Article

The Use of Emerging Technologies in Out of Court Dispute Management Procedures: International Legal Approach and Regulatory Challenges

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KEYWORDS:

Advanced analytics, artificial intelligence, tax administration, digitisation, digital transformation, algorithmic governance

ABSTRACT:

This article presents a study that examines the self-declared deployment of advanced analytics (AA) and artificial intelligence (AI) across thirteen tax administrations in Latin America and the Caribbean (LAC), incorporating Spain as an external comparative benchmark. Using self-reported information from the Organisation for Economic Co-operation and Development's (OECD) *Inventory of Tax Technology Initiatives* (ITTI), the study conducts a cross-sectional descriptive-comparative analysis of analytical infrastructure, specific technologies, functional use cases, and mechanisms of algorithmic governance. The findings show a regional consolidation of data infrastructure, a selective adoption of AI concentrated in risk and compliance-control functions, and a partial formalisation of ethical and technical oversight mechanisms. Overall, the results empirically distinguish between data digitalisation and institutional algorithmic maturity, revealing structural heterogeneity in the region's self-declared AI deployment.

PALABRAS CLAVES:

Analítica avanzada, inteligencia artificial, administración tributaria, digitalización, transformación digital, gobernanza algorítmica

RESUMEN:

Este artículo presenta un estudio que analiza el despliegue declarado de analítica avanzada (AA) e inteligencia artificial (IA) en trece administraciones tributarias de América Latina y el Caribe (ALC), incorporando a España como *benchmark* comparativo externo. Utilizando información autodeclarada contenida en el Inventario de Iniciativas Tecnológicas Tributarias (Inventory of Tax Technology Initiatives, ITTI) de la Organización para la Cooperación y el Desarrollo Económicos (OCDE), se desarrolla un análisis descriptivo-comparativo transversal de infraestructura analítica, tecnologías específicas, casos de uso funcional y mecanismos de gobernanza algorítmica. Los resultados evidencian una consolidación regional de infraestructura de datos, una adopción selectiva de IA concentrada en funciones de riesgo y control, y una formalización parcial de mecanismos éticos y de supervisión técnica. Los resultados permiten distinguir empíricamente entre digitalización de datos y madurez algorítmica institucional, mostrando heterogeneidad estructural en el despliegue declarado de IA en la región.

MOTS CLES :

Analyse avancée, intelligence artificielle, administration fiscale, numérisation, transformation numérique, gouvernance algorithmique.

RESUME :

Cet article présente une étude qui analyse le déploiement déclaré de l'analytique avancée (AA) et de l'intelligence artificielle (IA) au sein de treize administrations fiscales d'Amérique latine et des Caraïbes (ALC), en intégrant l'Espagne comme référence comparative externe (benchmark). À partir d'informations autodéclarées contenues dans l'Inventaire des initiatives de technologie fiscale (Inventory of Tax Technology Initiatives, ITTI) de l'Organisation de coopération et de développement économiques (OCDE), l'étude développe une analyse transversale descriptive-comparative portant sur l'infrastructure analytique, les technologies spécifiques, les cas d'usage fonctionnels et les mécanismes de gouvernance algorithmique. Les résultats mettent en évidence une consolidation régionale des infrastructures de données, une adoption sélective de l'IA concentrée sur les fonctions de risque et de contrôle, ainsi qu'une formalisation partielle des mécanismes éthiques et de supervision technique. Ils permettent de distinguer empiriquement la numérisation des données de la maturité algorithmique institutionnelle, révélant une hétérogénéité structurelle du déploiement déclaré de l'IA dans la région.

Contents:

1 INTRODUCTION

The digitisation of tax administrations has evolved from the automation of operational processes to the incorporation of advanced analytics (AA) and artificial intelligence (AI) tools, as part of broader digital transformation processes (OECD, 2020, 2024b, 2025a). The OECD has documented this evolution through the Inventory of Tax Technology Initiatives (ITTI). This instrument collects information on technology tools and digitalisation solutions implemented by tax administrations and enables a comparative examination of emerging technologies in this field (OECD, 2024a, 2025a).

This article addresses the following research question: What is the level of self-reported deployment of advanced analytics and artificial intelligence in tax administrations in Latin America and the Caribbean, and how does it compare structurally with Spain?

The study adopts a strictly descriptive-comparative approach to examine patterns of technology adoption, functional breadth, and algorithmic governance mechanisms reported by tax administrations themselves.

2 CONCEPTUAL FRAMEWORK

From an analytical perspective, it is first necessary to distinguish between digitisation and digital transformation. While related, these concepts are conceptually separable. In a previous article, this distinction was developed in the context of tax administration: digitisation was associated with the conversion and digital management of data and processes, whereas digital transformation was framed as a broader organisational and strategic change process. It was also argued that digitisation can constitute an enabling condition or an initial stage within wider digital transformation trajectories (Pires, 2023).

This differentiation is consistent with the specialist literature. Gradillas and Thomas (2025) systematise the conceptual distinction between digitization and digitalization in innovation management literature, while Vial (2019) conceptualises digital transformation as an organisational change process driven by digital technologies. Accordingly, in this study, digitisation is understood as an enabling foundation for digitally mediated capabilities and processes, whereas digital transformation refers to broader changes in the organisation, functions, and public value generation within tax administration (Gradillas & Thomas, 2025; Pires, 2023; Vial, 2019).

Building on this, it is also necessary to distinguish between digital infrastructure, advanced analytics (AA), and artificial intelligence (AI), as they correspond to different — though related — levels of the digitisation and digital transformation process in tax administrations. This differentiation is consistent with both the recent literature on tax administration's digital transformation and the conceptual architecture underpinning the OECD's measurement instruments for tax technology initiatives (OECD, 2024a, 2025a).

In this study, digital infrastructure is conceptualised as the enabling base for data management, quality, availability, and interoperability within tax administration, aligned with the OECD's "data management and standards" approach (OECD, 2020, 2024b, 2025a). Advanced analytics is understood as the systematic application of statistical methods to transform data into actionable management inputs and to support tax decisions and processes (OECD, 2016, pp. 3, 17-18). Artificial intelligence is treated as a specific category of algorithmic deployment with governance implications, consistent with recent literature on tax and customs administrations (Aslett et al., 2024; OECD, 2025a, 2025b).

Accordingly, digital infrastructure comprises enabling capabilities for data management, including storage, processing, integration, security, and information visualisation. Operationally, this layer provides the foundation for more complex analytical capabilities,

digital services, and automation processes. In the tax domain, these capabilities are particularly relevant given the volume, sensitivity, and heterogeneity of the data administered (OECD, 2020, 2024b, 2025a).

On this basis, AA is the systematic use of more complex analytical techniques to strategically exploit data for segmentation, prediction, pattern detection, anomaly identification, and decision support. In this sense, AA is not reducible to a single technology; it integrates a set of capabilities and methods - including business intelligence tools, more sophisticated data analytics, and, in some cases, algorithmic techniques - aimed at transforming data into usable information for tax management (OECD, 2016, 2025a).

Within this ecosystem, AI constitutes a specific category associated with algorithmic deployment, particularly when administrations report using machine learning, recommendation systems, virtual assistants, or other automated applications. Conceptually, AI can be understood as a subset or specific layer within the spectrum of advanced analytical capabilities, but it does not automatically equate to all forms of advanced analytics. This precision matters because it avoids conflating the development of analytical capabilities with the effective adoption of AI (Aslett et al., 2024; OECD, 2025a, 2025b).

Accordingly, the existence of AA capabilities does not necessarily presuppose the effective use of AI. This distinction is central to interpreting the study's empirical results, as it allows differentiation between: (i) enabling analytical infrastructure; (ii) reported general use of AI; (iii) functional AA/AI use cases; and (iv) governance and oversight mechanisms. Methodologically, this separation avoids treating as equivalent levels of institutional maturity that relate to distinct dimensions of the digital transformation process (OECD, 2024a, 2025a).

It is worth highlighting that the incorporation of AI in the public sector introduces an additional dimension: algorithmic governance. This dimension is particularly relevant in tax administrations, as they are not limited to providing general services; they exercise public authority, produce direct legal effects for taxpayers, and administer sensitive information at scale. In this context, the use of algorithmic systems is not only a technical issue, but also an institutional, legal, and public policy matter (OECD, 2025b).

AI applications in tax administration may affect functions such as risk assessment, case selection for audit, fraud detection, assistance to officials, and the automated provision of information to taxpayers. While these applications can strengthen analytical capacity and operational efficiency, they also raise additional requirements for public control, due process, and traceability, especially where algorithmic outputs influence administrative actions with tax consequences (Aslett et al., 2024; OECD, 2025b).

For these reasons, in the tax domain, and for descriptive and empirical operationalisation purposes in this study, algorithmic governance is approximated through three minimum components: (a) explicit recognition of limitations or risks in the use of AI; (b) the existence of ethical frameworks or formal guidelines to steer its use; and (c) technical oversight mechanisms such as source code review, review of inputs, probing and testing, and monitoring of outputs. These components do not exhaust the normative discussion, but they enable a comparative empirical approximation consistent with the self-reported information contained in the ITTI (OECD, 2024a, 2025a, 2025b).

In this context, the adoption of AI in tax administrations cannot be assessed solely in terms of efficiency or technological modernisation, but also in relation to its alignment with principles of legality, proportionality, transparency, public accountability, and procedural safeguards inherent in the exercise of tax functions. This perspective supports interpreting technological deployment not only as a technical capability, but also as part of a broader process of institutional transformation.

3 METHODOLOGY

3.1 DESIGN

Cross-sectional descriptive-comparative study based on self-reported secondary data.

3.2 DATA SOURCE

The OECD Inventory of Tax Technology Initiatives (ITTI) was used, corresponding to the version dated 1 October 2025 (18:35:11), downloaded on 16 February 2026 from the OECD's official platform, to ensure traceability of the version employed (OECD, 2024a, 2025a).

3.3 SAMPLE DELINEATION

The sample comprised thirteen countries in Latin America and the Caribbean (LAC) with information available in the OECD ITTI: Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay. In addition, Spain was incorporated as an external comparative benchmark jurisdiction, given its long-standing institutional links with the region's tax administrations - particularly through technical co-operation programmes promoted by the Inter-American Center of Tax Administrations (CIAT) - as well as its track record of technical co-operation with CIAT and its inclusion in international initiatives and comparative frameworks on tax administration digitisation and data analytics (Centro Interamericano de Administraciones Tributarias [CIAT], n.d.; Agencia Estatal de Administración Tributaria [AEAT], 2022). Spain is also included in the ITTI used, ensuring empirical comparability. Jurisdictions were selected solely based on data availability in this source; no additional discretionary inclusion or exclusion criteria were applied.

3.4 DATA TREATMENT

For each variable, the responses reported in the ITTI were identified. For the variables presented in Tables 1 and 2, the inventory reports responses for 100% of the sample; coding therefore distinguished Yes (affirmative response) and No (no affirmative response reported for the relevant variable). The analysis compared reported presence/absence across countries, without constructing composite indices, to avoid aggregations that could distort the interpretation of individual variables.

For presentation purposes, Tables 3 and 4 are restricted to LAC jurisdictions that report general use of AI and, therefore, have reported responses for functional and governance variables. Accordingly, the absence of the remaining countries in these tables is interpreted as data not reported due to the instrument's structure, not as an analytical exclusion.

3.5 CRITERIA FOR SELECTING VARIABLES AND TABLES

Variables were selected from the ITTI in line with conceptual criteria defined in the study's conceptual framework (advanced analytics and AI dimensions). Comparative tables were constructed based on this selection. Variable traceability is provided in the notes to each table and in Annex 1.

3.6 LIMITATIONS

The study has limitations arising mainly from the self-reported nature of the source used (ITTI-OECD) and the descriptive-comparative approach. In particular, results should be interpreted as self-reported deployment rather than as external verification of existence, intensity, or operational maturity. In addition, for certain dimensions (use cases and governance), data availability is conditional on reporting general use of AI, which restricts universal comparability for those tables. Finally, the study does not assess performance, impacts, biases, effectiveness, or institutional coverage of AA/AI use, avoiding causal or normative inferences.

4 RESULTS

4.1 ANALYTICAL INFRASTRUCTURE AND GENERAL USE OF AI

The empirical evidence shows that analytical infrastructure is highly consolidated in Latin America and the Caribbean. All thirteen countries analysed - Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay - report the use of business intelligence tools, reflecting the widespread adoption of institutional data visualisation and analysis capabilities.

Regarding big data implementation, ten countries - Argentina, Brazil, Chile, Colombia, Cuba, Guatemala, Honduras, Mexico, Paraguay, and Peru - report having associated capabilities, whereas three countries - Costa Rica, Ecuador, and Uruguay - do not report such capabilities. This pattern confirms broad, though not universal, penetration of advanced data infrastructure in the region.

By contrast, reported general use of artificial intelligence is significantly lower. Only five LAC countries - Brazil, Colombia, Costa Rica, Cuba, and Ecuador - report using AI, while eight countries - Argentina, Chile, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay - do not report AI use. This distribution indicates that consolidated digital infrastructure does not automatically translate into algorithmic deployment.

In Spain's case, business intelligence, big data capabilities, and general AI use are reported, placing it among the jurisdictions with the greatest breadth of reported technological adoption. Nonetheless, the regional contrast reveals a structural gap between consolidated digital infrastructure and selective algorithmic deployment, both in LAC and in the European benchmark jurisdiction analysed.

Table 1. *Analytical infrastructure and general use of AI (LAC–Spain)*

Country	Big data capabilities	Business intelligence and visualisation tool	Artificial intelligence (AI)
Argentina	Yes	Yes	No
Brazil	Yes	Yes	Yes
Chile	Yes	Yes	No
Colombia	Yes	Yes	Yes
Costa Rica	No	Yes	Yes
Cuba	Yes	Yes	Yes

Country	Big data capabilities	Business intelligence and visualisation tool	Artificial intelligence (AI)
Ecuador	No	Yes	Yes
Guatemala	Yes	Yes	No
Honduras	Yes	Yes	No
Mexico	Yes	Yes	No
Paraguay	Yes	Yes	No
Peru	Yes	Yes	No
Uruguay	No	Yes	No
Spain	Yes	Yes	Yes

Own elaboration based on variables Q_LR_Q39 (Big data capabilities), Q_AT_Q38-SQ002 (Enterprise-wide business intelligence and visualisation tool), and Q_LR_Q48 (Use of artificial intelligence), ITTI (OECD). "Yes" indicates an affirmative response reported; "No" indicates no affirmative response reported for the relevant variable.

4.2 SPECIFIC ADVANCED ANALYTICS TECHNOLOGIES

The empirical evidence shows a progressive decline in adoption as technological complexity increases, particularly when moving from general advanced analytics tools to more advanced algorithmic techniques.

Regarding machine learning, only four LAC countries - Brazil, Colombia, Cuba, and Guatemala - report its use, while nine countries - Argentina, Chile, Costa Rica, Ecuador, Honduras, Mexico, Paraguay, Peru, and Uruguay - do not report adoption in this category. This distribution confirms that machine learning is not a widespread practice in the region.

For network analysis, a higher level of penetration is observed. Nine LAC countries - Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, and Mexico - report their use, whereas four countries - Honduras, Paraguay, Peru, and Uruguay - do not report application of this technology. The breadth of this category suggests that network analysis functions as an intermediate tool between data infrastructure and the adoption of more complex algorithmic models.

With respect to a DataOps approach, five countries - Brazil, Colombia, Ecuador, Guatemala, and Mexico - report implementation, while Argentina, Chile, Costa Rica, Cuba, Honduras, Paraguay, Peru, and Uruguay do not report adoption in this dimension. The lower relative frequency of a DataOps approach indicates that institutionalisation of integrated data management and advanced analytics processes remains selective in the region.

In Spain's case, machine learning and network analysis are reported, but not a DataOps approach. Comparatively, Spain falls within the group of jurisdictions with the greatest breadth of reported technological adoption, while also sharing with the region the absence of universal uptake of higher-complexity technologies.

Overall, the results show that, while data analysis exhibits high penetration in LAC, technologies associated with machine learning and advanced operational integration of data remain more restricted, reinforcing the existence of a technological gradient within self-reported deployment.

Table 2. *Specific technologies reported (LAC–Spain)*

Country	Machine learning	Network analysis	DataOps approach
Argentina	No	Yes	No
Brazil	Yes	Yes	Yes
Chile	No	Yes	No
Colombia	Yes	Yes	Yes
Costa Rica	No	Yes	No
Cuba	Yes	Yes	No
Ecuador	No	Yes	Yes
Guatemala	Yes	Yes	Yes
Honduras	No	No	No
Mexico	No	Yes	Yes
Paraguay	No	No	No
Peru	No	No	No
Uruguay	No	No	No
Spain	Yes	Yes	No

Own elaboration based on variables Q_AT_Q40-SQ004, Q_AT_Q40-SQ005, and Q_AT_Q40-SQ006 of the ITTI (OECD). Within block Q_AT_Q40, only technologies directly associated with advanced analytical techniques or their operational support (machine learning, network analysis, and a DataOps approach) were included, excluding general infrastructure or non-analytical automation technologies (e.g., cloud storage or robotic process automation), to preserve conceptual coherence with the definition of advanced analytics adopted in the study. "Yes" indicates an affirmative response reported; "No" indicates no affirmative response reported for the relevant variable.

4.3 FUNCTIONAL AI USE CASES

Among the five LAC countries that report general use of AI - Brazil, Colombia, Costa Rica, Cuba, and Ecuador - functional AI use cases are concentrated primarily in risk assessment processes (Brazil, Colombia, Cuba, and Ecuador) and detection of tax evasion and fraud (Brazil, Colombia, Costa Rica and Cuba). To a lesser extent, the use of virtual assistants (Brazil, Colombia, and Costa Rica) and assistance to tax officials in making administrative decisions (Brazil and Colombia) is reported, pointing to a deployment oriented toward analytical support rather than decisional substitution.

Dispute resolution and the other uses category are reported exclusively in Brazil. None of the LAC countries reports AI applications aimed at automated provision of personalised information to stakeholders or ensuring the integrity of tax administration systems/processes. Likewise, no administration reports making recommendations for actions or making final administrative decisions in the region.

In Spain's case, reported deployment includes risk assessment processes, detection of tax evasion and fraud, virtual assistants, assistance to tax officials in making administrative decisions, and making recommendations for actions. However, Spain also does not report

automated provision of personalised information, ensuring the integrity of the tax administration system/process integrity, dispute resolution, or making final administrative decisions. Comparatively, Spain shows greater reported functional breadth, particularly through the inclusion of recommendations, while, like LAC, it shares the absence of full decisional automation.

Table 3. *Reported functional AI use cases (LAC–Spain)*

Country	Automated provision of personalised information to stakeholders	Virtual assistants	Risk assessment processes	Detection of tax evasion and fraud	Assistance to tax officials in making administrative decisions	Making recommendations for actions	Making final administrative decisions	Dispute resolution	To ensure the integrity of tax administration systems / processes	Other
Brazil	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes
Colombia	No	Yes	Yes	Yes	Yes	No	No	No	No	No
Costa Rica	No	Yes	No	Yes	No	No	No	No	No	No
Cuba	No	No	Yes	Yes	No	No	No	No	No	No
Ecuador	No	No	Yes	No	No	No	No	No	No	No
Spain	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Own elaboration based on all variables in block Q_AT_Q48x1-SQ (SQ001-SQ010) of the ITTI (OECD), corresponding to functional AI use cases reported by tax administrations. The table includes only jurisdictions with at least one reported functional AI use case. "Yes" indicates an affirmative response reported; "No" indicates no affirmative response reported for the relevant variable.

4.4 AI GOVERNANCE AND OVERSIGHT MECHANISMS

The empirical evidence shows that technological adoption is not uniformly accompanied by formal institutionalisation, particularly with respect to ethical frameworks and structured mechanisms of algorithmic oversight.

First, the five LAC countries that report general AI use - Brazil, Colombia, Costa Rica, Cuba, and Ecuador - report limitations on its application, suggesting a shared institutional perception of the need for safeguards or restrictions in AI use.

However, a specific ethical framework for the application of AI is reported only in Brazil and Colombia, while Costa Rica, Cuba, and Ecuador do not report such an instrument. This pattern confirms that recognising limitations does not necessarily translate into formal ethical institutionalisation.

Regarding technical oversight mechanisms, the evidence is more restrictive. Reviewing AI source code is reported only in Cuba, while Brazil, Colombia, Costa Rica, and Ecuador do not report this practice. Reviewing AI input information (data/texts) is not reported by any of the LAC countries considered in this table. Probing and testing AI responses is reported only in Brazil, while Colombia, Costa Rica, Cuba, and Ecuador do not report this practice. Monitoring AI outputs is not reported by any of the five countries analysed. Finally, other oversight approaches are reported only in Brazil.

In Spain's case, limitations on AI use and the presence of a formal ethical framework are reported. However, no operational technical oversight mechanisms are reported among the observed variables (source code review, input review, probing and testing of responses, output monitoring, or other approaches). Comparatively, Spain aligns with Brazil and Colombia in terms of reported ethical formalisation, but without reported operational technical oversight mechanisms in the variables analysed.

Overall, the results show a heterogeneous and, operationally, limited configuration of algorithmic governance in LAC, characterised by general recognition of limitations, partial ethical institutionalisation, and a low presence of reported technical oversight mechanisms. The comparison with Spain reinforces the idea that ethical formalisation can coexist with limited reporting of operational control practices, confirming the distinction between technological deployment and the institutional consolidation of algorithmic governance.

Table 4. *Reported AI governance and oversight (LAC–Spain)*

Country	Limitations on the use of AI	Ethical framework for the application of AI	Reviewing AI source code	Reviewing AI input information (e.g. data, texts)	Probing and testing AI responses	Monitoring AI outputs	Other approaches
Brazil	Yes	Yes	No	No	Yes	No	Yes
Colombia	Yes	Yes	No	No	No	No	No
Costa Rica	Yes	No	No	No	No	No	No
Cuba	Yes	No	Yes	No	No	No	No
Ecuador	Yes	No	No	No	No	No	No
Spain	Yes	Yes	No	No	No	No	No

Own elaboration based on variables Q_LR_Q48x2, Q_LR_Q48x3, and variables in block Q_AT_Q48x4x1-SQ (SQ001-SQ005) of the ITTI (OECD), corresponding to reported mechanisms of AI governance, control, and oversight. "Yes" indicates an affirmative response reported; "No" indicates no affirmative response reported.

5 COMPARATIVE TYPOLOGY

The descending sequence observed in the results - from consolidated analytical infrastructure to selective AA/AI adoption and partial formalisation of governance mechanisms - supports the construction of the following descriptive typology:

Table 5. *Comparative typology of the self-reported deployment of AA and AI (LAC)*

Group	Technical characterisation	Countries
I	Expanded AA/AI deployment: consolidated analytical infrastructure, general AI use, multiple functional use cases and the presence of a formal ethical framework; with limited and heterogeneous coverage of operational technical oversight mechanisms.	Brazil, Colombia
II	Selective AI adoption within consolidated analytical infrastructure, with limited functional diversification and partial governance (recognition of limitations, absence of a formal ethical framework and minimal or unreported technical oversight).	Ecuador, Cuba, Costa Rica
III	Reported analytical infrastructure (business intelligence and/or big data) without reported general AI use in the ITTI; with possible reporting of specific advanced analytics tools, without implying general institutional AI deployment.	Argentina, Chile, Guatemala, Honduras, Mexico, Paraguay, Peru, Uruguay

The typology is constructed only for the LAC jurisdictions included in the sample. Spain is excluded from the regional typology because it is used as an external comparative benchmark and is analysed separately in the text.

Based on this typology, Group I - Brazil and Colombia - concentrates the highest level of reported functional AA/AI deployment. Both countries combine consolidated analytical infrastructure, general AI use, and multiple functional applications (risk, fraud, virtual assistants, and support to officials), together with reported formal ethical frameworks. However, operational technical oversight mechanisms are not symmetrical: Brazil reports probing and testing of responses and other oversight approaches, whereas Colombia reports no operational technical mechanisms in the oversight variables observed, despite reporting limitations and a formal ethical framework. This result confirms that ethical formalisation and functional deployment do not necessarily imply broader technical oversight.

Group II - Cuba, Costa Rica, and Ecuador - is characterised by selective AI adoption in specific areas within consolidated analytical infrastructure, with limited functional diversification. Although all three countries report limitations on AI use, none report formal ethical frameworks. In terms of technical oversight, reporting is limited: Cuba reports reviewing AI source code, while Costa Rica and Ecuador report no operational oversight mechanisms in the variables analysed. Overall, the group reflects partial governance, with recognition of limits but low ethical institutionalisation and scarce technical oversight.

Group III - Argentina, Chile, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay - reports analytical infrastructure (business intelligence and/or big data) but does not report general AI use, indicating the existence of enabling capabilities without reported general institutional AI deployment in the ITTI, even where specific advanced analytics tools may be reported.

The typology is strictly descriptive and is based on the reported intensity of AA/AI functional deployment and the configuration of observed governance elements, without implying normative ranking or qualitative assessment of institutional performance.

By comparison, Spain shows expanded AA/AI deployment and greater reported functional breadth - including making recommendations for actions - together with a formal ethical framework. Nevertheless, it does not report operational technical oversight mechanisms among the variables observed (e.g., source code review, input review, probing and testing of responses, output monitoring, or other approaches). As in LAC, it also does not report making final administrative decisions, confirming that deployment remains within the sphere of analytical support.

6 CONCLUSIONS

The empirical evidence analysed shows that tax administrations in Latin America and the Caribbean display significant consolidation of analytical infrastructure - particularly business intelligence and big data capabilities - while exhibiting heterogeneity in the self-reported deployment of advanced analytics and artificial intelligence (AA/AI) and only partial formalisation of institutional governance mechanisms. In this context, self-reported digital transformation does not necessarily equate to institutional algorithmic maturity.

The comparison with Spain as an external benchmark shows that, although it reports greater functional breadth in AA/AI use - including decision-support applications and making recommendations for actions - it also does not report final decisional automation. Furthermore, while Spain reports limitations on AI use and a formal ethical framework, it does not report operational technical oversight mechanisms among the variables observed (e.g., source code review, input review, probing and testing of responses, output monitoring, or other approaches). This comparison reinforces the idea that AI adoption in the tax domain, even in institutionally advanced settings such as Spain, remains predominantly within analytical support functions rather than full decisional automation.

The study identifies a structural distinction between data digitisation and the effective adoption of artificial intelligence, providing a regional comparative systematisation based exclusively on self-reported information from the tax administrations included in the inventory analysed and, in the sample, defined in Section 3.3.

Specifically, the empirical evidence highlights four main findings:

1. Regional consolidation of analytical infrastructure:

   All 13 LAC countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay) report using business intelligence tools. Ten of them - Argentina, Brazil, Chile, Colombia, Cuba, Guatemala, Honduras, Mexico, Paraguay, and Peru - also report big data capabilities, except Costa Rica, Ecuador, and Uruguay. This indicates a broadly consolidated digital base in the region.

2. Selective and non-generalised adoption of AA/AI:

   Only five LAC countries - Brazil, Colombia, Costa Rica, Cuba, and Ecuador - report general AI use, while eight countries - Argentina, Chile, Guatemala, Honduras, Mexico, Paraguay, Peru, and Uruguay - do not report AI adoption. In addition, reporting on specific technologies, such as machine learning and DataOps, is more limited. These results confirm that analytical infrastructure does not automatically translate into algorithmic deployment.

3. Functional concentration in risk and control:

   Among LAC countries that report AI use, applications focus on risk assessment processes (Brazil, Colombia, Cuba, and Ecuador) and on detecting tax evasion and fraud (Brazil, Colombia, Cuba, and Costa Rica). To a lesser extent, virtual assistants and assistance to officials in making administrative decisions are reported. Dispute resolution and other uses are reported only in Brazil. No LAC country reports making final administrative decisions.

4. Partial and heterogeneous institutional governance:

   The five LAC countries that report AI (Brazil, Colombia, Costa Rica, Cuba, and Ecuador) report limitations on its use. However, only Brazil and Colombia report formal ethical frameworks. Regarding technical oversight mechanisms, reported evidence is limited: Cuba reports reviewing AI source code; Brazil reports probing and testing AI responses and other approaches; and Colombia, Costa Rica, and Ecuador report no operational technical oversight mechanisms in the variables observed. No country reports input review or output monitoring. Overall, the region does not display a homogeneous institutionalisation of algorithmic governance.

In sum, the study shows structural heterogeneity in the self-reported deployment of advanced analytics and artificial intelligence in Latin America and the Caribbean, clearly differentiating between operational data digitisation and institutional algorithmic maturity. The comparison with Spain confirms that, even in the benchmark analysed, adoption remains at the level of analytical support, without full decisional automation, suggesting that the transition towards comprehensive algorithmic maturity remains a work in progress both in the region and in the comparative European setting. These results also reinforce the need to empirically distinguish between enabling digital capabilities, functional AI deployment, and algorithmic governance as analytically separable dimensions within the digitisation and digital transformation processes of tax administrations.

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8 ANNEX 1. TRACEABILITY OF ITTI (OECD) VARIABLES USED IN THE TABLE

In all tables, "Yes" indicates an affirmative response reported in the ITTI; "No" indicates no affirmative response reported for the relevant variable, in line with the data-treatment criteria defined in the methodology section.

Table 1. Analytical infrastructure and general use of AI (LAC–Spain)

- Q_LR_Q39 (Big Data)
- Q_AT_Q38-SQ002 (Business Intelligence)
- Q_LR_Q48 (Artificial intelligence (AI))

Table 2. Specific technologies reported (LAC–Spain)

- Q_AT_Q40-SQ004 (Machine Learning)
- Q_AT_Q40-SQ005 (Network Analysis)
- Q_AT_Q40-SQ006 (DataOps Approach)

Within block Q_AT_Q40, only technologies directly associated with advanced analytical techniques or their operational support (machine learning, network analysis, and a DataOps approach) were included, excluding general infrastructure or non-analytical automation technologies (e.g., cloud storage or robotic process automation), to preserve conceptual coherence with the definition of advanced analytics adopted in the study.

Table 3. Reported functional AI use cases (LAC–Spain)

- Block Q_AT_Q48x1-SQ: SQ001-SQ010 (reported functional AI use cases)

Table 4. Reported AI governance and oversight (LAC–Spain)

- Q_LR_Q48x2 (limitations on use)
- Q_LR_Q48x3 (ethical framework)
- Block Q_AT_Q48x4x1-SQ: SQ001-SQ005 (reported governance/oversight mechanisms)

Table 5. Comparative typology of the self-reported deployment of AA and AI (LAC)

- Own elaboration based on the patterns observed in Tables 1-4 (no additional ITTI variables; descriptive classification).