Routledge
Taylor & Francis Group

Journal of Private International Law

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rpil20

Law applicable to proprietary issues of crypto-assets

Koji Takahashi

To cite this article: Koji Takahashi (2022) Law applicable to proprietary issues of crypto-assets, Journal of Private International Law, 18:3, 339-362, DOI: 10.1080/17441048.2022.2138102

To link to this article: https://doi.org/10.1080/17441048.2022.2138102

Published online: 17 Jan 2023.

Submit your article to this journal

Article views: 294

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=rpil20

Journal of Private International Law, 2022
Vol. 18, No. 3, 339–362, https://doi.org/10.1080/17441048.2022.2138102

Routledge
Taylor & Francis Group
Check for updates

Law applicable to proprietary issues of crypto-assets

Koji Takahashi*

Crypto-assets (tokens on a distributed ledger network) can be handled much in the same way as tangible assets as they may be held without the involvement of intermediaries and traded on a peer-to-peer basis by virtue of the blockchain technology. Consequently, crypto-assets give rise to proprietary issues in the virtual world, as do tangible assets in the real world. This article will consider how the law applicable to the proprietary issues of crypto-assets should be determined. It will first examine some of the cases where restitution was sought of crypto-asset units and consider what issues arising in such contexts may be characterised as proprietary for the purpose of conflict of laws. Finding that the conventional connecting factors for proprietary issues are not suitable for crypto-assets, this article will consider whether party autonomy, generally rejected for proprietary issues, should be embraced as well as what the objective connecting factors should be.

Keywords: crypto-asset; cryptocurrency; Bitcoin; blockchain; distributed ledger; property; ownership; trusts; *lex situs*; party autonomy

A. Purpose of this article

This article will consider how the law applicable to the proprietary issues of crypto-assets should be determined.[1] Crypto-assets encompass a wide range of tokens held and traded on a distributed ledger network[2] powered by blockchain technology[3] (hereinafter referred to as "blockchain network"). Thus, both

*Doshisha University, Kyoto, Japan. Email ktakahas@mail.doshisha.ac.jp. I wish to record my gratitude to the two anonymous referees for their useful comments.

[1]An abridged analysis is contained in the present author's earlier work, "Conflict of Laws in the Proprietary Restitution of Blockchain-based Crypto-Assets" forthcoming from the Japan Association of International Economic Law (*ed*), *Changing Orders in International Economic Law* (Routledge, 2023), vol. 2. Its analysis is compressed and its coverage is different from the present article: it focuses on proprietary restitution rather than proprietary issues in general but addresses the question of jurisdiction as well.

[2]A distributed ledger network is a network of ledgers kept by multiple nodes distributed across the network which are algorithmically synchronised. Its layout may be contrasted with the conventional server-client model which relies on a central server under the control of a specific entity.

[3]Blockchain technology is a method typically used to synchronise distributed ledgers. By chronologically linking the blocks containing details of transactions, this method makes it possible to synchronise ledgers even if they are kept by a number of unspecified nodes.

© 2023 Informa UK Limited, trading as Taylor & Francis Group

cryptocurrencies and non-monetary tokens are covered. Stablecoins[4] and the so-called non-fungible tokens (NFTs)[5] are also covered. But crypto-assets purporting to represent external rights such as crypto-securities, blockchain-based bills of lading and other blockchain-based negotiable instruments are excluded from the scope of this article since they merit special consideration.[6]

A range of private-law issues arise in connection with crypto-assets. Amongst them, this article will focus on proprietary issues[7] as they are particularly significant in practice and challenging in theory. Crypto-assets are nothing but data but, unlike other data circulating on the internet, can be handled much in the same way as tangible assets as they may be held without the involvement of intermediaries and traded on a peer-to-peer basis by virtue of the blockchain technology. Consequently, crypto-assets give rise to proprietary issues in the virtual world, as do tangible assets in the real world.

Proprietary issues arise in diverse contexts, including secured transactions, third-party objections to execution, and proprietary restitution. The restitution of crypto-asset units[8] may be sought in a number of circumstances.[9] Thus, where crypto-asset units are stolen by means of malware or a phishing attack, the original holder may seek their return from the thief (if identified) or from a subsequent transferee so long as they are traceable. In another example, where crypto-asset units are remitted by mistake to an unintended address or in an unintended quantity, the original holder may seek their return from the recipient. In yet another example, a customer of crypto-assets custody services, such as wallet

[4]Stablecoins are crypto-assets the financial value of which is designed to be pegged to a fiat currency. The pegging is implemented either by way of an algorithm or by way of the issuer holding a reserve of the pegged fiat currency.

[5]Non-fungible tokens (NFTs) are crypto-assets which, unlike those intended to serve merely as a medium of exchange, have unique identification codes and metadata that distinguish them from each other.

[6]With this type of crypto-asset, it is necessary to consider, *inter alia*, the implications of the governing law of the external right. See Koji Takahashi, "Blockchain-based Negotiable Instruments (with Particular Reference to Bills of Lading and Investment Securities)," in Andreas Bonomi and Matthias Lehmann (eds), *Blockchain & Private International Law* (Brill, forthcoming).

[7]Among the recent works considering the issues of contractual obligations, see Christoph Wendelstein, "Der Handel von Kryptowährungen aus der Perspektive des europäischen Internationalen Privatrechts" (2022) 86 *Rabels Zeitschrift für ausländisches und internationales Privatrecht (RabelsZ)* 644.

[8]This article will use the word 'crypto-asset' to refer to a species of crypto-asset and the word 'crypto-asset units' to refer to the holdings of a crypto-asset contained in a specific address of the blockchain. The Bitcoin, for example, is a crypto-asset and bitcoins are the units of the Bitcoin.

[9]For details, see Koji Takahashi, "Implications of Blockchain Technology for the UNCITRAL Works," in United Nations Commission on International Trade Law (ed), *Modernizing International Trade Law to Support Innovation and Sustainable Development* (United Nations 2017), 81, 88.

services and exchange services, may seek the return of their crypto-asset units from the service provider.

The original holder in such cases may also have a personal claim. Thus, in the case of theft, the original holder may have a claim in tort for damages covering the value of the stolen crypto-asset units against the thief or against a *mala fide* transferee. In the case of mistaken remittance, the original holder may have a claim in unjust enrichment for the recovery of the value of the remitted crypto-asset units. In the case of custody services, the original holder may have a contractual claim for the return of their crypto-asset units or their value. It should, however, be noted that where insolvency hits the current holder, the original holder would not obtain a full recovery by making a personal claim as he would have to join other creditors in the bankruptcy proceedings. If, on the other hand, the original holder is entitled to a proprietary claim, he will be able to obtain a full recovery.

Since the process of determining applicable law involves the characterisation of issues and the application of the connecting factors (geographical identifier) to the facts, this article will consider both the questions pertaining to characterisation (Section B) and those pertaining to connecting factors (Sections C, D and E).[10]

B. Causes of action and characterisation

Proprietary restitution may be sought on a variety of causes of action, depending on the factual circumstances and the applicable law. In what follows, we will examine some of such causes of action by reference to the actual cases involving crypto-assets and consider the characterisation of the issues raised in connection with such causes of action.

1. *Ownership-based claim for restitution* (rei vindicatio)

In the legal systems that inherited the Roman law concept of *dominium* (ownership right), proprietary restitution would be based on the ownership right and may be sought in an action for *rei vindicatio* (vindication of property: an owner's claim against the possessor for the return of goods). German law, for example, expressly provides for this relief.[11] It raises such issues as whether crypto-assets qualify as an object of the ownership right[12] and what are the prerequisites for their transfer,

[10]This journal has already carried an excellent article in this field of law: Michael Ng, "Choice of law for property issues regarding Bitcoin under English law" (2019) 15 *Journal of Private International Law* 315. The present article seeks to distinguish itself by covering a wider scope of crypto-assets, examining a wider range of legal systems, considering the questions of characterisation as well as connecting factors, and offering alternative suggestions.

[11]§ 985 of the German Civil Code (Bürgerliches Gesetzbuch: BGB).

[12]For a positive view under Austrian law on the interpretation of the concept 'things (Sache)' under §285 of the Austrian General Civil Code (Allgemeines Bürgerliches

including the possibility of *bona fide* acquisition. There can be no doubt that these issues should be characterised as proprietary for the purposes of conflict of laws.

The restitution of crypto-asset units was sought on the basis of the ownership right in an action known as the Mt. Gox case. Mt. Gox was the provider of the then world's largest Bitcoin exchange. It became insolvent and entered into winding-up proceedings in Japan. Most of the creditors were its former customers who had a contractual right to seek the return of the bitcoins which they had entrusted to the exchange. One of the customers, discontent with the partial recovery he would obtain through the bankruptcy proceedings, filed a separate action in Japan against the bankruptcy administrator and claimed the proprietary restitution of what he asserted as his own bitcoins. The Tokyo District Court rejected the claim, reasoning that the Bitcoin did not qualify as an object of the ownership right since under Japanese law, the ownership right (*shoyûken*) was statutorily limited to tangible assets as its objects.[13] The court ruled on the assumption that Japanese law was applicable. The facts of the case were centred almost exclusively in Japan: the plaintiff was an individual residing in Kyoto and the defendant was residing in Tokyo who had been appointed in the Japanese bankruptcy proceedings to be the administrator of the estate of Mt. Gox, a Tokyo-based company. Presumably for that reason, the court gave no explanation on why it considered that Japanese law was applicable, and nor did the parties raise the question of applicable law. Had the plaintiff been residing outside Japan (which would not have been a remote possibility in view of the international clientele of Mt. Gox), the parties might have raised the question of applicable law, compelling the court to address this question.

To be sure, the law applicable to the procedure of bankruptcy is the *lex fori concursus* (the law of the place where the proceedings are commenced)[14] in accordance with the maxim "*forum regit processum* (the law of the forum governs procedure)." The scope of the bankruptcy estate, for example, is a matter of procedure.[15] Thus, the bankruptcy estate of Mt. Gox extended, under Japanese law, to cover all the assets of the bankrupt wherever in the world they were situated,[16] including all the bitcoins wherever situated. Here, the difficulty

Gesetzbuch: ABGB), see Oliver Völkel, "Grundlagen der privatrechtlichen Einordnung," in Christian Piska and Oliver Völkel (eds), *Blockchain rules* (Manz 2019), § 3.10.

[13]The judgment of the Tokyo District Court on 5 August 2015 (2015WLJPCA08058001). For an analysis, see Koji Takahashi, "Cryptocurrencies Entrusted to an Exchange Provider: Shielded from the Provider's Bankruptcy?," in Charl Hugo (ed), *Annual Banking Law Update 2018* (Juta) 1, 2-8.

[14]See eg Art. 7 of Regulation (EU) 2015/848 of the European Parliament and of the Council of 20 May 2015 on insolvency proceedings (recast) [2015] OJ L141/19.

[15]UNCITRAL, *Legislative Guide on Insolvency Law, Parts One and Two* (2004) 73.

[16]This follows from the repeal in 2000 of the then Art 3(1) of the Bankruptcy Act which provided, enshrining the territoriality principle, that the bankruptcy declared in Japan only had effect on the assets of the bankrupt situated in Japan.

of localising bitcoins in a single jurisdiction, to be discussed later in this article,[17] poses no problem.

What impact, if any, the commencement of bankruptcy proceedings has on the right to seek proprietary restitution from the debtor is also a matter of procedure and should, therefore, be determined by the *lex fori concursus*. Where the proceedings are commenced in Japan, the Japanese Bankruptcy Act is applicable, which provides that the right to recover assets not belonging to the debtor prior to the declaration of bankruptcy is not affected by the commencement of bankruptcy proceedings (Article 62).[18] The question of what assets belonged to the debtor is, on the other hand, a question of substance and must, accordingly, be determined by the law applicable to proprietary issues.[19] Thus, to whom the bitcoins held in the custody of Mt. Gox belonged was an issue that should be characterised as proprietary for the sake of conflict of laws.

2. *Claim for restitution under the principle of trusts*

Proprietary restitution may alternatively be made under the principle of trusts. Thus, under English law, a beneficiary of an express trust may, by winding up the trust, require the trustee to transfer him the trust assets.[20] Even where there is no express trust, if the claimant can show that he has an equitable proprietary interest in property that is in the possession of the defendant, the court will treat the defendant as holding the property on a constructive trust for the plaintiff and will order the defendant to transfer it in specie to the plaintiff.[21] Many claims to a constructive trust are motivated by the principle that property held by the bankrupt on trust for another person does not form part of the bankrupt's estate.[22] Since intangible property could qualify as trust assets,[23] it may be argued that crypto-assets are a species of property capable of being the subject of a trust.

In a Singapore case, *Quoine v B2C2*,[24] such an argument was made with respect to bitcoins deposited with an exchange. B2C2, an English company,

[17]See section E, *infra*.
[18]As under Art 8(1) and (2)(c) of the Recast Insolvency Regulation, *supra* n 14.
[19]See also para 68 of the Recital of the Recast Insolvency Regulation, *ibid*.
[20]*Saunders v Vautier* (1841) 4 Beav 115; Andrew Burrows (ed) *English Private Law* (3rd edn, Oxford University Press 2013) para 4.357 [William Swadling]; Simon Gardner, *An Introduction to the Law of Trusts* (3rd edn, Clarendon 2011) § 10.4.
[21]*Boscawen v Bajwa* [1995] 4 All ER 769, 777 (English Court of Appeal); *Giumelli v Giumelli* (1999) 196 CLR 101 [3] (Australian High Court).
[22]Burrows (n 20) para 4.152 [William Swadling]; *Re Goldcorp Exchange Ltd* [1995] 1 AC 74 (Privy Council); *Chase Manhattan v. Israel-British Bank* [1981] Ch 105 (English High Court).
[23]With respect to carbon emission allowances, see *Armstrong v Winnington Networks* [2012] EWHC 10, para 59. More generally, see Richard Calnan, *Proprietary Rights and Insolvency* (2nd edn, Oxford University Press 2016) para 2.69.
[24][2020] SGCA (I) 02 (Singapore Court of Appeal).

sold a quantity of ethers (ETH) for bitcoins (BTC) on the platform operated by Quoine, a Singapore company. B2C2's account in the book of Quoine was accordingly credited with the proceeds of the sale in BTC. Upon learning that the rate of the sale had been enormously favourable to B2C2 compared to the going rate, Quoine cancelled the sale and reversed the credit. B2C2 sued Quoine in Singapore, arguing that the latter held the proceeds of the sale on trust for it and that the reversal of the credit was in breach of trust. While leaving open the question whether bitcoins could be the subject of a trust,[25] the Singapore Court of Appeal found that there was in the circumstances no certainty of intention to create a trust.[26] The court applied Singapore law without clarifying the conflict of laws basis.[27]

A similar claim was made in Japan after the aforementioned Mt. Gox decision of the Tokyo District Court in an action filed by some of the former customers of Mt. Gox against the trustee in bankruptcy. They sought the return of the bitcoins they had deposited with Mt. Gox, arguing that their bitcoins had been held on trust for them by Mt. Gox. They accordingly claimed entitlement to obtain the restitution of the bitcoins even if, as had been held by the Tokyo District Court, bitcoins did not constitute an object of the ownership.[28] Though no court decision in this case is reported, it is worth considering the conflicts questions which could be raised. To begin with, the question whether a bankruptcy estate extends to cover property which was held on trust by the bankrupt would be a procedural question and depend accordingly on the *lex fori concursus* (the law of the place where the proceedings are commenced). Where, as in this case, the bankruptcy proceedings are commenced in Japan, Japanese law is applicable, which provides that "property held on trust shall not form part of the bankruptcy estate" (Article 25(1) of the Trusts Act). That leads to the next question, namely whether the crypto-asset units deposited with an exchange by its customers are held on trust for them. It is a question of substance. That issue, together with the question

[25] *Ibid*, para 144. The court of first instance assumed an affirmative answer to this question (*B2C2 v Quoine* [2019] SGHC (I) 03, para 142).
[26] *Ibid*, paras 147-149, reversing the decision of the court of first instance ([2019] SGHC (I) 03, para 145).
[27] In a more recent case from New Zealand, *Ruscoe v Cryptopia Limited (in liquidation)* [2020] NZHC 728, the court found under the law of New Zealand that the crypto-currencies brought on to an exchange by its accountholders were held on express trust by the exchange provider for its accountholders. The exchange provider was a New Zealand company in liquidation and it had a global customer profile. The court undertook no conflicts analysis but noted that counsel for each of the parties agreed that New Zealand law was applicable (para 49). In an English case, *Wang v Darby* [2021] EWHC 3054 (Comm), the court found under English law that no trust was created on the units of crypto-asset called Tezos, which had been transferred under contracts for a swapping arrangement. It was common ground between the claimant, an Australian located in Australia, and the defendant, a UK national, that the issue was to be determined by English law.
[28] The Nikkei newspaper, the morning edition of 20 February 2018 at 38 (in Japanese).

of whether bitcoins are a species of property capable of being held on trust, should be characterised, for the purpose of conflict of laws, as issues pertaining to the constitution of trusts.

With respect to the constitution of an express trust, party autonomy is generally accepted,[29] with the result that a choice of law made by the relevant parties will be given effect. Where a trust is duly constituted under the applicable law, the next issue that may be raised is whether the beneficiary is entitled to the proprietary restitution of trust assets. While it may be thought that the law applicable to the constitution of the trust should also determine that issue,[30] some would favour characterising it as a proprietary issue for the purpose of conflict of laws.[31]

Opinion is also divided over the characterisation of a proprietary claim for restitution where it arises from a constructive trust. Some would favour characterising the question as unjust enrichment[32] on the ground that constructive trusts arise in response to unjust enrichment. Others would prefer proprietary characterisation[33] on the ground that the issue of whether property is held in trust lies at the heart of such a claim.

[29]See eg Art 6(1) of the Hague Convention on the Law Applicable to Trusts and their Recognition (hereafter "the Hague Trusts Convention") and *Akers v Samba Financial Group* [2017] UKSC 6 at para 34. Also, under the Japanese General Act on the Application of Laws (*Hô no Tekiyô ni kansuru Tsûtoku Hô*), the constitution of trusts is considered to fall within Art 7, which permits party autonomy for contracts and other juridical acts (acte juridique, Rechtsgeschäft). The Regulation (EC) No 593/2008 on the law applicable to contractual obligations, which permits party autonomy (Art 3), excludes the constitution of trusts from its scope of application (Art 1(2)(h)). It may, however, be applied by analogy to the constitution of an express trust as a matter of autonomous private international law of the relevant EU Member State (For a position in Germany, see Gerrit Merkel, *Die Qualifikation des englischen Trusts im deutschen internationalen Privatrecht: Ein Beitrag zur Frage der kollisionsrechtlichen Behandlung des express, resulting und constructive trust* (Nomos, 2020) 182).

[30]The Hague Trusts Convention, though not unequivocal, may be so interpreted (Art 11 (3)(d)).

[31]Anatol Dutta, "Trust," in Jürgen Basedow et al. (eds), *Encyclopedia of Private International Law* (2017), Ch. T.9, § IV, observes that in civil law jurisdictions which are not parties to the Hague Trusts Convention and do not have their own specific conflict-of-law rules for trusts, the property law consequences of a trust are governed by the law of the place where the trust assets are situated.

[32]See eg George Panagopoulos, *Restitution in Private International Law* (Hart 2000) 74; Jonathan Harris, "Constructive trusts and private international law: determining the applicable law" (2012) 18 *Trusts & Trustees* 965, 975.

[33]Adeline Chong, "The Common Law Choice of Law Rules for Resulting and Constructive Trusts" (2005) 54 *International and Comparative Law Quarterly* 855, 883; Tiong Min Yeo, *Choice of Law for Equitable Doctrines* (Oxford University Press 2004), para 5.22.

3. *Claim for restitution based on the principle of conversion*

In the English common law, there is no remedy equivalent to the Roman law *vindicatio* and this gap is filled by the tort of conversion.[34] The relief for conversion includes the proprietary restitution of goods which may be ordered at the discretion of the court.[35] The discretion will be exercised if damages are an inadequate remedy,[36] as would be the case where the defendant is insolvent.[37]

In the legal systems of the common law tradition, it has been long debated whether this remedy is available for intangible property such as choses in action, information constituting a database, and domain names.[38] The same question may be raised with respect to crypto-assets, as was in fact done in the British Columbia case of *Copytrack Pte Ltd. v Wall*.[39] In that case, Copytrack, a Singapore company, created a crypto-asset named CPY and offered it for sale as part of a fundraising campaign known as ICO (initial coin offering). Wall, apparently a resident of British Columbia, participated in the ICO and subscribed for 530 units of the CPY. However, Copytrack mistakenly transferred approximately the same quantity of the Ether (ETH) to Wall's wallet. The Ether was worth roughly 600 times more than the CPY. Copytrack requested Wall to return the ethers. When he refused, Copytrack filed for a summary judgment ordering the return of the ethers. The parties disputed whether the doctrine of conversion was applicable to ethers on the assumption that the law of British Columbia was applicable. The Supreme Court declined to rule on the issue, stating that it was a complex question that was not suitable for determination by way of a summary judgment application.[40]

Since conversion is a type of tort under domestic law, the prevailing opinion seems to characterise it as tort also for the purpose of conflict of laws.[41] Some authors, however, prefer proprietary characterisation for conflicts purposes[42]

[34]*OBG Ltd v Allan* [2007] UKHL 21, para 308 (House of Lords); Burrows (n 20) paras 17.304 and 17.309 [Donal Nolan and John Davies].
[35]Torts (Interference with Goods) Act 1977, s 3.
[36]Graham Virgo, *The Principles of the Law of Restitution* (3rd edn, Oxford University Press 2015), Ch 22.2.
[37]Calnan (n 23) para 2.108.
[38]On choses of action, see *OBG v Allan* [2007] UKHL 21 (answered in the negative under English law); on information constituting a database, see *Your Response Limited* [2014] EWCA Civ 281 (English Court of Appeal) (answered in the negative under English law); and on domain names, see *Kremen v Cohen* (2003) 337 F.3d 1024 (US Court of Appeals for the 9th Circuit) (answered in the affirmative under California law).
[39][2018] BCSC 1709 (Supreme Court of British Columbia).
[40]*Ibid*, para 34.
[41]*Autocephalous Greek-Orthodox Church v Goldberg*, 717 F. Supp. 1374 (SD Ind. 1989) fn. 13; Lawrence Collins and Jonathan Harris (eds), *Dicey, Morris & Collins on the Conflict of Laws* (15th edn, Sweet & Maxwell 2012), para 24–026 (stating the position in England).
[42]Quentin Byrne-Sutton, "The Goldberg Case: A Confirmation of the Difficulty in Acquiring Good Title to Valuable Stolen Cultural Objects" (1992) 1 *International Journal of Cultural Property* 151, 158 (criticising the characterisation adopted in the Goldberg case,

since although nominally tortious, conversion has become the remedy to protect the ownership of goods.[43]

C. Suitability of the conventional connecting factors

Having examined in the preceding section (Section B) what issues arising in connection with the restitution of crypto-assets may be characterised as proprietary for the purpose of conflict of laws, we will now turn to consider in the remainder of this article what should be the connecting factors to determine the law applicable to the proprietary issues of crypto-assets. In this section, we will examine whether the conventional connecting factors for proprietary issues of tangible and intangible assets are suitable with respect to crypto-assets.

1. *The* lex situs *rule for tangible assets*

With tangible assets, the prevailing conflicts rule for proprietary issues is to apply the *lex situs* (the law of the place where the asset is situated).[44] As noted above, crypto-assets can be handled much in the same way as tangible assets as they may be held without the involvement of intermediaries and traded on a peer-to-peer basis by virtue of blockchain technology. Notwithstanding this similarity to tangible assets, the direct application of the *lex situs* rule to crypto-assets is not possible because crypto-assets, being intangible, have no physical *situs*.

Intangible assets can only be localised by assigning them a fictional situs. Thus, a debt could be fictionally localised in the place where the debtor is residing.[45] Not being a debt, a crypto-asset does not come with a debtor and accordingly could not be localised in the same way. It will be discussed later in this article whether there are other appropriate methods of localisation.[46]

2. *The connecting factors for intangible assets*

While conflicts rules for intangible assets are nowhere near as established as the *lex situs* rule for tangible assets, at least two possible rules suggest themselves.

---

ibid). See also James Fawcett and Janeen Carruthers, *Cheshire, North & Fawcett Private International Law* (14th edn, Oxford University Press 2008) 794, 821 (arguing, however, that where damages are claimed as relief, it should be characterised as tort).

[43] *OBG Ltd v Allan* [2007] UKHL 21, para 308 (House of Lords).

[44] Art 43(1) of the German Introductory Act to the Civil Code (Einführungsgesetz zum Bürgerlichen Gesetzbuche (EGBGB)); § 33(1) of the Austrian Federal Act on Private International Law (Bundesgesetz über das internationale Privatrecht); Arts 99(1) and 100 (1)(2) of the Swiss Federal Act on Private International Law (Bundesgesetz über das Internationale Privatrecht (IPRG)); Art 13 of the Japanese General Act on the Application of Laws; Collins and Harris, *supra* n 41, Rule 133 (England).

[45] *New York Life Insurance Co v Public Trustee* [1924] 2 Ch 101 (CA).

[46] See section E *infra*.

They are the rule that applies the *lex creationis* and the rule that applies the law of the place of registration. Neither of them, however, are suitable for crypto-assets due to their *sui generis* character.[47]

(a) *The* lex creationis *rule*

Since proprietary issues concern the legal fate of the asset in question, it seems sensible to apply the *lex creationis*, the law under which the asset is created, to the proprietary issues of intangible assets. Receivables are a type of intangible asset for which such a conflicts rule is workable. Thus, under Article 14(2) of the Rome I Regulation, the conditions under which the assignment of a claim can be invoked against the debtor is subject to the law governing the assigned claim, that is to say the *lex creationis* of the receivable.[48] Intellectual property rights are another type of intangible asset for which the *lex creationis* rule is workable. Thus, the transfer of an intellectual property right is subject to the law of the protecting State,[49] that is to say the *lex creationis* of the intellectual property right.

It may indeed be viewed that the *lex creationis* is to intangible assets what the *lex situs* is to tangible assets.[50] It must, however, be noted that the *lex creationis* could only be conceptualised for an intangible property created by law. Thus, intellectual property rights are created by law according to the industrial policy of the protecting State. Receivables are also a legal construct. Thus, if a receivable is created by a contract, the *lex creationis* is the governing law of the contract. If it arises from a tortious act, the *lex creationis* is the governing law of the tort. If it arises from an unjust enrichment, the *lex creationis* is the governing law of the unjust enrichment. Crypto-assets, on the other hand, are a product of information technology. Since they are not a legal creature, there can be no *lex creationis* for crypto-assets. The *lex creationis* rule is, accordingly, unworkable for crypto-assets.

[47]For an analogy with goodwill under English conflict of laws, see Andrew Dickinson, "Cryptocurrencies and the Conflict of Laws," in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford University Press 2019), paras 5.108-5.109.

[48]A pledge on a receivable may also be subject to the law governing the receivable itself, as was held by the Japanese Supreme Court on the reasoning that the pledge constituted a title dictating the legal fate of the receivable (the judgment of the Supreme Court on 20 April 1978 (32-3 *Minshû* 616)).

[49]See eg European Max Planck Group on Conflict of Laws in Intellectual Property (CLIP) "Principles on Conflict of Laws in Intellectual Property" (2011) < https://bit.ly/3xJviku> Article 3:301 (concerning transferability); the judgment of the Intellectual Property High Court of Japan on 22 June 2016 (2318 *Hanrei Jihô* 81) (a ruling on the transfer of a copyright).

[50]Louis d'Avout, "Property and proprietary rights," in Basedow et al. (eds), *Encyclopedia of Private International Law* (Edward Elgar 2017) Ch. P.13, § III.

(b) *The* lex loci registrum

Another possible conflicts rule for intangible assets is the rule that applies the law of the place of registration (*lex loci registrum*). Obviously, this rule would only work with registrable assets. For example, emissions allowances of greenhouse gases are intangible assets which are, like crypto-assets, registrable and financially valuable.

Emissions allowances are generally recorded on national registries. It has been suggested that the proprietary issues of emissions allowances should be subject to the law of the country where they are registered.[51] Such a connecting factor, however, would be unworkable with crypto-assets since they are not registered on a national registry. Crypto-assets are rather recorded on ledgers distributed across a borderless network. This makes it difficult to assign a place of registration to crypto-assets.

D. Acceptability of party autonomy

Having seen in the preceding section (Section C) that the conventional connecting factors for proprietary issues are unsuitable for crypto-assets, we need to either somehow assign a fictional situs to crypto-assets or come up with alternative connecting factors.

In this regard, it is worth exploring whether party autonomy – freedom of the parties to choose the governing law – should be accepted. There is a large measure of support for the choice of law by the parties with respect to issues concerning the rights of monetary value (*droit patrimonial*; *Vermögensrecht*). Thus, party autonomy is firmly established for contractual issues,[52] for the constitution of an express trust[53] and, to a lesser extent, also for matrimonial property and inheritance.[54] Although proprietary issues doubtlessly concern the rights of monetary

[51]Koji Takahashi, "Conflict of Laws in Emissions Trading" (2011) 13 *Yearbook of Private International Law* 145. It should be noted that locating data at the place of the server where it is stored is generally not a satisfactory solution, because this place is difficult to predict and can be easily manipulated: Dan Svantesson, *Private International Law and the Internet* (3rd edn. Kluwer Law International, 2016) 469. But crypto-assets and emissions allowances are not mere data since they are amenable to exclusive control.

[52]See the Hague Principles on Choice of Law in International Commercial Contracts (2015) I.3.

[53]See *supra* note 29.

[54]See eg Art 22 of the Council Regulation (EU) 2016/1103 implementing enhanced cooperation in the area of jurisdiction, applicable law and the recognition and enforcement of decisions in matters of matrimonial property regimes; Art 22 of the Regulation (EU) No 650/2012 on jurisdiction, applicable law, recognition and enforcement of decisions and acceptance and enforcement of authentic instruments in matters of succession and on the creation of a European Certificate of Succession; and Art 26(2) of the Japanese General Act on the Application of Laws (matrimonial property).

value, party autonomy is generally not accepted.[55] In this section, we will first examine why party autonomy is generally rejected for proprietary issues and then consider whether it may be embraced with respect to crypto-assets.

1. *Reasons for the rejection of party autonomy*

The rejection of party autonomy for proprietary issues may be attributed to several concerns. We will examine them in turn to see whether they are well founded.

To begin with, a choice of law by the parties would affect the interest of third parties, given the *erga omnes* ("towards everyone") effects of property rights. It could even result in irreconcilable outcomes. This may be illustrated by the following hypothesis involving double transfers. Suppose that X concludes a contract of sale to transfer the ownership of his chattel to Y and then another contract of sale to do the same to Z who, knowing of the earlier transaction, receives the possession of the chattel from X. As the law governing the transfer of the chattel, the law of State A is specified by a choice-of-law clause contained in the contract with Y while the law of State B is specified by a choice-of-law clause contained in the contract with Z. Under the law of State A, the ownership of the chattel is transferred by a transfer agreement alone and the possession of the transferee is only required to invoke the transfer against *bona fide* third parties. Under the law of State B, the ownership of the chattel is not transferred unless the transferee receives its possession under a valid agreement for transfer. In this scenario, the application of both the law of State A and the law of State B would give rise to inconsistent results regarding who owns the chattel, assuming that the ownership right has the *erga omnes* effect.

Another concern is the negative externalities which could entail if the parties by collusion choose a legal system that would harm the interest of third parties. Thus, for example, the owner of a chattel encumbered with a security right may transfer the chattel by choosing, in collusion with the transferee, a legal system which extinguishes the security right upon transfer. It should, however, be noted that the negative externalities could be avoided if the conflicts rules confine the effect of the parties' choice of law to the internal relationships between them or bar it from being invoked against third parties.[56] To be sure, such limitations would cause the fragmentation of governing laws along the lines of different pairs of parties and defeat the *erga omnes* effect that is a hallmark of property rights. But such results may not be unacceptable since

[55]Roel Westrik and Jeroen van der Weide, "Introduction," in Westrik and van der Weide (eds), *Party Autonomy in International Property Law* (Sellier 2011), 1, 2.

[56]For example, Art 104 of the Swiss Federal Act on Private International Law provides, while allowing a limited degree of party autonomy with respect to movables, that the choice of law by the parties may not be invoked against third parties.

proprietary disputes are in reality often resolved in a bilateral framework. Perhaps reflecting this reality, English law handles proprietary questions relatively by asking which of the two competing litigants has the better right.[57] Even the legal systems which have inherited the Roman law concept of *dominium,* though in theory favour the absolute exclusivity of ownership, would tolerate relative handling of disputes due to procedural limitations.[58]

Another reason given for opposition to party autonomy is the principle of *numerus clausus*.[59] Under this principle, the individual parties are not permitted to change the species of property rights and their effects as prescribed by law. It follows – so the argument goes – that they should not be permitted to change them by a choice-of-law agreement. This argument seems to assume that the law which prescribes the species of property rights and their effects is determined *a priori*. This assumption is, however, false since that law is determined through the conflicts process. It is the law applicable to proprietary issues which sets the parameter within which the principle of *numerus clausus* operates, and not the other way around. Accordingly, the principle of *numerus clausus* should have no bearing on the question of whether party autonomy should be accepted to determine the applicable law.

2. *Suggestion: conditional acceptance of party autonomy*

(a) *Uniformity of choice as a condition*

Whatever their respective merits, such concerns as presented above are behind the rejection of party autonomy for proprietary issues in general. Notwithstanding these concerns, it is submitted that party autonomy should be embraced with respect to crypto-assets under one condition. The condition is that a uniform choice of law be made for the crypto-asset in question or for the blockchain network on which the crypto-asset is traded.[60] By a uniform choice of law, it is meant that the choice is common to all the persons engaged in the trading of

[57]Peter Birks, "The Roman Law Concept of Dominium and the Idea of Absolute Ownership" (1985) *Acta Juridica* 1, 27. Thus, where a thief is robbed of the goods he has earlier stolen, he holds a better title to the goods than the robber. He may accordingly sue the robber for the wrong of conversion (*Armory v Delamirie* [1722] EWHC KB J94) and obtain the delivery of the goods. See also Robert Stevens "Party Autonomy and Property Rights," in Westrik and van der Weide, *supra* n 54, at 85.

[58]Birks, *ibid*, 28.

[59]See Deutscher Bundestag, "Entwurf eines Gesetzes zum Internationalen Privatrecht für außervertragliche Schuldverhältnisse und für Sachen" (1999) 14/343 Bundestags-Drucksache 16.

[60]For a similar suggestion, see the Financial Markets Law Committee (FMLC) "Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty" (2018) <http://fmlc.org/wp-content/uploads/2018/05/dlt_paper.pdf.> para. 7.3, which supports the application of the law chosen for a 'distributed ledger technology (DLT) system' by the network participants.

the crypto-asset in question through the use of the blockchain network. Where a uniform choice of law is made, the above-mentioned concerns would not arise. Since the choice of law is uniform, there is no fragmentation of governing laws, and nor can there be any inconsistency in the results of the application of the governing laws; and since there is no room for choice by individual parties, the concern about negative externalities would not arise.

A uniform choice of law may be made in such various ways as sketched out below. Where there is a conflict between a uniform choice made for a crypto-asset and a uniform choice made for the blockchain network on which the same crypto-asset is traded, the former should prevail as the more specific choice.

(b) *Ways in which a uniform choice may be made*

A uniform choice of law for a crypto-asset may be made by way of inserting a choice-of-law clause in the white paper (prospectus) where the units of a crypto-asset are issued in an ICO (initial coin offering) or in the sale contract where the units of a crypto-asset called "stable coin" are issued in return for the payment of fiat currencies. Where the units of crypto-asset are issued as the governance tokens of a decentralised application, a choice-of-law clause could be inserted in the terms of use placed on the portal site for that application. It must, however, be acknowledged that ensuring uniformity in the choice of governing law will be difficult even with such methods. Thus, there can be multiple portal sites for a single decentralised application, each presenting a different choice-of-law clause. An ICO white paper and a stable coin sale contract, though they may be binding on the primary acquirer, may not even come to the notice of the purchasers on the secondary market.

A uniform choice of law for a blockchain network may be made by way of inserting a choice-of-law clause in the terms of use of the network. Amongst the different types of blockchains, the type called "private blockchain" requires the permission of its gatekeeper for its use. Since the gatekeeper can impose a set of terms of use on all its users, it should be possible to secure their consent to a choice-of-law clause common to all the users by placing the clause in the terms of use. It is true that persons who are not the network users will also be affected by the chosen law to which they have not consented if they take the crypto-asset units as collateral or become the bankruptcy creditors of a holder of the crypto-asset units. It may, however, be said that such persons should tolerate the impact of the chosen law since the proprietary interests that they have in a crypto-asset are those existing only in the eco-system constructed under that law.[61]

On the other hand, there is no gatekeeper for the type of blockchain called "public blockchain" which is open to all users. While it is possible for a choice

[61]For a similar observation, see Ng, *supra* n 10, 333.

of law to be made for a public blockchain by its developers, it will be difficult to secure the consent of all its users to the choice of law. If, however, a choice of law is widely known in the user community, could it be deemed to have been accepted by all the users? An interesting example is the EOS, once dubbed as a "governed blockchain." Until April 2019, there were terms of use for this blockchain called "Constitution",[62] which was created by its developers. It contained a clause entitled "choice of law", which specified a non-State rule of "Maxims of Equity", though the idea of referring to the law of Malta was earlier floated.[63] No thorough discussion is to be found as to whether this choice-of-law clause is legally binding. But the Constitution did contain a provision stating that it was "a multi-party contract entered into by the Members by virtue of their use of this blockchain." The Constitution also contained an arbitration clause, pursuant to which arbitrations had been conducted to resolve disputes arising out of the theft or misappropriation of the EOS tokens.[64] One of the published awards stated, "the Constitution probably applies automatically in much the same way that the notice posted at a railway station informs the users of their rights & obligations."[65] There was also a suggestion that the blockchain should be programmed to insert the hash value of the Constitution in the electronic signatures necessary to transact the EOS tokens.[66] The latter is an interesting idea but since electronic signatures lack visibility to human eyes, it is questionable that this method would be sufficient to render the terms of the Constitution binding on all users.

(c) *Governing law of a choice-of-law clause*

As observed in the foregoing analysis, it is doubtful that a choice of law for a crypto-asset or for a public blockchain will be effective as a uniform choice of law, namely a choice common to all the users. Theoretically, however, whether a choice-of-law clause is valid and who is bound by it are matters to be determined by the governing law of the clause in question. This is true regardless of whether the clause is contained in a white paper for a crypto-asset, or in a sale contract for a stable coin, or in the terms of use for a decentralised application. And this is also true with a choice-of-law clause in the terms of use for a

[62]See an archived text at https://web.archive.org/web/20190120062226/https://eoscorearbitration.io/home/governance/.
[63]Thomas Cox, "Article XVII –v0.4.0 Draft EOS.IO Constitution – Choice of Law" (2018) <https://www.mifengcha.com/news/5c6424cfbabcc754b64ec0a1>.
[64]See an archived webpage at https://web.archive.org/web/20200419230017/https://www.eoscorearbitration.io/disputes/cases/.
[65]Case Number: # ECAF00000023. The award, previously available on the internet, is on file with the present author.
[66]Adam Sanitt, "Legal analysis of the governed blockchain" (2018) 2 and 4 <https://bit.ly/2XwcWWd>.

private blockchain, as the question of whether it is binding on a non-user of the network as well could arise.

What should be the law governing a choice-of-law clause is a classic issue with choice-of-law clauses for contractual issues. A prevailing position is to apply the chosen law but allow for certain exceptions[67] since the application of the chosen law, being the putative governing law, would involve the circularity of logic. This circularity would not arise with respect to a choice-of-law clause for proprietary issues since the governing law of the contract in which the clause is placed is to be determined separately. This is because the choice of law for proprietary issues is conceptually different from the choice of law for contractual issues, though both may be made in a single clause for the sake of drafting convenience. Being one of the clauses in a contract, a choice-of-law clause for proprietary issues is subject to the law applicable to the contract, be it a white paper, a sale contract, or the terms of use of a blockchain.

(d) *Limitations on the choice of law*

Another question traditionally debated in the context of contractual issues is whether a choice of non-State law rules should be permitted. In the field of proprietary issues of crypto-assets, it will be long before substantive rules emerge from legislation or case law in a number of States. We should, therefore, be more open to the choice of non-State law rules, which may be developed at an international stage.[68]

It might also be thought that the scope of State laws from which a choice is made should be limited based on the concern that an uninhibited choice might be used to avoid regulatory rules.[69] Such a concern does not, however, seem warranted since the process of determining the law applicable to regulatory issues[70] is different from the conflicts process for private-law issues.

E. Objective connecting factors

In the preceding section (Section D), it is suggested that party autonomy should be accepted where there is a uniform choice of law but it is observed that it will be

[67]Art 10 of the Regulation (EC) No 593/2008 on the law applicable to contractual obligations (Rome I Regulation), for example, refers primarily to the putative governing law but secondarily to the law of the country where the party disputing consent is habitually resident. See also Art 6 of the Hague Principles on Choice of Law in International Commercial Contracts.

[68]See eg UNIDROIT's project on digital assets and private law <https://www.unidroit.org/work-in-progress/digital-assets-and-private-law/>.

[69]See the Financial Markets Law Committee, *supra* n 60 paras 6.8 and 6.9.

[70]See Koji Takahashi, "Prescriptive Jurisdiction in Securities Regulations: Transformation from the ICO (Initial Coin Offering) to the STO (Security Token Offering) and the IEO (Initial Exchange Offering)" (2020) 45 *Ilkam Law Review* 31, 33.

difficult in practice to ensure uniformity where the choice of law is made for a crypto-asset or for a public blockchain. Where no uniform choice of law is made, the applicable law needs to be determined by objective connecting factors. This section will consider what are the objective connecting factors appropriate for determining the law applicable to the proprietary issues of a crypto-asset.

1. *Crypto-assets traded on a private-blockchain network*

Where the crypto-asset in question is traded on a private-blockchain network, it is suggested that the appropriate connecting factor is the place where its gatekeeper, the person having the power to give permission for the use of the network, is based. The gatekeeper, whose identity is usually clear, may be regarded as the administrator of the network.[71] The place where it is based may, therefore, be seen as the centre of gravity of that network. It follows that even if the other actors involved in the maintenance of the network are based in other jurisdictions, the law of the place where the gatekeeper is based should be the law applicable to the proprietary issues of the crypto-assets traded on that network.

2. *Crypto-assets traded on a public-blockchain network*

(a) *Hard-and-fast conflicts rules*

Where, on the other hand, the crypto-asset in question is traded on a public-blockchain network, it is far more difficult to formulate such a good hard-and-fast conflicts rule since there is no gatekeeper for this type of network. A public-blockchain network is often created and maintained by a variety of actors. They include the developers of the blockchain,[72] the miners and validators of blocks and the full nodes, namely the nodes keeping the record of the whole chain. What is more, where the crypto-asset in question is the governance token of a decentralised application, there are also the creators of the application and the token, the holder of the admin key for the application and the webmaster of the portal website for accessing the application. Since diverse actors are involved in a variety of ways, it seems impossible to come up with a single connecting factor based on the location of any one of them by deeming him to be the

[71]The Financial Markets Law Committee, *supra* n 60, at para 6.16-6.18, uses the term 'PROPA' to denote 'Place of the Relevant OPerating Administrator' but does not specify who the administrator is. See also the UK Jurisdiction Task Force, "Legal statement on cryptoassets and smart contracts" (2019) para 95.

[72]The development of a blockchain does not always remain in the same hands after its launch. Thus, for instance, Polkadot was built by Parity Technologies based in London but its development is coordinated by Web3 Foundation based in Switzerland; Cosmos was built by Tendermint based in the United States but its development is coordinated by Interchain Foundation based in Switzerland.

administrator of the blockchain network. This is so unless in the future public-blockchain networks come under influential regulatory regimes[73] which mandate the nomination of an actor responsible for the entire network.

(b) *The place with which the network is most closely connected*

Given the difficulty of formulating a good hard-and-fast conflicts rule for a crypto-asset traded on a public-blockchain network, should the place with which the network is most closely connected be adopted as the connecting factor? Generally, the place of the closest connection is a connecting factor which directly pursues the goal of modern private international law, namely to ascertain the seat (*Sitz*) of legal relationships.[74] It may, therefore, serve as the connecting factor of the most basic conflicts rule, from which other hard-and fast conflicts rules may be derived.[75]

This connecting factor has its strength in its versatility as it allows various factors to be taken into account on a case-by-case basis. Thus, it should be possible, if it were applied to a blockchain network, to evaluate the places where various actors are based in accordance with the respective role each of them performs in the creation and maintenance of the network.

On the flip side, gauging the proximity of connection involves a great deal of uncertainty and unpredictability, which may be seen as a weakness of this connecting factor as it ultimately requires the decision of a court. Another weakness of this connecting factor lies in the fact that the closest connection does not necessarily mean that the connection is strong in absolute terms since "closest" is only a relative concept. These two weaknesses come to the fore where the factors to be taken into account are highly dispersed. In this regard, public-blockchain networks are often created as an antithesis to centralised systems and maintained by a range of highly dispersed actors. A quintessential example is the Bitcoin network, which is supported by diverse actors, including miners and other full nodes, who are dispersed around the world. There is a suggestion that the State of Massachusetts should be viewed as the place of closest connection with the Bitcoin network and the law of that State should accordingly be applied as the governing law of the proprietary issues of the Bitcoin.[76] Even if we accept, for the sake of argument, that the Bitcoin network is most closely connected with the State of Massachusetts, the connection with that State is not strong. Massachusetts may indeed be far from the mind of the parties concerned. Thus, if the Tokyo District Court in the Mt. Gox case had ruled on the basis of the

[73]The EU's regulatory initiatives, for example, are a space to watch out for.
[74]Friedrich Carl von Savigny, *System des heutigen römischen Rechts*, Bd. 8 (Berlin 1849) S. 108.
[75]§ 1 of the Austrian Federal Act on Private International Law.
[76]Ng, *supra* n 10, 337.

law of Massachusetts, it would have taken the parties by surprise. It may, therefore, be concluded that the place with which a public-blockchain network is most closely connected would not be a good connecting factor.

(c) *Suggestion: the law of the place of control of the specific crypto-asset units*

The foregoing analysis has demonstrated that for crypto-assets traded on a public-blockchain network, it is not possible to formulate a good hard-and-fast conflicts rule, and nor is it appropriate to rely on the place of closest connection as a connecting factor. It should, however, be noted that this is only true if we focus our analysis on the contacts with the network itself. It is suggested that we should rather turn our attention to the specific units of the crypto-asset which have given rise to a proprietary issue. Thus, for example, the specific bitcoins (or the specific units of the Bitcoin) which have given rise to a proprietary issue, rather than the Bitcoin network, should be the focus of our analysis. It may be recalled that we have suggested earlier in this article that as a condition for embracing party autonomy, the choice of law should be uniform for the crypto-asset in question or for the blockchain network on which the crypto-asset is traded. As noted, that condition is necessary because unless the choice is uniform, party autonomy could cause the fragmentation of governing laws which could, in turn, produce inconsistent *erga omnes* effects. Such concerns would not arise where an objective connecting factor is set for the specific units of a crypto-asset even if that connecting factor does not point to a single law common to all the available units of that crypto-asset.

Since crypto-asset units derive their economic value from their amenability to exclusive control, it is suggested that the appropriate connecting factor is the place of control of the specific units of the crypto-asset which have given rise to a proprietary issue. Crypto-asset units are, by their design, controlled by means of the private key associated with the address in which they are contained.[77] Accordingly, the place of control of crypto-asset units may also be seen as the place of control of the address in which the units are contained. If the person controlling the crypto-asset units is a natural person,[78] his habitual

[77]The balance of bitcoins in a blockchain address merely represents UTXOs (unspent transaction outputs), which is worked out by referring to all the previous transactions associated with that address. An address on the Bitcoin blockchain, therefore, only conceptually contains bitcoins and, unlike a bank account, exhibits no electronic record showing their balance. The Bitcoin's UTXO architecture is not, however, the only record-keeping model for blockchains. The Ethereum blockchain, for example, keeps the record of each user account showing the most recent balance, like a bank account.

[78]The pseudonymity of a blockchain may conceal the identity of the controlling person. But that is an evidential problem unrelated to conflict of laws. When discussing the determination of the applicable law, it will be sufficient to focus on the cases where the identity is known.

residence will usually be the place of control of the units. If the controlling person is a body corporate or unincorporated, the location of the branch or other establishment in charge of the safekeeping of the associated private key will be the place of control.

The location of the private key itself would not be a helpful criterion[79] because a private key is a piece of information and is accordingly intangible. Even if we were to deem a private key to be located where its recording medium (such as paper, a flash memory, or a server) is situated, the difficulty of localisation would remain where the same private key is copied on to more than one medium situated in multiple jurisdictions. It should further be noted that even where the location of the private key does not operate well as an effective test, the place of control of specific crypto-asset units could be ascertained by identifying the person essentially in control of the units. Thus, for example, where crypto-asset units contained in one address are sold by disclosing the associated private key to the buyer without the units being transferred to another address, the location of the private key may not operate well as an effective test since the seller and the buyer may keep it in different jurisdictions. But the place of control of the units could be ascertained since the buyer could be seen as the person essentially in control of the units. Again, where the address containing crypto-asset units is fortified with multi-signature private keys, the location of the private key does not operate well as an effective test since each private key may be stored in more than one jurisdiction. But the place of control of the units could be ascertained if the person essentially in control of the units could be identified by having regard to the respective role of each of the persons storing the keys.

(d) Conflit mobile

Where the crypto-asset units are transferred from one address to another, it may entail a cross-border change in the place of control of those units from one jurisdiction to another. It will then give rise to the question at what point in time the connecting factor should be triggered to determine the applicable law. This question may be answered by fictionally treating the place of control as the situs of the crypto-asset units since it would then be possible to apply the conflicts rules for tangible movables by analogy. Because movables can change locations, the conflicts rules for movables of all countries should have a built-in mechanism for dealing with a change of location across borders (*conflit mobile; Statutenwechsel*). It seems defensible to fictionally treat crypto-asset units as being situated

[79] *Cf* Markus Aigner, "Das internationale Privatrecht und die Blockchain – ein unlösbarer gordischer Knoten?" (2020) *Zeitschrift für Europarecht, internationales Privatrecht und Rechtsvergleichung* 211, 219 argues for the application of the law of the place where the private key is situated as the place of the closest connection under the Austrian Federal Act on Private International Law.

in their place of control in view of the close nexus that crypto-asset units have with their place of control, just like the close nexus that movables have with their physical location.

The conflicts rules for *conflit mobile* typically make a distinction between the acquisition and loss of property rights, on the one hand, and effects of the property rights, on the other. Thus, whilst the acquisition and loss of property rights may be governed by the law of the place where the movable is situated at the time of the causal facts, the effects of property rights may be governed by the law of the place where the movable is situated as and when the issue is raised.[80] This may be illustrated by the following hypothesis.

Suppose that X, the owner of a movable, concludes with Y a contract to sell the movable to the latter when the movable is situated in State A and then transfers its possession to Y in State B. Whether the ownership right is transferred from X to Y is determined by the law of the place where the movable is situated at the time of the causal facts. This is to be analysed by following the timeline. Thus, when the sale contract is concluded, the law of State A governs the requirements for the transfer of the ownership right since the movable is situated in that State at that moment. If under that law, the taking of possession by the transferee is needed in addition to a valid contract to effectuate transfer, the ownership right is not transferred to Y at that moment. Then, when Y takes possession of the movable, the law of State B is applicable since the movable is situated in State B at that moment. If the requirements for transfer under that law are met, the ownership right is transferred to Y. No matter to whom – X or Y – the ownership right belongs upon the completion of this analysis, the effects of the ownership are governed by the law of State B while the movable remains situated in that State. Thus, whether X can obtain proprietary restitution from Y would depend on whether the ownership right has the effect of allowing the holder to seek proprietary restitution as well as whether it belongs to X.

On the same facts as above, whether a security right is created in the movable while it is situated in State A is, as a question of acquisition, governed by the law of that State. If the movable is subsequently removed to State B, the effects of that security right is governed by the law of State B, with the consequence that it is converted by way of transposition to a comparable right under the law of State B. If no comparable security right exists under the law of State B, the effects of the security right created under the law of State A are suspended while the movable remains situated in State B.

[80]See eg Art 100 of the Swiss Federal Act on Private International Law; Art 13 of the Japanese General Act on the Application of Laws; § 31 of the Austrian Federal Act on Private International Law; Art 87(1) of the Belgian Act on Private International Law (Loi portant le Code de droit international privé). For similar rules under French law, see Pierre Mayer and Vincent Heuzé, *Droit international privé* (10th edn, Lgdj 2010) para 656; under Dutch law, see Jacobien Rutgers, *International Reservation of Title Clauses* (TMC Asser Press 1999) para 2.3.3.3; and under English law, see Collins and Harris, *supra* n 40, Rule 134.

If such rules for *conflit mobile* as illustrated above are applied by analogy to crypto-asset units, it would follow that the acquisition and loss of property rights in crypto-asset units are governed by the law of the place where the units are controlled at the time of the causal facts whilst the effects of the property rights are governed by the law of the place where the units are controlled as and when the issue is raised. This may be illustrated by the following hypothesis.

Suppose that the ownership right or other similar property right (let us call it "right M") is vested in the crypto-asset units contained in a certain address controlled by X under the law of State A where he has his habitual residence. X concludes a contract with Y who has her habitual residence in State B to sell the crypto-asset units to the latter and then transfers the units to an address controlled by Y. Whether the right M is acquired by Y would be governed by the law of State A while the units are still contained in the address controlled by X and subsequently by the law of State B after they have been transferred to the address controlled by Y. The requirements for acquisition under the respective legal systems will be applied by following the timeline to see whether they are fulfilled in the respective periods of time. No matter to whom – X or Y – the right M belongs upon the completion of this analysis, the effects of that right are governed by the law of the State where the person having control over the units has his or her habitual residence as and when the issue is raised. It follows that the law of State B is applicable after the units have been transferred to the address controlled by Y, with the result that the right M is converted by way of transposition to the comparable right, if any, under the law of State B. Thus, whether X can obtain proprietary restitution from Y would depend on whether the converted right M has the effect of allowing the holder to seek proprietary restitution as well as whether it belongs to X.

On the same facts as above, whether the security right N is created on the crypto-asset units while they are contained in the address controlled by X depends, since it is a question of acquisition, on the law of State A as the State of habitual residence of the person controlling the crypto-asset units at the time of the causal facts. Whether the security right N is extinguished when the right M in the units is acquired by Y depends on the same law as that governs the requirements for the acquisition of the right M (as above), since it is a question of whether Y acquires the right M without encumbrance. The effects of the security right N are governed by the law of the State where the person having control over the crypto-asset units has his or her habitual residence as and when the issue is raised. It follows that where the security right N continues to exist on the units after they have been transferred to the address controlled by Y, its effects are governed by the law of State B. In other words, the security right N would be converted by way of transposition to the comparable right, if any, under the law of State B.

F. Concluding remarks

This article has considered the questions pertaining to characterisation (Section B) and connecting factors (Sections C, D and E) in connection with the

proprietary issues of crypto-assets. Among them, the questions related to characterisation do not arise uniquely in the context of crypto-assets, whereas the questions of connecting factors call for considerations specific to crypto-assets and pose significant theoretical difficulties. As we have seen, since crypto-assets are a species of intangible assets and have no physical situs, the *lex situs* rule is not directly applicable to them. Since crypto-assets are, unlike receivables and intellectual property rights, not a legal creature, they cannot be referred to the *lex creationis*. And neither can they be referred to the *lex loci registrum* as they are recorded on ledgers distributed across a borderless network. Moreover, the choice of law by the parties is unsuitable as a connecting factor for determining the law applicable to proprietary issues in general. And finally, the application of the law of the place with the closest connection would, if we focus on the blockchain network to evaluate the connection, sit ill at ease with the idea of decentralisation pursued by the proponents of the blockchain technology.[81]

In view of these theoretical difficulties, it may be thought that the conflicts methodologies are ill-suited for the proprietary issues of crypto-assets. That may explain the tendency of the courts to rule on the basis of the *lex fori*, as shown in the cases we have examined in Section B above. There is also a scholarly suggestion for applying the *lex fori* as an option in the absence of a better solution.[82] As with other areas of law, however, the application of the *lex fori* is not an ideal solution as it would invite forum shopping and call into question the very *raison d'être* of conflict of laws. The fact that the courts around the world are wrestling with this new technology as seen in Section B illustrates the urgent need to come up with a global solution to this emerging challenge to conflict of laws.[83]

This article has suggested that party autonomy should be embraced where a uniform choice of law is made. Where there is no such choice, it has suggested that the place where the gatekeeper is established should be the connecting factor for a private blockchain. With respect to crypto-assets recorded on a public blockchain, this article has suggested that the place of control of the specific units of the crypto-asset which have given rise to a proprietary issue should be the connecting factor. The place of control is usually the habitual

[81]See also the UK Jurisdiction Taskforce, *supra* n 71, which observes at para 97 that there is very little reason to try to allocate a location to an asset which is specifically designed to have none because it is wholly decentralised.

[82]Florence Guillaume, "Aspects of private international law related to blockchain transactions," in Daniel Kraus, Thierry Obrist & Olivier Hari (eds), *Blockchains, Smart Contracts, Decentralised Autonomous Organisations and the Law* (Edward Elgar 2019), 49, 79 (in the context of discussing smart contracts); Barbara Graham-Siegenthaler and Andreas Furrer, "The Position of Blockchain Technology and Bitcoin in Swiss Law" Jusletter, 8 May 2017, para 35.

[83]See also Janeen Carruthers and Matthias Weller, "Property," in Paul Beaumont and Jayne Holliday (eds), *A Guide to Global Private International Law* (Hart 2022), 295, 307.

residence of the controlling person or, in the case of a body corporate or unincorporated, the location of the branch or other establishment in charge of the safekeeping of the associated private key. Where the crypto-asset units are transferred from one address to another, causing a cross-border change in the place of control of those units, the question at what point in time the connecting factor should be triggered may be answered by applying the rules for *conflit mobile* for tangible movables by analogy.

Disclosure statement

The author holds a variety of crypto-assets.