transparency about the operation of the algorithms used in the field of artificial intelligence.

However, the controller, according to the same provision, must observe the "commercial and industrial secrets", in a caveat that is explained in paragraph 2 of the aforementioned legal provision, which provides for the case of non-provision of information in the event, a situation in which the controller is subject, alternatively, to an audit by the National Data Protection Authority – ANPD, to verify any discriminatory aspects in the processing of data. The secrecy of business activities encompasses the "protection of data recorded in business books, telephone bills, bank and tax documents" (Negrão, 2012, p. 270). In particular, creations of commercial and industrial relevance find explicit protection as an individual guarantee in article 5, item XXIX, of the Federal Constitution, which provides that the "protection of industrial creations, the ownership of trademarks, the names of companies and other distinctive signs, in view of the social interest and the technological and economic development of the country". This is a protection dear to our legal system, which also has repercussions in relation to the breadth of the of application of the LGPD, as can be seen.

The rule of national legislation, therefore, is that of algorithmic transparency, except in cases of protection of commercial or industrial secrets, a situation in which an alternative obligation arises: subjection to an audit by the ANPD.

Potentially, this protection may be included in a contractual clause, signed by an entity of the Public Administration and the creator of the AI tool, which is being used for tax inspection purposes, as a way of protecting its intellectual property rights in the creation of software products, under the terms of Federal Law No. 9,609, of February 19, 1998 (Brazil, 1998), being perfectly applicable as an exception to the transparency rule referred to in the LGPD.

4.3 Supervisory criteria as an implicit exception to full algorithmic transparency

It is presumable, in all fields of state police power, the impossibility of monitoring the entirety of the universe of potentially illicit facts, which would require – if an army of inspectors were not enough to make the activity financially unfeasible – true powers of state omnipresence and

omniscience.

Hence, there is a need to elect inspection criteria that prioritize what is considered most relevant, leaving the entire set of facts that will not be inspected subject to the expectation of spontaneous compliance with the rules by their addressees. For this to be feasible without having to rely only on their eventual moral rectitude, it is necessary to have at least the potential risk that the unlawful facts may be discovered and penalized.

One can imagine, therefore, the reason why inspection bodies in general should not share in detail the criteria used for the exercise of their mission. It is that, knowing these exactly, it would also be possible to know with a high degree of probability which unlawful facts would be outside of potential inspection and, therefore, would be – in fact – outside the field of normative application and without risk of penalty. Such a situation would lead to a considerable increase in regulatory non-compliance, due to the lack of risk of sanction. Thus, the very effectiveness of the norms is therefore at stake.

That is to say: for state inspection to be effective in the midst of a scenario in which not everyone will be effectively inspected due to the scarcity of resources or the virtual material impossibility of them being inspected, it is of its very nature the impossibility of full knowledge of the selection criteria used by the State. It should be noted that if the entirety of the selection criteria for inspection were known by the potential inspected, the possibility of creating strategies to evade inspection would also be open, which is why which contradicts the very télos of such state activity.

Hence, if it is not possible to defend the secrecy of the inspection procedure, which contradicts basic principles of the Rule of Law, it seems quite reasonable that the entirety of the criteria used for the selection of those who will be inspected should not be widely disclosed, under penalty of rendering the state's inspection capacity insubsistent. Therefore, it can be said that a notion of absolute transparency is applicable in this case, not an absolute but a tempered one. It is no coincidence that, in the scope of Criminal Procedural Law, the possibility of secrecy of investigations is defended, one of its foundations being the efficiency of such state action, that is, the search to guarantee its possibility (Cavalcanti, 2017).

Obviously, this does not advocate the possibility of secret investigations in the administrative tax sphere, but only the impossibility of unrestricted disclosure of criteria for selecting the universe of cases that will be investigated, as this relative secrecy is inherent to the very nature of such inspection activity.

This premise seems to us to be perfectly applicable to the operation of AIs used in tax inspections. If transparency regarding its use by the Tax Administration and about the general criteria of its operation seem essential to guarantee administrative transparency – after all, as stated by Elgemann *et al.* (2020, p. 50), the more transparent an AI, the better the acceptability of its use – technical details of the functioning of algorithms could lead to

paradoxical situations in relation to the objectives of the very supervisory function they serve. If there were total algorithmic translucency, it would be possible, in the extreme, a reverse engineering that would allow those inspected to hide from the automated selection criteria, with the generation of blind spots that are not consistent with the necessary effectiveness of legal norms.

For this reason, this seems to be an implicit case of exception to the transparency rule of paragraph 1 of article 20 of the LGPD, by the same *ratio* applicable to the defeatability of the rule based on business secrets, duly adapted to the peculiarities of the Public Administration.

If, however, the case is tempered algorithmic transparency, the Tax Administration would be subject to the audit of the National Data Protection Authority (ANPD), as provided for in paragraph 2 of the aforementioned legal article, which guarantees the existence of a controlling body, with technical knowledge that would allow avoiding possible abuses and biases in the use of AI.

5 Sisam, machine decisions and algorithmic opacity

As previously exposed, Sisam is an AI system that works as a tool to support the activity of the tax audit of the Federal Revenue of Brazil in the control of customs operations, with the ability to make automated decisions.

The philosophical and legal consequences of state decisions made by machines are considerable, with ethical issues of various kinds, which impact individual rights, whether in terms of autonomy, equality or personality rights (Doneda *et al.*, 2018, p. 4), taking into account that algorithms are neither technically nor ethically neutral (Fioriglio, 2021, p. 55).

Sisam "is capable of analyzing all import declarations in real time" with "a significant hit rate" (Lietz, 2021, p. 86), having enormous data analysis capacity that corroborates the potential of using AI as an instrument to guarantee compliance with administrative efficiency in the midst of mass relations. This system also indicates aspects of the taxpayer's declaration with a risk of error, directing the inspection and, therefore, producing concrete administrative effects that, if they serve efficiency well, may end up biasing the analysis through algorithmic discrimination backed by statistics, which is a problem that should be a matter of concern (Caliendo, 2020b, p. 504; Jarude, 2020, p. 62). In the face of the growing use of algorithms for decision-making, there is a risk that in addition to old discriminations (social, cultural, economic, gender, *etc.)* being accentuated, new forms of prejudice will also emerge. From this perspective, the contributions offered by Critical *Data Studies* or Critical Data and Algorithmic *Studies* highlight the need to reflect on the risks related to the use of data and algorithmic decision-making in order to explore the potential of algorithms to

combat the inequities they produce or reproduce, that is, seeking to use the algorithms themselves as weapons to service of transparency and algorithmic fairness (Iliadis; Pirosa, 2021; Russo, 2016; Vantin, 2021, p. 109).

As far as the present study is concerned, it is noted that the Federal Revenue of Brazil deliberately maintains secrecy about the operation of Sisam's algorithms, as an inspection strategy so that the universe of possible inspected parties cannot predict in which situations they will be selected:

> [...] In addition to supporting the decisions of inspectors, Sisam has the ability to automatically select DIs for conference channels, occupying part of the space of Siscomex's parameterized selection. This feature is not yet in production, but it is implemented and works using the decision theory that recommends the selection of cases with the highest expectation of return and the theory of games that recommends being unpredictable for the opponent, making draws weighted by the expectation of return. This does not allow anyone to feel comfortable, keeping themselves below Sisam's radar. [...] (Jambeiro Filho, 2015, p. 42)

It is, therefore, a clear example of algorithmic opacity challenging compliance with due process and the need for administrative transparency: strictly speaking, the criteria and decision-making procedures of AI will be unknown to taxpayers.

This is a situation considered offensive to the principles of our legal system, in the view of Bichara and Montenegro (2020, p. 294), who consider it essential "to disclose the criteria adopted in the development of the codes used in state action", which underlies "a minimum assumption in a Democratic State of Law, in which transparency must prevail". Although this conclusion may be the subject of debate, the diagnosis of these authors seems to be accurate: "[...] In the absence of greater transparency in the use of algorithms that define the taxpayer to be inspected, and of a minimum normative discipline on the subject, the debate on the limits of the use of sophisticated technologies by the tax authorities is urgent".

And, with this in mind, it is appropriate to inquire about the validity or not of algorithmic opacity in relation to Sisam.

At first, although it is an AI system that uses machine learning, it is not embodied in a "black box", as the exact functioning of its algorithms and the steps taken in decisions are known in detail by the Federal Revenue of Brazil, according to information provided by one of the creators of the system:

In the development of Sisam, there was a concern with the auditability of the system, which in addition to the usual explanations, can produce a *complete log* of its reasoning. Most artificial intelligences do not have the same concern. They are black boxes. So, at least, we are moving in a positive direction. (Jambeiro Filho apud Köche, 2021)

The question that remains, therefore, refers to the lack of knowledge of these criteria on the part of the subjects tax liabilities.

As previously stated, we consider that tempered transparency in relation to the technical details of the operation of algorithms used by the Tax Administration is the most appropriate with regard to the inspection selection criteria, under penalty of making a tabula rasa of the very terms of the inspection procedure, being an implicit exception to what is provided for in paragraph 1 of article 20 of the LGPD.

This premise seems to us to be completely applicable to the case of Sisam.

In addition to this line of reasoning, it must be taken into account that this is a matter of selecting the universe of taxpayers to be inspected or, at most, of automated decisions in the initial stages of the inspection procedure, validated by human tax auditors, decisions that must be, under penalty of nullity, motivated. There will be the possibility, in the continuity of the administrative tax proceeding and to guarantee the full defense and adversarial proceedings, of presenting defenses and administrative appeals that will serve as a tool to control the legality of administrative acts, and it is possible to state that at no time will the taxable person have been penalized or deprived of his assets without due process of law – in full compliance with the guarantee of article 5, LIV, of the Constitution of the Republic.

This tempered transparency is what Pasquale (2017) calls "qualified transparency", a middle ground between "complete algorithmic secrecy" and "complete public disclosure", extremes that may not be appropriate, depending on the situation. It is achievable by the analysis and certification, by expert authorities, about the security, quality, validity and reliability of the system (Pasquale, 2017), which seems to be exactly the case of the alternative applicable to the case, that is, the audit of the system by the ANPD based on paragraph 2 of article 20 of the LGPD. It should be noted, however, that, even if this alternative solution were ideal, there is, so far, no external control in relation to Sisam (Köche, 2021, p. 198), in an evident deficit of transparency in the use of AI by of the Federal Tax Administration.

6 Conclusion

In this article, we seek to bring initial reflections on the topic of algorithmic opacity of AI systems used by the Tax Administration, in the context of the increasing use of this technology in the scope of tax inspection, which is faced with the need to strictly comply with the Principle of Legality and to meet administrative efficiency, in the midst of massive tax relations. To this end, we analyzed the specific case of Sisam, a software used by the Federal Revenue of Brazil in the customs field since 2014.

We found that, regarding this system, there is a deliberate lack of public disclosure in relation to the way the algorithms work, which causes a clear tension in relation to the duty

of administrative transparency that should govern, as a rule, state action at all levels of the Brazilian Federation.

We found that the issue of algorithmic opacity has been a matter of concern in the regulation of AI, as can be seen from normative acts of the European Union and the CNJ on the matter, as well as from the provision of article 20 of the LGPD. We identified that such lack of transparency may result from existing confidentiality agreements with the program's developers or from the lack of knowledge about the operation of the algorithm with machine learning, which configures the so-called "black boxes", a worrying situation, especially when it comes to systems that serve to support administrative decisions – perhaps issuing them in an automated way.

We agree that paragraphs 1 and 2 of article 20 of the LGPD exempt cases subject to business secrecy from the duty of transparency, placing them under the ANPD's audit scrutiny.

We came to the conclusion that the same reasoning of a "tempered transparency" would be applicable in cases where the full opening of the operation of AI could cause damage to the state's supervisory function, contrary to the very reason for its existence, by allowing the universe of taxable persons, potentially, to be hidden from automated selection criteria, with the generation of blind spots that are not consistent with the necessary effectiveness of legal norms. With this, there would be an implicit case of exception to the transparency rule of paragraph 1 of article 20 of the LGPD, by the same *ratio* applicable to the defeatability of the rule based on business secrets, duly adapted to the peculiarities of the Public Administration, which would be subject, in this case, to the ANPD's audit.

In the case of Sisam, there is an AI system with machine learning that does not configure an algorithmic "black box", since its reasoning is fully known to the Federal Revenue of Brazil, and, due to the need to safeguarding the confidentiality of inspection criteria, we conclude that tempered transparency is applicable subject to the audit of the national data protection authority.

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