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Title	**Developments with respect to PIL Implications of the Digital Economy**
Document	**Prel. Doc. No 4 REV of January 2022**
Author	PB
Agenda Item	Item TBD
Mandate(s)	C&D No 10 of CGAP 2021
Objective	To report on developments with respect to private international law implications of the digital economy, including DLT, and to propose future work on this area
Action to be Taken	For Decision ☒ For Approval ☐ For Discussion ☐ For Action / Completion ☐ For Information ☐
Annexes	I. Applications of DLT and Blockchain: New Developments in 2021 (revision on page 12) II. Domestic Initiatives in relation to the Digital Economy (revision on page 19) III. Summary of Selected Case Law
Related Documents	Prel. Doc. No 28 of February 2020 for CGAP 2020 Prel. Doc. No 4 of November 2020 for CGAP 2021

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Developments with respect to PIL Implications of the Digital Economy

I. Introduction

1 At its 2021 meeting, the Council on General Affairs and Policy (CGAP) mandated the Permanent Bureau (PB) to continue monitoring developments with respect to the digital economy and to identify private international law issues for potential future work.[1] CGAP also mandated the PB to continue to make arrangements for the 2022 Commercial and Financial Law Conference.[2]

2 This document builds on Prel. Doc. No. 4 of November 2020, and reports on the status of work at the PB as well as recent developments with respect to private international law (PIL) implications of the digital economy, including distributed ledger technology (DLT). While broadly discussing other recent trends in the digital economy, this document acknowledges the specific and significant impact of DLT applications on the development of PIL in the digital economy. It provides an overview of new DLT and Blockchain applications in 2021 (Annex I), an update on domestic initiatives concerning digital economy with PIL implications (Annex II), and a summary of selected case law that discuss PIL issues relating to the digital economy (Annex III).

3 Recalling CGAP's decision for the PB to continue preparing for the 2022 Commercial and Financial Law Conference, issues relating to PIL implications of the digital economy, including DLT, will be included in the programme of the 2022 Conference as topics for discussion.

II. Status of work

A. Coordination with Other Organisations

4 The PB has continued to closely coordinate, including through participation as an observer, with UNCITRAL and UNIDROIT in relation to these organisations' current work in this area.

5 The PB continues to observe work on a taxonomy for the digital economy being drawn up by UNCITRAL. The focus of this UNCITRAL project has been substantive private law issues arising in contract law, property law, securities law, secured transaction law, the law of negotiable instruments, and insolvency law.[3] The PB participated as an observer at the 62nd session of UNCITRAL's Working Group IV (E-commerce) held from 22 to 26 November 2021. This meeting advanced the drafting of an instrument on the use and cross-border recognition of identity management and trust services. At its 63rd session in spring 2022, work by UNCITRAL will begin on a project related to artificial intelligence and automation in contract formation and performance. The PB will continue to monitor this work for PIL implications.

6 The PB also continues to participate as an observer in UNIDROIT's Working Group on Digital Assets and Private Law.[4] The goal of this Working Group is to develop a legal instrument containing principles and legislative guidance on private law and digital assets. This project has PIL elements in that it examines: (a) the law applicable inside a digital assets platform, which should also apply to transfers and collateralisation on that platform, (b) conflicts between the law applicable to a

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1 "Conclusions and Decisions of the Council on General Affairs and Policy of the Conference (1-5 March 2021)", C&D No 10, available on the HCCH website at www.hcch.net under "Governance" then "Council on General Affairs and Policy" and "Archive (2000-2021)".

2 *Ibid.*, C&D No 38.

3 UNCITRAL (2020), "Legal issues related to the digital economy – digital assets", A/CN.9/1012/Add.3.

physical asset and the law applicable to its representation in the form of a digital token, and (c) the law governing the third-party effects of digital assets in insolvency situations.[4]

7 The PB further monitors projects in the digital economy undertaken by other institutions for any PIL implications that these projects may have.[5] Acknowledging the importance of engagement with industry leaders, market participants and private sector-specific experts, the PB also monitors research, initiatives and actions by actors in the digital economy space.

B. Scope and focus of work

8 In light of the HCCH's mandate to work towards the progressive unification of the rules of PIL, and taking care not to repeat work already being undertaken, the PB's work on the digital economy focuses on the specific issues arising from emerging technologies and applications in the digital economy, including DLT applications, as follows:

- jurisdiction and choice of court (*e.g.*, how to determine the competent court to resolve a dispute in relation to a crypto asset),
- applicable law and choice of law (*e.g.*, what is the most appropriate connecting factor defining the law applicable to a transaction via blockchain),
- recognition and enforcement (*e.g.*, how to enforce a foreign judicial decision in relation to a service regulated by a smart contract), and
- cross-border and cross-platform cooperation mechanisms (*e.g.*, what cooperation frameworks are feasible and desirable to overcome challenges that the digital economy faces).

III. Recent developments and trends in the digital economy, in particular DLT systems and applications, which pose challenges for PIL

9 This section first takes a brief look at the recent developments and trends in the digital economy. It then reports on the PIL challenges in the digital economy, in particular in relation to (1) DLT and blockchain, (2) cloud economies and metaverses,[6] (3) asset tokenisation, both fungible and non-fungible, (4) crypto and digital currencies, including Central Bank Digital Currencies (CBDCs), and (5) financial technology (fintech).

A. Recent developments and trends in the digital economy

10 The greatest strides in the past year have been made in the growth and mainstreaming of Web3 as powered by the token economy, and its "potential to revolutionize agreements and value exchange".[7] Web3 is defined by various parties as the "Read-Write-Own"[8] internet "owned by its builders and users, and orchestrated with tokens".[9] Forecasts increasingly predict that this new

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4 UNIDROIT (2021), "Study LXXXII – W.G.2 – Doc. 2: Issues Paper", *Digital Assets and Private Law Working Group*, paras 98-124.

5 These institutions and stakeholders include the United Nations Conference on Trade and Development (UNCTAD), the Organisation for Economic Co-operation and Development (OECD), the World Economic Forum (WEF), the World Bank, the Financial Markets Law Committee (FMLC), the Financial Action Task Force (FATF), the International Swaps and Derivatives Association (ISDA), the Bank for International Settlements (BIS), various initiatives of the European Commission (EC), the European Central Bank (ECB), the European Law Institute (ELI), the MENA Fintech Association, the Law Commission of England and Wales, and many others.

6 See *infra* section III.B.2.

7 S. Voshmgir (2020), *Token Economy: How the Web3 Reinvents the Internet* (2nd ed.), p. 2.

8 eshita (2021), "Web3: in a nutshell".

9 C. Dixon (26 September 2021), "Why Web 3 Matters", Thread originated by @cdixon on Twitter.

user-owned economy will, in the long-term, outperform the traditional economy based on legacy institutions in various ways.[10]

11 Together with the optimistic outlook on Web3 and the cryptoeconomy, another trend in the past year is the widespread decoupling of crypto use cases, leading to the validation and adoption of concrete use cases that are specific to their sectors, as well as the unique drivers of growth as a result of these use cases.[11] These can be seen in the expansion of DLT applications to various fields, including financial transactions, Internet of Things (IoT), and value and supply chains.[12] From cryptocurrency as the foundation of blockchain technologies relying on proof-of-work (PoW) protocol in Blockchain 1.0, Blockchain 2.0 moved on to smart contracts involving more financial functionality and decentralised applications with autonomously executing algorithms. This has further evolved into Blockchain 3.0, with larger-scale applications of non-cryptocurrency-related DLT, improved performance, greater scalability and more interoperability, all rooted in proof-of-stake (PoS) protocol.[13]

B. PIL challenges in the digital economy

12 Specific PIL challenges arise in the different sectors of the digital economy. This section briefly explains the relevant characteristics of each of these sectors, and then discusses the specific PIL challenges that they raise.

1. DLT and blockchain

13 DLT has been defined as

> "…the practice that uses nodes…to record, share and synchronize transactions in their respective electronic ledgers (instead of keeping data centralized as in a traditional ledger). The participant at each node of the network can access the recordings shared across that network and can own an identical copy of it. Any changes or additions made to the ledger are reflected and copied to all participants in a matter of seconds or minutes".[14]

14 DLT is the protocol on which blockchain, the technology that created Bitcoin, is based. Blockchain technology created a register of payments ("ledger") distributed across an online network without a central control point.[15] A network of computers cryptographically identifies users and validates interactions among them before recording the interactions across the network of identifying and validating computers.[16] People or entities interacting through the system are identified with a pair of cryptographic keys: a public key that acts like an address, and a private key that acts like a password. Any computer connected to the blockchain network is referred to as a node. Each of these nodes operates a full copy of validated transactions of the blockchain ledger.[17] Packages of

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10 See, *e.g.*, J. Potts and E. Rennie (2019), "Web3 and the creative industries: how blockchains are reshaping business models", in *A Research Agenda for Creative Industries*, S. Cunningham and T. Flew (eds), pp. 93-111.

11 See, *e.g.*, in the field of security in the Internet of Things, A. Jain, T. Singh and N. Jain (2020), "Framework for Securing IoT Ecosystem Using Blockchain: Use Cases Suggesting Theoretical Architecture", in *ICT Systems and Sustainability*, M. Tuba, S. Akashe and A. Joshi (eds), pp. 223-232.

12 Marketwatch (2019), "Blockchain market size analytical overview, demand, trends and forecast to 2024".

13 "Proof of stake" refers to

> "a consensus distribution algorithm which determines which users are eligible to add new blocks to the blockchain, thus, earning a cryptocurrency payment as mining fee. Using this method, of the users who participate in the mining process, those with more tokens are favoured over those with less".

See UNCTAD (2021), "Harnessing Blockchain for Sustainable Development: Prospects and Challenges", UNCTAD/DTL/STICT/2021/3 and Corr. 1, pp. 4 and 52.

14 *Ibid.*, p. 50.

15 UNCTAD, *op. cit.* (note 13), p. 2.

16 See, *e.g.*, S. Nakamoto (2008), "Bitcoin: A Peer-to-Peer Electronic Cash System", (the Bitcoin Whitepaper, explaining the basics of blockchains); V. Buterin (2013), "A next-generation smart contract and decentralized application platform", (the Ethereum Whitepaper, elaborating on the functioning of blockchains as well as smart contracts).

17 UNCTAD, *op. cit.* (note 13), p. 51.

data that carry the recorded data on the network are called "blocks".[18] Each block is definitively linked to the next block using a cryptographic signature, creating a "chain". This allows "blockchains" to act as a ledger that can be accessed and shared with the appropriate permissions.[19]

15 There are many ways of designing, implementing and employing DLT, which may be very different from the model used for blockchain. The characteristics of each DLT system impact the use cases best suited to it and raise different PIL issues.[20]

16 PIL issues arise in relationships facilitated by DLT systems because the pseudonymity of users and the decentralised nature of the ledger make it difficult to determine the *situs* of a transaction.[21] This has led to differing views as to whether analogies can be drawn from legal frameworks in existing regimes such as intellectual property[22] or goodwill in a business,[23] or whether an entirely novel approach should be taken.[24] Moreover, the regulatory perimeters of many domestic legal institutions have been deemed to be insufficient to address the difficulties raised by the cross-border nature of DLT systems and applications.[25] The larger-scale applications serviced by Blockchain 3.0 may also mean that "[n]o one solution can fit all DLT systems".[26]

17 Other PIL issues that arise in DLT use cases in the digital economy include:[27]

- the characterisation of, and law applicable to, the relationship between participants in a DLT system, including digital asset holders and DLT intermediaries such as crypto-exchanges and wallet providers;
- the characterisation of, and law applicable to, the holding and transacting of digital assets in a DLT system;
- the law applicable to the proprietary effects of digital assets towards third parties, including issuers of crypto-securities, takers of collateral in digital assets, heirs in succession of digital asset holders, and creditors of digital asset holders who have become insolvent;
- the jurisdiction of courts to hear disputes related to the outcomes of self-executing smart contracts deployed on DLT systems; and
- the recognition and enforcement of DLT-based dispute resolution outcomes.

2. Cloud economies and metaverses

18 Web3 crypto metaverses are "emerging market virtual world economies with a continually developing complex mix of digital goods, services, and assets that generate real-world value for users".[28] They create a new paradigm by allowing users to own and trade digital assets as non-fungible tokens (NFTs), eliminating capital controls and creating a "new free-market internet-native

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18 *Ibid*., p. 50.
19 *Ibid*.
20 On the use case analysis of DLT by asset class and product line, see World Economic Forum (May 2021), *Digital Assets, Distributed Ledger Technology and the Future of Capital Markets: Insight Report*, pp. 32-86.
21 M. Lehmann (2019) "Who Owns Bitcoin? Private (International) Law Facing the Blockchain", *European Banking Institute Working Paper Series 2019*, No. 42, p. 2.
22 G. Spindler (2019), "Fintech, digitalization, and the law applicable to proprietary effects of transactions in securities (tokens): a European perspective", *Unif. L. Rev.*, Vol. 24, pp. 336-337.
23 A. Dickinson (2019), "Cryptocurrencies and the Conflict of Laws", in *Cryptocurrencies in Public and Private Law*, D. Fox & S. Green (eds), paras 5.107-5.121.
24 M. Ng (2019), "Choice of law for property issues regarding Bitcoin under English law", *Journal of Private International Law*, Vol. 15, Issue 2, p. 316.
25 *Ibid*. pp. 3-6.
26 Financial Markets Law Committee (2018), "Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty", p. 21.
27 See also the discussion about the different PIL implications of permissioned and permissionless systems, in Prel. Doc. No 4 of November 2020, para. 16 and Annex I, available on the HCCH website at www.hcch.net (see path indicated in note 1).
28 Grayscale Research (2021), "The Metaverse: Web 3.0 Virtual Cloud Economies", p. 10.

economy that can be monetised in the physical world".[29] Examples of business activities in metaverse economies include art galleries,[30] business headquarters,[31] sponsored content,[32] and music venues.[33] The metaverse has been forecast to be a trillion-dollar revenue opportunity annually that spans social commerce, digital events, hardware, and content monetisation.[34]

19 Cloud economies and metaverses are use cases for Decentralised Finance (DeFi), including aggregators, DeFi primitives, oracles, and marketplaces. They also require agents relating to sovereign virtual goods and NFTs, including minting houses, metadata and token standards, and physically redeemable NFTs. The characterisation of these agents will have an impact on the legal frameworks that are relevant, and the PIL implications of those legal frameworks. Perhaps most significant in relation to PIL, cloud economies and metaverses involve decentralised governance, including DAO frameworks and their attendant voting mechanisms, community audits, and multisignature wallets.[35] The decentralised cloud services implicated also means that storage, computing, and databases are decentralised in the borderless cloud. The borderless nature of cloud economies and metaverses will find itself in tension with the traditional significance of geographic location in PIL.[36]

20 Another issue that arises in cloud economies and metaverses is the PIL implications of cross-border data transactions. While the general focus of regulators has thus far been on consumer privacy and the protection of personally identifiable data,[37] PIL questions relating to jurisdiction, applicable law and recognition will become increasingly urgent as data transactions take place in the cloud economy, and as certifications of data transactions are increasingly tokenised.[38]

21 Another PIL issue that arises in cross-border data transactions is the question of characterisation. UNCITRAL's work related to data transactions has found that contracts for the provision of data are analogous to contracts for the sale of goods, whereas contracts for the processing of data are analogous to contracts for services.[39] This may have an impact on the determination of the applicable law. It is moreover significant that UNCTAD's position is that that cross-border data flows are distinct from both goods and services, and should be considered neither e-commerce nor trade.[40] These divergent approaches to the characterisation of cross-border data flows have implications on the development of a PIL framework for cross-border data transactions in cloud economies and metaverses.

3. Asset tokenisation

22 There are two types of asset tokenisation. The first type is tokenisation that represents a pre-existing off-chain real asset, including financial assets in conventional securities, non-financial assets such as real estate, and commodities such as gold. The second type consists of tokens that

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29 *Ibid.*, p. 7.
30 See, *e.g.*, Sotheby's Metaverse.
31 See, *e.g.*, Binance's metaverse headquarters.
32 See, *e.g.*, DCL x Atari in the Decentraland Marketplace.
33 See, *e.g.*, Travis Scott in Fortnite, Kizuna AI's 2020 Hello World Concert, and the Kai Live Roblox Concert.
34 Grayscale Research, *op. cit.* (note 28), pp. 9 and 16. See also P. Palandrani (September 2021), "The Metaverse Takes Shape as Several Themes Converge", *Global X ETFs Research*.
35 A "multisignature wallet" (also referred to as a "multigeniture wallet") refers to a cryptocurrency wallet that requires authentication from multiple parties to complete a transaction, which is the type of cryptocurrency wallets commonly used in DAOs, see, *e.g.*, M. di Angelo and G. Salzer (2020), "Characteristics of Wallet Contracts on Ethereum", *IEEE*, pp. 1-2.
36 D. Svantesson (2020), "The (uneasy) relationship between the HCCH and information technology", *The Elgar Companion to the Hague Conference on Private International Law*, p. 462.
37 J. Huang (2020), "Applicable Law to Transnational Personal Data: Trends and Dynamics", *German Law Journal*, p. 1285.
38 See *infra* section III.B.3.
39 UNCITRAL (2021), "Legal issues related to the digital economy (including dispute resolution) – progress report", A/CN.9/1064, pp. 4-5.
40 UNCTAD (2021), "Digital Economy Report 2021 Overview", pp. 3-5.

are native to the blockchain, and which exist and trade only on-chain, including financial assets issued on DLT and equity securities.

23 Tokenisation of real assets refers to the digital representation of existing real (physical) assets on distributed ledgers,[41] including the representation on DLT of traditional asset classes such as financial instruments, collateral or real assets.[42] According to the OECD,

> "[t]he application of DLTs and smart contracts in asset tokenisation has the potential to deliver a number of benefits, including efficiency gains driven by automation and disintermediation; transparency; improved liquidity potential and tradability of assets with near-absent liquidity by adding liquidity to currently illiquid assets; faster and potentially more efficient clearing and settlement. It allows for fractional ownership of assets which, in turn, could lower barriers to investment and promote more inclusive access by retail investors to previously unaffordable or insufficiently divisive asset classes, allowing global pools of capital to reach parts of the financial markets previously reserved to large investors".[43]

Nevertheless, the OECD goes on to note that the large-scale adoption of asset tokenisation would face "governance risks related to AML/CFT;[44] digital identity issues; and data protection and privacy issues; as well as rais[e] questions about the legal status of smart contracts".[45]

24 Tokens that are issued in asset tokenisation carry the rights of the assets that they represent. The real assets exist off-chain, and are generally placed into safekeeping or custody to ensure that the tokens are constantly backed by the assets they represent. This raises questions relating to the characterisation of such tokens for PIL purposes, and the significant role of custodianship of assets that have been tokenised.

25 Trust in the tokenisation of assets will depend on a credible central authority that can guarantee the connection of the real world with the blockchain. In order to promote financial stability and market integrity while also protecting the consumer, it will become necessary to regulate tokenisation. In this regard, there has been argument that tokenisation is simply the replacement of one digital technology with another – *i.e.,* a change from the use of electronic entries in securities registries of depositories with the use of cryptographic dematerialised securities based on DLT. As such, no issues in relation to jurisdiction would arise if regulation were to take a technology-neutral approach.

26 However, given the novel nature of the models and processes involved in asset tokenisation, it may be difficult to know whether a regulatory perimeter fully captures tokenisation. Regulators may need to ensure that they will have jurisdiction over new actors, which will mostly be acting across borders. New regulation may also become necessary to regulate jurisdiction, applicable law, recognition and enforcement in relation to the interoperability between the on-chain and off-chain environments. Risks associated with the cross-border use of DLT, *e.g.* the cross-border management of financial risks and the cross-border protection of digital identity, may also need to be addressed. The OECD has noted that "[c]ross-border transactions of tokenised assets require international cooperation to limit regulatory arbitrage and for the smooth operation of tokenised markets".[46] This also includes dispute settlement, recourse and redress in case of fraud, insolvency, or technical fault.

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41 G. Hilleman and M. Rauchs (2017), Global Blockchain Benchmarking Study, pp. 51 and 64.

42 See for example Financial Stability Board (FSB) (2019), "Decentralised financial technologies: Report on financial stability, regulatory and governance implications".

43 OECD (2020), "The Tokenisation of Assets and Potential Implications for Financial Markets", OECD Blockchain Policy Series, p. 7.

44 AML/CFT is the acronym for "anti-money laundering/combating the financing of terrorism".

45 OECD (2020), *op. cit.* note 43, p. 7.

46 OECD (2020), *op. cit.* note 43, p. 8.

27 A trending topic in tokenisation is the rapid proliferation of NFTs. NFTs form a class of digital asset or token that can be proved to be unique, meaning that it is not interchangeable (*i.e.* "non-fungible") with another digital asset token. The uniqueness, transparency and provability of ownership, and asset programmability of the NFT is usually cryptographically, immutably and publicly recorded on a distributed ledger.[47] The European Union Blockchain Observatory and Forum has noted that indicative NFT use cases include digital art[48] (including gaming collectibles)[49], supply chain logistics,[50] content ownership,[51] and metaverse assets.[52] Total sales of NFTs in 2021 are expected to achieve at least USD 17.7 billion.[53]

28 One issue that NFTs face is the recognition and enforcement of the underlying mechanism used for transferring and establishing ownership. Some commentators have opined that NFTs are property deeds that give an ownership title to a physical asset.[54] However, the deed or title entitles the holder to ownership of the asset and is not the asset itself. The purchase of an NFT gives ownership of the NFT itself, with any further rights or entitlements decided by the terms of the token smart contract. This raises the question of the characterisation of NFT transactions – whether they are solely contractual, or whether they carry proprietary characteristics. Other issues that arise in regard of characterisation[55] is whether NFTs can be considered commodities,[56] securities,[57] or intellectual properties.[58]

4. Digital and crypto currencies

29 Digital currencies are a "digital version of cash, controlled by a private cryptographic key – a unique random string of numbers."[59] Digital currency is owned by the holder of the private key associated with the relevant crypto wallet, which is used to hold and transfer the currency. There are currently three types of digital currencies: Cryptocurrencies (*e.g.* Bitcoin, Ethereum, Solana); StableCoins (*e.g.* Diem, formerly Libra), which are backed by a reserve asset such as fiat currency[60] held at banks; and Central Bank Digital Currencies (CBDCs), which are digital versions of fiat issued by a country's central bank.

30 Engagement with digital and crypto currencies has been found to be inversely proportional with age, and stronger in emerging markets.[61] As of 3 December 2021, a bull market in 2022 is forecast for global cryptocurrencies, with an expectation of continued digital-asset outperformance.[62] The global crypto market capitalisation as of 15 December 2021 is USD 2.26 trillion.[63]

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47 EU Blockchain Observatory and Forum (November 2021), "Demystifying Non-Fungible Tokens (NFTs)", pp. 4-5.
48 See, *e.g.*, Beeple (2021), "Everydays: The First 5000 Days", minted on 16 February 2021 and sold at online auction on 11 March 2021 for in excess of USD 69 million.
49 See, *e.g.*, Cryptokitties, backed on the Ethereum blockchain, which allows players to breed digital kitties in-game to be traded via the use of NFTs.
50 See, *e.g.*, Nike's Cryptokicks project, for which it secured a patent, that stores unique identifiers given to each pair of shoes.
51 See, *e.g.*, Audius, a decentralised audio streaming and sharing platform on the blockchain.
52 See, *e.g.*, sales of digital land in the Sandbox and Decentraland, Cointelegraph (6 December 2021), "Virtual land in the metaverse dominated NFT sales over past week".
53 Cointelegraph Research (2021), "Nonfungible Tokens: A New Frontier", p. 73.
54 *Ibid.*, p. 40, see also J. Goldman (March 2021), "A Primer on NFTs and Intellectual Property".
55 Cointelegraph Research (2021), *op. cit.* note 53, pp. 62-64.
56 See, *e.g.*, the U.S. Commodity Futures Trading Commission (CFTC), CFTC (2020), Digital Assets Primer.
57 See, *e.g.*, the position of the U.S. Securities and Exchange Commission (SEC), SEC (2021), "Framework for 'Investment Contract' Analysis of Digital Assets".
58 A.M. Luo (11 March 2021), "NFTs: A Legal Guide for Creators and Collectors".
59 Visa (2021), "The Crypto Phenomenon: Consumer Attitudes & Usage", p. 7.
60 "Fiat currency" refers to "any legal tender designated and issued by a central authority that people are willing to accept in exchange for goods and services because it is backed by regulation and because they trust this central authority." Consultative Group to Assist the Poor, World Bank (2014), "Bitcoin versus Electronic Money", p. 1.
61 *Ibid.*, p. 13.
62 Bloomberg (December 2021), Global Cryptocurrencies 2022 Outlook, p. 3.
63 CoinMarketCap (15 December 2021), Today's Cryptocurrency Prices by Market Cap.

31 There have been specific objections raised to the application of PIL frameworks to legal relationships involving the use of cryptocurrencies. These have either been based on the argument that these relationships are self-regulated and are subject to the *lex cryptographica* as opposed to legal regulation such as *lex mecatoria*,[64] or that there are major obstacles to the application of PIL in this field, including the delocalisation of transactions and the pseudonymity of actors.[65] Commentators addressing these objections have framed their ripostes along two lines – either by viewing cryptocurrencies as assets in the sense of intangible movable property or by viewing cryptocurrencies as currency, and applying PIL by analogy.[66] Some commentators have moreover argued that the rapid evolution and diversification of the crypto asset and cryptocurrency landscape means that choice of law rules should offer "a sufficient degree of flexibility along with legal foreseeability and certainty".[67] Here, one solution may be to allow for the principle of party autonomy in choice of law,[68] which would allow parties to agree on the law governing the relationship between them, while accepting that there may be certain limitations on the freedom of choice in this context.[69]

5. Fintech

32 The WEF defines "fintech" as "a broad category that refers to the innovative use of technology in the design and delivery of financial services and products".[70] The intermediated holding system for securities, to which the HCCH 2006 Securities Convention was a response, is an early example of fintech.[71] Areas of fintech innovation include peer-to-peer (P2P) lending, robo-advising, algorithmic and automated trading, and the use of artificial intelligence (AI) in lending services.[72] Aside from relying on DLT, fintech services also employ technologies such as cloud computing, mobile applications, AI, and machine learning.[73] Fintech has also enabled cross-industry services through an overarching open finance framework, including product comparisons, accounting and load switching, Request to Pay (R2P), variable recurring payments (VRP), and credit scoring.[74]

33 The broad category of fintech raises fintech questions similar to those raised by DLT and blockchain, as these fintech technologies also exhibit the same issues of decentralisation and delocalisation. These include:[75]

- The characterisation of new processes and concepts such as crypto assets, automated processes such as smart contracts, AI, and claims relating to mobile-initiated value-transfer services;
- The applicable law for fintech activities relating to the holding and disposition of crypto assets, insolvency of a custody service provider, and escrow- or trust-like arrangements;
- Questions in relation to jurisdiction, applicable law, recognition and enforcement in open banking and open finance systems;

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64 See, *e.g.*, P. de Fillippi and A. Wright (2018), *Blockchain and the Law – The Rule of Code*. For an opposite view, see D. Sindres (forthcoming 2022), "Is Bitcoin out of Reach for Private International Law?", in *Blockchain and Private International Law* A. Bonomi and M. Lehmann (eds).

65 See, *e.g.*, M. Audit (2020), "Le droit international privé confronté à la blockchain", *Rev. crit. DIP* 669, p. 689.

66 See, *e.g.*, D. Sindres (forthcoming 2022), *op. cit.* note 64.

67 B. Yüksel Ripley and F. Heindler (forthcoming 2022), "The Law Applicable to Crypto Assets: What Policy Choices are Ahead of Us?", in *Blockchain and Private International Law* A. Bonomi and M. Lehmann (eds).

68 S.C. Symeonides (2014), *Codifying Choice of Law Around the World: An International Comparative Analysis*, Chap. 3.

69 See, *e.g.*, Prel. Doc. No 4 of November 2020, Annex I, available on the HCCH website at www.hcch.net (see path indicated in note 1).

70 WEF (20 April 2016), "Five things you need to know about fintech".

71 F. Garcimartín Alférez and F. Sánchez Fernández (2020), "Is private international law tech-proof? Conflict of laws and FinTech: selected issues", *The Elgar Companion to the Hague Conference on Private International Law*, p. 406.

72 International Monetary Fund and World Bank Group (2019), "Fintech: The Experience So Far", p. 27.

73 *Ibid*., p. 8.

74 MENA FinTech Association (November 2021), "Open Finance: A Framework for the Arab region is more than a question of scope", p. 1.

75 International Monetary Fund and World Bank Group (2019), *op. cit*. note 72, p. 9.

- The applicable law in relation to data frameworks, including cross-border data flows and data transactions; and
- The applicable law in relation to payments, settlement systems, and securities transfers.

34 Some jurisdictions have taken different approaches to addressing the challenges posed by fintech. Some national authorities, such as France, Luxembourg, Switzerland and Russia have, in consultation with private sector stakeholders and experts, considered the reform of their domestic legislations in relation to the use of DLT in fintech.[76] Regulatory frameworks on fintech services were also issued by the Dubai Financial Services Authority in April 2020 on the matter of money services in open finance, and by the Abu Dhabi General Market's Financial Services Regulatory Authority in April 2021 on third-party fintech services.[77] Reforms of legal and regulatory frameworks for fintech have also been undertaken in Colombia, Kenya, Mexico, Peru and the Philippines.[78] Others, such as Bangladesh, Colombia, Georgia, India, Malaysia, Peru, Saudi Arabia and Singapore have launched sandboxes, focused roundtables, and proofs of concept to explore the legal issues relating to fintech.[79] Yet others, such as Brazil, have decided that existing frameworks are sufficiently clear and certain, and have chosen to integrate fintech issues into their existing frameworks rather than pass new legislation.[80]

35 The MENA FinTech Association has flagged the importance of two key factors when assessing the regulatory intervention necessary: market structure, and technological maturity and industry cooperation; it noted that most jurisdictions in the Arab region favoured prescriptive regulation over an entirely market-led approach or a moderator role for the regulator.[81] The divergence in practice goes to show that, without the development and implementation of uniform rules of PIL in order to co-ordinate the relationships between different private law systems, the fragmentation and legal uncertainty that may arise can undermine innovation and good business practices.[82]

IV. Possible topics for inclusion in the programme of the 2022 Commercial and Financial Law Conference

36 The PB has collated the following list of possible topics inclusion in the programme of the 2022 Commercial and Financial Law Conference. This list is by no means exhaustive, but provides an overview of the issues that have been recently raised or discussed in relation to the PIL implications of the digital economy:

- Characterisation of records on distributed ledgers: for PIL purposes, should these be characterised as property, contract, or others?
- Possible approaches to applicable law: Should the applicable law be determined by the system (e.g. Ethereum, Bitcoin etc.), asset (e.g. token, cryptocurrency etc.), or transaction (e.g. transfer, holding, collateralisation etc.)?
- Connecting factors: What connecting factors are feasible and desirable for DLT systems and applications?
- Asset tokenization: What is the relevance of the (non-)fungibility of tokens, and the existence of off-chain assets, for PIL?

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76 J. Ehrentraud, D.G. Ocampo, L. Garzoni and M. Piccolo (2020), "FSI Insights on policy implementation No 23: Policy responses to fintech: a cross-country review", p. 34. See also W. Michalczyk (2021), *Crytocurrencies in the Global Economic and Financial System: Initial Coin Offerings as an Innovative Tool of Crowdfunding and Promotion*, p. 66.

77 MENA FinTech Association (November 2021), *op. cit.* note 74, p. 1.

78 International Monetary Fund and World Bank Group (2019), *op. cit*. note 72, p. 13.

79 *Ibid.,* pp 14-15.

80 International Monetary Fund and World Bank Group (2019), *op. cit*. note 72, p. 16.

81 MENA FinTech Association (November 2021), *op. cit.* note 74, pp. 6-7.

82 See also the findings of the International Monetary Fund and World Bank Group (2019), *op. cit*. note 72, p. 28.

- Party autonomy: What is the potential, and what limits should be considered, in party autonomy to determine the law applicable to DLT systems and applications?
- Third parties: What effect does the trading of assets in the digital economy, and more specifically through DLT systems and applications, have on third parties?
- Relationship between asset holders and exchanges: How should the relationship between assets holders and digital/crypto exchanges be characterised? Is the relationship proprietary, contractual, a trust, or another form?
- Dispute resolution: What on-chain options are there in relation to dispute resolution, and what PIL implications would the resolution of disputes on-chain have? What is the cross-border recognition and enforceability of dispute resolution outcomes concerning DLT systems and applications, such as blockchain?[83]
- Developments in the digital economy: What PIL implications are there, in general, of developments in relation to fintech, DAOs and CBDCs?

V. Proposal for CGAP

37 Given the growing importance of the digital economy, and the implications on PIL that developments in the digital economy have, the PB invites CGAP to consider the issues described in this document, which will be further discussed in the programme of the 2022 Commercial and Financial Law Conference. The PB will continue to prepare for the 2022 Commercial and Financial Law Conference, with a view to including the questions raised in this document in the programme of the Conference. The PB proposes that it will report on the conclusions and outcomes of the 2022 Commercial and Financial Law Conference in relation to the digital economy to CGAP at its 2023 meeting.

38 CGAP is invited to mandate the PB:

- to continue monitoring developments with respect to the digital economy,
- to continue to study the topic, with a view to identifying private international law issues for potential future work, and
- to work with other organisations in the field, such as UNCITRAL and UNIDROIT.

[83] See, for a discussion on the use of blockchain applications for dispute resolution, P. Ortoloni, (forthcoming 2022), "Recognition and Enforcement of Blockchain Judgments and Arbitral Awards" (title tentative), in *Blockchain and Private International Law* A. Bonomi and M. Lehmann (eds).

Annexes

Annex I – Application of DLT and Blockchain: New Developments in 2021

New Developments in 2021				
Type of Applica-tion	Trend	Description	Example/ Use Cases	Countries concerned (if applicable)
Crypto-assets	~~Asset Tokenisation~~ Representation and Issuance of Crypto-securities on a Blockchain	Tangible and intangible assets are capable of being tokenised on a blockchain and sold to investors, if they are or can be represented by securities. ~~In 2021, investors have moved into investing in 'tokens' that represent real assets, such as art works and real estate.~~ According to the International Securities Services Association (ISSA),[1] DLT enables certain illiquid asset classes such as fine art, real estate and rare coins to be fractionalised and made available to a wider pool of investors.	~~Following Switzerland's enactment of a law allowing owners of tokens to freely register and transfer them with DLT technology (effective as of 1 February 2021)[2], fine wines became the first assets to be tokenised by digital platform Sygnum, which sold tokens representing 'investible fine wines' to new private and institutional investors.[3]~~	Switzerland
Crypto-assets	**Representation and Issuance of Crypto-securities on a Blockchain**	Intangible assets, such as a stock or a bond, can also be tokenised and represented on a blockchain. The term 'crypto-securities' refers to "virtual tokens which constitute or represent 'traditional' securities".[4]	Binance, one of the world's biggest crypto-exchanges by volume, has offered a new crypto-token which represents equity shares.[5] These tokens track the stock prices of companies such as Tesla, Coinbase and Apple[6] and offer investors the "economic returns" of owning shares, which include potential dividends.[7] The move has thus far caught the attention of the UK and German securities regulators.	The United Kingdom, Germany, France

1 International Securities Services Association (2019), "Crypto Assets: Moving from Theory to Practice – An analysis of how to issue, settle, safekeep and service Crypto Assets, with recommendations and best practices to maintain compliance with laws and regulations and use standards to maximise inter-operability between market participants".

~~2 S. Handagama (2020), "Swiss Government Makes Moves to Encourage Crypto Businesses", *Coindesk*, https://www.coindesk.com/swiss government makes moves to encourage crypto businesses.~~

~~3 S. Sinclair (2021), "Fine Wines Become First Tokenised Securities Under New Swiss Blockchain Law", https://www.coindesk.com/crypto bank sygnum tokenization dlt.~~

4 C. Mooney (2020), "Beyond Intermediation: A New (FinTech) Model for Securities Holding Infrastructures", *Faculty Scholarship at Penn Law*, p. 2098.

5 A. Samson et al (2021), "Regulators to examine crypto exchange Binance's foray into equities", *Financial Times* https://www.ft.com/content/cfbd084f-a118-4090-8301-2e45eceac304.

6 *Ibid.*

7 *Ibid.*

			Some countries also enacted laws that allowed direct issuance of securities on a blockchain. France allows equity and debt securities traded over the counter to be issued on blockchain networks.[8] In the same legislation, it also declared that records in the blockchain are equivalent to a registry.[9] As a result, registration and transfer on a blockchain would be deemed equivalent to registration and transfer on traditional registries.[10] In a similar vein, German legislators proposed to allow the issuance of bonds on the blockchain.[11] If passed, the law would acknowledge entries in records as an equivalent to traditional securities.[12]	
Crypto-assets	**Non-Fungible Tokens (NFTs)**	NFTs are a kind of "unique digital property" which constitutes the digital equivalent of rare artwork, collectible trading cards, or other assets that gain value from scarcity.[13]	The market for non-fungible tokens grew 115% in December 2020 alone[14] and in March 2021, artist Beeple made headlines for selling his digital artwork on an NFT for $69 million USD through a first-of-its-kind auction at Christie's.[15]	Worldwide
Crypto-assets	**Central Bank Digital Currencies (CBDCs)**	Central banks around the world are looking at issuing CBDCs which may become a new payment method for retail customers.	The Bank of International Settlement's (BIS) 2021 survey revealed that 60% of Central Banks are considering Central Bank Digital Currencies (CBDCs) and 14% are carrying out pilot tests.[16] The UK Treasury and Bank of England jointly announced in April 2021 that it will set up a taskforce to evaluate the creation of a Central Bank Digital Currency for	Worldwide

8 M. Lehmann (2021), "How to Determine the Law Applicable to Crypto Assets?", *the EAPIL blog*, https://eapil.org/2021/04/02/how-to-determine-the-law-applicable-to-crypto-assets (quoting Art. L211-3 of the French Monetary and Financial Code).

9 G. Spindler (2019), "Fintech, digitalization, and the law applicable to proprietary effects of transactions in securities (tokens): a European perspective", *Unif. L. Rev.*, Vol. 24, pp., 724–737 (quoting Article 211–3(2) of the French Monetary and Financial Code).

10 *Ibid.*

11 M. Lehmann, *op. cit.* (note 35).

12 G. Spindler, *op. cit.* (note 36), pp. 724–737.

13 J. Fairfield (2021), "Tokenized: The Law of Non-Fungible Tokens and Unique Digital Property", *Indiana Law Journal*, forthcoming.

14 *Ibid*.

15 J. Kastrenakes (2021), "Beeple sold an NFT for $69 million", *The Verge*, https://www.theverge.com/2021/3/11/22325054/beeple-christies-nft-sale-cost-everydays-69-million.

16 C. Boar and A. Wehrli (2021), "Ready, steady, go? Results of the third BIS survey on central bank digital currency", *Bank for International Settlements*, BIS Papers, No 114, https://www.bis.org/publ/bppdf/bispap114.pdf.

			the UK.[17] It will allow individuals to have digital accounts at the Central Bank. However, the taskforce has said that the CBDC would not necessarily be based on distributed ledger technology.[18] The Indian government is planning to introduce an official, central bank-run digital coin. However, it has also planned to introduce a bill to parliament that would "prohibit all private cryptocurrencies".[19]	
Crypto-assets	**Crowdfunding & Initial Coin Offerings (ICO)**	An ICO refers to the process by which a company issues and sells digital tokens to investors in order to raise capital.	The ICO bench report revealed that, as of November 2019, $26.5 billion USD was raised through ICOs.[20] Among these, the USA is leading by the countries that raised the most funds ($7.33bn), followed by Singapore ($2.46 bn) and British Virgin Islands ($2.5 bn).[21]	Worldwide
Crypto-assets	**Clearing and Settlement of Crypto-securities on a blockchain**	Clearing and settlement of securities (referred to as 'post-trade' functions) can be greatly facilitated by the use of DLT.	The use of DLT technology in post-trade functions can enhance operational efficiencies, reduce time and risk in completing transactions, and provide security for processes and data.[22] The Australian Securities Exchange has been experimenting with overhauling the Clearing House Electronic Sub-register System (CHESS) since 2015.[23]	Australia
Smart Contracts	**Smart Derivative Contracts**	The International Swaps and Derivatives Association (ISDA) published a report in January 2020 detailing the development of 'smart derivative contracts' by ISDA and	Parties who would like to enter into a derivatives contract can make use of the smart contract to automate some parts of its performance. Importantly, there are two parts to the 'smart contract': it will include, on the one hand, "formal representation" of terms using a conventional contract, and on the other hand code that is	Worldwide

17 C. Giles (2021), "UK considers creating central bank digital currency", *Financial Times*, https://www.ft.com/content/b39d663a-5082-42cb-ab9b-7b91e4ee1d19.

18 Bank of England (2020), "Central Bank Digital Currency: Opportunities, challenges and design", https://www.bankofengland.co.uk/-/media/boe/files/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design.pdf?la=en&hash=DFAD18646A77C00772AF1C5B18E63E71F68E4593.

19 B. Parkin (2021), "India's digital currency plans put pressure on crypto industry", *Financial Times,* https://www.ft.com/content/a6767184-d216-4582-aa74-c25cb418802e.

20 ICO Market Monthly Analysis November 2019, ICO Bench. https://icobench.com/reports/ICObench_ICO_Market_Analysis_November_2019.pdf.

21 *Ibid*.

22 DTCC (2016), "Embracing Disruption: Tapping the Potential of Distributed Ledgers to Improve the Post-Trade Landscape", https://www.dtcc.com/~/media/Files/Downloads/WhitePapers/embracing-disruption.pdf.

23 M. Thuvarakan (2020), "Regulatory changes for redesigned securities markets with distributed ledger technology", *The Knowledge Engineering Review*, Vol. 35, p. 14.

		R3.[24] These contracts will run on Corda, a private, permissioned blockchain developed by R3.	external to the contract which enables automated execution. ISDA's report discussed the potential for errors in execution and subsequently, loss for the parties to a smart contract. It states that, "in cases of software programming bugs or hardware issues, corrupted or otherwise incorrect data might be fed into smart contracts, or smart contracts may not function as envisaged."[25] In these cases, it will be all the more important that parties have incorporated jurisdiction and choice of law clauses into natural language contracts so that these may be upheld in front of a court.	
Smart Contracts	**On-chain Dispute Resolution**	The worldwide smart contract market is expected to reach $345.4 million by 2026.[26]	In April 2021, the UK Jurisdictional Taskforce (UKJT) published the Digital Dispute Resolution Rules. The rules aim at encouraging rapid and cost-effective resolution of commercial disputes, particularly those involving novel digital technology such as crypto-assets, cryptocurrency, smart contracts, distributed ledger technology, and fintech applications.[27] More specifically, the rules allow for arbitral or expert dispute resolution within 30 days from the tribunal's appointment. They also allow arbitrators to implement decisions directly on-chain using a private key.[28] The rules provide legal certainty to parties by specifying that "the outcome of any automatic dispute resolution process shall be legally binding on interested parties" (article 4).[29]	The United Kingdom

24 ISDA, Clifford Chance, R3 and Singapore Academy of Law (2020), "Private International Law Aspects of Smart Derivatives Contracts Utilizing Distributed Ledger Technology".

25 *Ibid*.

26 PRNewsire, Valuates Reports, "Smart Contracts Market Size to Reach USD 345.4 Million by 2026 at CAGR 18.1%", https://www.prnewswire.com/in/news-releases/smart-contracts-market-size-to-reach-usd-345-4-million-by-2026-at-cagr-18-1-valuates-reports-832536081.html.

27 UK Jurisdiction Taskforce (2021), "Digital Dispute Resolution Rules", https://35z8e83m1ih83drye280o9d1-wpengine.netdna-ssl.com/wp-content/uploads/2021/04/Lawtech_DDRR_Final.pdf.

28 *Ibid.*

29 *Ibid.*

Annex II – Domestic initiatives in relation to the digital economy

Domestic initiatives in relation to the digital economy					
Location	**Initiatives**	**Description**	**Relevant framework document**	**Scope**	**Possible PIL implications**[1]
Australia	Australia's National Blockchain Roadmap	"Several Australian Government agencies have sought to clarify the regulatory issues that affect the implementation and use of blockchain in the financial sector, including: (...) The Australian Securities and Investments Commission (ASIC), which has: *developed an information sheet on evaluating distributed ledger technology; *developed an information sheet to assist issuers of initial coin offerings and crypto-assets to understand their obligations under the Corporations Act 2001 and the Australian Securities and Investments Commissions Act 2001; *established an Innovation Hub that fintech start-ups can approach for help to navigate the regulatory system, and has run series of meetups to engage directly with stakeholders."	ASIC Information Sheet 225 Initial coin offerings and crypto assets; ASIC Information Sheet 219 Evaluating distributed ledged technology	Crypto assets; ICOs	(3)
Bermuda	New legislation: Digital Assets Business Act and ICO Act	"Bermuda enacted comprehensive legislation in 2018 that regulates cryptocurrencies, digital assets, and initial coin offerings. There is an extensive set of licensing requirements designed to ensure that digital asset businesses meet standards to ensure liquidity and transparency and comply with anti-money laundering laws and various consumer protections."	Digital Assets Business Act; Company and Limited Liability Company (Initial Coin Offering) Amendment Act 2018	Cryptocurrencies; digital assets; ICOs	(1), (3)
China, People's Republic of	Interpretation of the legislation	Article 127 of the General Rules of the Civil Law of China, which took effect on October 1, 2017, provides that: "In case laws have provisions on the protection of data and internet virtual properties, such laws should be complied with." Some Experts believe that this means that one of the basic laws in China recognizes the legal status of cryptocurrencies as virtual property. In a joint statement issued in May 2021, the National Internet Finance Association of China, the China Banking Association and the Payment and Clearing Association of China banned financial institutions and payment companies from offering services related to cryptocurrency trading and warned investors not to get involved in cryptocurrency trading.[2]	General Rules of the Civil Law of China (Article 127) (Property Law) Joint statement of the National Internet Finance Association of China, the China Banking Association and the Payment and Clearing Association of China (May 2021)	Cryptocurrencies	(3), (4)
EU	DLT Pilot [Proposal]	The DLT Pilot Regime is a regulatory sandbox for DLT market infrastructures providing trading and settlement services for DLT-transferable securities. More specifically, it is open for market participants running "multilateral trading facilities" or "securities settlement systems" using DLT. Moreover, such actors have to be authorised as an investment firm or a market operator under Directive 2014/65/EU (MiFID II) or as a Central Securities Depository under Regulation 909/2014 (CSDR). If those requirements are met, the actor can apply for specific	2020/0267 (COD)	DLT market infrastructures	(1)

1 Possible PIL implications: (1) Cross-border framework, (2) Jurisdiction, (3) Applicable law, (4) Recognition and enforcement*

* In relation to recognition and enforcement, and not reflected in the table, there are several countries which have banned transacting and holding of cryptocurrencies (Algeria, Bangladesh, Bolivia, Burundi, Egypt, Libya, Morocco, Nepal, Pakistan, Palau, Qatar, Tanzania, Uzbekistan, the West African Economic and Monetary Union (including Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo)) or banned financial institutions from transacting with and holding cryptocurrencies (Iran, Kuwait, Laos, Myanmar) according to the GBBC Global Standard Mapping Initiative (GSMI) 2020.

2 Joint statement of the National Internet Finance Association of China, the China Banking Association and the Payment and Clearing Association of China (May 2021)', reported by Xinhua.net < http://www.xinhuanet.com/fortune/2021-05/18/c_1127461941.htm>.

		permission under the Pilot Regime, the consequence of which is the actor's temporary exemption from certain rules."			
Estonia	Inclusion of cryptocurrencies definitions in the Money Laundering and Terrorist Financing Prevention Act	"The definition and legal nature of cryptocurrencies (*i.e.*, are they a right, thing or private money) in the civil law is unsettled, and there is no case-law on this subject in Estonia."	Money Laundering and Terrorist Financing Prevention Act	Cryptocurrencies	(3)
	Unofficial guidelines for ICO issuers and token traders	"The Estonian Financial Supervisory Authority (EFSA) is of opinion that tokens in terms of the offerings mentioned above, depending on their structure, might be considered as securities according to the definition set forth in the current Securities Market Act (SMA) as well as in the Law of Obligations Act (LOA). In assessing whether or not securities laws apply, the EFSA states that substance should be considered over form."	Guidelines for ICO issuers and token traders – Estonian Financial Supervision and Resolution Authority (EFSA)	Tokens; ICOs	(3)
El Salvador	Adoption of new legislation on cryptocurrencies	In June 2021, El Salvador became the first country in the world to adopt bitcoin as legal tender. The legislation, adopted by congress, will go into law in 90 days.		Cryptocurrencies	(1)
France	Action Plan for Business Growth and Transformation (PACTE) Modification to existing law	In April 2019, France passed the PACTE law (Action Plan for Business Growth and Transformation), which defines regulation around digital assets. In December 2017, the *Code monétaire et financier* has been modified to allow for securities traded over the counter (OTC) to be issued on blockchain networks.	PACTE info in English Loi PACTE French Code monétaire et financier.	Digital Assets	(3)
Germany	Blockchain strategy of the Federal Government New legislation on electronic securities	"Alongside questions of consumer protection and data protection, the consultation process addressed questions of company law. Primarily, the matter raised was the enforceability of law in blockchain structures, especially if they cross national borders." "3.6 The Federal Government is checking the suitability, feasibility and potential of an international arbitration authority - Cross-border blockchain networks can provide new challenges from the legal viewpoint, for instance on the matter of which legal system is applied. In the realm of blockchain technology, in which the contracting parties usually do not know one another, it is complicated, and possibly unjust to the interests involved, if there is a classic negotiation to attain a consensus-based dispute resolution." In June 2021, a new Electronic Securities Act, *Gesetz über elektronische Wertpapiere* (eWpG) was introduced to allow the issuance of bonds and investment participations on the blockchain.[3]	Blockchain strategy of the Federal Government Gesetz zur Einführung von elektronischen Wertpapieren	Token economy	(1), (3), (4)
India	Potential new legislation on cryptocurrencies	The Budget season of Parliament (2021) will consider a bill that prohibits all private cryptocurrencies and provides for an official digital currency to be issued by the Reserve Bank of India. As of March 2021, Finance Minister Nirmala	Cryptocurrency and Regulation of Official Digital Currency Bill	Cryptocurrencies	(1), (3), (4)

[3] Gesetz zur Einführung von elektronischen Wertpapieren https://www.bmjv.de/SharedDocs/Gesetzgebungsverfahren/Dokumente/Bgbl_elektronische_Wertpapiere.pdf;jsessionid=414777AE2C7032C37CD942FADFF528F4.1_cid297?__blob=publicationFile&v=2.

		Sitharaman said the government is still holding talks with the Reserve Bank of India.[4]			
Ireland	Discussion Paper, Department of Finance	In 2018, the Department of Finance issued a discussion paper on virtual assets. The paper explicitly states that its purpose is not: "[t]o provide guidance or set forth policy in relation to virtual currencies trading, purchasing, selling, or raising funds via Initial Coin Offerings (ICO)". One of the key considerations from the Department of Finance in the Discussion Paper was the need for a "clear legal & regulatory environment to ensure compliance when investing in blockchain linked businesses [and] Guidance in relation to tax and consumer protection matters."	Discussion paper Virtual Currencies and Blockchain technology	Virtual currencies, ICOs	(3)
Israel	Blockchain ecosystem	"The three main recommendations of the [ISA] report were the following: a tailor made disclosure regime, the ease of restrictions through a regulatory sandbox and a regulatory infrastructure for security token trading platforms."	Final Report of the ISA (Israel Securities Authority) Committee	Cryptocurrencies	(3)
Italy	Italian AML legislation	"A virtual currency is a digital representation of value which is neither issued by a central bank or a public authority, nor necessarily attached to a legal tender, and which is used as a means of payment and can be transferred, stored or traded electronically."	Italian AML legislation	Cryptocurrencies	(3)
Kazakhstan	Astana International Financial Center (AIFC)	"The Constitutional Statute of the Republic of Kazakhstan On the Astana International Financial Centre dated December 7, 2015 (the Constitutional Statute) defines the Astana International Financial Centre as a territory within the capital city, defined by the President of the Republic of Kazakhstan, where a special legal regime for the finance industry applies. The AIFC acting law is based on the Constitution of the Republic of Kazakhstan and consists of the Constitutional Statute, the AIFC Acts based on the principles, norms and precedents of the law of England and Wales, the standards of leading global financial centres, and the law of the Republic of Kazakhstan, which applies to matters not regulated by the Constitutional Statute and AIFC Acts. (...)"	AIFC Report	Financial Market	(1), (2), (3), (4)
Latvia	Joint action Estonia, Latvia and Lithuania on FinTech	"The Estonian Ministry, the Latvian Ministry and the Lithuanian Ministry recognise the importance of the development of the capital market and a stronger institutional framework to handle the cross border challenges in the Baltic States."	MoU	FinTech	(1)
Liechtenstein	Liechtenstein Blockchain Act	"The Liechtenstein Parliament passed the Token and Trusted Technology Service Provider Act (TVTG) on October 3, 2019, and the law has entered into force on January 1, 2020. Liechtenstein is the first country to introduce a comprehensive regulation for the blockchain industry, for cryptocurrencies, utility tokens, payment tokens, stable coins, and digital securities like security tokens."	Token and Trusted Technology Service Provider Act (TVTG)	Wide-range	
Lithuania	Ministry of Finance Guidelines	"In 2018, the Lithuania Ministry of Finance issued ICO guidelines that reiterated the differentiated approach to cryptocurrencies adopted by the Bank of Lithuania in 2017. The guidelines stated that there is no single piece of legislation that governs cryptocurrencies and cryptoassets. Applicable laws will depend on the nature of particular cryptocurrencies, their purpose, and their potential utilization."	ICO Guidelines	Virtual currencies and ICOs	(3)
Mauritius	New legislation on custody of digital assets	"Digital asset custody regulatory framework effective from 01 March 2019."	Financial Services [Custodian Services (digital asset)] Rules 2019 and Financial Services (Consolidated Licensing and Fees) (Amendment) Rules 2019	Digital assets	(1)

[4] H. Rakheja (2021), "India May Allow Experiments in Crypto Instead of Ban, says FM Sitharaman", *Inc 42*, https://inc42.com/buzz/india-may-allow-experiments-in-crypto-instead-of-ban-says-fm/.

Mexico	New legislation on fintech	The legislation deals with four main areas: financial technology institutions, including crowdfunding enterprises and electronic payment institutions, virtual assets (Cryptocurrencies), application programming interface (API) and regulatory sandboxes.	Ley para regular las instituciones de tecnología financiera (March 2018)	Fintech, Digital Assets	(1), (3), (4)
The Russian Federation	Amendment to existing legislation	Amendments to the Civil Code in 2019 introduced the concept of "digital rights" as an object of civil law rights.[5]	Federal Law No. 34-FZ of 18 March 2019	Digital Assets	(1), (3)
Singapore	Payment Services Act 2019	"Singapore took a wait-and-see approach to blockchain and digital assets. Then, in January 2019, Parliament passed the Payment Services Act 2019, which streamlined existing laws for payment services under the Payment Systems (Oversight) Act 2006 and the Money-Changing and Remittance Businesses Act 1979 and established new requirements relevant to digital asset businesses."	Payment Services Act 2019	Digital assets	(1), (3)
Spain	Digital Legacy – Trust for Wills	TrustForWills ensures the automated compliance with wishes of digital services users (e.g. social profiles, storage platforms, banking services) in case of temporary disability or death.	-	Digital assets	(1), (2)
Switzerland	Blockchain Act	"The new set of Swiss laws on blockchain and distributed ledger technology (DLT; Blockchain/DLT Laws) has entered into force on 1st of February, 2021".	Anpassung des Bundesrechts an Entwicklungen der Technik verteilter elektronischer Register. Bundesgesetz	Wide-range	(3)
United Arab Emirates	Dubai Blockchain Strategy	"The Financial Services Regulatory Authority of the Abu Dhabi Global Market has published regulations and guidance on accepted crypto assets, ICOs, and crypto asset businesses."	Virtual Assets Activities Guidance Guidance – Regulation of Digital Securities Activities	Wide-range	(1), (3)
United Kingdom	Legal Statement – UK Jurisdiction Taskforce	"Whether English law would treat a particular cryptoasset as property ultimately depends on the nature of the asset, the rules of the system in which it exists, and the purpose for which the question is asked. In general, however: (a) cryptoassets have all of the indicia of property; (b) the novel or distinctive features possessed by some cryptoassets—intangibility, cryptographic authentication, use of a distributed transaction ledger, decentralisation, rule by consensus—do not disqualify them from being property; (c) nor are cryptoassets disqualified from being property as pure information, or because they might not be classifiable either as things in possession or as things in action;(d) cryptoassets are therefore to be treated in principle as property. This is likely to have important consequences for the application of a number of legal rules, including those relating to succession on death, the vesting of property in personal bankruptcy, and the rights of liquidators in corporate insolvency, as well as in cases of fraud, theft or breach of trust. Cryptoassets cannot be physically possessed: they are purely 'virtual'. Accordingly, as a matter of law they cannot be the object of a bailment, and only some types of security can be granted over them, though we see no obstacle to the granting of other types of security. They are not documents of title, documentary intangibles or negotiable instruments (though some form of negotiability may arise in future as a result of market custom), nor are they instruments under the Bills of Exchange Act".	Legal statement on cryptoassets and smart contracts	Crypto assets; smart contracts	(3)

5 Russian Federation, Federal Law No. 34-FZ of 18 March 2019 on amendments to parts 1, 2 and article 1124 of part 3 of the Civil Code of the Russian Federation.

		"There is a contract in English law when two or more parties have reached an agreement, intend to create a legal relationship by doing so, and have each given something of benefit. A smart contract is capable of satisfying those requirements just as well as a more traditional or natural language contract, and a smart contract is therefore capable of having contractual force. Whether the requirements are in fact met in any given case will depend on the parties' words and conduct, just as it does with any other contract".			
United States of America	Law reform by the Uniform Law Commission (ULC)/ American Law Institute (ALI) Committee on the Uniform Commercial Code (UCC) and Emerging Technologies	The ULC/ALI committee is planning to reform the Uniform Commercial Code (UCC) to include a new sub-category of Controllable Electronic Records (CERs) for digital assets. Pending the ALI, ULC and American Bar Association's approval, the enactment process will begin in late 2022.	2021 Informal Session Draft: Uniform Commercial Code and Emerging Technologies	Digital Assets	(1), (3)

Annex III – Summary of Selected Case Law

Summary of Selected Case Law		
Case Name	**Jurisdiction**	**Summary of Decision**
Ruscoe and Moore v Cryptopia Limited (In Liquidation) (2020)	New Zealand High Court	In this case, Justice Gendall decided that cryptocurrencies are property because Lord Wilberforce's four requirements for a property interest, laid down in *the National Provincial Bank v Ainsworth,* are clearly met.[1] To constitute a "property" interest, the asset must be a) definable, b) identifiable by third parties, c) capable of assumption by third parties and d) have some degree of permanence or stability. Gendall J concluded that cryptocurrencies met the four requirements: ▪ the public key so allocated to a cryptocurrency account is readily identifiable ([108]) ▪ the existence of the private key inhibits the possibility of involuntary transfers and gives the power to exclude third parties from access; Secondly, the creation of a new private key after each transfer or disposition inhibits a holder from purporting to transfer the cryptocurrency data twice". ([113]) ▪ Cryptocurrencies can be, and many are, the subject of active trading markets. ([116]) ▪ And finally, the blockchain methodology which cryptocurrency systems deploy greatly assist in giving stability to cryptocoins ([118])
Quoine PTE ltd v B2C2 Ltd (2020) and *B2C2 Ltd v Quoine Pte Ltd* (B2C2) (2019)	Singapore Court of Appeal and Singapore International Commercial Court	In considering the certainty of subject matter, Simon Thorley LJ (at the Singapore International Commercial Court) commented that cryptocurrencies meet all the requirements of the classic definition of property. While cryptocurrencies are not considered legal tender, he recognized that they have "the fundamental characteristic of intangible property as being an identifiable thing of value".[2] Thorley J considered that Quoine holds the cryptocurrencies on trust for B2C2. Quoine appealed and the CA allowed the appeal on the breach of trust claim. The CA held that the mere fact that Quoine's assets were segregated from its customers' could not in and of itself lead to that conclusion (at [144] and [145]): "It is not necessary for us to come to a final position on this question in the present case. This is because even if BTC were to be regarded as a species of property which is capable of being the subject of a trust, we are satisfied that B2C2's breach of trust claim would fail because, contrary to what the Judge found, we consider that there was no certainty of intention to create a trust. In our respectful view, the mere fact that Quoine's assets were segregated from its customer's cannot in and of itself lead to the conclusion that there was a trust".[3]
AA v Persons Unknown (2019) EWHC 3556 (Comm)	The UK High Court	Bryan J determined that "a crypto asset such as Bitcoin are property. They meet the four criteria set out in Lord Wilberforce's classic definition of property in *National Provincial Bank v Ainsworth [1965] 1 AC 1175* as being definable, identifiable by third parties, capable in their nature of assumption by third parties, and having some degree

1 *Ruscoe and Moore v Cryptopia Limited, (In Liquidation)* (2020), NZHC 728, para. 102.
2 *B2C2 Ltd v Quoine Pte Ltd* (2019), SGHC(I) 3, para. 142.
3 Quoine Pte Ltd v B2C2 Ltd (2020), SGCA(I) 02 paras 144-145.

		of permanence".[4] Bryan J cited the United Kingdom Jurisdictional Taskforce (UKJT) Legal Statement and commented that even though the legal statement "is not in fact a statement of the law. Nevertheless, in my judgment, it is relevant to consider the analysis in that Legal Statement as to the proprietary status of crypto currencies because it is a detailed and careful consideration, I consider that that analysis as to the proprietary status of crypto currencies is compelling and for the reasons identified therein should be adopted by this court".[5]
Civil Judgment (2019) Hu 01 Min Zhong No. 13689	Shanghai First Intermediate People's Court	In this case, the Appellants went into the Respondents' residence and forced the Respondents to unlock their Skycoin account. The Respondents were forced to transfer 18.88 Bitcoins and 6,466 Skycoins to a designated account. This case centers on: 1) whether Bitcoin is of a proprietary nature and should be protected by law as such, and 2) whether the Appellants should transfer back the Bitcoins to the Respondents, and if this is not possible, whether they should compensate for loss and how the quantum of damages should be determined. On the legal nature of Bitcoin, the Court decided that "Bitcoin is a form of internet virtual property, and should be protected by law". The Court further reasoned that "Bitcoin has features such as value, scarcity, alienability, and is capable of constituting property". On the appropriate remedy, the Court decided that the Appellants' acts amounted to unlawful detention, and the Appellants violated the property rights of the Respondents. Therefore, the Appellants must return the Bitcoins to the Respondents. If this is not possible, the Appellants should pay compensation in lieu of them. The amount of compensation is determined through considering the market price at the time of loss, the price for which the Respondents acquired the property, the Appellants' profits and the amount proposed by the parties and all the circumstances of the case.
Copytrack Pte Ltd v Wall (2018 BCSC 1709)	The Supreme Court of British Columbia	Copytrack mistakenly transferred Ether Tokens to the defendant's wallet. The tokens later dissipated without the defendant's knowledge or consent. Copytrack claimed wrongful detention and conversion against the defendant.[6] The judge decided that "in my view, the proper characterization of cryptocurrency, including the Ether Tokens, is a central issue in this case, and one that informs the analysis of whether Copytrack's claims in conversion and detinue can succeed. However, the evidentiary record is inadequate to permit a determination of that issue on this application, and, in any event, it is a complex and as of yet undecided question that is not suitable for determination by way of a summary judgment application. Further, regardless of the characterization of the Ether Tokens, it is undisputed that they were the property of Copytrack, they were sent to Wall in error, they were not returned when demand was made and

4 *AA v Persons Unknown* (2019), para. 59.
5 *AA v Persons Unknown* (2019) EWHC 3556 (Comm), para. 57.
6 *Copytrack Pte Ltd v Wall* (2018 BCSC 1709), para. 28.

		Wall has no proprietary claim to them".[7] He therefore ordered a "track and recover" order in relation to the Ether tokens without proclaiming the legal nature of the tokens.
Civil Judgment (2018) Yue 03 Min Te No 719	Shenzhen Intermediate People's Court	In this decision, the Shenzhen Intermediate People's Court decided to set aside the Shenzhen Arbitration Commission's decision ordering the Applicant to compensate the Respondents for the USD equivalent of Bitcoins in RMB. The Court held that this conversion (from Bitcoin to USD) amounted to redemption and trading between Bitcoin and fiat currency in a disguised form, which contravenes the spirit of *the Announcement on Preventing Risks relating to Fundraising through Token Offerings* jointly issued by seven authorities, including the People's Bank of China, in 2017 and violates public interest.
BitGrail (2018)	Court of Florence	The court found that cryptocurrencies were "irregular deposit": "precisely because of their interchangeability, once the users' cryptocurrencies were directed towards BitGrail's main address, the currencies no longer bore the distinctive elements associated with ownership by a single user, thereby giving rise to a relationship of irregular deposit. This type of deposit is characterised by the obligation of the custodian to always keep available to the depositors the full amount of their goods, with a 100% cash ratio… when these interchangeable assets have not been identified upon delivery, the assets become available to the custodian who acquires the right to use them and therefore becomes their owner. At the same time, the custodian is under an obligation to return as many assets of the same kind and quality, save when a derogation clause has been executed by the parties".[8]
Mt Gox (2015)	Tokyo District Court	In the insolvency proceedings, the District Court of Tokyo decided on a claim filed by one of the customers of MtGox, the crypto-exchange which went insolvent. The customer requested the return of crypto-assets deposited with the exchange. The Tokyo District Court ruled that Bitcoins are not tangible assets. The court analysed the nature of Bitcoin and concluded that it did not have the necessary corporeality. Moreover, the court reasoned that due to the involvement of other participants of the network (i.e. nodes) in the process of transferring bitcoins, the person who manages the private key of a Bitcoin address does not have exclusive control over a remaining Bitcoin balance on this address. As a result, the court found that Bitcoin cannot be the object of ownership.[9]

7 *Copytrack Pte Ltd v Wall* (2018 BCSC 1709) paras 34–35.

8 Court of Florence Decision No. 17/2019 (English translation), https://medium.com/@bitgrailvictims/court-decision-by-the-court-in-florence-jan-21-20-c6d0c3e4247c.

9 M. Haentjens et al (2020), "The Failed Hopes of Disintermediation: Crypto-custodian Insolvency, Legal Risks and How to Avoid Them", *Hazelhoff Research Paper Series*, No. 9.