

The Law Applicable to Crypto Assets: What Policy Choices Are Ahead of Us?

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1 Introduction

Crypto assets can be defined broadly as cryptographically secured digital representations of value which can be transferred, stored or traded electronically by the use of distributed ledger technology (DLT) or a similar technology. Since their introduction in 2009 with Bitcoin, and particularly in the last few years with their expansion of use in various areas and sectors for different purposes, regulators and legislators at national and international levels have been struggling to catch-up with the development of crypto assets and to adapt their laws to the global paradigm shift represented by the possibilities of crypto assets.

Private law aspects of crypto assets raise various questions including the rights to possess, transfer, pledge, lease, or exclude others from their use. Traditional methods and concepts of private law are challenged by crypto assets due to their novel and complex nature and the cross-border situations they involve. Currently, there is no international regime that governs crypto assets. There are various initiatives in progress for developing international substantive rules, such as the work of the Unification of Private Law (UNIDROIT) and the United Nations Commission on International Trade Law (UNCITRAL).¹ However, due to the novel, complex and fast-evolving nature of crypto assets, and given the difficulties with previous attempts to include crypto assets into the scope of other projects,² the development of a harmonised or unified

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- 1 See *e.g.* UNIDROIT, “Digital Assets and Private Law: Study LXXXII - Digital Assets and Private Law Project” (UNIDROIT) <<https://www.unidroit.org/work-in-progress/digital-assets-and-private-law>> accessed 29 June 2023; Matthias Lehmann, “National Blockchain Laws as a Threat to Capital Markets Integration” (2021) 26 *Uniform Law Review* 148.
 - 2 For example, when preparing the Guide on the Commentary on the UNCITRAL Model Law on Secured Transactions, an interpretative comment saying that the term “money” includes digital currency was agreed to be excluded from the discussion report by the participating states. On this issue, see Stella Galehr and Tessa Grosz, “Discussion report: receivables and securities in private international law” (2019) 24 *Uniform Law Review* 738.

substantive legal framework on aspects of crypto assets, if possible at all, will likely take time. In addition, potential international substantive law rules in the area are likely to cover only some of the main aspects of crypto assets and require compromise in the scope, which means that they cannot provide a complete legal regime for crypto assets.³ It is therefore inevitable that there will be questions to be resolved by the applicable national law which is to be determined by either harmonised or unified Private International Law (PIL) rules, if they exist, or PIL rules of the forum.

This emphasises the importance of PIL in this area and of the development of widely accepted PIL rules concerning crypto assets at the international level to enhance legal certainty and predictability in this context. This has been reflected in the current work of the Hague Conference on Private International Law (HCCH) concerning the developments with respect to PIL implications of the digital economy, including DLT and its certain applications including crypto assets.⁴

One of the PIL questions to be addressed is the law applicable to crypto assets. The purpose of this chapter is to critically examine, from a comparative law perspective, some of the key applicable law questions regarding crypto assets, including characterisation, party autonomy under subjective choice of law rules, and the potential objective choice of law rules along with the related issues. The chapter first gives an overview of crypto assets highlighting their key features as well as their diversified and fast-evolving nature in order to assist the choice of law analysis. Building on this foundation, the chapter next addresses challenges around characterisation of crypto assets as money or legal tender, and property, and reflects on the legal implications of this characterisation from a choice of law point-of-view. The chapter then discusses freedom of choice and its operation and limitations in this context, explores considerations around suitable objective connecting factors in the absence of choice and aims to shed light on the possible ways forward in terms of policy choices in determining the law applicable to crypto assets with a view to providing guidance for future work in this fast developing and challenging area.

3 Lehmann (n 1).

4 See HCCH, “Developments with respect to PIL implications of the digital economy, including DLT (Prel. Doc. No 4 of November 2020)” (HCCH, March 2021) <<https://assets.hcch.net/docs/8bdc7071-c324-4660-96bc-86efba6214f2.pdf>> accessed 29 June 2023; HCCH, “Proposal for the Allocation of Resources to Follow Private International Law Implications relating to Developments in the Field of Distributed Ledger Technology, in particular in relation to Financial Technology (Prel. Doc. 28 of February 2020)” (HCCH, March 2020) <<https://assets.hcch.net/docs/f787749d-9512-4a9e-ad4a-cbc585bddd2e.pdf>> accessed 29 June 2023.

2 An Overview of Crypto Assets

The idea of crypto assets was put forward in 2008, with the publication of a 9-page white paper on Bitcoin by its pseudonymous founder Satoshi Nakamoto, as “a purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution”.⁵ Bitcoin, underpinned by blockchain, which is a type of new and revolutionary DLT, was then introduced in 2009 as the first crypto asset to enable the making of non-cash payments with secure digital records being held independently of the usual central trusted authorities, such as banks (*i.e.* without intermediation).⁶ In a remarkably short period of time, a global market with thousands of crypto assets has come into existence and continues to grow and evolve.

2.1 Key Features of Crypto Assets

There is no universally agreed definition of crypto assets yet. Definitions that have been given thus far are being revisited from time to time and change as necessary as the crypto asset landscape continues to evolve. There is no universally agreed terminology. The term “crypto”⁷ and “digital” are sometimes used interchangeably in describing these assets or sometimes the latter is used to refer to a broader category including, but not limited to, the former.⁸

In the European Commission’s Proposal for a Regulation on Markets in Crypto-assets (MiCA),⁹ the term crypto asset is defined as “a digital

5 Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System” (*Bitcoin*, 24 May 2009) <<https://bitcoin.org/bitcoin.pdf>> accessed 29 June 2023.

6 On disintermediation, see *e.g.*, Benjamin Geva, “Banking in the Digital Age - Who Is Afraid of Payment Disintermediation? (European Banking Institute (EBI) Working Paper Series No. 23)” (2018) All Papers 322.

7 The term comes from “cryptography,” a technique which is used to ensure security for validation of transactions. See Robleh Ali et al., “Innovations in payment technologies and the emerge of digital currencies” (2014) 54 Bank of England Quarterly Bulletin 262, 263, 266.

8 For an approach which considers crypto assets as a sub-set of digital assets, see *e.g.*, Law Commission of England and Wales, “Digital assets: Call for evidence” (*Law Commission*, April 2021), para. 1.20 <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-1nj5xou24uy7q/uploads/2021/04/Call-for-evidence.pdf>> accessed 18 June 2021. For an approach which differentiates crypto assets from other digital assets, see also Jason G. Allen et al., “Legal and Regulatory Considerations for Digital Assets” (*University of Cambridge*, 2020), 13 <<https://www.jbs.cam.ac.uk/wp-content/uploads/2020/10/2020-ccaf-legal-regulatory-considerations-report.pdf>> accessed 29 June 2023.

9 Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets, and amending Directive (EU) 2019/1937, [2020] COM(2020) 593 final, 2020/0265(COD) (“MiCA Proposal”).

representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology”.¹⁰ A similar definition can be found in the United Kingdom (UK) Government consultation and call for evidence on the UK Regulatory Approach to Cryptoassets and Stablecoins,¹¹ which states that “a cryptoasset is understood to be a digital representation of value or contractual rights that can be transferred, stored or traded electronically, and which may (though does not necessarily) utilise cryptography, distributed ledger technology or similar technology”.¹²

Based on these definitions, one can identify at least two distinguishing elements of crypto assets. First, they exist only electronically as values and do not have any physical existence. Second, they are underpinned by a DLT or similar technology to securely transfer values and also record and store the values on the ledger within the network. Each network participant has a public key (used to encrypt data) paired with a private key (used to decrypt data), and transactions take place between crypto asset wallets¹³ of the participants.¹⁴

Specific technicalities of the network may differ depending on how the ledger is accessed and updated and by whom. The network can be “permissionless”, “permissioned” or a combination of both.¹⁵ In permissionless networks, as is the case with Bitcoin, the ledger is public and can be updated by a consensus of the participants, known as miners or nodes, who act as transaction verifiers and bookkeepers and work in a peer-to-peer network informally formed with no central coordination.¹⁶ There is a high degree of privacy by encryption

10 See *id.*, Article 3(2).

11 HM Treasury, “UK regulatory approach to cryptoassets and stablecoins: Consultation and call for evidence” (*HM Treasury*, January 2021) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/950206/HM_Treasury_Cryptoasset_and_Stablecoin_consultation.pdf> accessed 29 June 2023.

12 *Id.*, para. 1.11.

13 According to *id.*, 38, a crypto asset wallet (although its design and particular features may vary) typically allows the storage and management of crypto assets and cryptographic keys to enable the user to store and transfer.

14 Ali et al. (n 7), 268–270, 273–274.

15 See *e.g.*, UK Government Chief Scientific Adviser, “Distributed Ledger Technology: beyond block chain” (*Government Office for Science*, 2015) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf> accessed 29 June 2023.

16 See *e.g.*, Ali et al. (n 7), 266, 268; Committee of Payments and Market Infrastructures Markets Committee of the Bank of International Settlement, “Central Bank Digital Currencies” (*BIS*, March 2018), 97 <<https://www.bis.org/cpmi/publ/d174.pdf>> accessed 18 June 2021 (“BIS 2018 Report”). This process is done by special purpose-built hardware and involves solving complex algorithmic equations which requires a high amount of computing power. See Ali et al. (n 7), 273–274.

in the network since participants do not disclose their identity.¹⁷ In permissioned networks, the ledger is private and can be updated by trusted participants, known as trusted nodes, under the permission of a central entity which is generally the company that has developed the crypto asset in question.¹⁸

The distributed ledger, regardless of the type of network, can therefore be understood as a kind of distributed database which includes the entire history of all the transactions that have ever happened within the network and which cannot be modified by a participant secretly as every transaction is recorded together with the history of previous transactions in the ledger.¹⁹ This offers several advantages, including traceability and transparency, privacy, integrity, immutability, verification of receipt, high-level security and immunity, direct peer-to-peer real-time transaction bypassing intermediaries, and, as a result, making trust rather superfluous among the participants of the network.²⁰

As the size of the distributed ledger keeps growing substantially every moment with the addition of each new transaction to the ledger, this has led to scalability issues, particularly in permissionless networks, and also the emergence of third-party intermediaries, such as crypto asset wallet providers or crypto asset exchanges,²¹ through which participants access and manage their crypto assets.²² In terms of crypto asset wallet providers, the model can be (i) custodial (known as a “hot” wallet) where the service provider is in full

17 Ali et al. (n 7), 266.

18 BIS 2018 Report (n 16), 96–97; HM Treasury, Financial Conduct Authority (FCA), and the Bank of England, “UK Cryptoassets Taskforce: final report” (*HM Treasury*, October 2018), 10 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf> accessed 29 June 2023 (“UK Taskforce Report”).

19 See Riccardo de Caria, “A Digital Revolution in International Trade? The International Legal Framework for Blockchain Technologies, Virtual Currencies and Smart Contracts: Challenges and Opportunities,” in UNCITRAL, “Modernizing International Trade Law to Support Innovation and Sustainable Development” (*UNCITRAL*, November 2017), 106 <<https://aperto.unito.it/retrieve/handle/2318/1632525/464608/R.%20de%20Caria%20%20A%20Digital%20Revolution%20%282017%29.pdf>> accessed 29 June 2023.

20 See e.g., Burcu Yüksel and Florian Heindler, “Use of Blockchain Technology in Cross-Border Legal Cooperation under the Conventions of the Hague Conference on Private International Law (HCCH)” (*Aberdeen Law School Blog*, 15 August 2019) <<https://www.abdn.ac.uk/law/blog/use-of-blockchain-technology-in-crossborder-legal-cooperation-under-the-conventions-of-the-hague-conference-on-private-international-law-hcch/>> accessed 29 June 2023.

21 According to the HM Treasury (n 11), 38, a crypto asset exchange is a venue that facilitates the purchase or selling of crypto assets, either in exchange for fiat currencies or other crypto assets.

22 BIS 2018 Report (n 16), 99, 105.

control of keys and assets, generally in the interest of customer convenience when transacting; (ii) non-custodial (known as a “cold” wallet) where the customer is in full control of keys and unilaterally transfers crypto assets; or (iii) hybrid where approval of both the service provider and the customer is required to unlock or transfer crypto assets.²³ In terms of crypto asset exchanges, the model can be (i) centralised where the exchange operator controls matching, clearing, and settlement, (ii) peer-to-peer where the exchange operator connects buyers with sellers for clearing and settlement; or (iii) decentralised where all processes are directly executed on and by the DLT system without a central operator.²⁴

As is seen, technical and operational aspects of crypto assets underpinned by DLT or a similar technology significantly differ from those of centralised networks. From a choice-of-law point-of-view, these key features of crypto assets are important to be taken into account, in particular in identifying or developing suitable connecting factors and localising these connecting factors in determining the law applicable to crypto assets.

2.2 *Current Crypto Assets Landscape*

The first crypto asset, Bitcoin, was issued privately (*i.e.* not by a central bank or other central authority of a state), and was originally designed to create an alternative system of payment in the context of the exchange of goods and services. Over the years, with the introduction of other crypto assets with different functions and nature, the crypto assets landscape has been significantly and continuously evolved and diversified.

Although there is no universally agreed classification of crypto assets, based on their functions, crypto assets can be classified via three main categories: exchange tokens, security tokens, and utility tokens.²⁵ According to the classification by the UK Cryptoassets Taskforce, exchange tokens are crypto assets like Bitcoin that are used as a means of exchange and investment but are not state backed. Security tokens are used for investment and as a capital raising tool. They may provide certain rights such as ownership, repayment of a sum of money or entitlement to a share of future profits. They may also be transferable securities or financial instruments. Utility tokens are also used for investment and as a capital raising tool, and they can be redeemed for access to a specific product or service typically provided using a DLT platform. It is also to

23 HM Treasury (n 11), 38.

24 *Id.*

25 For this classification, see the HM Treasury, FCA, and the Bank of England (n 18), 11–15. For an overview of major token classification frameworks, see Allen et al. (n 8), 10.

be noted that many crypto assets take a hybrid form, falling into different categories at different points in time.²⁶ For example, they may be initially used to raise capital and fall into the category of security tokens, and later, with changing user behaviour, be used primarily as a means of exchange and fall into the category of exchange tokens.²⁷

Another type of crypto assets, the so-called “stablecoins”, has also recently emerged as a new category. In contrast to crypto assets like Bitcoin, which are highly volatile, stablecoins (such as Diem, formerly Libra) aim to maintain their value against one or more reference asset, such as fiat currency or a commodity.²⁸ They are considered to have significant potential of becoming widely accepted globally, in particular in cross-border payments, and are attracting attention in many countries.

Crypto assets issued by central banks, the so called “Central Bank Digital Currencies (CBDC)” are also attracting attention globally and being explored by over 50 monetary authorities,²⁹ including the Bank of England,³⁰ the European Central Bank,³¹ the Federal Reserve System,³² the Bank of Canada³³ and the Swiss National Bank.³⁴

From a choice-of-law point-of-view, the fast-evolving and diversifying crypto assets landscape is to be taken into account in developing choice-of-law rules. This is not an area where one hard and fast rule could satisfactorily accommodate the needs of the current, and future, crypto assets landscape.

26 HM Treasury (n 11), 5.

27 *Id.*

28 On stablecoins, see *id.*, Chapter 3; see also the MiCA Proposal (n 9), Explanatory Memorandum.

29 Luca D'Urbino, “The digital currencies that matter: Get ready for Fedcoin and the e-euro” (*The Economist*, 9 May 2021), 11 <<https://www.economist.com/leaders/2021/05/08/the-digital-currencies-that-matter>> accessed 29 June 2023.

30 Bank of England, “UK central bank digital currency” (*Bank of England*, 13 May 2022) <<https://www.bankofengland.co.uk/research/digital-currencies>> accessed 18 June 2021.

31 European Central Bank (ECB), “A digital euro” (*ECB*) <https://www.ecb.europa.eu/paym/digital_euro/html/index.en.html> accessed 29 June 2023.

32 Board of Governors of the Federal Reserve System, “FAQs: What is a Central Bank Digital Currency?” (*Federal Reserve*, 20 January 2022) <<https://www.federalreserve.gov/faqs/what-is-a-central-bank-digital-currency.htm>> accessed 29 June 2023.

33 Bank of Canada, “Digital currencies and fintech: projects” (*Bank of Canada*) <<https://www.bankofcanada.ca/research/digital-currencies-and-fintech/projects/>> accessed 29 June 2023.

34 Marc Jones, “Swiss central bank readying cross-border digital currency test” (*Reuters*, 29 April 2021) <<https://www.reuters.com/article/snb-digitalcurrency-idUSL1N2MM1UX>> accessed 29 June 2023.

Choice-of-law rules in this area should offer a sufficient degree of flexibility along with legal foreseeability and certainty to facilitate the crypto assets landscape.

3 Characterisation of Crypto Assets

With respect to choice of law, characterisation is one of the first questions raised in relation to crypto assets. Will they be treated as money or legal tender, or as property? The answer may vary from one jurisdiction to another, and in some jurisdictions, there is no clear answer yet.³⁵

3.1 *Crypto Assets as Money or Legal Tender*

Money can have different meanings in different situations.³⁶ From an economic point of view, it is usually taken that there are three main criteria for something to be considered as money: acting as a medium of exchange, as a store of value and as a unit of account.³⁷ Acceptance in a community is considered as an element in this analysis.³⁸

Legal tender, on the other hand, has a narrower technical meaning than money. Legal tender usually refers to the banknotes or coins that constitute the national currency issued under the legislation of the given state.³⁹ What is classed as legal tender therefore varies. For example, across the UK, English banknotes are not legal tender in Scotland, and Scottish banknotes are not legal tender in England or Scotland.⁴⁰ Foreign currency, unless adopted by a

35 For a comparative study on this matter, see Law Library of Congress and the U.S. Global Legal Research Directorate, "Regulation of Bitcoin in selected jurisdictions" (*Library of Congress*, January 2014) <www.loc.gov/item/2014427360/> accessed 18 June 2021; for different accounts on this topic see Philipp Hacker, Ioannis Lianos, Georgios Dimitropoulos and Stefan Eich (eds), *Regulating Blockchain: Techno-Social and Legal Challenges* (Oxford: OUP 2019) Part II; Primavera De Filippi, "Bitcoin: a regulatory nightmare to a libertarian dream" (2014) 3 *Internet Policy Review: Journal on Internet Regulation* 1; Georgios Dimitropoulos, "The Law of Blockchain" (2020) 95 *Wash. L. Rev.* 1117.

36 Charles Proctor, *Mann on the Legal Aspect of Money* (7th edn, Oxford: OUP 2012), para. 1.04. *Id.*, para. 1.09.

37 Benjamin Geva and Dorit Geva, "Non-State Community Virtual Currencies," in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019), 292.

39 For this definition, see *id.*, 285.

40 Bank of England, "What is a legal tender?" (*Bank of England*, 30 January 2020) <<https://www.bankofengland.co.uk/knowledgebank/what-is-legal-tender>> accessed 18 June 2021; Committee of Scottish Bankers (CSCB), "Legal Position" (CSCB) <<https://www.scotbanks.org.uk/banknotes/legal-position.html>> accessed 29 June 2023.

state as its own, is not legal tender, but can still be considered by law as money without having the legal tender capacity.⁴¹

Early responses from regulatory authorities in some jurisdictions seem to have indicated a tendency towards not recognising crypto assets as money or currency. In the UK, the Cryptoassets Taskforce assessed that crypto assets are too volatile to be a good store of value; they are not widely accepted as a means of exchange, and they are not used as a unit of account; and, they therefore are not considered to be a currency or money.⁴² Similarly, in the EU, the European Central Bank assessed that they do not fit the economic or legal definition of money or currency.⁴³ As a reflection of this, and probably to avoid any confusion with fiat currencies, the term crypto assets has been preferred to be used by regulatory authorities as opposed to the term cryptocurrencies or virtual currencies. Although early responses from judicial authorities varied on this question,⁴⁴ it is asserted that the decisions were given in a particular context and therefore do not represent a general principle or conclusive answer on the question.⁴⁵ These early responses are also likely to be re-visited in parallel with the fast-evolving nature of crypto assets and in light of the emergence of new categories of crypto assets.

From a choice-of-law perspective, the importance of this discussion lies in the application of the principle of *lex monetae* and the application of currency as a connecting factor in determining the law applicable to crypto assets. As money traditionally reflects an exercise of sovereignty by states,⁴⁶ the issues relating to money and currency are subject to the law of the issuing state (*lex monetae*). The *lex monetae* is deemed to have a broad scope of application that includes, in addition to the meaning of the currency in which the debt is expressed, its form, its nominal value, and also the relationship between

41 Geva and Geva (n 38), 285–286.

42 HM Treasury, FCA, and the Bank of England (n 18), para. 2.13.

43 European Central Bank, “Virtual Currency Schemes - a further analysis” (ECB, February 2015), 23–25 <<https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf>> accessed 29 June 2023.

44 See e.g., *Case Skatteverket v. David Hedqvist*, C-264/14, ECLI:EU:C:2015:718; *Securities and Exchange Commission v Trendon T. Shavers and Bitcoin Savings and Trust*, Case No. 4:13-cv-416 (6 August 2013); *United States v. Faiella*, 39 F. Supp. 3d 544 (S.D.N.Y. 2014); *Florida v. Espinoza*, Case No. F14–2923 (Fla. 11th Cir. July 22, 2016).

45 See Rosa María Lastra and Jason Grant Allen, “Virtual currencies in the Eurosystem: challenges ahead” (*European Parliament*, July 2018), 18–21 <https://www.europarl.europa.eu/cmsdata/150541/DIW_FINAL%20publication.pdf> accessed 29 June 2023; Geva and Geva (n 38), 301. More broadly, see also Charles Proctor, “Cryptocurrencies in International and Public Law Conceptions of Money,” in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019).

46 Proctor (n 36), para. 1.12.

the old currency and the new currency in case of a change.⁴⁷ The application of the principle of *lex monetae* in the context of crypto assets is not straightforward.⁴⁸ For crypto assets which are not state backed, there seems to be no room for the application of the principle of *lex monetae*, since there is no issuing state whose law could be applied to these types of crypto assets.⁴⁹ On the other hand, the newly emerging stablecoins, with value backed by one single fiat currency, and CBDCs, which are issued by central banks of states, would require a different approach, and the principle of *lex monetae* is likely to find a scope of application in relation to these types of crypto assets.

The analogy would be similar regarding the application of currency as a connecting factor in cases concerning crypto assets.⁵⁰ For crypto assets which are not state backed, currency as a connecting factor does not establish a link to any country. On the other hand, types of stablecoins referenced against a fiat currency and CBDCs are likely to be capable of establishing such a link between the asset in question and a country in most cases.

As a very recent development, El Salvador, where the US dollar is legal tender, has announced that it plans to adopt Bitcoin as legal tender alongside the US dollar.⁵¹ If this happens, this will make El Salvador the first country in the world to adopt Bitcoin as legal tender. From a choice-of-law perspective, this would initiate a new discussion as regards the application of the principle of *lex monetae* and the application of currency as a connecting factor in cases where the crypto asset in question is privately issued but backed by a state (or more than one state). It is likely that an additional connecting factor or factors would be needed in such cases for the application of the law of that state.

47 On *lex monetae*, see e.g., Lord Collins of Mapesbury and Jonathan Harris (eds), *Dicey, Morris & Collins on the Conflict of Laws* (15th edn, Mytholmroyd: Sweet and Maxwell 2012), paras. 37–009, 37–010. The principle of *lex monetae* is also accepted in national PIL rules; see e.g., Article 147 of the Swiss Federal Act on Private International Law (PILA) of 18 December 1987, AS 1988 1776, SR 291.

48 Burcu Yüksel, “International Payments in Virtual Currencies Underpinned by Blockchain: New Challenges for Private International Law” (78th International Law Association Biennial Conference, August 2017), Sydney, Australia.

49 For the *lex monetae* in relation to obligations denominated in Bitcoin or analogous crypto assets, see Andrew Dickinson, “Cryptocurrencies and the Conflict of Laws,” in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019), 120–121.

50 For the application of currency as a connecting factor for objective choice of law rules in determining the law applicable to electronic funds transfer, see Burcu Yüksel, *Uluslararası Elektronik Fon Transferine Uygulanacak Hukuk* (Istanbul: XII Levha 2018), 172.

51 BBC, “Bitcoin: El Salvador plans to make cryptocurrency legal tender” (*BBC*, 6 June 2021) <<https://www.bbc.co.uk/news/world-latin-america-57373058>> accessed 29 June 2023.

3.2 *Crypto Assets as Property*

Property and ownership, from a legal point-of-view, can be defined, understood and categorised differently in different jurisdictions. Property law is an area that differs significantly between Common Law and Civil Law, as well as between different Civil Law jurisdictions.⁵² Therefore, it is an area in which it is difficult to find a compromise in developing widely-accepted international rules or standards.⁵³

Early responses from regulatory authorities as well as judicial authorities in some countries seem to have indicated a tendency towards recognising crypto assets as property in a variety of contexts. In the UK, one of the first regulatory responses came from Her Majesty's Revenue and Customs (HMRC) which stated in one of its policy papers that crypto assets will be considered as property for the purposes of inheritance tax while also noting that it "will look at the facts of each case and apply the relevant tax provisions according to what has actually taken place (rather than by reference to terminology)."⁵⁴ This indicated that the legal characterisation and treatment of crypto assets will require a case-by-case analysis in which the type, peculiarities and function of the crypto asset in question will be relevant and taken into account, along with the issue in question. English court judgments suggest so far that crypto assets are, or can be, treated as property within the Common Law definition of the term.⁵⁵ These judgments are in line with the view of the UK Jurisdiction Task Force

52 For example, the legal regime in Germany (and in states which adopted the German Civil Code) is very different to the regime of other Civil Law countries; see Maxim Bashkatov et al., "A Comparative Analysis on the Current Legislative Trends in Regulation of Private Law Aspects of Digital Assets (University of Aberdeen School of Law Working Paper Series 004/19)" (*University of Aberdeen*, 2019) <<https://www.abdn.ac.uk/law/documents/Yuksel-Ripley-004.pdf>> accessed 29 June 2023.

53 This is, for example, reflected in the UNCITRAL, *United Nations Convention on Contracts for the International Sale of Goods (Vienna, 1980)* (New York: United Nations Publication 2010) ("CISG"), and in the International Chamber of Commerce, *Incoterms® 2020* (ICC 2020), as neither deals with the effect of the sales contract on the property in the goods sold.

54 For the HMRC's work in the area, see HM Revenue & Customs, "Tax on cryptoassets" (HMRC, 30 March 2021) <<https://www.gov.uk/government/publications/tax-on-cryptoassets>> accessed 29 June 2023.

55 See e.g., *Ion Science Ltd v Persons Unknown* (Unreported, 21 December 2020); Andrew Moir et al., "High Court considers where cryptocurrencies are located and compels disclosure of information by cryptocurrency exchange outside the UK" (*Herbert Smith Freehills*, 24 February 2021) <<https://hsfnotes.com/litigation/2021/02/24/high-court-considers-where-cryptocurrencies-are-located-and-compels-disclosure-of-information-by-cryptocurrency-exchanges-outside-the-uk/>> accessed 29 June 2023; *AA v Persons Unknown* [2019] EWHC 3556 (Comm).

Statement on Cryptoassets and Smart Contracts under English law⁵⁶ and also with the conclusion that was reached in another Common Law jurisdiction, *i.e.* New Zealand, in the case of *Rusco v Cryptopia Ltd (in liquidation)* [2020] NZHC 782.⁵⁷ The tendency towards recognising crypto assets as property is also seen in the US and Singapore.⁵⁸

If crypto assets are regarded as property, the next issue would be their classification and treatment in a given property law framework. In general, a distinction is made between real property and personal property in Common Law, corresponding to immovable property and movable property in Civil Law, and between tangible property (*e.g.* physical things) and intangible property (*e.g.* intellectual property) mirroring *choses* in possession and *choses* in action in Common Law.⁵⁹ The traditional understanding of property, as well as ownership in law under this categorisation, is challenged in the context of crypto assets due to their unique nature.⁶⁰ They are a form of intangible property, meaning that they do not have a physical existence, but they also share several characteristics with tangible property such as transferability and storage.⁶¹ Furthermore, the fact that the transfer of title to a crypto asset does not involve physical objects blurs the boundaries between proprietary and obligatory rights.⁶²

From a substantive law point-of-view, it is important to note the traditional discussion that exists relating to the question about the nature of property law

56 UK Jurisdiction Task Force, “Legal Statement on Cryptoassets & Smart Contracts” (*Tech Nation*, November 2019), 21–22 <<https://technation.io/lawtech-uk-resources/#cryptoassets>> accessed 29 June 2023.

57 Moir et al. (n 55).

58 See Allen et al. (n 8), 21–22.

59 See *e.g.*, Jonathan Hill and Máire Ní Shúilleabháin, *Clarkson & Hill’s Conflict of Laws* (5th edn, Oxford: OUP 2016), 470–472.

60 For English Common Law position, see Law Commission of England and Wales (n 8), 6–9. On this issue, see also David Fox, “Cryptocurrencies in the Common Law of Property,” in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019); Daniel Carr, “Cryptocurrencies as Property in Civilian and Mixed Legal Systems,” in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019); Kelvin FK Low and Wu Ying-Chieh, “The Characterisation of Cryptocurrencies in East Asia,” in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (Oxford: OUP 2019).

61 Financial Markets Law Committee, “FinTech: Issues of Legal Complexity” (*FMLC*, June 2018), 20–21 <http://fmlc.org/wp-content/uploads/2018/06/FinTech_bound.pdf> accessed 18 June 2021; Joanna Perkins and Jennifer Enwezor, “The legal aspects of virtual currencies” (2016) 10 *Butterworths Journal of International Banking and Financial Law* 569, 570.

62 See Florian Heindler, “The law applicable to third-party effects of transactions in intermediated securities” (2019) 24 *Uniform Law Review* 685, 696.

either as a right which is characterised mainly by *erga omnes* entitlements and, therefore, in principle applies to tangibles and intangibles, or as a subjective right which is connected with a particular power in relation to goods.⁶³ From a choice-of-law point-of-view, this discussion raises the question as to whether intangibles, such as crypto assets, should be characterised as obligations or whether choice-of-law rules for property law should be applied to them.

One of the important aspects of this discussion lies in the application of *lex situs*, i.e. the law of the country where the property is located, in determining the law applicable to crypto assets. *Lex situs* frequently applies in international property law.⁶⁴ However, its application to crypto assets is not straightforward as crypto assets are not located in one single place, at least not in many cases where the ledger is distributed or decentralised with a cross-border nature. The English High Court recently considered for the first time the location of a crypto asset in *Ion Science Ltd v Persons Unknown*⁶⁵ and reached the view that the location of a crypto asset (in the given case Bitcoin) is the place where the person or company who owned the coin or token is domiciled.⁶⁶ Although this decision helps to bring some clarity to the issue, it leaves room for a debate on the suitability of the application of *lex situs* in its traditional understanding in the context of crypto assets which do not have a situs as such. As will be explored in Part 5 below, this raises the question as to whether proprietary aspects of crypto assets should be governed by the law applicable to obligations or by newly adopted choice of law rules. Whether the network is permissionless or permissioned can make a difference in developing a suitable connecting factor in this context as well, since, particularly for the former, the application of a single law could be preferred over splitting the applicable law based on the location of participants.

4 Defining the Scope of Choice-of-Law Rules or Instruments

Particular matters relating to the scope of application require specific attention to inform policy choices in defining an adequate choice-of-law framework

63 See the discussion in Claus-Wilhelm Canaris, "Die Verdinglichung obligatorischer Rechte," in *Festschrift für Werner Flume* (Köln: Schmidt 1978), 371. Since then, the arguments have not changed considerably.

64 See recently, Caroline Rupp, "lex rei sitae reloaded," in Florian Heindler (ed), *Festschrift 40 Jahre IPRG* (Wien: Jan Sramek Verlag 2020), 309, 310.

65 See (n 55).

66 It is stated in Moir et al. (n 55), that the court was assisted by the analysis of Dickinson (n 49).

for crypto assets. This includes the adoption of technological neutrality to accommodate future technological innovation and varieties between the legal systems, and to raise awareness of the existing PIL landscape, in particular the prospective interplay of a newly developed choice-of-law rule with choice-of-law rules which are already being applied to neighbouring aspects.

4.1 *Technological Neutrality*

The key to the scope of a specific choice-of-law rule or instrument are the legal terms used to describe the scope of the rule or instrument. The relevant terms in a choice-of-law rule or instrument must be broad enough to encompass the varieties stemming from the diversity of legal systems coordinated by the choice-of-law rule or instrument. It is, therefore, inevitable that the terms defining the scope must be broader than the terms of the substantive law rule of a specific jurisdiction. If the choice-of-law rule or instrument describes its scope with the same narrow terms as in the respective substantive law of the forum, the choice of law rule or instrument cannot be applied to refer equally to an applicable foreign law differing from the substantive law of the forum. This must be avoided particularly if the choice-of-law rule or instrument would be one with universal application such as in the meaning of Article 2 of the Rome I Regulation.⁶⁷ This particularity of choice-of-law rules in contrast to substantive law rules is one of the reasons why the decisive terms defining the scope of the choice-of-law rule or instrument must be sufficiently broad.

The second element to be observed is the fast technological progress made in connection with digitalisation. In various fields of cross-border legal interaction, an argument made in favour of technological neutrality is the avoidance of situations where a rule drafted against the background of a specific technological innovation (*e.g.* email) quickly becomes outdated.⁶⁸ In the field of PIL, this observation has also been stressed in the recent work of the HCCH on PIL implications for the digital economy.⁶⁹ In the field of substantive law, the American Law Institute (ALI) and Uniform Law Commission (ULC) Joint Committee on the Uniform Commercial Code and Emerging

67 Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I), [2008] OJ L177/6 (“Rome I Regulation”).

68 See, with further references, Florian Heindler, “The digitisation of legal co-operation – reshaping the fourth dimension of private international law,” in Thomas John, Rishi Gulati and Ben Köhler (eds), *The Elgar Companion to The Hague Conference on Private International Law* (Cheltenham: Edward Elgar Publishing 2020), 428–429.

69 HCCH, “Developments” (n 4), para. 2.8.

Technologies⁷⁰ has most recently emphasised the importance of technological neutrality in substantive law by refraining from giving any references to DLT or other specific technologies and instead using the electronically neutral functional term “controllable electronic record” to encompass future technological innovation. Similarly, the UNCITRAL for its recent Model Law has preferred to use the term “electronic transferable record” and defined it without giving a reference to any specific type of technology such as DLT or blockchain.⁷¹ This is in contrast to the EU’s MiCA Proposal and the UK Government’s consultation papers concerning crypto assets.⁷²

In light of the above analysis, the scope of a choice-of-law rule or instrument should be technologically neutral (first requirement) and broad enough to encompass technological differences in various legal systems (as opposed to being workable for particular legal systems only with the inclusion of specific terms of substantive law) (second requirement). Therefore, the reference to DLT and blockchain in the Council document of the HCCH Permanent Bureau⁷³ is better to serve only as guidance in developing a rule or instrument; otherwise, the first requirement would not be satisfied.

Moreover, the terms used to define the scope of a choice-of-law rule or instrument should include the functionalities of the phenomenon, mainly those which represent the core for the transactions executed by the involved parties. As observed above,⁷⁴ the so-called crypto assets consist of cryptographically secured digital representations of value that can be transferred, stored, or traded electronically by the use of DLT. The special feature of crypto assets is their unique use in a system which, from a purely factual perspective, assigns particular electronic values to a particular person or a particular group of persons and thereby enables the possession-like⁷⁵ attribution of digits to a particular person or group. Although the consequences of the control of particular electronic values are extremely diverse, the fact that a certain value is assigned to a particular person or group constitutes a general feature. It is, therefore,

70 Uniform Law Commission, “Uniform Commercial Code and Emerging Technologies” (*ULC*, 2021) <<https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=36a12016-c502-2458-d6a0-0dbe3fddaff7&forceDialog=0>> accessed 29 June 2023.

71 UNCITRAL, *UNCITRAL Model Law on Electronic Transferable Records* (New York: United Nations Publications 2017); on technological neutrality, see *id.*, Recital 18 of the Article-by-article commentary.

72 On this issue, see *supra* Part 2.1.

73 HCCH, “Developments” (n 4).

74 See *supra* Part 1.

75 See Article 11 of UNCITRAL (n 70) and its Explanatory Note, para. 13, 105–109.

convincing to consider crypto assets as digital data or electronic values which can be attributed to a particular person or group.

So far as certain types of attributable electronic values can already be classified under the existing choice-of-law rules or instruments (such as financial instruments or electronic money), they should be excluded from the scope of newly developed choice-of-law rules on crypto assets. Further exclusions would be a matter of policy choices. Nevertheless, it seems to be less cumbersome to start with a broad notion of attributable electronic values and provide exceptions, rather than to start with a very narrow definition or complex taxonomy which is better suited to be the focus of a substantive law framework.⁷⁶

4.2 *Different Legal Aspects of Crypto Assets and Scope Rules*

Crypto assets are real-life phenomena which have a potential impact on a large scale of different legal transactions and legal situations.⁷⁷ They also raise cross-sectional issues, giving rise to legal questions in the context of family law, particularly the financial aspects of family law, successions law, contract law, tort law, intellectual property law, insolvency law and property law. Therefore, it is important that a choice-of-law framework in this area coordinates the interplay with other choice-of-law rules and instruments.

4.2.1 *Crypto Assets as Representations*

Crypto assets, defined as attributable electronic values, can be used as representations of contractual and non-contractual claims or of physical objects (*e.g.* tokenised ownership rights in cars). Whether the possession of respective crypto assets (token) leads to ownership of the tokenised object is a question of substantive law.⁷⁸ In cases where the ownership and transfer of physical objects or the assignment of rights or claims is already governed by other conflict-of-laws rules, they are to be excluded from the scope of a newly-developed choice-of-law rule or instrument.

The same is true if tokens no longer qualify as crypto assets. In other words, a choice-of-law rule or instrument on attributable electronic values should only refer to the transfer of the attributable electronic values itself and not to

⁷⁶ See the references in HCCH, “Developments” (n 4), para. 9.

⁷⁷ See Susanne Gössl, “IPR and Smart Contracts,” in Thorsten Voß (ed), *Recht der FinTechs* (De Gruyter 2023, forthcoming).

⁷⁸ See *e.g.*, Steven Harris, “Memorandum to the Committee on the Uniform Commercial Code and Emerging Technologies: Controllable Electronic Records” (*UCC*, 18 April 2021) <<https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=cdb4e8dd-84ed-8fc6-f579-f0a82805274f&forceDialog=0>> accessed 29 June 2023.

the transfer of an embodied right or physical token. Therefore, all questions relating to the nature and content of the embodied right are to remain outside the scope of application. This view is supported via an analogy to the scope of choice-of-law rules on intermediated securities. For example, the nature and existence of rights embodied in the security are outside the scope of choice-of-law rules for the proprietary aspects of transactions in intermediated securities in the Hague Securities Convention.⁷⁹

4.2.2 Interplay in the Existing Choice-of-Law System

It is important that situations involving crypto assets are accommodated within the existing choice-of-law system under choice-of-law rules and instruments being applied by courts and tribunals in various fields. This means that, for example, an insolvency regulation cannot be rendered inapplicable just because crypto assets are involved in the case. A corporation purchasing crypto assets still operates under the legislation referred to by *lex societatis*. The statist framework of choice of law continues to exist and the questions arising in connection with crypto assets must be addressed within this system.⁸⁰ A stand-alone solution to address all issues arising across various fields of law in connection with crypto assets does not seem feasible. Moreover, a choice-of-law rule or instrument on crypto assets should only deal with specific questions which are not sufficiently addressed by the existing choice-of-law rules or instruments. Other matters, such as the determination of the law applicable to the operational matters of a company issuing crypto assets or the law applicable to the question of who the legal successor of inheritance (including crypto assets) is, are not questions for a newly developed rule or instrument concerning crypto assets. The crypto community will therefore need to be ready for the complexity to arise by the application and interplay of different choice-of-law rules for situations involving crypto assets. There will be no PIL one-stop-shop for such situations.

It is well understood that complexities arising from a constantly refined and progressively growing nuanced choice-of-law framework, in particular regarding incidental questions, leads to fragmentation and creates challenges. More specifically, the lack of binding rules addressing incidental questions

79 Convention of 5 July 2006 on the Law Applicable to Certain Rights in Respect of Securities held with an Intermediary (“Hague Securities Convention”). The Convention also provides for a limited freedom to choose the applicable law.

80 See *e.g.*, Matthias Lehmann, “Who Owns Bitcoin: Private law Facing the Blockchain,” (2020) 21 Minnesota Journal of Law Science & Technology 93, 132–133, regarding *inter alia* applying the choice of law rules for unjust enrichment in case of an erroneous transfer.

could increase the number of situations in which the applicable law cannot be clearly determined *ex-ante*. It is, therefore, vital to create a concise choice-of-law rule or instrument, which avoids further characterisation within the domain of attributable electronic values and keeps the scope rule technologically neutral and broad. The analysis of the existing choice-of-law rules and instruments should provide for a narrow gap of questions which have not yet been sufficiently addressed to keep the add-up to the existing and already complex choice-of-law framework as concise as possible.

One of the main exclusions from the scope of a choice-of-law rule or instrument is to be the title to acquire an attributable electronic value. Thus, a sales contract or disposition upon death by virtue of which electronic values ought to be transferred to another person is to be governed by the relevant choice of law rules or instruments on contract or succession respectively. Basically, this leads to a choice-of-law rule or instrument aiming at the bundle of rights relating to the crypto assets and their acquisition. These questions are typically connected to the notion of property (*e.g.* rights to use, to allow others to use, to prevent others from using (*i.e.* exclude), to extinguish, *etc.*). They address important preliminary questions in, for example, insolvency law, successions law and family law connected with the aforesaid rights. The important interplay of the different choice-of-law rules with the rule governing proprietary effects should therefore fall into the scope of existing rules in those areas. This means that connecting factors in choice-of-law rules of those areas remain untouched and this would reduce fragmentation in the applicable law. It is, thus, possible to identify, to a large extent, the domain of proprietary questions as a field of law which requires specific legislative intervention for choice-of-law rules or instruments on crypto assets.

5 Policy Choices in Developing Suitable Connecting Factors

Building on the analysis in the previous parts of this chapter, it is useful to make some preliminary points in exploring options for suitable connecting factors in determining the law applicable to crypto assets. In terms of monetary aspects, since money can be legally classified as circulating credit,⁸¹ characterisation of crypto assets used as a payment device can raise, apart from the application of *lex monetae*, the issues of assignment and, in a broader sense and similar to

81 See, with further references, Andreas Rahmatian, *Credit and Creed: A Critical Legal Theory of Money* (London: Routledge 2020), 232; for a complete discussion on the *lex monetae*, see *supra* Part 3.1.1.

other payment schemes (e.g., credit cards), contractual obligations. In terms of proprietary aspects, the acquisition of proprietary rights in crypto assets could be qualified as a question of the law of obligations for choice of law purposes⁸² given the challenges around the application of *lex situs* in the context of crypto assets. Different connecting factors might, therefore, be potentially relevant depending on specific uses or functions of crypto assets. This part of the chapter does not, however, take an approach of examining the connecting factors individually under certain categories of issues. It rather aims to shed light on some common considerations that might be taken into account in developing suitable connecting factors for crypto assets across different issues to which they might give rise.

Various connecting factors are currently being explored for determining the law applicable to crypto assets.⁸³ Different policy choices include considerations around freedom of choice, alignment with the forum of the competent regulatory body (also sometimes referred to as deemed election)⁸⁴ if there is one, rules based on the place of record and account keeping (which are linked to the choice-of-law rules on financial instruments),⁸⁵ rules used for the issuance of securities for contractual obligations, and, finally, traditional rules on the law applicable to proprietary rights in physical objects.

5.1 *Freedom of Choice*

Freedom of choice usually refers to the choice of law made by parties to a transaction and finds its origin in the well-established principle of party autonomy.⁸⁶ This suggests that the parties can agree on the law governing their relationship.

Freedom of choice is an attractive option for a choice-of-law rule regarding crypto assets for a variety of reasons. First of all, parties' choice will be respected under the principle of party autonomy. Secondly, if the freedom of choice is not adopted in this area, the determination of the applicable law based on the objective choice-of-law rules will be extremely complex and some traditional connecting factors in use, such as *lex rei sitae*, will not be straightforward to apply to crypto assets given that these assets do not have a physical

82 See the statements in the discussion report by Galehr and Grosz (n 2), 742.

83 For an overview, see HCCH, "Developments" (n 4), Annex I.

84 For an overview, see *id.*, 8–9.

85 See European Commission, "FISMA Targeted consultations on the review of the Directive on settlement finality in payment and securities settlement systems and on the review of the Financial Collateral Directive" (EC, 2021) <https://ec.europa.eu/info/consultations/finance-2021-settlement-finality-review_en> accessed 18 June 2021.

86 See generally Symeon C. Symeonides, *Codifying Choice of Law Around the World: An International Comparative Analysis* (Oxford: OUP 2014) Chapter 3.

location. As the HCCH Permanent Bureau puts it, “DLT and blockchain do not recognise traditional national borders and have global reach.”⁸⁷ In addition, freedom of choice will also reduce complex interpretation of choice-of-law rules based on, for example, habitual residence, which is particularly difficult in a pseudonymous crypto environment. In permissioned networks, this approach can also ensure the application of single law across the network and allow certain stakeholders, for example creators of a certain technology or type of crypto asset, to determine the applicable law.⁸⁸

However, there are certain limitations to the application of party autonomy in this context, including ambiguities around what is meant by the parties.⁸⁹ In addition, there may be issues around the protection of third parties in case of an unlimited freedom of choice. If parties to a specific transaction have the right to choose the law applicable to *erga omnes* effects of their transaction, they could execute their choice to adversely affect or interfere with acquired rights of third parties. Therefore, the general principle that freedom of choice between parties to a specific transaction shall not prejudice the rights of third parties has to be respected. In addition, the application of party autonomy is likely to result in the fragmentation of law within one system unless the choice is made by a central stakeholder and extends to the respective class of assets or systems.⁹⁰

5.2 *Applicable Law in the Absence of Choice*

In cases where there is no choice of law by the parties, the law applicable to crypto assets will be determined according to the objective choice-of-law rules. There are different methods used in different jurisdictions in determining the applicable law in the absence of choice. In the context of crypto assets, some considerations deserve special attention.

5.2.1 Record and Account Keeping

The Hague Securities Convention and the EU directives including choice-of-law rules for intermediated securities⁹¹ contain objective connecting factors

87 HCCH, “Proposal” (n 4), 2.

88 The HCCH refers to it *inter alia* as the *lex digitalis*, see, HCCH, “Developments” (n 4), Annex I 10.

89 On the limitations of party autonomy in the context of international electronic funds transfers, see Yüksel (n 50), 166–168.

90 See HCCH, “Developments” (n 4), Annex I 9.

91 Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems, [1998] OJ L166/45; Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on

which, broadly speaking, refer to the law of the account keeping credit institution's location. Indeed, the Convention and the EU directives address similar questions as debated herein, since they focus on proprietary questions and include non-tangibles, in particular undocumented book-entry securities.⁹² They build on the regulatory environment providing for central gatekeepers acting as intermediaries.⁹³ Therefore, as it has been often said, it is difficult to imagine a similar approach to be applied to de-centralised crypto assets stored in permissionless networks with no intermediary or service provider.⁹⁴ On the other hand, as regards the permissioned networks, there are still attempts to create an analogous rule with reference to the primary residence of the encryption private master keyholder (PREMA) and the place of the relevant operation authority/administrator (PROPA).⁹⁵ However, in contrast to an intermediary subject to prudential supervision, so far, there is a lack of transparency in the trading of crypto assets, which makes it difficult to determine who the relevant operation authority/administrator is and where it is located.⁹⁶ The location of the private master key raises similar difficulties.

In case of a traceable system which allows the identification of an account keeper, the approach that the Convention and EU directives adopt seems sensible. It is not a continuation of the *lex rei sitae* or *lex cartae sitae*, but a workable connecting factor which is determinable and which cannot be easily manipulated.⁹⁷ Therefore, it provides legal certainty, as also stressed by the HCCH.⁹⁸

financial collateral arrangements, [2002] OJ L168/43; Directive 2001/24/EC of the European Parliament and of the Council of 4 April 2001 on the reorganisation and winding up of credit institutions, [2001] OJ L125/15.

92 Florian Heindler, "§ 33a IPRG" in Peter Rummel and Meinhard Lukas (eds), *ABGB* (4th edn, Vienna: Manz 2022, forthcoming), para. 8; Matthias Lehmann, *Finanzinstrumente* (Tübingen: Mohr Siebeck 2009), 497.

93 Hubert de Vauplane, "Blockchain and intermediated securities" (2018) 36 *Nederlands Internationaal Privaatrecht* 94, 102.

94 Michael Ng, "Choice of law for property issues regarding Bitcoin under English law" (2019) 15 *Journal of Private International Law* 315, 330; Gerald Spindler, "Fintech, digitalization, and the law applicable to proprietary effects of transactions in securities (tokens): a European perspective" (2019) 24 *Uniform Law Review* 724, 731; Christiane Wendehorst, "Digitalgüter im Internationalen Privatrecht" (2020) 40 *Praxis des Internationalen Privat- und Verfahrensrechts* 490, 497.

95 Financial Markets Law Committee (FMLC), "Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty" (FMLC, March 2018), 17–18 <http://fmlc.org/wp-content/uploads/2018/05/dlt_paper.pdf> accessed 29 June 2023.

96 See HCCH, "Developments" (n 4), Annex I 9.

97 Heindler (n 62), 694.

98 See HCCH, "Developments" (n 4), Annex I 9.

5.2.2 One System – One Law

From a choice-of-law point-of-view, there are advantages if one single law applies to a network facilitating various transactions between different participants.⁹⁹ The idea that one trading system should be subject to a single law is reflected in, for example, Article 4(1)(h) of the Rome I Regulation. According to that provision, “a contract concluded within a multilateral system which brings together or facilitates the bringing together of multiple third-party buying and selling interests in financial instruments, as defined by Article 4(1), point (17) of Directive 2004/39/EC, in accordance with non-discretionary rules and governed by a single law, shall be governed by that law”. The same idea prevents the application of consumer protection as per Article 6(4)(e) for contracts concluded within such a system. Substantive law, however, might still provide rules to protect consumers. The one system-one law idea has also been reflected in the use of an escape clause for the transactions consisting of linked contracts, such as guarantee, reinsurance, letter of credit and electronic funds transfer.¹⁰⁰

Although this analysis is regarding contractual obligations, it can be argued that, within one trading system, the different types of proprietary entitlements should be made subject to one law to avoid confusion. However, it is to be noted that a trading system can accommodate different types of proprietary entitlement, for example different security rights governed by different laws. In addition, the applicable law could also change, for instance with the transfer of a crypto asset. It, therefore, seems more convincing that the attribution of crypto assets in the system is comparable with possession. Holding a crypto asset within the trading system does not mean being the owner, *i.e.* being the holder of a valid title. The applicable law of proprietary aspects can still determine the diverse bundles of rights of the various holders of crypto assets and the applicable law of obligations can determine whether a holder is obliged to hand over the asset to another person because of a pledge or sales agreement. The system can accommodate the legal duties of participants, regardless of whether their obligations to transfer result from a contract concluded under for example French law or Austrian law. In contrast, divergent rules from different jurisdictions about *bona fide* acquisitions, presumption of ownership or good faith, and the requirement that the transferor was the legal owner cannot be easily brought together within one trading system.

99 For this approach regarding international electronic funds transfer, see *e.g.*, Yüksel (n 50), 175–177.

100 On this issue, see *id.* 157–165.

Another situation worth noting is the one addressed for example in Article 6(4)(d) of the Rome I Regulation. The provision excludes the application of consumer protection for “rights and obligations which constitute a financial instrument and rights and obligations constituting the terms and conditions governing the issuance or offer to the public and public take-over bids of transferable securities, and the subscription and redemption of units in collective investment undertakings”. The idea behind this exclusion is that those matters should be governed by a single law which is determined by the issuer on the basis of Article 3 of the Rome I Regulation. Consequently, the obligations of the issuer with respect to one class of assets, for example bonds issued under a certain programme, are governed by the same law. In cases where the conflict rule is limited to proprietary effects and excludes questions of title, there will be no need for the protection of consumers through choice-of-law rules either. The contract to acquire crypto assets should be governed by the *lex contractus*¹⁰¹ which can foresee mechanisms for the protection of weaker parties. A respective choice made by the issuer cannot be overturned by a subsequent choice between the parties of a secondary market transaction, so that the rights of third parties are not negatively affected. The choice is communicated no later than the obligation arises. Similarly, the issuer of a certain class of crypto assets could determine the law governing the proprietary effects of the respective crypto asset. Such a choice made by the issuer of a certain class of crypto assets would govern the proprietary effects of all future transactions regarding a crypto asset out of the respective class. A fall-back rule could refer to an objective connecting factor related to the issuer in the absence of a choice, such as the habitual residence of the issuer. For the purpose of crypto assets, the reference to the creator of the assets, functionally comparable with an issuer of securities, finds its expression particularly in the PResC rule referring to the primary residence of the coder.¹⁰²

The law applicable to the creation of the asset determines the content of the asset (referred to in German as *Wertpapierrechtsstatut* in securities law). Issuing a uniform class of crypto assets requires that the content of the issued class of crypto assets is governed by the same law. In contrast, trading with these assets (referred to in German as *Wertpapiersachstatut* in securities law) could be subject to different laws. Thus, parties can trade different crypto assets governed by different laws in a single transaction or hold these assets in one account.

101 Lehmann (n 80), 132.

102 FMLC (n 95), 21.

5.2.3 Aligning (Regulator's) Forum and Law

The most common method of aligning forum and law is the application of the *lex fori* rule.¹⁰³ The application of the law of the state for which protection is claimed (*i.e. lex loci protectionis*) most frequently leads to the application of the *lex fori* as well. The *lex loci protectionis* is widely acknowledged in international intellectual property (IP) law.¹⁰⁴ Intuitively, it may seem preferable to extend the connecting factor for intellectual property rights to crypto assets.¹⁰⁵ However, apart from being well-suited to determine the applicable law for intangibles which cannot have a physical location, the application of the *lex loci protectionis* is based on the ideal of national preferences regarding the protection of intellectual property. It allows states to grant exceptions from the protection and to set conditions under which protected content could be used. The connecting factor is, therefore, deeply rooted in the industrial policies of nation states.¹⁰⁶ Accordingly, both rules have weaknesses in the recognition of title in crypto assets acquired elsewhere. On the other hand, it would be a policy choice to create territorially restricted licence systems over crypto assets and to introduce crypto assets which can be traded solely under the law of a specific jurisdiction. Similar to IP rights, a state could thereby control the acquisition of proprietary rights in crypto assets.¹⁰⁷ This would imply a reasonable threat for the trade in crypto assets and eliminate the current mechanisms. The application of the *lex loci protectionis* or *lex fori*, however, would be well-suited to determine the specific content of the right to a crypto asset. It is not the acquisition and termination of the right as such which should be subject to the law of the forum or the law of the state in which protection is sought, but merely the content of the right acquired under a given contract.¹⁰⁸

103 See *e.g.*, Anton Zimmermann, "Blockchain-Netzwerke und Internationales Privatrecht – oder: der Sitz dezentraler Rechtsverhältnisse" (2018) 38 *Praxis des Internationalen Privat- und Verfahrensrechts* 566, 573.

104 See *e.g.*, European Max Planck Group on Conflict of Laws in Intellectual Property, "Principles on Conflict of Laws in Intellectual Property" (*CLIP*, 1 December 2011), Art. 3:102 <https://www.ip.mpg.de/fileadmin/ipmpg/content/clip/Final_Text_1_December_2011.pdf> accessed 29 June 2023: "The law applicable to existence, validity, registration, scope and duration of an intellectual property right and all other matters concerning the right as such is the law of the State for which protection is sought."

105 See *e.g.*, Spindler (n 94), 737; Wendehorst (n 94), 495.

106 See, with further references, Florian Heindler, "Der kollisionsrechtliche Schutz digitaler Inhalte aus urheberrechtlicher Sicht," in Caroline S. Rupp (ed), *IPR zwischen Tradition und Innovation* (Tübingen: Mohr Siebeck 2019), 146–148.

107 See Heindler (n 92), para. 22.

108 On the distinction in Austrian and German international property laws, see Florian Heindler, "Continuation of security rights in movable assets in conflict of laws – Austrian approach reconsidered" (2019) 8 *European Property Law Journal* 301, 303–306, 313–316.

Another method could be seen as a modification of the traditional *lex fori* approach. Instead of referring to the law of the state in which the relevant court is located, a choice for the regulator's forum can imply that the law of the state in which the competent supervisory authority is located would be the applicable law. If the substantive law allows registration under a certain jurisdiction, the connecting factor will further imply a *lex registrationis* principle.¹⁰⁹ However, a permissionless decentralised system does not have a *situs* as such and therefore cannot be addressed satisfactorily by the given choice-of-law rule.¹¹⁰

5.3 *Subsequent Occurrences*

In many jurisdictions, the law applicable to the acquisition of property remains unaffected if the location of an asset or other facts of the case determinative for the selection of a particular legal order change after the asset has been acquired. Subsequent occurrences, in other words, do not affect transactions which are already completed. This is said with regard to the determination of the person having a title over an object and their acquisition and loss of property rights. On the other hand, the content of the right *in rem*, subject to *numerus clauses*, is usually determined in accordance with the most current location of the object. The same rule applies to IP law. Similarly, the EU proposal on the law applicable to the third-party effects of assignments of claims¹¹¹ defines the relevant time ("time of the conclusion of the assignment contract") and, thus, excludes the impact that subsequent occurrences would otherwise have on the applicable law. This rule, disregarding subsequent occurrences, has a direct connection with the logic of substantive property law, *i.e.* availing and protecting *erga omnes* entitlements across borders. If, following the above motivation, such *erga omnes* entitlements are the focus of a choice-of-law rule or instrument, similar reasoning will be required. This is even the case regarding parties' freedom of choice.¹¹²

The ratio of protecting *erga omnes* entitlements, thus, requires a stable connecting factor and, accordingly, the respective determination of the relevant time. It excludes the possibility of referring to the applicable law as determined by the connecting factor at the time when a case is pending at a court or when

109 See Sarah Green and Ferdisha Snagg, "Intermediated Securities and Distributed Ledger Technology," in Louise Gullifer and Jennifer Payne (eds), *Intermediation and Beyond* (Oxford: OUP 2019), 352.

110 The problem seems to have addressed in substantive law by transitional provisions in the EU (*e.g.*, Article 123 of the MiCA Proposal (n 9)).

111 Proposal for a Regulation of the European Parliament and of the Council on the law applicable to the third-party effects of assignments of claims, [2018] COM/2018/096 final, 2018/0044(COD).

112 See *supra* Part 5.1.

a suit is submitted to a court. It seems preferable to apply the connecting factor at the time when the activities in question took place.

6 Conclusion

Crypto assets, underpinned by DLT or a similar technology, introduce new challenges to various areas of law, including PIL, due to their novel, complex, fast-evolving and cross-border nature. In light of the global paradigm shift represented by the possibilities of crypto assets, what is at stake is adapting and reforming laws as necessary for a developing global system facilitated by the use of digital innovation. This would arguably be a more challenging task in PIL, compared to substantive law, as demonstrated by the difficulties with previous attempts on reaching a consensus on PIL aspects of technology-driven concepts including crypto assets.

The law applicable to crypto assets is a question that is at the heart of this challenge. The analysis in this chapter suggests that new approaches are needed in interpreting and applying the traditional concepts of choice of law in the context of crypto assets. This requires a good understanding of technological aspects of crypto assets and their continuously evolving and diversifying nature across different fields. Some of these approaches will be informed by the developments in substantive law, including characterisation of crypto assets as money or legal tender, or property or as another category. In terms of defining the scope of application of a choice-of-law rule or instrument in this area and in finding suitable connecting factors, the analysis in this chapter suggests the adoption of technological neutrality, and the consideration of existing and future interplay between crypto assets and their use in other fields of law to be important factors to be taken into account. It is also important that the PIL community keeps the dialogue open and ensures international collaboration in finding workable and widely acceptable solutions for challenges raised by crypto assets globally.