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CO-OWNERSHIP AND JOINT USE OF DIGITAL ASSETS: LEGAL IMPLICATIONS AND DISPUTES AMONG CO-OWNERS IN THE DIGITAL SPHERE

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Abstract: This analysis highlights significant legal gaps in the regulation of digital assets, with a particular focus on decision-making processes, management rights, and unilateral access restrictions imposed by one co-owner or user on others. It delves into the concept of "effective access", underscoring the importance of equitable usage and the need for clear guidelines to resolve conflicts when one party seeks to block or limit access to a shared digital asset. Additionally, the paper examines the limitations on the use of digital assets, assessing how traditional principles of property law may either apply or require reinterpretation or legislative adjustment to better accommodate the unique nature of these assets in a digital context. Ultimately, the aim of this paper is to propose solutions to the legal challenges arising from the growing role of digital assets in the economy and society, particularly with regard to co-ownership and joint usage. It offers recommendations for legislative reform and further research, stressing the importance of establishing clear frameworks to address conflicts of interest among co-owners and joint users of digital assets.

Keywords: Digital Assets; Co-ownership; Property Rights; Control over Digital Assets, UNIDROIT Principles on Digital Assets and Private Law.

Resumo: O presente estudo evidencia lacunas jurídicas significativas na legislação relativa aos ativos digitais, com particular enfoque nos processos de decisão, nos direitos de gestão e nas restrições de acesso unilaterais instituídas por um coproprietário ou um utilizador a outros coprietários e utilizadores. O texto debruça-se sobre o conceito de *effective access*, salientando a importância da utilização equitativa e a necessidade de diretrizes claras para resolver conflitos sempre que uma das partes vise bloquear ou limitar o acesso a um ativo digital partilhado. Ademais, o artigo examina as limitações à utilização de ativos digitais, analisando como os princípios tradicionais do direito de propriedade podem ser aplicados ou requerer reinterpretação ou ajustes legislativos para melhor atender à natureza única desses ativos no contexto digital. O principal objetivo deste artigo é sugerir soluções aos desafios jurídicos decorrentes do papel emergente dos ativos digitais na economia e na sociedade, sobretudo em relação à copropriedade e à utilização conjunta. O artigo apresenta ainda recomendações para reformas legislativas e investigações adicionais, enfatizando a importância de estabelecer estruturas claras para resolver conflitos de interesse entre coproprietários e utilizadores conjuntos de ativos digitais.

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Palavras-chave: Ativos Digitais; Copropriedade; Direitos de Propriedade; Controlo sobre Ativos Digitais; Princípios da UNIDROIT sobre Ativos Digitais e Direito Privado.

1 . Introductory considerations

The right of access to digital assets in the event of a conflict among co-owners or joint users raises a series of legal questions that are essential to understanding the status of digital assets within legal systems around the world. Digital assets – which may include various forms of data, electronic accounts, cryptocurrencies, non-fungible tokens (NFTs), and other digital goods – are increasingly becoming the subject of proprietary relations among multiple persons. Whenever a dispute arises between co-owners or joint users, it becomes necessary to determine the rights of access, use, and disposal of the digital asset, and to ensure the equality and protection of the interests of all parties.

The legal nature of digital assets calls into question whether such assets may be qualified as things (Lat. *res*) or as proprietary rights, and how that qualification affects the regime of co-ownership and joint use. Digital assets do not fit neatly into traditional legal categories, requiring legislative adaptation and the definition of specific rules for their governance. A particular issue concerns the relationship between co-ownership and joint use of digital assets, necessitating a clear determination as to whether digital assets can be regarded as the subject of classical co-ownership or whether they constitute a distinct form of collective usage right.

Moreover, the rules governing decision-making and administration in the event of a conflict among co-owners or users are of fundamental importance. The key question is how decisions regarding access to, management of, and disposal of digital assets are made when there are multiple right-holders, and whether analogous rules from the law of things apply or if new legal solutions are required. At the same time, the concept of "effective access" and the limitations on the use of digital assets emerge as a critical aspect of this problem. It is necessary to examine the legal mechanisms regulating the right to access digital resources and the consequences of one co-owner's or user's unilateral restriction of access.

One of the core problems in this context is the absence of a clear statutory framework regulating digital assets in the context of co-ownership and joint use. Traditional legal institutions do not fully address the challenges of the digital sphere, raising the question of whether special legal rules should be adopted or existing norms adapted. Furthermore, practical problems arise concerning the technical aspects of managing digital assets, including the possibility of unilateral access restriction, without due process or legal basis, by one co-owner or user, as well as the protection of rights where there is no physical control over the digital goods.

This paper aims to analyse the legal aspects of access to digital assets in the context of conflicts among co-owners or joint users, to identify existing legal gaps, and to propose potential solutions through the interpretation of current norms and recommendations for possible reforms.

With the aim of achieving the previously set objectives, the author structures the paper as follows. The first part focuses on the concept and legal nature of digital assets, which is of fundamental importance for understanding the framework of proprietary rights over digital property. Given the novelty and rapid development of this area, particular attention is devoted to the theoretical foundations of digital assets, as well as to the existing attempts to provide a normative classification of such assets. The second part of the paper addresses the *Concept of Co-Ownership and Joint Management of Digital Assets*, with an emphasis on potential conflicts that may arise in practice. In this section, the author undertakes several analytical steps: (1) identifying and systematizing the relevant legal frameworks and theoretical positions; (2) analysing existing case law and legal practice, to the extent available; (3) synthesizing the key challenges in applying current legal rules to relationships between co-owners and joint users of digital assets; and (4) highlighting conceptual and functional differences in comparison to traditional forms of ownership and asset management in the context of tangible property.

The objective of this approach is not only to provide a theoretical reflection but also to offer practical guidance for the further development of legal doctrine and regulation in this emerging field.

2. The concept and legal nature of digital assets

Digital assets are gaining increasing significance in modern legal systems, particularly in the context of the development of digital technologies and markets. The challenges facing the contemporary legal landscape regarding digital assets can be grouped into three main categories: first, the effort to define the fundamental concepts of digital assets, including the question of their legal nature; second, the need to harmonize the concept of digital assets with existing legal principles (or, conversely, to adapt those principles to new phenomena); and third, the provision of effective and consistent application of rules governing digital assets in legal practice. This paper will primarily focus on the first of these challenges – an analysis of the concept of digital assets and an examination of their legal nature.

In the analysis of the statutory regulation of the concept of digital assets, several normative texts will be used: the UNIDROIT (*International Institute for the Unification of Private Law*) Principles on Digital Assets and Private Law (hereinafter: the UNIDROIT Principles)[2], Directive (EU) 2015/849 of the European Parliament and of the Council[3] (hereinafter: AMLD5), the

2. UNIDROIT (International Institute for the Unification of Private Law) Principles on Digital Assets and Private Law (hereinafter: the UNIDROIT Principles). Available at: https://www.unidroit.org/wp-content/uploads/2024/01/Principles-on-Digital-Assets-and-Private-Law-linked-1.pdf (accessed: April 4, 2025).

3. Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC. Available at: https://eur-lex.europa.eu/eli/dir/2015/849/oj (accessed: April 4, 2025).

Regulation on Markets in Crypto-Assets[4] (hereinafter: MiCA), Malta's Virtual Financial Assets Act[5] (hereinafter: the VFA Act), and the Digital Assets Act of the Republic of Serbia[6] (hereinafter: the ZDI).

In order to construct a theoretically grounded and legally relevant definition of the concept of digital assets, it is necessary to rely on sources that both reflect contemporary trends in the regulation of this area and provide orientation for further normative development. The UNIDROIT Principles represent an attempt to establish transnational rules in the field of digital assets, based on the values of private law, and as such offer a universal theoretical framework suitable for comparative legal analysis. The AMLD5 Directive and the MiCA Regulation, on the other hand, are key instruments of the European Union in the normative regulation of digital assets, with the former addressing the issues of identification and prevention of misuse, while the latter provides a systematized classification and legal regime for various forms of digital assets. The VFA Act is considered as an example of national legislation that was among the first to attempt precise regulation of this subject matter, while the ZDI serves as the basis for the analysis of the domestic legal framework and its alignment with European and global standards. The use of these sources allows for the examination of the concept of digital assets from the perspective of different legal systems and traditions, thereby contributing to a more comprehensive understanding of their legal identity.

The UNIDROIT Principles emerged in response to the rapid development of digital technologies and the need for international harmonization of legal frameworks governing digital assets. They were adopted in May 2023 with the aim of increasing legal certainty and predictability in transactions involving digital assets. These principles provide guidance to national legislators on issues such as property rights, the transfer and securing of digital assets, thereby enabling a consistent approach across jurisdictions. The first part of the UNIDROIT Principles defines the basic concepts, including one particularly concise definition of digital assets, which states that they are:

> "[...] electronic record which is capable of being subject to control."[7]

4. Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937. Available at: https://eur-lex.europa.eu/eli/reg/2023/1114/oj/eng (accessed: April 4, 2025).
5. Available at: https://legislation.mt/eli/cap/590/eng/pdf (accessed: April 4, 2025).

6. Law on digital assets (Published in the *Official Gazette of the RS*, No. 153/20 of 21 December 2020). Available at: https://www.nbs.rs/export/sites/NBS_site/documents-eng/propisi/zakoni/digitalna_imovina_e.pdf (accessed: April 4, 2025).

7. Principle 2 of The UNIDROIT Principles.

According to the UNIDROIT Principles, digital assets are qualified as digital records[8], but only those that may be subject to control.[9] However, it is important to note that the UNIDROIT Principles on digital assets frequently rely on national legal systems, allowing for the tailoring of the definition and regulation of digital assets to the respective legal orders of individual states. These principles function as guidelines in the process of national regulation in this domain but are not, by themselves, binding instruments with regard to how states will implement digital assets within their legal orders.[10]

The AMLD5 recognizes that digital assets represent a digital representation of value, often based on distributed ledger technologies such as blockchain. Although the Directive does not offer a highly technical definition of "digital assets", it acknowledges that such assets are accepted by natural or legal persons as a means of exchange and can be transferred, stored, and traded electronically.[11] Unlike this Directive, the MiCA Regulation provides a detailed framework for various forms of crypto-assets[12], with the aim of adapting the legal structure to the specific characteristics of each type of digital asset, depending on its nature and purpose (Matek, Poljak, Tomić, 2024: 86). The Regulation identifies three main categories: asset-referenced tokens, e-money tokens, and other types of crypto-assets, including so-called *utility tokens*.[13] Both documents are essential for the development of the legal and

8. The following analysis provides comments on Principle 2.1 of the UNIDROIT Principles: "Electronic records comprise a class of which 'digital assets' (as defined in Principle 2(2)) form a subset. As defined, an 'electronic record' consists of information stored in an electronic medium, which is capable of being retrieved. 'Electronic medium' must be understood in a broad sense. Thus, the definition is intended to include any type of digital technology, even if the storage itself may not rely on electrons, such as hard disks using magnetic fields, and DVDs using physical changes in the material. It is implicit in the requirement that the information be retrievable that the information also must be retrievable in a form that can be perceived. It follows that an electronic record would not include, for example, oral communications that are not stored or preserved or information that is retained only through human memory."

9. Comments on Principle 2.3 of the UNIDROIT Principles: "The definition of 'digital asset' includes an electronic record only if it is 'capable of being subject to control' – as 'control' is defined in Principle 6. For example, some electronic records might be described colloquially as 'digital assets', but normally could not be subjected to 'control', as defined, and consequently would not be digital assets as defined here. While reference is made to Principle 6 for a detailed explanation of the concept of control, it should already be stated here that 'control' as defined in these Principles means exclusive control (subject to qualifications in the definition)."

10. Principle 5 of The UNIDROIT Principles.

11. AMLD5 defines virtual currencies as "a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money, but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically". See Article 1, (2), d) of the AMLD5.

12. Crypto-assets constitute a specific subcategory of digital assets, encompassing digital currencies and tokens based on cryptography and decentralized networks. Thus, while all forms of crypto-assets fall within the broader category of digital assets, not all digital assets qualify as crypto-assets.

13. Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on Markets in Crypto-Assets (MiCA), OJ L 150, 9.6.2023, article 18: "Those crypto-assets should be defined in this Regulation as 'e-money tokens'. The second type of

regulatory framework for digital assets, as they offer a comprehensive approach to regulating this subject within a broad market such as the European Union. While AMLD5 and MiCA offer regulatory frameworks for specific forms of crypto-assets within the European Union, other jurisdictions, such as the Republic of Malta and the Republic of Serbia, have enacted their own laws regulating a broader range of digital assets, not limited solely to crypto-assets.

Malta was the first European country to adopt a comprehensive regulatory framework for digital assets. In July 2018, it enacted three key laws: the Virtual Financial Assets Act (VFA Act), the Innovative Technology Arrangements and Services Act (ITAS Act), and the Malta Digital Innovation Authority Act (MDIA Act). Malta recognized the potential of digital assets and their importance for the financial sector and accordingly created a regulatory environment that encourages innovation while ensuring investor protection (Buttigieg, Efthymiopoulos, 2018: 30-40). This framework has allowed Malta to attract numerous *fintech companies* and investors, positioning itself as a leader in the digital asset industry (Biedermann, Moncada, 2024: 85). Under the VFA Act, digital (financial) assets are defined as:

> "[...] means any form of digital medium recordation that is used as a digital medium of exchange, unit of account, or store of value and that is not: (a) electronic money; (b) a financial instrument; or (c) a virtual token."[14]

In the context of digital assets, Malta provides a detailed classification of digital assets into categories such as coins, financial tokens, and utility tokens. This approach differs from the Serbian legislation, which offers a broader definition of digital assets and focuses primarily on the regulation of the market and service providers.

crypto-assets concerns 'asset-referenced tokens', which aim to stabilise their value by referencing another value or right, or combination thereof, including one or several official currencies. That second type covers all other crypto-assets, other than e-money tokens, whose value is backed by assets, so as to avoid circumvention and to make this Regulation future-proof. Finally, the third type consists of crypto-assets other than asset-referenced tokens and e-money tokens, and covers a wide variety of crypto-assets, including utility tokens."

14. Article 2 of Virtual Financial Assets Act, Chapter 590 of the Laws of Malta, enacted on 25 July 2018.

It is worth recalling that the Republic of Serbia was one of the first countries in Europe[15] – and among the first in the world[16] – to adopt a *Law on Digital Assets*[17], under which digital, or virtual, assets are defined as:

> "[…] a digital record of value that can be digitally purchased, sold, exchanged, or transferred and that can be used as a means of exchange or for investment purposes, whereby digital assets do not include digital records of currencies that are legal tender or other financial assets regulated by other laws, unless otherwise provided by this law."[18]

In other words, digital assets can be defined as a collection of digital resources (records) that possess economic, legal, or personal value and that are accessible, subject to control, and transferable through digital technologies. Radović observes that several essential characteristics of digital assets can be inferred from the legal definition: they represent a symbol of value or rights; they exist exclusively in digital form; they are stored and transferred through digital means; and they can be subject to control (Radović, 2024b: 21). The ZDI identifies typical manifestations of digital assets: virtual currencies and digital tokens.[19] Given that the field of digital assets is constantly evolving, there is a legitimate concern that new forms of digital assets may go unrecognized in the future. Therefore, it is proposed that, from a legislative drafting (nomotechnical) perspective, the manifestations of digital assets should be governed by a general clause, while simultaneously listing the most typical and undisputed examples of existing digital asset forms. Although such a solution may potentially shift the burden of identifying new forms of digital assets onto judicial practice, it is believed that, overall, this approach would bring more benefits than risks.

Finally, the FATF[20] has been addressing the issue of virtual assets since 2014 (EU Global Facility, 2023). In June of that year, the organization published a

15. In addition to Malta and Estonia, by enacting the Token and Trusted Technology Service Providers Act – TVTG, commonly referred to as the *Blockchain Act*, Liechtenstein became one of the first countries in Europe to legally recognize digital assets *in a broader context*, including their tokenization and trade.

16. With the adoption of the Payment Services Act – PSA, Japan was among the first countries to legally regulate cryptocurrencies, recognizing them as a lawful means of payment. Shortly thereafter, the wave of digital asset regulation spread to other jurisdictions, such as: the United States (*Delaware Blockchain Initiative*, 2017); Bermuda (*Digital Asset Business Act*, 2018); and El Salvador (*Bitcoin Law*, 2021).

17. For the development of digital assets in the Republic of Serbia, see Radović, 2024a: 80-94.

18. Article 2(1)(1) of the Law on Digital Assets of the Republic of Serbia, enacted on 29 December 2020.

19. Article 2(1)(2)–(3) of Law on Digital Assets of the Republic of Serbia, enacted on 29 December 2020.

20. The Financial Action Task Force *(FATF)* is an international organization whose mission is to develop and promote international standards for the prevention of money laundering, the financing of terrorism, and the proliferation of weapons of mass destruction. The organization sets forth a framework of 40 recommendations (along with additional specific recommendations) that countries should implement in order to protect their financial systems from potential misuse.

document titled "Virtual Currencies: Key Definitions and Potential AML/CFT Risks" (FATF, 2014), responding to the emergence of virtual currencies and their accompanying payment mechanisms, thus paving the way for new methods of transferring value over the internet. In June 2015, the FATF presented risk-based guidance on virtual currencies as part of a gradual approach to addressing the problems of money laundering and terrorist financing (ML/TF) in relation to virtual currency-based products and services (FATF, 2015). In October 2018, the organization introduced the concept of a "virtual asset", defining it as:

> "[...] a digital representation of value that can be digitally traded, or transferred, and can be used for payment or investment purposes. Virtual assets do not include digital representations of fiat currencies, securities and other financial assets that are already covered elsewhere in the FATF Recommendations." (FATF, 2019)

When it comes to the legal nature of digital assets, it is complex (Kalbaugh, 2016: 26), as digital assets do not fit neatly into traditional categories of property law, while at the same time possessing economic significance and certain elements of ownership rights. Within the domain of civil law, digital assets can be the subject of contractual relations, inheritance issues, and obligations related to compensation for damages. Their value is recognized through the regulation of contractual relations, such as smart contracts, digital tokens, and intellectual property rights.

From the perspective of property law, a challenge arises from the traditional understanding of things as tangible objects. However, digital assets exhibit certain characteristics of proprietary rights—they can be possessed, transferred, and even registered (e.g., NFTs and cryptocurrencies).

3. The concept of "ownership rights" over digital assets

Before addressing the issue of co-ownership of digital assets, it is essential to consider whether ownership rights over digital assets exist at all. Given that the object of ownership is traditionally a "thing", the question arises: can digital assets be considered "things" (Wyczik, 2024: 2-3)? The answer to this question will determine whether digital assets can be the subject of co-ownership or jointly held property.

The question of whether digital assets can be regarded as "things" in the legal sense is one of the key theoretical and practical issues in contemporary property law. Traditionally, a "thing" is defined by three fundamental characteristics: (1) it must be a material part of nature; (2) it must be susceptible to human control; and (3) it must be capable of being the object of ownership or another real right. Analysing digital assets in light of these criteria leads to the conclusion that their legal nature remains debatable. Specifically, a "thing" in the legal sense implies a material entity that exists in the physical world. Digital assets, encompassing virtual currencies and digital tokens, lack physical substance in the classical sense. They exist as sequences of binary data, whose existence depends on electronic systems and information technologies. From this perspective, digital assets do not

fulfil the first criterion of a "thing" in the traditional sense.[21] The second criterion requires that a "thing" be susceptible to human control, meaning it can be under the control of an individual or legal entity. Digital assets, although lacking physical form, can be possessed and controlled through private keys, digital wallets, and blockchain technology. *The owner of a digital asset* has the ability to control it, including rights of disposition, transfer, and access restriction, indicating certain elements of authority over it. Finally, the third criterion pertains to the possibility of establishing ownership or another real right over the object. In most legal systems, digital assets are legally recognized as having economic value, but not necessarily as "things" in the property law sense as objects of ownership rights.[22] Nevertheless, in practice, the question arises regarding the possibility of property law protection of digital assets, especially in the context of inheritance, pledges, and other forms of legal disposition.

Considering these criteria, it can be concluded that digital assets do not fully correspond to the classical understanding of "things" due to the lack of materiality. The aforementioned suggests that the concept of "ownership" over digital assets can only be discussed conditionally – as "control over digital assets to which the holder of such control is legally entitled" (Živković, 2024: 148). However, if the legal system adapts to contemporary developments and treats digital assets as a *special form of property* (Lee, 2024: 5-10) that can be under human control and over which certain property rights can exist, then their inclusion in a broader definition of

21. However, modern legal systems increasingly depart from the strict requirement of materiality, as seen in the regulation of rights to electricity, gas, and even in some cases, intellectual property rights. In certain areas of legal theory, it is also asserted that digital assets are a type of *intangible property*. See Babović, 2022: 33.

22. French law does not explicitly classify digital assets as "things" (Fr. *bien meuble*) within the meaning of the Civil Code (*Code civil*), which defines movable property in Article 528 as physical objects that can be moved. Digital assets, being intangible (see Article L54-10-1 of the *Code monétaire et financier*), do not fit this traditional definition. In Article L54-10-1 of the *Code monétaire et financier*, digital assets are treated as a distinct category of intangible goods (Fr. *biens incorporels*), which is closer to the concept of property rights than physical things. For example, tokens can be linked to rights (e.g., control, disposal), but they are not things in the classical sense. It is also important to note that Article L54-10-6 1 of the *Code monétaire* et financier allows for the pledging of digital assets, which suggests that they are treated as property that can be subject to legal transactions, but not necessarily as physical things.
In Germany, the regulation of digital assets is integrated into the existing financial framework through the Implementation of AMLD5 Act (Ger. *Gesetz zur Umsetzung der Änderungsrichtlinie zur vierten EU-Geldwäscherichtlinie*), which also amended the Banking Act (Ger. *Kreditwesengesetz – KWG*) and introduced the definition of "crypto assets" (Ger. *Kryptowerte*). According to this law, crypto assets are digital representations of value that have neither been issued nor guaranteed by any central bank or public authority and do not possess the legal status of currency or money. However, they are accepted by natural or legal persons as a means of exchange or payment based on an agreement or actual practice, or they serve investment purposes and can be transferred, stored, and traded electronically (see §1 Abs. 11 KWG). On the other hand, German law has a stricter definition of "thing" (Ger. *die Sache*) in the Civil Code (Ger. Bürgerliches Gesetzbuch – BGB). According to §90 BGB, "things are only physical objects" (Ger. *physische Gegenstände*). Digital assets, as intangible entities, do not meet this requirement. In September 2018, the Higher Regional Court of Berlin (Ger. *Kammergericht Berlin*) issued one of the first rulings concerning cryptocurrencies, concluding that bitcoins do not constitute accounting units and, therefore, cannot be considered financial instruments under the KWG (case number: 161 Ss 28/18 (35/18)). See also: Lee, 2024: 5-10.

"things" or property law goods can be considered (Kurt, Kurt, 2022: 213-259).

3.1 Control over digital assets

In the traditional legal framework, control over tangible objects is predominantly exercised through *actual possession*, often accompanied by physical control, whereas in the domain of digital assets, control is achieved through technical and legal mechanisms for managing digital resources, enabling exclusive disposition and administration thereof. From a technical standpoint, control over digital assets is exercised through: private cryptographic keys – the person possessing the private key can authorize transactions and thereby dispose of the asset, while the public key is visible on the network and is used for verification. Furthermore, regarding digital wallets – actual control lies with the person holding the private key associated with the digital wallet. Finally, in legal systems where blockchain networks (Glaser, 2022: 28-45) and distributed ledgers are developed (Glaser, 2017: 1543-1551), digital assets are recorded on decentralized networks, meaning that their existence and ownership are publicly verified, but only the person holding the corresponding private key may exercise control over them. Unlike technical mechanisms, the legal aspects of control over digital assets are linked to various sources of law.

The UNIDROIT Principles constitute, as previously mentioned, one of the most significant international legal frameworks addressing the issue of control over digital assets. These Principles do not introduce the traditional concept of ownership but instead establish the concept of a "right of control" as the central criterion for the legal protection of digital assets (Rodríguez de las Heras Ballell, 2024: 5-8). In other words, the person possessing the *right of control* over a digital asset may exercise rights over it. Which rights are concerned can be seen from Principle 6, which provides:

> (1) A person has 'control' of a digital asset if: (a) subject to paragraphs (2) and (3), the digital asset, or the relevant protocol or system, confers on that person: (i) the exclusive ability to prevent others from obtaining substantially all of the benefit from the digital asset; (ii) the ability to obtain substantially all of the benefit from the digital asset; and (iii) the exclusive ability to transfer the abilities in sub-paragraphs (a)(i), (a)(ii) and (a)(iii) to another person; and (b) the digital asset, or the relevant protocols or system, allows that person to identify itself as having the abilities set out in sub-paragraph (a).
>
> (2) A 'change of control' means a transfer of the abilities in sub-paragraph (1)(a) to another person, and includes the replacement, modification, destruction, cancellation, or elimination of a digital asset, and the resulting and corresponding derivative creation of a new digital asset (a 'resulting digital asset') which is subject to the control of another person.
>
> (3) An ability for the purposes of sub-paragraph (1)(a) need not be exclusive if and to the extent that: (a) the digital asset, or the relevant protocol or system, limits the use of, or is programmed to

> make changes to, the digital asset, including change or loss of control of the digital asset; or (b) the person in control has agreed, consented to, or acquiesced in sharing that ability with one or more other persons.

The commentary to Principle 6 provides a detailed explanation of the meaning, use, and scope of the term "control", acknowledging that it is a factual (not legal) concept[23], and, more importantly, emphasizing that control as a factual authority should not be equated with possession (which is often considered synonymous with factual authority): "[…] control as used in these Principles must not be understood to be identical to 'possession' as a legal concept used in certain jurisdictions." This suggests that the drafters of Principle 6 intended to build the concept of control upon the traditional understanding of possession over movable tangible objects, while explicitly recognizing that digital assets are not tangible things, and thus the concept of possession cannot be directly applied to them.[24] In line with the commentary to Principle 6, in the continuation of this paper, the notion of control will be used in a somewhat broader sense – as "effective control". *Effective control* encompasses: protection against unauthorized access; the enjoyment of all benefits arising from the digital asset; and the ability to exclusively dispose of the digital asset.

Protection against unauthorized access (exclusivity of *effective control*) implies the exclusive right of the controller to access, use, and manage a particular digital resource. Digital assets are typically protected by cryptographic keys, passwords, authentication procedures, or smart contracts, enabling only the authorized user to access and use the asset, thereby ensuring, to some extent, the security and durability of the digital asset. However, from a legal perspective, the controller has the right to prohibit others from accessing the asset, meaning that any unauthorized interference with a digital asset may constitute an infringement of rights and grounds for legal protection. On the other hand, *effective control* is not limited to protection against unauthorized access, but also includes the ability of the controller to enjoy all the benefits that the digital asset provides (completeness of *effective control*). Thus, the holder of *effective control* may use the digital asset in accordance with its intended purpose (for example, in the case of cryptocurrencies, this would mean the ability to hold or invest them), and may economically exploit the digital asset if it has market value – earning income not only through sale but also by participating in DeFi (decentralized finance) protocols. Ultimately, what most closely approximates *effective control* to the concept of ownership (without equating them) is the ability to exclusively dispose of the digital asset, i.e., the right to transfer the digital asset to another party, thereby enabling legal circulation and economic utilization of digital assets.

According to the aforementioned Principle, control over a digital asset is transferred when one person loses the factual ability to dispose of it, and

23. See paragraph 6.1 of the Commentary on Principle 6 of the UNIDROIT Principles.

24. For arguments in favour and against, see Sheehan, 2024: 12-13. Available at: https://eprints.whiterose.ac.uk/203868/4/Digital%20Assets%20Blockchain%20Relativity.pdf (accessed: April 5, 2025).

another person gains it.[25] Accordingly, several important points should be emphasized: Control is acquired factually – the person who "takes over" the digital asset must have exclusive technical capability to dispose of it, most commonly by holding the private key.[26] The transfer of control may occur with or without a legal basis. That is, even if someone unlawfully acquires a private key, they factually become the controller of the digital asset, but this does not imply they have a lawful right to it.[27]

The UNIDROIT Principles explicitly distinguish between control (the controller being factually capable of managing the digital asset) and "ownership". Control is transferred through factual acts, whereas "ownership" is transferred based on a legal title. The legal title for acquiring digital assets may include: a contract (e.g., purchase agreements on cryptocurrency exchanges, NFT marketplaces, or private transactions, gift agreements), the law (e.g., inheritance in jurisdictions that recognize it (Traxler, 2021: 8-10), or *acquisitio a non domino*), and original acquisition through cryptocurrency mining, such as *Bitcoin*, where a person invests resources into processing transactions and, in return, receives new digital units. The possibility of transfer enables digital assets to participate in market circulation, facilitates their convertibility, and allows the holder of control to monetize or reassign their rights as needed.

The issue of control over digital assets at the level of the European Union is regulated through the MiCA Regulation[28], although it is not entirely identical to the solutions contained in the UNIDROIT Principles. Interestingly, MiCA does not use the term "control" in the same sense as the UNIDROIT Principles, but instead focuses on crypto-asset service providers (CASPs) who facilitate the transfer, custody, and management of digital assets (Clifford Chance, 2004: 5). Under MiCA, crypto-asset service providers, such as crypto exchanges and digital wallet custodians, are subject to regulatory supervision and are obliged to ensure the security and protection of users' assets (Linden, Shirazi, 2023: 15-26). However, MiCA does not regulate the private holding of digital assets without intermediaries.

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25. Serbian legislation follows these trends, recognizing control through private cryptographic keys, which grant the holder of the cryptographic key the ability to dispose of the asset.

26. In technical terms, this can mean not only the transfer of the private key but also the authorization of a transaction or the issuance of a new token in favour of another person.

27. See paragraph 6.5 of the Commentary on Principle 6 of the UNIDROIT Principles: "The change of control from one person to another person must be distinguished from a transfer of a digital asset or an interest therein, i.e., a transfer of proprietary rights." In the following: "Whilst in many situations a transfer of proprietary rights will be accompanied by a change of control, in some situations it may not. The law of a State, for instance, may provide that under certain circumstances 'ownership' (as defined by the applicable national law) in a digital asset may pass to another person, whilst control stays with the transferor."

28. Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1114 (accessed April 5, 2025).

4. The concept of co-ownership and joint management of digital assets

Co-ownership represents a legal relationship in which multiple persons hold ownership rights over the same asset, whereby their share in that right can be determined through so-called *aliquot parts*. The three fundamental characteristics of co-ownership are: the existence of at least two subjects, precisely determined shares in the asset, and the existence of ownership rights both over individual shares and the asset as a whole.

The question of co-ownership of digital assets opens a complex discussion as to whether digital assets can be the subject of joint ownership in the sense of classical property law. Traditionally, co-ownership requires the existence of a tangible asset in the legal sense, that is, a material good that can be physically possessed and over which factual control can be exercised (Clarke, Kohler, 2005: 571-608). However, since digital assets are intangible, the question arises whether they are even suitable for the regime of co-ownership.

Digital assets, unlike tangible things, lack a physical structure and can be easily duplicated, which challenges the application of co-ownership rules. Nevertheless, certain forms of digital assets can be legally equivalent to material goods and potentially subject to co-ownership. In fact, the issue of co-ownership of digital assets transcends the traditional concept and now generally opens the question of whether it is possible to exercise joint control over digital assets. In other words, if the "ownership" right over digital assets is equated with the right of effective control, then by analogy, the question arises whether the joint exercise of effective control rights over private keys and governance rules within blockchain technology could represent the functional equivalent of the classical notion of co-ownership.

Since the UNIDROIT Principles do not explicitly address the possibility of joint control, the answer to this question should nonetheless be sought within the general legal institutes of civil law. First, we must answer what joint control over digital assets would imply. Joint control would mean that multiple persons have access to and decision-making power over the digital asset, which can be regulated through technical and legal mechanisms, such as multisignature (*multisig*) wallets, where signatures from all or most authorized users are required to execute a transaction[29], or through multi-factor authentication (MFA[30]) and shared access, where multiple users may

29. A multisig *(multi-signature)* wallet is a type of cryptocurrency wallet that requires more than one cryptographic key to authorize transactions. This means that a single signature (private key) is not sufficient to validate a transaction; instead, approval by multiple parties is required – either by majority or by joint action.

30. Multi-Factor Authentication *(MFA)* is a security mechanism that requires a user to provide multiple independent forms of identity verification in order to gain access to a particular system, platform, or digital asset. When digital assets are jointly controlled or managed by multiple parties (e.g., a company, foundation, or group of investors), *MFA* can be configured in various ways: each person may have their own authentication factor (e.g., each team member possesses a unique code without which access to the system is not possible); authentication may be tiered according to access levels (e.g., one person may have read-only access, whereas executing transactions requires an additional layer of *MFA* from another party); or it may involve the use of

have joint access to the platform or application controlling the digital asset, with decisions made through multiple levels of authentication. Thus, viewed technically, joint control is not only conceivable but is already very much present today.

Naturally, the concept of co-ownership is a legal construct that presupposes a legal basis for shared rights, whereas joint control refers to the factual ability of multiple parties to manage a digital asset, which may exist with or without a legal basis for "co-ownership". For "co-ownership" of digital assets to exist, there must be some "legal trace" that would qualify the joint control as the result of a legal basis for co-ownership. "Co-ownership" of digital assets can arise in various ways, depending on the applicable legal framework. Most commonly, it is through a contract, where multiple persons agree to invest jointly in a digital asset and thereby acquire co-ownership rights, similar to how founders of a company agree on ownership shares. In other words, if several persons invest certain resources (primarily financial investments), the general regime permits the acquisition of co-ownership. Similarly, by using smart contracts, blockchain technology enables the creation of automated solutions where multiple users jointly manage certain digital assets.

However, even if there is no legal basis for joint control over digital assets, this does not negate the possibility of multiple controllers exercising factual control over the digital asset. In fact, co-ownership always implies joint control, whereas the converse is not true. Namely, joint control, understood as a factual matter, can exist without a legal basis for establishing the legal status of co-ownership. Hence, the conclusion follows that if there is a valid legal basis for jointly exercising factual control, one may conclude that there exists a specific "co-ownership" regime over digital assets; however, if no legal basis exists and one party unlawfully gains control alongside another, it may still be concluded that there is joint factual control, but not co-ownership.

By accepting the existence of a specific regime of co-ownership over digital assets, arising primarily as a consequence of joint control over digital assets, the question is also raised regarding the application of the general co-ownership regime in relation to the rights of the co-owners. Joint users, in addition to having the right to exercise factual control over the digital asset via a shared key, also possess a range of other rights, such as: the right to use the digital asset, so that each "co-owner" may have certain rights of use as agreed; the right to participate in decision-making, where in classical co-ownership decisions about management are made by the agreement of all or a majority of the co-owners, while for digital assets there may exist automated decision-making mechanisms, such as smart contracts[31]; and

hardware security devices (e.g., YubiKey, Titan Key), where each individual has a personal device required for authentication.

31. Co-owners may enter into an agreement specifying the conditions under which they may dispose of their respective "shares" of a digital asset. This agreement may include clauses such as a right of first refusal, a prohibition on disposal without the consent of the other co-owners, or rules regarding voting procedures when making decisions. Additionally, in the context of blockchain technology, smart contracts can be used to automate certain restrictions – for example, by preventing the transfer of the asset without the digital consent of all co-owners.

finally, the right to dispose by transferring participation in the control of the digital asset (Liu, 2024: 251). Undoubtedly, the transfer of a "co-ownership" share in digital assets can be restricted by technical and legal factors, especially if the digital asset is tied to a specific platform or blockchain protocol.

The concept of co-ownership of digital assets presents a challenge for traditional property law, because digital assets are not tangible goods, but they can nonetheless be the subject of joint control and management. Whereas classical property law associates co-ownership with physical objects, modern technology and blockchain enable legal models in which multiple parties can simultaneously hold ownership interests in digital assets. The further development of the legal framework for digital assets requires a more precise definition of the rules of co-ownership and governance mechanisms, with a special focus on security, transparency, and efficiency in decision-making.

5. Conflicts between multiple holders of control rights over digital assets

Following the discussion on the concept of "co-ownership" of digital assets, wherein multiple parties may exercise control over the same asset, an inevitable question arises concerning potential conflicts among the "co-owners", namely, multiple titulars of control rights. Conflicts regarding the manner of exercising control over digital assets may occur under various circumstances. For instance, if one holder intends to transfer, monetize, or modify the status of the digital asset while another objects, a dispute may arise. Furthermore, ambiguities or insufficiently specified contractual provisions concerning the management of digital assets (e.g., within a co-ownership agreement or DAO governance rules[32]) significantly increase the risk of potential disagreements. The UNIDROIT Principles do not prescribe specific guidelines for resolving conflicts between multiple controllers; however, the general regime of co-ownership implies the application of certain supplementary rules.

Regarding the mechanisms of rights protection, two principal approaches are identified: judicial resolution and arbitration, complemented by alternative methods such as mediation. Each mechanism possesses distinct advantages and disadvantages, particularly in the context of digital assets. In judicial proceedings, the actively legitimized party is the holder of control, simultaneously a co-owner, who claims that their right to joint control has been infringed by another holder. Upon the initiation of appropriate proceedings, the parties must substantiate their claims through the presentation of evidence. In the context of digital assets, evidentiary matters are particularly nuanced due to their technological nature, with typical forms

32. A Decentralized Autonomous Organization *(DAO)* is a digital organization that operates without centralized authority, where all decisions are made through programs (smart contracts) that are automatically executed on blockchain technology. Members of a *DAO*, who typically hold governance tokens, participate in voting and decision-making processes, enabling transparency and decentralized control. This model does not require traditional governance structures, as all processes are defined in code, and all transactions and activities are recorded on an immutable digital ledger. See https://www.coinbase.com/learn/crypto-basics/what-are-decentralized-autonomous-organizations (accessed April 6, 2025).

of evidence including: Written evidence: such as contracts (handwritten or electronic) regulating joint control, correspondence (*e-mails*, *SMS messages*), and payment confirmations (bank statements documenting the financing of asset acquisition); Digital evidence: encompassing blockchain transactions (address and transaction history analysis through tools like *Etherscan* or *Blockchain Explorer*), private keys, passwords, metadata, and similar; Witness testimony: where third parties have been involved in the formation of agreements or the technical management of the asset; Expert reports: produced by digital forensics specialists, verifying the authenticity of blockchain transactions or determining control over the asset.

In the dispositive part of the judgment, the court would decide on the alleged infringement of joint management rights over the digital asset and could, inter alia, order the restoration of access, the restitution of unlawfully transferred assets, and the award of damages if applicable conditions are satisfied. The decision may also impose technical measures (e.g., the transfer of cryptocurrencies to a specified address). Arbitral proceedings, notwithstanding their procedural specificities, would generally lead to analogous outcomes.

It is noteworthy that in legal systems where possessory protection proceedings do not address substantive legal issues but are confined to factual circumstances, conflicts between multiple holders of control rights over digital assets are markedly simplified. In such frameworks, without the necessity of establishing the legal basis for joint control, a party alleging infringement could request the initiation of proceedings aimed at the prompt restoration of factual control over the asset, thereby potentially preventing subsequent, more complex disputes involving both factual and legal determinations. Naturally, this approach presupposes the recognition of factual control over digital assets as a form of possession.

In conclusion, conflicts among co-owners of digital assets often stem from ambiguous agreements or technological constraints. Judicial proceedings provide legal certainty but tend to be slower and public, whereas arbitration offers advantages in terms of speed, confidentiality, and specialization. Alternative methods such as mediation can prove effective if parties are amenable to compromise, while smart contracts present preventive solutions. Judicial or arbitral decisions define rights and obligations with precision, often accompanied by technical directives, while evidentiary matters necessitate a combination of traditional and digital methods, with particular emphasis on blockchain analysis and digital forensics.

6. Concluding considerations

The legal treatment of digital assets in the context of co-ownership and joint usage is a complex and evolving issue that reflects the broader challenges of adapting existing legal frameworks to the digital age. This paper has analysed the nature of digital assets, their legal classification, and the particular challenges that arise in cases of conflicts among co-owners or joint users. It is clear that traditional concepts of property and ownership, especially as they pertain to tangible things, do not seamlessly translate to the digital realm. While digital assets, such as cryptocurrencies and non-fungible tokens (NFTs), exhibit certain characteristics of proprietary rights –

such as possession and control – they do not fit neatly into the classical legal categories of "things". One of the central legal questions concerns whether digital assets can be regarded as objects of ownership in the traditional sense. The lack of physical substance, combined with the reliance on technical systems such as blockchain and private keys, challenges the classical notion of ownership as control over a tangible object. However, as the law continues to evolve, it is plausible to consider digital assets as a special category of property that can be subject to control and legal rights, albeit in a manner distinct from traditional property.

Joint control over digital assets arises when multiple parties share interests in digital resources such as data, digital accounts and cryptocurrencies. The key legal issue is determining who has the authority to make decisions regarding the use and management of such assets, especially when disputes arise between co-owners or users. Since digital assets are intangible, their legal status is often unclear, and this creates challenges in regulating access, control, and the protection of data. In cases of joint control, clear legal frameworks are necessary to define the rights and responsibilities of all parties involved, and to establish mechanisms for resolving conflicts, ensuring transparency, and safeguarding privacy and security. In this context, contracts and agreements that clearly outline the terms of shared use are vital to preventing legal disputes.

In the case of conflicts among co-owners or joint users of digital assets, the absence of a clear statutory framework creates significant challenges in determining rights of access, use, and disposal. Existing legal norms, particularly those governing traditional co-ownership, do not adequately address the unique characteristics of digital assets. Therefore, it is necessary to explore whether new legal solutions should be developed, or existing laws should be adapted to better accommodate the needs of digital asset holders.

In conclusion, as digital assets become increasingly significant in modern legal systems, it is crucial to establish clear, adaptable, and effective legal mechanisms to regulate their use in the context of co-ownership and joint usage. This requires both a theoretical understanding of the legal nature of digital assets and a practical approach to ensuring the protection of all parties involved in their management and administration. The legal profession must continue to evolve in response to the rapid development of digital technologies to ensure that the rights of individuals and entities interacting with digital assets are adequately safeguarded.

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