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Tax challenges for Uruguay in the tokenization of natural resources

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1. Introduction and objective

Virtual assets, also known as cryptoassets, are digital representations of value or rights that can be stored, transferred, and traded using distributed ledger technologies such as blockchain (BCU, 2021). Their rapid expansion in digitized economies poses challenges for tax systems, and Uruguay is no stranger to this reality.

The tokenization of natural resources has gained global relevance by combining financial innovation and environmental sustainability (OECD, 2025; World Bank, 2023). In Uruguay, Law No. 20,345, dated September 19, 2024, incorporates virtual assets into the financial system, although gaps in their tax and regulatory treatment remain.

The objective of this paper is to analyze the tax and regulatory challenges of the tokenization of natural resources in Uruguay, integrating national regulations with international standards, in order to propose guidelines for its future regulation.

2. Methodology

The study is based on a documentary and regulatory review of national laws, administrative pronouncements, and international frameworks (OECD, IMF, FATF, World Bank), supplemented by technical and doctrinal literature, to conduct a comparative analysis of the tax treatment applicable to tokenization in Uruguay.

3. Conceptual and regulatory framework

Law No. 20,345 assigns the Central Bank of Uruguay (BCU) the supervision of virtual asset service providers, establishing principles of stability, transparency, and traceability (BCU, 2021). According to the *Conceptual Framework for the Regulatory Treatment of Virtual Assets* (BCU, 2021), assets are classified as: value, utility, stable, and exchange. The tokenization of natural resources falls under the utility category, as it grants access to specific rights—such as carbon credits or water rights—through decentralized networks.

At the international level, the OECD (2025) highlights benefits such as the reduction of intermediaries and the democratization of access, although it warns of legal loopholes and transition costs. The IMF warns of systemic risks if leverage is not controlled (Agur et al., 2025). In terms of taxation, the CIAT (Vadell, 2023) and Porporatto (2020) highlight the need to adapt tax frameworks, given that tokens may not be taxable, but the underlying assets may be subject to taxes such as VAT.

According to the OECD (2022) and the World Bank (2023), tokenization consists of converting rights to a physical asset into a transferable digital token registered on the blockchain. In natural resources, a token represents a specific fraction of a physical resource or of the economic benefits derived from it, such as carbon credits, water rights, or participation in reforestation projects.

The process begins with the identification of the resource and the definition of the rights it represents. Once digitized, they are recorded on the blockchain, ensuring

transparency, immutability, and traceability. These tokens can be bought, sold, or exchanged on digital platforms, creating more liquid and accessible markets.

Distributed ledger technologies and cryptography ensure that transactions are verifiable and that rights are not duplicated. Smart contracts can automate payments, redistribute benefits, and verify environmental or legal conditions, ensuring sustainability in resource exploitation.

4. Taxation challenges for Uruguay

Uruguay currently lacks specific tax rules on crypto assets. In their absence, the General Tax Directorate (DGI) considers them to be intangible movable property. Thus, income derived from their disposal may be taxed by IRAE, IRPF, or IRNR, depending on the recipient and the territorial source (DGI, 2021a). However, the tax implications will depend on the nature of the underlying asset. For example, the tax authorities (DGI, 2021b) have considered that carbon certificates from CO₂ absorption projects are exempt under the Forestry Law (Law No. 15,939, 1987).

One complex aspect is determining the source, since the Uruguayan system is based on the criterion of territoriality. If a token issued abroad represents national resources, it could be argued that the income is from a local source.

With regard to VAT, as they are considered intangible movable property, exchange transactions are included in the hypothesis of circulation of goods. If the delivery takes place in national territory and the subjective requirements are met, they could be taxed, except for exemptions. It could even be treated as an export of intangible goods, as in Consultation No. 5.482 (DGI, 2012) on carbon credits.

Coordination between the BCU, the DGI, and the Financial Information and Analysis Unit (UIAF), combined with alignment with international standards such as the OECD's Crypto-Asset Reporting Framework (CARF), the "travel rule" of the FATF (2019), and Pillars I and II of the BEPS project, will be key to strengthening oversight and positioning Uruguay as a regional benchmark in digital taxation.

Therefore, questions arise regarding:

- I. **Determination of source:** whether a token issued abroad but representing Uruguayan resources generates local source income.
- II. **Tax valuation:** absence of official criteria for establishing the tax base in highly volatile markets (OECD, 2025).
- III. **Legal nature:** heterogeneity among tokens for financial, environmental, or property purposes.

5. Conclusions

The tokenization of natural resources represents an innovative opportunity to improve efficiency, transparency, and accessibility in the management of environmental assets such as carbon credits, water rights, or reforestation projects. In a context of growing demand for environmental assets, Uruguay could strategically position itself as a benchmark, integrating technological innovation, environmental sustainability, and tax compliance in response to the European Union's Carbon Border Adjustment Mechanism (CBAM).

However, the fiscal challenges are significant, and although the DGI's interpretation allows for some flexibility, clear and uniform criteria are required for the valuation, determination of the source, and legal nature of crypto assets.

Institutional coordination between the BCU, the DGI, and the UIAF, together with the adoption of international standards such as CARF, BEPS, and the FATF recommendations, will be decisive in ensuring legal certainty, transparency, and fiscal equity.

Ultimately, tokenization offers opportunities to create transparent, liquid, and sustainable markets (World Bank, 2023; CIAT, 2023). However, it requires a specific tax framework that defines criteria for determining source, valuation, and taxation.

Future research should focus on tax valuation methodologies, interaction with environmental policies, and regional tax harmonization.

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