The impact of tokenisation on property law

Keywords
tokenisation, property, property law, real estate, non-fungible tokens, utility tokens, security tokens, smart property, movable property, immovable property, intellectual property, digital assets

Abstract
The article considers the implications of tokenisation for the property rights system. After a brief reconnaissance of the issue of whether or not tokens can be considered as objects of property, we observe how property rights transversally involve the different possible categories of tokens elaborated according to the main classification criteria proposed by scholars in their taxonomic work. The work is therefore structured on the analysis of the impact of tokenisation not by type of token, but by category of assets, and in particular movable (physical) assets, immovable assets, and intangible or natively digital assets. The conclusion is that, while the existing legal framework for movable goods can be adapted fairly easily to tokenisation, there are greater problems with immovable goods, especially in systems with a Latin notary system. As for intangible or natively digital goods, in some respects it is necessary for states to withdraw from their legal monopoly positions in order for some of the potentialities of tokenisation to materialize, while on the other hand it seems possible to envisage, even under existing law, forms of tokenisation of intellectual property rights or rights to goods that are born digital. The conclusion reflects on the prospects that the category of *non-fungible tokens* has, central to the discourse addressed, to undermine some essential structures of sovereignty, not unlike what has been observed in the field of cryptocurrencies, with particular reference in this case to the monopoly power of governments to ensure the protection of property rights, a protection that could become automatic and inherent in the technological and market mechanisms if these distributed ledger technologies gain mass adoption without encountering significant regulatory restrictions.

1. Introductory considerations, between "ownership" of tokens, tokens representing property rights and their possible classifications

This paper reviews the main legal issues related to the impact of tokenisation on property rights. From an economic point of view, tokenising property rights through distributed public registries seems to offer "new solutions to old property problems"[1], potentially guaranteeing the realization of a system of property transfer and certification that improves the existing ones in terms of security, certainty, speed and cost[2].

As for the legal implications of this practice, as the existing literature on the subject tends to emphasize, it is an issue made extremely complex first of all by the absence of a clear and shared definition of the terms used in different jurisdictions to describe the phenomena in question, starting from the fundamental and ubiquitous notion of "digital asset"[3]. Moreover, the right of property itself

[1] J.A.T. Fairfield, *Bitproperty*, 88 *S. Cal. L. Rev.* 805 (2015), 827.

[2] *Ibid*. Fairfield, pp. 827-828: "The tokens can be securely transferred for very little cost. A block chain can trace transactions even where the number and speed of such transactions would confound a regular recording system. Attempts to double spend tokens are rapidly detected and resolved. Unlike many property systems, where clouds on title resulting from double spending can last for years, double sales within a public ledger are blocked within minutes. Indeed, while the passage of time makes interests in traditional property more obscure and less secure, the passage of even an hour builds a transaction so firmly into the block chain that it cannot practically be reversed or falsified".

[3] See J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations for Digital Assets*, Cambridge Centre for Alternative Finance, 2020, available at https://www.jbs.cam.ac.uk/wp-content/uploads/2020/10/2020-ccaf-legal-regulatory-considerations-report.pdf (last accessed 5 October 2021): "At present, a common system of

assumes, as is well known, a very different content depending on the jurisdictions considered, and the very configurability of a right of property on assets without corporeality is a question that is far from being univocally resolved.

Before attempting to offer some coordinates to orientate oneself in this very intricate framework, a preliminary consideration must be made: when considering the profiles of tokenisation related to property law, one must always distinguish between two levels, which are sometimes confused. On the one hand, there are all the problems connected to how the different legal systems frame (and/or should ideally frame) the different operations in which the circulation of (digital) tokens takes place, which have as their object non-financial assets, or, adopting the classification proposed by the Cambridge Centre for Alternative Finance, real estate and collectibles (which have in common the possibility of acting as a store of value), and goods and services, commodities, means of production and intellectual property (which have in common the fact that they are consumable/transformable)[4].

However, upstream there is a further question, which tends to be confused with the second order of problems, but which in my opinion should be kept distinct and which appears as a conceptual priority, namely: can (digital) tokens, as such, regardless of whether they represent a financial or non-financial asset, be made the subject of a property right? In other words, are tokens susceptible to appropriation in the technical sense, or is the relationship between the person who, on the basis of the distributed register, appears to be the legitimate owner of the tokens, and the token itself, attributable to the right of ownership[5]?

The answer to this question is already problematic in itself, at least in *civil law* systems, where the system has a more rigidly structured character. As it has been observed, in effect, in the face of some legal systems which, either expressly or by way of interpretation, certainly bring the digital tokens to the general category of goods (the most explicit is Liechtenstein, but this category also includes Spain, Austria, The Netherlands, Italy and France), there are others where the requirement of corporeity remains, at least formally, essential (as in Germany and Switzerland)[6].

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categorisation does not exist for digital assets. This is a barrier to the regulation and management of digital assets which often exist in an international and multi-jurisdictional environment" (p. 10).

[4] See J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations*, cit., p. 14. The other category, financial assets (which includes equity securities, debt securities, derivatives, money and other bonds), raises questions relating to the law of obligations and contracts and their regulatory treatment, irrespective of the considerable differences that emerge in the comparative analysis of this vast area of private law.

[5] See in this regard the considerations of A. Blandin, A.S. Cloots, H. Hussain, M. Rauchs, R. Saleuddin, J.G. Allen, B. Zhang, K. Cloud, *Global Cryptoasset Regulatory Landscape Study*, Cambridge Centre for Alternative Finance, 2019, available at https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf (last accessed 5 October 2021), 21-22. See also, in depth, J.G. Allen, *Property in Digital Coins*, 8(1) *Eur. Prop. L. J.* 64 (2019).

[6] R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization of property rights. A comparative perspective*, 41 *Computer Law and Security Review* (2021), 4-5. J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations, cit.*, p. 23, also cite Japan, where the famous case of the failure of the Mt. Gox exchange concerned precisely the question of whether Bitcoins were things susceptible to possession. See also O. Konashevych, *General Concept of Real Estate Tokenization on Blockchain. The Right to Choose*, 9(1) *EPLJ* 21 (2020), 37, according to which "*[a] token is an object of ownership and a carrier for information on property rights.*" For an analysis of this issue with specific reference to cryptocurrencies, see, among many, S. Green, *Cryptocurrencies in the Common Law of Property*, and D. Carr, *Cryptocurrencies as Property in Civilian and Mixed Legal Systems*, in D. Fox, S. Green (eds.), *Cryptocurrencies in Public and Private Law*, OUP, Oxford, 2019 (by D. Fox we also note *Tokenised Assets in Private Law*, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3807858, last accessed on 5 October 2021). For a reflection on the topic with reference in general to the susceptibility of 'data' to be considered as the subject of property rights, see S. van Erp, *Land registration and 'disruptive' (or 'trustworthy'?) technologies: Tokenisation of immovable property*, in A. Fraga, E. Ioriatti, S. van Erp (eds.), *IMOLA II Project, The European Land Register Document (ELRD): A common Semantic Model for Land Registers Interconnection*, European Land Registry Association, Brussels, 2019, 157 ff, also available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3441938 (last accessed on 5 October 2021): the following quotations from this article are precisely taken from the pdf available at SSRN (here, p. 6 ff.); as well as S.

Certainly in the latter, but also in those belonging to the first group, the identification of the legal regime applicable to tokens that unambiguously digitally represent non-financial assets appears therefore complicated by the existence of this double level: the (digital) tokens are in fact the instrument through which subjects exercise their dominion over other assets. Tokenisation is therefore configured as dominion over assets mediated by (digital) instruments that represent a property right. As is well known to operators and scholars of the subject, these assets may consist of physical assets, which existed and continue to exist *off-chain*, in the real world, or have been created "natively" *on-chain*, or be born originally on a distributed [7]*ledger* . On the other hand, the representative instruments (the tokens) may or may not be qualified in turn as assets, within the category (lacking, however, currently a clear and unambiguous legal framework) of "digital assets"[8].

These considerations connect to a further point: if we consider the main categories of tokens commonly identified by legislators/regulators and legal literature, we have to take note of how non-financial tokens, which as said constitute the focus of interest of this paper, cross these categories, not falling exclusively into one of them. In fact, if we refer to the excellent summary scheme drawn up by the *Association pour le développement des actifs numériques* (ADAN)[9], we find that not only, as we said a moment ago, *crypto-assets* [10](non-financial, as far as we are concerned) can be natively digital or not, but they can be both fungible and infungible. The former essentially include tokens representing title to fungible goods, while the latter include both native crypto-assets such as works of art and other digital collectibles (e.g. football cards, or *CryptoKitties,* which were one of the first applications[11]), or other virtual assets, or domain names related to the world of crypto-assets, and non-native crypto-assets such as securities representing physical goods such as works of art and luxury goods.

Instead, it is more complex to univocally link the tokens we are dealing with to the categories of *utility* or *security token,* which, together with that of *payment token*, the regulatory authorities normally employ to classify the various existing tokens (albeit with differences in terminology, but with strong similarities in substance[12]). If the category of *payment* token does not come to the fore here (and this is true also for *asset-backed stablecoins*, where the monetary purpose prevails in the broad sense), the attribution to one or other of the remaining categories is not so obvious. In fact,

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Thobani, *The personal data market: between data subject protection and user protection*, in *Medialaws. Rivista di diritto dei media*, 2019, f. 3, 131 ff.

[7] See OECD, *Regulatory approaches to the tokenization of assets,* 2021, available at https://www.oecd.org/daf/fin/financial-markets/Regulatory-Approaches-to-the-Tokenisation-of-Assets.pdf (last accessed 5 October 2021), 10: "the process of digital representation of real (physical) assets on distributed ledgers, or the issuance of traditional asset classes in tokenised form. In the first case, the economic value and rights derived from pre-existing real assets is linked or embedded by convention to DLT-based tokens, acting as a store of value. Tokens issued exist on the chain ('digital twin'), while the real assets on the back of which the tokens are issued continue to exist in the "off-chain" world. In the second case, asset tokenisation involves the creation of a trading instrument through a blockchain and the issuance of tokens that are 'native' to the Blockchain, built directly on-chain and living exclusively on the distributed ledger".

[8] See also the category of "new intangible assets" ("nuovi beni immateriali"): G. Resta (ed.), *Diritti esclusivi e nuovi beni immateriali*, UTET, Torino, 2010.

[9] ADAN, *Taxonomy of blockchain-based crypto-assets*, Apr. 8, 2021, available at https://adan.eu/en/taxonomy-blockchain-basedcrypto-assets (last accessed 5 October 2021).

[10] For our purposes, we can relate the notion of token to that of crypto-asset, which in turn is usually considered to be a subcategory of the broader notion of "digital asset".

[11] R. Morone, Smart Properties, in R. Battaglini, M.T. Giordano (eds.), *Blockchain e Smart Contract. Funzionamento, profili giuridici e internazionali, applicazioni pratiche*, Giuffrè Francis Lefebvre, Milan, 2019, 447 ff., 449, also cites as examples "the rights in *Decentraland* or on *Second Life*". Here as in all the rest of the article, all quotes from an original Italian source were translated by me, unless otherwise specified.

[12] See, among many, the summary outline in J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations,* cit., 10.

what appears to be decisive is the existence or otherwise of a prevalent investment purpose for those who purchase them: where this is present, it seems inevitable that the application of the regulations on financial products is determined and that we fall, therefore, into the category of security tokens; vice versa, if the prevalent purpose of employment of capital linked to an expectation of return (and correlative assumption of a risk) is absent[13], we fall into the category of utility tokens, with fewer burdens from the point of view of compliance.

Given these premises, we can now move on to consider non-financial crypto-assets, i.e., as mentioned, those that appear to have as their object assets that are susceptible to appropriation, dividing the analysis on the basis of the three categories into which we can divide them according to a classification based on their nature, i.e., movable assets, immovable assets, and intangible assets. In fact, I believe that, while it is appropriate to take into account the different categories of tokens, as I have done in this paragraph, it is then necessary to address the issue from the point of view of the traditional categories of private law, since it is with these that the new phenomenon must reckon, at least as long as the regulatory framework remains this one and does not undergo significant changes[14].

2. The tokenisation of movable assets

In this paragraph I will consider the tokenisation of all physical goods, endowed with a corporeity, which are not immovable or in any case registered in a public register such as cars. This category includes all the operations of the so-called digital twin, that is, the creation of a (virtual[15]) title equivalent to a physical original, of which it is a digital representation, and which is intended to circulate in place of or in parallel with the original physical asset. What we are trying to achieve is to allow the transfer of ownership of the asset through the circulation of the token[16].

In other words, the tokenisation involves in this case the splitting of the good, and the creation of a sort of digital copy of it, not too different, to tell the truth, from more traditional forms of "securitisation", even if dematerialized[17]. More generally, "From handing over the car keys as symbolic delivery of a gift of personal property, to conveying ownership in bulk commodities through

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[13] Thus, R. Morone, Smart Properties, cit., 448 reconstructs the "discrimination suggested and applied" by the Italian authority of control on the financial markets (Consob). It should be noted, however, that immediately above this author writes that the product that derives from the "tokenisation" of goods or rights is what, from the technical point of view, will be a "*non-financial security token*". This category, however, does not seem to find confirmation in the literature, and, in effect, it seems possible to recognize a possible contradiction, insofar as the attribute of "non-financial", which, in itself, is in line with the categorization adopted here, also on the basis of that of the CCAF, seems to imply, first of all, a reduction to the category of *utility tokens*, without, however, being able to exclude, where, effectively, an investment purpose is recognizable, the belonging to the category of *security tokens*.

[14] From this point of view, J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations,* cit., 24 ff., explain that this could happen alternatively in two ways: by a modification of the existing framework, or by the creation of a new special regime.

[15] The virtual character, according to R. Morone, Smart Properties, cit., 451, prevents to apply "extensively the discipline of titles representing goods" ("titoli rappresentativi di merci"), because this requires, at least under Italian law, the paper form.

[16] See R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., 14.

[17] See J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations*, cit., p. 18: ""Tokenisation" is often presented as a novel process, but conventional forms of securitisation and financialisation involve something very similar. The essence of these processes is that the economically and legally most important features of an asset are recorded, and that written record is treated as an object that can be bought and sold on the secondary market". See also J.M. Moringiello, C.K. Odinet, *The Property Law of Tokens*, *Florida L. Rev.* (forthcoming, 2022), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3928901 (last accessed 5 October 2021), p. 1 of the pdf (all subsequent citations of that work will be taken from the pdf available on SSRN at the time of writing this article): "tokenization under the law actually has a long history, backed by practical economic considerations and animated by strong theoretical underpinnings".

warehouse receipts, to the ritual of livery of seisin at common law, the law has long recognized the need to transfer property interests through the expedient of a symbol, deed, or token"[18].
The (more or less new) question that arises with reference to the tokens is whether the change of ownership/availability of the tokens, i.e., the passage from a wallet attributable to a subject A to another wallet attributable to a different subject B, entails, in civil law terms, the transfer of ownership from A to B, with all the consequences that derive from it in terms of remedies (but also, potentially, in the tax area).
As highlighted by some excellent studies on the subject[19], the greater or lesser practicability of this operation in the existing legal framework of the different legal systems depends directly on the rules adopted for the acquisition and transfer of property rights[20]. In particular, where the transfer of ownership is already completed with the exchange of consent between the parties (e.g. in France and Italy, but also in England), the delivery of the token, or rather the stipulation of the smart contract that will determine the passage from one wallet to another, will constitute an obligation resulting from a contract already perfected in itself, and therefore fewer problems will arise.
Where, on the other hand, the delivery of the asset is an essential element in order to complete the transfer, regardless of whether or not a valid title is also required[21], a difficulty arises first of all from the dichotomous relationship between the off-chain world and the on-chain world. In fact, the smart contract, although self-executing, has no way to realize the physical delivery of the asset. The token can then act as a symbol of the thing to be transferred, using a figure already elaborated by the jurists of Ancient Rome, that is the *traditio symbolica* or *ficta* (symbolic delivery), on the basis of which there is no material delivery of the good, but only of an object that represents it: thus the token can represent the physical movable object of the transfer.
In this regard, it is worth noting that some authors include in this notion the classic case of the delivery of keys or other means of access to a closed place in which are contained the goods to be transferred[22]. Other authors believe instead that the case of the keys constitutes a *traditio vera*, an actual delivery[23], probably by including in the notion of *traditio symbolica* only the delivery of documents such as "bills of lading, certificates of deposit, notes of pledge", typical of the "modern circulation of goods in warehouses"[24].

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[18] J.A.T. Fairfield, *Bitproperty*, cit., 827.
[19] I refer in particular to the already cited R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., see in particular 10 ff.; the following part of the text makes extensive reference to this valuable study.
[20] Therefore always including the so-called minor real rights or "different rights" (diritti diversi): see R. Morone, Smart Properties, cit., 448-449. I will not deal with it specifically here, but I would like to point out that Garcia Teruel and Simón-Moreno, *The digital tokenisation*, cit., 19 ff., make a very interesting study of usufruct. See also H.S.H. Prince Michael von und zu Liechtenstein, *The tokenization of assets and property rights*, 25(6) *Trusts & Trustees* 630 (2019), 631: "A token is the digital representation of, for example, a claim to ownership, usufruct, or other rights associated with assets and economic goods, such as buildings, land, securities, art collections, patents, etc., in which the corresponding rights are represented by a token. In other words, the corresponding rights are digitally securitized in a token and can then be traded, processed, and administered directly by means of decentralized blockchain technologies, and this without having to go through a third party, such as a bank, land register, notary, etc.".
[21] As reminded by R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., 11, in some legal systems, such as The Netherlands and Spain, a valid title is also necessary, while in others, such as Germany, Austria and South Africa, the title is necessary but the transfer of ownership is not subordinated to the prior verification of its legitimacy. The perspective of S. van Erp, *Land Registration,* cit., 13, is different.
[22] Thus R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., 11. With regard to the handing over of keys, see also the Fairfield passage recalled just above in the text.
[23] M. Hinteregger, L. von Vliet, in S. van Erp, B. Akkermans (eds.), *Cases, Materials and Text on Property Law*, Bloomsbury, Oxford, 2018 (2012), 783 ff., 814 ff.
[24] E. Albertario, *Tradizione*, in *Enc. Treccani,* 1937, available at https://www.treccani.it/enciclopedia/tradizione_res-f922688d-8bb7-11dc-8e9d-0016357eee51_%28Enciclopedia-Italiana%29/ (last accessed on 5 October 2021).

Regardless of whether the delivery of the token representing physical movable goods is qualified as *symbolic* or *true delivery*, in any case it appears to be able to satisfy the requirement of delivery, at least in the majority of legal systems, i.e. with the exception of those, already mentioned in the previous paragraph, where possession of intangible goods cannot be configured, and therefore one cannot correctly speak of possession of the token. But outside of these jurisdictions, which have developed and are developing techniques to overcome this difficulty, the transfer of the token representing physical assets, made in the context of *a smart contract*, seems to integrate a form of *traditio*, albeit mediated by a "digital asset", which entitles the person who has the availability of the token in his wallet to obtain the material availability of the assets it represents. This conclusion seems to be a confirmation of the more general thesis according to which the existing legal framework, which has been consolidated for a long time, is already ready to accept an innovation as disruptive as distributed ledger technologies, without the need to develop new legal categories[25].

Notwithstanding this, the dichotomy between the off-chain world and the on-chain world recurs here with reference to all the cases in which there is no correspondence between one and the other, that is, the factual situation does not correspond to that represented in the distributed registers, because, for example, a third party owns or holds a good in violation of valid agreements formalized and recorded on the blockchain. In this regard, appear perfectly feasible remedies both possessors and petitioners, but it should be borne in mind that there is a need for the courts to investigate the content of the token (or through the smart contract or through the analysis of its metadata), typically with the help of experts in the programming language used[26], with all the problems of interpretation that arise in these cases and already authoritatively studied by legal doctrine[27].

Conversely, a similar situation can occur in the opposite case in which it is instead the constitutive title, then transferred to the smart contract which produced the transfer, which turns out to be invalid for whatever reason, and therefore the misalignment between the legal and factual situation depends not on a failure to align the latter with the former, as in the previous case, but on an upstream defect which invalidates the validity of the legal situation, and which must be remedied so that then downstream the factual situation can adapt to it[28]. This is a general problem, which also in this case seems to be able to be answered through the ordinary instruments, without the self-executing nature of smart contracts being able to eliminate the possibility of activating the remedies provided by the law to restore the coincidence between the ownership situation and the availability of an asset, in the presence of a violation of rules that remain immanent to the conclusion of any agreement, in any form[29].

Finally, I would like to briefly address situations of joint ownership of property rights, with reference to the context of tokenisation. Once again, the paper by Garcia Teruel and Simón-Moreno appears very instructive in this respect as well [30]. These two authors identify two different possible situations. On the one hand, it is possible that an asset that in the off-chain world is subject to co-ownership is tokenised, or at least that it is sold through tokenisation to more than one person. To reproduce the

[25] R. de Caria, *The Legal Meaning of Smart Contracts*, 26(6) *Eur. Rev. Priv. L.* 731 (2018).
[26] R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., 15.
[27] See M. Cannarsa, *Interpretation of Contracts and Smart Contracts: Smart Interpretation or Interpretation of Smart Contracts?* , 26(6) *Eur. Rev. Priv. L.* 773 (2018).
[28] See L.A. DiMatteo, C. Poncibò, *Quandary of Smart Contracts and Remedies: The Role of Contract Law and Self-Help Remedies*, 26(6) *Eur. Rev. Priv. L.* 805 (2018).
[29] See R. de Caria, *Blockchain and Smart Contracts: Legal Issues and Regulatory Responses Between Public and Private Economic Law*, 6(1) *Italian L. J.* 363 (2020).
[30] R.M. Garcia Teruel, H. Simón-Moreno, *The digital tokenization*, cit., 16-18. See also the work they cite, R.M. Garcia Teruel, *La propiedad y las situaciones de comunidad en la "Tokenización" de bienes*, in R.M. Garcia Teruel (ed.), *La tokenización de bienes en blockchain. Cuestiones civiles y tributarias*, Aranzadi Thomson Reuters, Cizur Menor, 2020, 145 ff..

co-ownership situation, the token can be sent to a multi-signature wallet, whose holders are the two or more owners of the asset in the physical world (upstream or downstream of the sale).
But it is the second case that has the greatest practical-operative potential. The authors describe it this way: "The "tokenization" of an asset in a number of different shares represented in different tokens, so that a multitude of people can acquire tokens that refer to a part of the asset, creating an ordinary co-ownership and facilitating their subsequent transfer".
This is an extremely important area because many tokenisation operations, as mentioned above, are aimed at laying the foundations for a subsequent circulation of the tokens on a secondary market. This will probably have the consequence of making these operations appear to have an investment purpose, with the consequences in terms of regulatory compliance already mentioned, but it undoubtedly constitutes a promising development of the potentialities inherent in the possibility of fragmenting the securities owned into many or very many securities representing small portions, in a much more efficient manner than is possible with traditional methods[31], where the parcelling out of property rights constitutes a largely inefficient situation, most often the result of incorrectly planned hereditary successions, and to which recourse is made voluntarily only in almost exclusively school cases in which completely different objectives are pursued. An example of this is when one tries to boycott an expropriation by forcing the public authority to deal with a myriad of small owners, instead of just one, with an evident and very substantial increase in possible procedural defects which could invalidate the validity of the procedure, as is precisely the intention of those who resort to such a practice[32]. On the other hand, the divisibility of a Bitcoin up to the eighth decimal digit means that there are one hundred million minimum units of Bitcoin portions (the so-called satoshi) in a single Bitcoin, laying the foundations for the realization of very interesting concrete operations of fragmentation of the proprietary titles, to be realized, in a typical positive externality, on already existing and independently constituted infrastructures [33].
Some legal questions concerning the application of the ordinary legal regime also arise in this case: the traditional Romanesque co-ownership regime may not best meet the requirements of the regulation of tokenised co-ownership. Garcia Teruel and Simón-Moreno refer to the burdens and responsibilities of each co-owner, as well as the right to request judicial division at any time[34]. But even in this case it seems possible to imagine solutions such as the provision of clauses in the original smart contract that limit the rights of the co-owners (however, the question of their possible contravention of mandatory rules seems open), or the intermediate creation of a Special Purpose Vehicle, which is the sole owner of the asset to be tokenised, with the fragmentation among the multitude of investors transferred to the shares of such special purpose vehicle (a path that confirms the tendency of tokenisation to broaden the spheres of obligatory and contractual relationships, to the detriment of the more traditional forms of relationship with the assets attributable in the systems of Romanesque derivation to real rights[35]).

3. The tokenisation of real estate

Coming instead to consider the issues raised by tokenisation in the context of property rights on immovable property, it is necessary first of all to premise that almost all the considerations made in the previous paragraph with reference to the tokenisation of (property rights on) movable property can be applied unchanged with reference to immovable property (and, in many ways, to the category,

[31] R. de Caria, *Il diritto di fronte alla tokenizzazione dell'economia*, in 66(1) *Il diritto dell'economia* 855 (2020).
[32] See F. Morello, M. Tropeano, *AAA, vendesi terreno No Tav*, in *La Stampa*, 10 February 2008.
[33] J.A.T. Fairfield, *Bitproperty,* cit., 825-826.
[34] R.M. Garcia, H. Simón-Moreno, *The digital tokenization*, cit., 17.
[35] See R. de Caria, *Il diritto di fronte alla tokenizzazione*, cit.

present in some jurisdictions such as the Italian one, of the so-called registered movable property, which for brevity I will not deal with specifically here). What changes and adds an additional level of operational difficulty are the questions regarding the form required for the validity and/or opposability to third parties of transfers of immovable property.

The potential advantages of real estate tokenisation are several[36]: on the one hand, one can imagine lower costs, linked to disintermediation, with a particularly marked impact when considering transactions with transnational elements[37]; on the other hand, this reduction in transaction costs can in turn make it economically viable to invest in even very small shares of assets that traditionally act as a store of value, increasing the liquidity of the market and at the same time democratizing it, by offering new investment opportunities accessible to a much wider range of possible subscribers.

In effect, those who need a sum of money and have a property at their disposal, can today only offer the property in its entirety as collateral, in exchange for a loan for a value that may even be much lower than the overall value of the property, which can thus be put up as security a very limited number of times. Moreover, in addition to normally requiring the intervention of *conveyance* professionals, as I will explain in more detail in a moment, typically, for a series of regulatory and fiscal reasons, only specialised intermediaries provide the loan.

Conversely, tokenising a property would allow for an incomparably larger pool of potential investors/money lenders, as well as limit the number of units/tokens to only the amount necessary to meet the need of the owner in need of a loan, with the ability to tokenise other portions as future needs arise, without new investors/lenders encountering the limitations arising in the current system from the presence of prior mortgages[38].

However, as already anticipated, the main problem remains the fact that in many legal systems, especially those of continental origin, the circulation of real estate today takes place through centralised registers managed by the public authorities, which can only be modified by persons representing or delegated by the latter, such as typically notaries.

In many ways, land registries have much in common with blockchain, since they too represent a chain of information, where consistency is required between one piece of data and the next, and each new entry must collimate with the existing framework. The fundamental difference, however, is precisely that, with the aim of providing certainty to the ownership status and circulation of assets that have traditionally constituted a fundamental store of value for many citizens, governments have centralized and monopolized the management of the registries where title to real estate and events related to its transfer are recorded.

As a result, there seems to be an insurmountable difficulty to implement mechanisms for the transfer of ownership of real estate on blockchain, regardless of the current public regime: if it is true, in fact, that in many systems the written form is a sufficient requirement for the validity of the contract between the parties, to obtain the fundamental opposability to third parties cannot be separated from the intermediation of one of the subjects authorized to intervene in the land registers.

This seems to be the reason why many tokenisation projects in the real estate sector have been developed in collaboration with or on the initiative of the authorities themselves, or in any case on the initiative of the very subjects who hold the power to intervene in the real estate registers[39], but in

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[36] *Ibid*.

[37] R.M. Garcia Teruel, *Legal challenges and opportunities of blockchain technology in the real estate sector*, 12(2) *J. Prop. Planning and Envir. L.* 129 (2020).

[38] R. de Caria, *Il diritto di fronte alla tokenizzazione*, cit.

[39] Cf. B. Verheye, *Real estate publicity in a blockchain world: a critical assessment*, 6(3) *EPLJ* 441 (2017). See also BitnewsToday, *Italian "Notarchain": Too Many Problems, Too Few Solutions*, in Medium.com, Aug. 22, 2018, available at https://medium.com/@bitnewstoday/italian-notarchain-too-many-problems-too-few-solutions-5c974c8f182e (last accessed 5 October 2021).

this way inevitably end up compromising an essential feature of all distributed registry technologies, namely the decentralized character and the absence of a central control authority, confirming what appears to be an irreducible basic incompatibility between the public/permissionless blockchain and some essential contents of sovereignty[40]. It is no coincidence that even the perhaps most advanced legislation in the world, and that has most understood and taken seriously the disruptive scope of this innovation, namely that of Liechtenstein, has not gone so far as to regulate the tokenisation of real estate[41].

It is true that, as Sjef van Erp, one of the main scholars on the subject, seems to prefigure, one can imagine blockchains of a private/permissioned type[42]. However, even in this case there seems to be an irremediable contradiction with the most innovative features of this model, which are found only where there is no "manager of the blockchain", but the management is entrusted to the joint and coordinated operation of the nodes, in a way, however, perhaps incompatible with the needs of a traditional real estate registry.

More generally, another author has identified four particular issues that arise in law with respect to tokenisation in the real estate sector: control of the identity of the parties; validity of the circulation contract; management of co-ownership; and modification of the register[43].

With reference to identity, Garcia Teruel writes that the management of identities should be delegated to a central authority (or to the blockchain, provided, however, that it contemplates a recognition system validated in some way by the nation states). As for the validity of the circulation contract, the author sees another inherent difficulty, namely that smart contracts can only verify the fulfilment or otherwise of a condition a posteriori, but are not designed to perform an *ex ante* evaluation, typical instead of more traditional intermediaries.

As for co-ownership, this also involves management difficulties: it could be envisaged to limit, at least in certain cases, the rights of token subscribers, but this type of agreement is not necessarily compatible with existing law, to the point that the author envisages a regulatory change as the only feasible way forward.

Lastly, a reason for difficulty still lies in the impossibility of modifying the blockchain, unlike what happens (under certain conditions) with real estate registries (again, unless a contradictory permissioned blockchain model is adopted).

Ultimately, tokenisation in the real estate sector seems much more complex to practice than that of movable goods, and would require either some necessary changes that risk distorting it, or the collaboration of the authority, which however seems to be a contradiction in terms (unless one imagines a very unlikely liberalization of the public monopoly on property registers[44]). Beyond the evaluations expressed here, it seems to be the conclusion also made by Garcia Teruel, according to

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[40] See R. de Caria, *Blockchain and sovereignty*, in O. Pollicino, G. De Gregorio, *Blockchain and Public Law: Global Challenges in the Era of Decentralisation*, Elgar, Cheltenham, 2021, 40 ff.

[41] S. van Erp, *Land Registration,* cit., 13 ff. On this subject, in addition to the already mentioned H.S.H. Prince Michael von und zu Liechtenstein, *The tokenization of assets*, cit. , T. Nägele, P. Bont, *Tokenized structures and assets in Liechtenstein law*, 25(6) *Trusts & Trustees* 633 (2019).

[42] S. van Erp, *Land Registration,* cit., 11 ff. To tell the truth, van Erp does not speak about it in an explicit way, but it seems to be possible to infer that he refers to it when he writes how much he imagines a possible solution entrusted to the management of a "manager of the blockchain": "Whenever a written deed still is necessary, the builder of the blockchain will take care that such deed is registered in the name of a legal person that manages the blockchain and the smart contract. In case deeds can be submitted electronically, the process is even simpler. Any objection that tokenisation must remain within the existing numerus clausus of property rights and that data cannot be an object of entitlement and transfer in a land registry are then beside the point. The initial registration, transferring the property to the manager of the blockchain, fulfils the traditional requirements; it is from that point that the IT takes over".

[43] R.M. Garcia Teruel, *Legal challenges,* cit., 136 ff.

[44] See R. de Caria, *La liberalizzazione dei servizi notarili in prospettiva giuseconomica, tra interesse pubblico, concorrenza e vincoli europei*, forthcoming in 16 *Il nuovo diritto delle società* (2021).

which "blockchain might be permissioned or permissionless, might have different types of consensus (e.g. proof of work, proof of consensus, proof of authority), might be anonymised or linked to a certain ID, etc., etc.". However, to provide a protocol that allows for a complete real estate transaction, which can offer at least the same guarantees for both the signatories and for third parties as current procedures, this technology should meet the following criteria: Permissioned blockchain controlled by public authorities [...]. The blockchain should be linked to an official digital ID, allowing the transaction only with legitimate access"[45].

Therefore, in the current context, and at least in continental systems with a system of real estate circulation necessarily intermediated by the notariat of Latin tradition[46], it seems to have to conclude that the tokenisation of real estate can play at most a function of efficiency of procedures, or achieve the first of the possible functions of the blockchain identified by van Erp in this area: "The blockchain can, first of all, merely represent in cryptographic format information (documents, such as deeds) which are stored on what is called an originating system. The blocks are then the "finger prints" of documents stored elsewhere"[47]. As for the second function described by this author, that of "digital record", it seems possible, but it requires a regulatory adaptation, although not too significant. Instead, the third function, that of "storage of tokens", which is described as the operation for which ""Blocks" in a blockchain can be filled with information which derives its value from an underlying asset, such as land. Blockchains thus become value-communication technology. The block then in a sense represents the land, not unlike derivatives in the world of finance (for example futures, options and swaps)"[48]. In this case, the regulatory framework would have to change in a really substantial and widespread way, because a partial and sectorial intervention would run into a serious problem of systemic (in)coherence[49].

4. The tokenisation of "immaterial" assets

Finally, coming to consider the goods without corporeality, not physical, this category includes both the so-called reified rights, such as intellectual and industrial property rights, and the natively digital goods, such as the works of the so-called *digital art*.

First of all, it is necessary to consider how, in this context, the problems mentioned in the initial paragraph regarding the configurability or otherwise of a property right in the technical sense on tokens are amplified by the fact that the rights represented or "incorporated" by the token are also rights on intangible assets, making in some ways even more complex the application of traditional categories.

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[45] R.M. Garcia Teruel, *Legal challenges,* cit., 141-142.

[46] Although the first real estate tokenisation transaction in Europe took place in France: see OECD, *The Tokenisation of Assets and Potential Implications for Financial Markets* (2020), available at https://www.oecd.org/finance/The-Tokenisation-of-Assets-and-Potential-Implications-for-Financial-Markets.pdf (last accessed 5 October 2021), 51.

[47] S. van Erp, *Land Registration,* cit., 10.

[48] *Ibid.*, 10-11. van Erp continues: "This type of block is now more and more called either a "coloured coin" (a layer on top of the bitcoin software with specific, i.e. "colouring", features) or a "token", depending on the software used, and the development towards creating a derivative value in electronic format is called "tokenisation". Once a token has been created, it can be transferred using a smart contract, thus entirely computerising the process of transferring the value contained in immovable property or burdening it with a mortgage or other limited property right. No need for so-called intermediaries or trusted third parties: estate agents, notaries and land registrars. Here we see the original anarchistic ideas underlying these technologies surfacing, as in essence the argument is that people can take their own decisions in their own hands, particularly when it concerns the creation, transfer or burdening of value".

[49] See in this regard the observations of J.G. Allen, M. Rauchs, A. Blandin, K. Bear, *Legal and Regulatory Considerations,* cit., 24: "[o]ften, amendments to the code entail high "systemic costs", as the ramifications of a change might spread throughout the whole Civil Code and produce unknown consequences, impacting negatively on legal certainty. In such contexts, law reform is less likely to take place by judicial development and may, in the first instance at least, take the form of an insulated special regime rather than an amendment to the general provisions of the relevant code".

In any case, with regard to intellectual and industrial property rights, it has been observed that the blockchain offers a potential of considerable interest, among other things, in terms of "security of the existence of information in time, certainty of exchanges (albeit virtualized), revival of the uniqueness of intangible *assets* and reliability of information in the register"[50] . In fact, several applications have been created in the market that try to capitalize on these advantages, and follow paths that lead to a more efficient management of the rights in question[51].

In my opinion, some of the considerations made with regard to immovable property apply to certain types of transactions relating to goods subject to intellectual property. Indeed, intellectual property regimes are also, from a legal-economic point of view, forms of legal monopoly. This legal reservation can, in my opinion, be equated in some respects, as far as we are concerned here, with the legal reservation granted by the States to those who act on their behalf in keeping land registers.

So, for example, the management of copyright appears certainly susceptible to be conducted effectively through tokenisation mechanisms and smart contracts that, for example, automate the collection and distribution of sums due to authors. More generally, the blockchain, through the function of timestamp, appears able to provide an excellent tool to offer at least certain date on the existence at a certain date of a certain work, and under certain conditions also on the identification of its author, so as to facilitate the resolution of possible disputes arising from situations of uncertain attribution, which may result from the general principle of prohibition of formal registration of intellectual property as a requirement of the establishment of copyright, stipulated by the Berne Convention[52].

However, such potential can only be fully developed where the public monopoly on these activities is considerably reduced, if not completely overcome. And indeed, this is what happened in Europe with the liberalization of brokerage services, by Directive 2014/26/EU [53], an extremely significant fact, but still much easier to achieve, in terms of those "systemic ramifications" I mentioned earlier, than the overcoming of mandatory notary intermediation. This has opened the way to a possible recourse to tokenisation by old and new operators, to a much more significant extent than can happen today with regard to real estate.

Beyond this, it seems certainly possible for authors to tokenise (some components of) their copyright and thus exploit it economically, given the principle of general application of freedom of disposition of usage rights and related rights of a patrimonial nature. This would generate a new investment opportunity that would also be a harbinger of possible new sources of income and liquidity for artists, according to the logic of crowdfunding[54].

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[50] L. Egitto, *Blockchain, intellectual and industrial property: concrete applications and potential applications*, in R. Battaglini, M.T. Giordano (eds.), *Blockchain and Smart Contract,* cit., 471 ff. , 471.

[51] See again L. Egypt, *Blockchain,* cit., 480 ff..

[52] See A. Rainone, *La disciplina della* blockchain *e le sue implicazioni pratico-applicative: il caso del diritto d'autore*, dissertation (unpublished), 177 ff.

[53] Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 , on the collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market Text with EEA relevance.

[54] See A. Rainone, *La disciplina,* cit., 336-337, who refers to R. Matulionyte, *Can Copyright be tokenized?,* 42(2) *Eur. Intell. Prop. Rev.* 101 (2020) and S. Sater, *Tokenize the Musician*, 21 *Tul. J. Tech. & Intell. Prop.* 107 (2019). Rainone then proposes, on the basis of a different doctrine from the one mentioned above, a different possible interpretative reconstruction: "The issue can be resolved, or rather circumvented, even with other methods, without necessarily having to assume a division of the rights of use in shares as is done by a part of the doctrine, resorting to a remodulation of the institution of the partnership, under which those who finance a project, for example the construction of a work, share in the profits generated by that project. A legal relationship would be created between the promoter of the token offer, as well as the promoter of a substantial royalty-based crowdfunding, which provides for the association of an open and indeterminate number of investors in a project that invests primarily in the exploitation of an intellectual property right; the *tokens*, in this case, would not represent the fragmentation of the copyright, but simply the right to receive a compensation for the demonstrated support, parameterized on the yield of the exploitation of a protected work; making

As far as natively digital goods are concerned, they have gained the headlines of many generalist media due to the diffusion of digital works of art sold on international markets at very high prices, through a unique representation by non-fungible tokens[55]. But this category generally includes all digital "objects" (from *CryptoKitties* to football stickers and ultimately also particularly iconic tweets) sold as unique thanks to their representation in the form of non-duplicable and non-replaceable tokens.

In this case, the relationship with these digital objects seems to be configured in terms of property in the strict sense, not in terms of the right to exploit an intellectual work[56]. From this point of view, appears convincing the thesis of Fairfield according to which "NFTs are personal property, not contracts (despite the "smart contracts" popular nomenclature) or pure intellectual property licenses (despite the currently governing law of digital assets like e-books). Because transactions in NFTs are in the form of a sale, the law of sales of personal property should apply"[57].

It should be taken into account, however, also the different perspective adopted by authors such as Moringiello and Odinet, according to which "NFTs do not actually embody property rights in a reference asset. […] [P]romoters of these tokens say that they can be used to establish "an immutable record of ownership" and will allow for the purchase of fractional rights in an underlying asset. In other words, ownership of the token conveys ownership of something else. But NFTs, as currently constituted, do no such thing. They are not *propertizing*—they do not embody property rights in a reference thing"[58].

According to the thesis of some of the authors who have studied the subject in depth, therefore, the NFTs can be as such the object of property rights, thus having to resolve in a positive way, at least with reference to this category, the question addressed in the first paragraph of the configurability or not of a property right in the authentic sense on the "digital assets". More controversial is, however, whether the NFTs have or not the requirements to act as symbols representative of property rights, at least in the absence of an appropriate regulatory intervention (authentic *Leitmotiv* in the studies in this area): always according to Moringiello and Odinet, "A thing cannot be propertizing merely because a contract says so. Legal recognition is needed and there is none when it comes to NFTs"[59].

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the necessary modifications to this typical contract, for example the exclusion or limitation of the participation in losses by the associate admitted by the jurisprudence, it is possible to consider the *token* a symbol of that participation. This, however, would sacrifice the possibility of "unpacking", possibly, the right of use of the work, since the tokenisation of copyright could allow, where necessary, to tokenise only some rights of use, for example radio or television broadcasting rights, in the case where the author intends to distribute only the revenues from some types of activities" (the reference is to I. Pais, P. Peretti, C. Spinelli, *Crowdfunding. La via collaborativa all'imprenditorialità*, Egea, Milan, 2014).

[55] On this topic, see L.J. Trautman, *Virtual Art and Non-fungible Tokens, forthcoming* in 50 *Hofstra L. Rev.* (2022).

[56] See J.A.T. Fairfield, *Tokenized: The Law of Non-Fungible Tokens and Unique Digital Property*, forthcoming in *Indiana L.J.*, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3821102 (last accessed on October 5, 2021): citations to this work come from the pdf available on SSRN. See the abstract "The attraction to buyers is that unlike digital assets like e-books or licensed movies, NFTs can be bought, sold, displayed, gifted, or even destroyed just like personal property. Yet law has not kept pace with demand for unique digital property. In particular, the rules designed for the 2000s internet focused on expanding intellectual property licenses and online contracts to the point that we are mere users, not owners, of digital assets").

[57] *Ibid*, also in the abstract. The author concludes by noting that "NFTs will serve as a powerful grounding example of digital personal property, a legal form of ownership that is both sorely needed and has not yet been clearly established online. That example will ground others, and permit law to again characterize those who buy scarce and valuable digital assets as true owners rather than mere users". It should also be noted that NFTs are spoken of mainly with reference to the ownership of digital works, but in themselves they can also represent physical goods, so the NFTs per se are also relevant to the categories examined in the two previous paragraphs (see J.M. Moringiello, C.K. Odinet, *The Property Law of Tokens*, cit.). For a general framing of NFTs, see EU Blockchain Observatory and Forum, *NFT - Legal Token Classification*, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3891872 (last accessed 5 October 2021).

[58] J.M. Moringiello, C.K. Odinet, *The Property Law of Tokens,* cit., 34.

[59] *Ibid*, 36. However, these authors also specify that "we are skeptical that legal recognition is forthcoming. Throughout history, legal rules develop when markets mature. New technologies give rise to individualism. The development of

If one does not accept this thesis of the difficulty, if not impossibility, at least under existing law, of reconciling NFTs with the foundations of property law, this type of "*digital asset*" could instead counterbalance the push to enlarge the obligatory relationships to the detriment of property ones, inherent in tokenisation[60] and more generally in many of the evolutions determined by new technologies (such as the sharing economy). As a matter of fact, in line with what prefigured by Fairfield, a protagonism of NFTs could mean a renewed protagonism of property rights too, reducing the economic centrality of contractual relations.

5. Conclusions

Tokenisation is progressively involving new economic sectors[61], and consequently its impact manifests itself in different areas of law. In fact, it involves contract law, since tokens are issued and circulate by means of smart contracts, company law, since these instruments make it possible to create unprecedented forms of participation in the capital of a company, and regulatory compliance, since the issuance of these securities raises delicate issues of investor protection and compliance with the rules laid down in this area.

In this paper, I have focused on one aspect in particular, and on a specific area (though broad and complex in itself), namely the impact on property law resulting from the issuance and circulation of digital securities representing originally tangible assets, whether movable assets such as a work of art or other valuable asset, or immovable assets such as land or buildings, or natively digital assets. The analysis carried out followed a scan relative to these three fundamental categories, finding a greater possibility of adaptation of current legal categories and regimes to the tokenisation of movable assets, a greater difficulty for immovable assets, and separate problems, making them in some ways an intermediate category, for natively digital assets.

What will be particularly interesting is to see how much of the original anarchist and anti-statist charge that is also characteristic of NFTs, which as mentioned have a central role in the field we have considered, will be maintained. As has been written, "If you ask hard-core champions of Bitcoin - the often-libertarian "crypto natives," as they call themselves - NFTs presage the future of digital property. They're a glimpse at a coming day when people spend their income on digital items they can trade, resell or hoard as an investment; when government will lose its unique power to mint currency and protect property, because people will instead trust the implacable math of blockchain networks"[62].

There are those who, like Moringiello and Odinet, are very doubtful and almost ironic about the possibility that this crypto-libertarian scenario will materialize[63], recalling how the Internet, despite the palingenetic expectations of some, has not at all led to an overcoming of the ability of governments to monitor illegal activities or collect taxes[64]. It is possible that, not differently from what is

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cyberspace in the late 20th century provides a memorable example of this; internet entrepreneurs often claimed that cyberspace meant the end of rules by national governments. The same sentiment permeates the words of those who promote cryptocurrencies and NFTs. These same entrepreneurs come back to governments for rules because governments can protect their property rights and "keep pirates at bay." The problem with NFTs, however, is that the only property right to protect is in the token itself, not the underlying asset. As we elaborate on in the two subsections that follow, there is no reason to give an NFT the legal status of a token".

[60] R. de Caria, *Il diritto di fronte alla tokenizzazione*, cit..

[61] See OECD, *The Tokenisation of Assets,* cit..

[62] C. Thompson, *The Untold Story of the NFT Boom,* in *The New York Times Magazine*, May 12, 2021, available at https://www.nytimes.com/2021/05/12/magazine/nft-art-crypto.html (last accessed October 4, 2021). See also the reflections of G. Ishmaev, *Blockchain Technology as an Institution of Property*, 48(5) *Metaphilosophy* 666 (2017).

[63] See also the passage quoted above, note 59. A shorter quotation of the passage quoted immediately above in the text appears in their article *The Property Law of Tokens,* cit., at p. 36.

[64] The reference here is to D.L. Spar, *Ruling the Waves: Cycles of Discovery, Chaos, and Wealth from Bucaneers to Bill Gates*, Houghton Mifflin Harcourt, Boston, 2001, 22.

manifesting itself with reference above all to cryptocurrencies[65], even with regard to non-fungible tokens, state sovereignty is far from being defeated, and is fighting to assimilate, when not to neutralize or outright banish these innovations, perceiving them as a potentially fatal threat to some of its essential elements. Certainly, the resilience of distributed-ledger technologies appears to be considerable also in the field of tokenised property, making the visionary challenge launched in 1994 by Szabo with the notion of "smart property" now current and even higher in its possible implications than what was foreseen in the short but revolutionary work of this author on smart contracts[66].

[65] R. de Caria, *Blockchain and sovereignty*, cit..

[66] This confirms the continuous intersection between contract and property that is found in this field. Szabo wrote: "we can extend the concept of smart contracts to property. Smart property might be created by embedding smart contracts in physical objects. These embedded protocols would automatically give control of the keys for operating the property to the agent who rightfully owns that property, based on the terms of the contract. [...] Smart property may be a ways off, but digital cash and synthetic assets are here today, and more smart contract mechanisms are being designed". The "smart property" imagined by Szabo, and still to come at the time, as recognized by the author himself, was therefore a notion much less wide than the one, linked to the phenomenon of tokenisation, considered in this paper.