Law Commission
Reforming the law

Digital assets: Final report

HC 1486

Law Com No 412

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Digital Assets: Final report

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The Law Commission

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The text of this report is available on the Law Commission's website at https://www.lawcom.gov.uk/project/digital-assets/.

Contents

Glossary

Term	Definition
Account abstraction	Account abstraction involves programming a user account with smart contracts, such as to improve the security, accessibility, and general flexibility of the account.
Airdrop	A distribution of an allocation of crypto-tokens, often to past and/or current users of a Layer 1 or Layer 2 system, and often unsolicited. Users might receive airdrop crypto-tokens directly to their wallet or need to go through a process to claim the allocated tokens.
Assignment	The transfer of a right from one person to another.
Bailment	A bailment occurs when one person takes possession of a possessable thing that belongs to (is owned by) another, usually for a specific purpose.
Bitcoin	Bitcoin is the archetypal example of a public, permissionless crypto-token system and is a communications channel which creates a system for electronic transactions. The system allows individuals to communicate with one another without the need for a centralised intermediatory to authenticate the integrity of any communication or message.
bitcoin	The native notional quantity unit which exists within, and as a result of, the Bitcoin system.
Blockchain	A method of recording data in a structured way. Data (which might be recorded on a distributed ledger or structured record) is usually grouped into timestamped “blocks” which are mathematically linked or “chained” to the preceding block, back to the original or “genesis” block.

Burn address	A crypto-token public address the private key to which is unknown. This type of address is normally used to remove tokens from circulation, thus reducing the total number and so “burning” or “destroying” them.
Carbon emissions allowance	A carbon emissions allowance (“CEA”) is an allowance created under a statutory scheme designed to incentivise certain market participants to reduce the emissions released into the atmosphere annually, on a net basis. The current scheme applicable in England and Wales is the United Kingdom Emissions Trading System.
Central bank digital currency	A central bank digital currency (“CBDC”) is a digital fiat currency issued by a country’s central bank.
Charge	A type of non-possessory security interest that can be taken over an asset. The owner of the asset creates a proprietary right in relation to that asset in favour of the person who takes the benefit of the charge.
Code	A language used to give instructions to computers. Code might take various forms of abstraction depending on how the code is created by software developers, its usage (for example, in DLT systems), or whether it is intended for direct execution by a computer.
Composable/composability	Composability is a system design principle that deals with the inter-relationships of components. A highly composable system provides components that can be selected and assembled in various combinations to satisfy specific user requirements.
Computer program	A collection of instructions written in code that are executed by a computer.
Conversion	An action in tort for wrongful interference with possession of a thing.

Cryptoasset	A cryptoasset, in the sense we use it in this report, refers to a crypto-token which has been “linked” or “stapled” to a legal right or interest in another thing. Linking or stapling refers to a legal mechanism whereby the holder of a legal right or interest in a thing is identified by reference to a crypto-token. For more detail, see Chapter 8 (Collateral arrangements).
Crypto-token	A crypto-token exists as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data. For more detail, see Chapter 4 (Third thing in practice).
Custodial intermediated holding	An arrangement under which users retain superior legal title or equitable title to the assets or entitlements to assets held on their behalf or for their account. In the event of the custodial holding intermediary entering an insolvency process, these entitlements would ordinarily not form part of the holding intermediary’s estate and would not be available to meet the claims of its general creditors.
Custody	See custodial intermediated holding.
Data structure	A data structure is a format for organising, processing, retrieving and storing data.
Decentralised finance/DeFi	A general term for automated and/or deterministic and decentralised and/or disintermediated applications providing financial services on a (generally decentralised and often blockchain-based) settlement layer, including payments, lending, trading, investments, insurance and asset management.
Digital asset	Any asset that is represented digitally or electronically. There are many different types of digital assets, not all of which will be capable of being things to which personal property rights can relate. In this report, we use the term in a broad sense.

Distributed ledger	A digital store of information or data. A distributed ledger is shared (that is, distributed) among a network of computers (known as nodes) and may be available to other participants. Participants approve and eventually synchronise additions to the ledger through an agreed consensus mechanism.
Distributed ledger technology (“DLT”)	Technology systems that enable the operation and use of a distributed ledger.
Downtime	A temporal period during which a machine, computer, or a network is out of action or unavailable for use.
Ethereum	A public, permissionless blockchain system operating as a transaction-based state machine. Ethereum serves as a foundation upon which decentralised applications can be built using smart contracts.
ether	The native notional quantity unit which exists within, and as a result of, the Ethereum system.
Fiat currency	Currency that is accepted to have a certain value in terms of its purchasing power which is unrelated to the value of the material from which the physical money is made or the value of any cover which the bank (often a central government bank) is required to hold.
Fungible	A subjective quality of things that parties are willing to accept as mutually interchangeable with other things of a similar kind, quality and grade. For example, pound coins are generally treated as a class of fungible things because one pound coin is generally accepted by counterparties as equivalent to and interchangeable with another pound coin. Other classes of things that are generally treated as fungible include gold, crude oil and shares in a company.

Hash Time Locked Contract (“HTLC”)	Hash Time Locked Contracts require the recipient to acknowledge receipt by generating cryptographic proof prior to a stipulated deadline to receive the payment. A HTLC is a combination of two technical encumbrances that can be added to a transaction — a hashlock and a timelock. A hashlock is a type of encumbrance that restricts a transaction until a hashed version of a public key generated by the initiator of that transaction is unlocked with the associated private key. A timelock is a similar form of constraint that specifies the earliest time or block when that transaction can be added to the blockchain.
Instantiated / Instantiation	See Chapter 4 (Third thing in practice), para 4.16.
Intermediary	An individual or, more commonly, an organisation which holds an interest in securities or other assets held on the behalf of, or for the account of, another person.
Intermediated securities	Interests in investment securities which are held by participants through an intermediary or a chain of intermediaries.
Layer 1	A general term used to describe base-level blockchain, DLT or crypto-token architecture, systems, networks or protocols.
Layer 2	A general term used to describe a secondary protocol built on top of, or to interact with, an underlying (“Layer 1”) DLT or crypto-token architecture, system, network or protocol. Layer 2 protocols generally use the underlying Layer 1 protocol for certain functions, including settlement of transactions and transaction security.
Lien	A right to retain possession of a thing until a claim or debt has been satisfied.
Lock and mint	A general term used to describe arrangements which involve relinquishing control over one form of crypto-token (the “locked” token), and the related receipt of control of a different form of crypto-token, which is the “minted” token.

Multi-signature arrangement	Multi-signature arrangements are also referred to as M-of-N arrangements, with M being the required number of signatures or keys to authenticate an operation and N being the total number of signatures or keys involved in the arrangement.
Negotiable/Negotiability	Negotiability means not only that an instrument is transferable but also that, in the hands of a holder in due course (broadly a good faith purchaser for value without notice that has satisfied all relevant formalities), it is enforceable despite a defect in the title of any prior holder. The transferor who negotiates a bill to a holder may, therefore, pass a better title than they themselves possess.
Non-custodial intermediated holding	An arrangement under which the holding intermediary acquires (or retains) superior legal title to the assets or entitlements to assets that they hold (or acquire) on behalf of or for the account of users. Under this model, users have primarily personal contractual claims to the return of assets equivalent to those held. In the event of a non-custodial holding intermediary entering insolvency proceedings, these claims would consequently rank as unsecured claims only and would give rise to no priority right of recourse to any specific crypto-tokens or token entitlements.
Novation	A process by which the rights and obligations under a contract are taken up by a third party through the extinction and replacement of the original contract.
Offchain/onchain	Offchain refers to actions or transactions that are external to (or are undertaken on a distinct secondary protocol such as a Layer 2 that operates on top of or interacts with) the distributed ledger, structured record, blockchain or crypto-token system. Onchain refers to actions or transactions where the data is recorded by the distributed ledger or blockchain.
Omnibus account	An account which is used to hold the securities of more than one investor on a pooled unallocated basis (in contrast to an individually segregated account in which securities of each investor are separated from one another).

Open-source software	Open-source software is software that is released under a licence in which the copyright holder grants users the rights to use, study, change, and distribute the software and its source code to anyone and for any purpose.
Permissioned	Requiring authorisation to perform a particular activity.
Permissionless	Not requiring authorisation to perform a particular activity.
Pledge	A type of security interest involving a debtor transferring possession of a thing serving as security to a creditor. It is therefore a type of bailment.
Private key	See “Public key cryptography”.
Public key	See “Public key cryptography”.
Public key cryptography	Public key cryptography, or asymmetric cryptography, is an encryption scheme that uses two mathematically related, but not identical, keys (normally structured as long strings of data) — a public key and a private key. The generation of such key pairs depends on cryptographic algorithms which are based on mathematical problems. Each key performs a unique function. The public key is used to encrypt, and the private key is used to decrypt. So in a public key cryptography system, any person can encrypt a message using the intended receiver’s public key, but that encrypted message can only be decrypted with the receiver’s private key.
Rollup	Rollups perform transaction execution outside Layer 1 systems and then the data is posted to Layer 1 systems (where consensus as to the state of the DLT, blockchain, or crypto-token system may be reached). As data is included at the Layer 1 level, this allows rollups to be secured by native Layer 1 security. This layered approach means rollups allow for potential increases in transaction execution, increased scalability, and lower transaction costs.

Sharding of keys	Splitting a single key into multiple pieces and copies of those pieces, such that some subset of the pieces can be recombined to recover and use the key for a signature and transaction.
Smart contract	Computer code that, upon the occurrence of a specified condition or conditions, is capable of running automatically or deterministically according to pre-specified functions.
Smart legal contract	A legally binding contract in which some or all of the contractual terms are defined in and/or performed automatically or deterministically by a computer program.
Social recovery wallet	A way of implementing wallet security that allows for recovery of access in the event that the private key is inaccessible. A wallet is configured with a single “signing key” that can be used to approve transactions, with the added layer of a set of “guardians”, of which a majority can cooperate to change the signing key of the account.
Stablecoin	Crypto-tokens with a value that is intended to be pegged, or tied, to that of another asset, currency, commodity or financial instrument. The peg might be based on assets held by the issuer, or on a mathematical algorithm and is generally intended to remain on a stable (often 1:1) basis over time.

Staking	The term staking derives from its use within the “proof-of-stake” type of consensus mechanism used by certain blockchains or crypto-token systems to achieve distributed consensus. Under proof-of-stake consensus mechanisms, validators transfer or “stake” capital or value into a smart contract within the system. This staked value then acts as collateral that can be destroyed if the validator behaves in certain, pre-agreed ways which are considered to be negative for the overall consensus mechanism or system security (such as acting dishonestly or lazily). The validator is then responsible for checking that new blocks propagated over the network are valid and occasionally creating and propagating new blocks themselves. The validator is rewarded (often with new crypto-tokens) for undertaking this process (and contributing to the overall security of the consensus model) and penalised by the destruction of some or all of its staked collateral if it behaves in certain negative ways. The term staking has recently been used by market participants in a broader, less specific way, simply to refer to transferring or locking certain capital or value to smart contracts in return for a reward, even where no positive contribution is made by the staker and/or where the staked capital or value is not at risk.
State/State change/Transfer operation that effects a state change	We use the term “state” to refer to the canonical and chronological order of events as recorded within the distributed, transaction-based ledger or structured record of a crypto-token system (and “change of state” to changes to that record). The transaction operation, once confirmed, results in a change of state of the distributed ledger or structured record according to the protocol rules of the crypto-token system.
Unspent transaction output (“UTXO”)	The output of a valid transaction on certain crypto-token systems, which is available to be used by the transferee as the input for a new transaction. The distributed ledger or structured record of the crypto-token system records (in the form of data) these available and spendable transaction outputs.

Voluntary carbon credit ("VCC")	A voluntary carbon credit is a carbon credit created pursuant to self-regulatory programs. Those who participate in voluntary carbon markets can "offset" their emissions by purchasing VCCs, which evidence that investment has been made or action has been taken in projects aimed at reducing greenhouse gas.
Wrench attack	A wrench attack is where an attacker physically coerces a holder of crypto-tokens either to transfer those crypto-tokens or give up control of those crypto-tokens (for example by giving over their private key). It is called a wrench attack because a wrench might be a suitable object with which physically to coerce someone.

List of abbreviations

ALI	American Law Institute
BAYC	Bored Ape Yacht Club
BTC	bitcoin
CBDC	Central bank digital currency
CEA	Carbon emission allowance
DAO	Decentralised autonomous organisation
DeFi	Decentralised finance
DLT	Decentralised ledger technology
ENS	Ethereum Name Service
ETH	ether
ETS	Emissions Trading System
EUA	European carbon emission allowance
FCA	Financial Conduct Authority
FCARs	Financial Collateral Arrangements (No 2) Regulations 2003
FCD	European Union Financial Collateral Directive 2002/47/EC
NFT	Non-fungible token
LPA 1925	The Law of Property Act 1925
UCC	Uniform Commercial Code (United States)
ULC	Uniform Law Commission (United States)
UNIDROIT	The International Institute for the Unification of Private Law
UTXO	Unspent transaction output
VCC	Voluntary carbon credits

Digital assets

To the Right Honourable Alex Chalk MP, Lord Chancellor and Secretary of State for Justice

Chapter 1: Introduction

1.1 Digital assets are fundamental to modern society and the contemporary economy. They are used for an expanding variety of purposes — including as valuable things in themselves, as a means of payment, or to represent or be linked to other things or rights — and in growing volumes. Electronic signatures, cryptography, distributed ledgers, smart contracts and associated technology have broadened the ways in which digital assets can be created, accessed, used and transferred.

1.2 Such technological development is set only to continue. As technology advances and humans spend increasing amounts of time online, our relationships with digital assets will become ever more important.

1.3 The term digital asset is extremely broad. It captures a huge variety of things including digital files, digital records, email accounts, domain names, in-game digital assets, digital carbon credits, crypto-tokens and NFTs. The technology used to create or manifest those digital assets is not the same. Nor are the characteristics or features of those digital assets.

1.4 This report considers how principles of private law, specifically personal property law, apply to digital assets and concludes that certain types of digital assets are capable of being things to which personal property rights can relate.

DIGITAL ASSETS AND THE LAW OF PERSONAL PROPERTY

1.5 Personal property rights are vital to modern social, economic and legal systems.[1]

1.6 Property rights are important for many reasons. The concept of property rights is widely used in statutes and cases and property rights feature in most commercial transactions relating to things of value. Property rights are important for the proper characterisation of numerous modern and complex legal relationships, including intermediated holding arrangements, collateral arrangements and structures involving trusts. Property rights are also important in cases of bankruptcy or insolvency, when objects of property rights are interfered with or unlawfully taken, and for the legal rules concerning succession on death.[2] Property rights are useful because, in principle,

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1 For a more detailed consideration of personal property rights, see paras 2.1–2.25 of our consultation paper.

2 We do not consider succession in this paper. However, if a digital asset is found to be an object of personal property rights at law, then it will be capable of forming part of a deceased person's estate. Some

they are recognised against the whole world, whereas other — personal — rights are recognised only against someone who has assumed a relevant legal duty.

1.7 We demonstrate in this report that the law of England and Wales has proven itself sufficiently resilient and flexible to recognise some digital assets as capable of being things to which personal property rights can relate. We conclude that the law in this respect is now relatively certain and that most areas of residual legal uncertainty are highly nuanced and complex. That complexity remains, in part, because both the digital asset market and the technology in question is evolving and will continue to do so. We identify the remaining areas of residual legal uncertainty and recommend law reform to reduce that uncertainty, but in a way that acknowledges the different features of those different digital assets.

1.8 The law reform that we recommend in this report aims to ensure that the legal system, as part of a wider social framework, can reinforce the overall strength of digital asset ecosystems (which also rely on social elements). Our recommendations also aim to ensure that the private law of England and Wales remains a dynamic, globally competitive and flexible tool for market participants in the digital asset space.

ABOUT THIS PROJECT

Background

1.9 In March 2020, the Ministry of Justice asked the Law Commission to review the law on crypto-tokens and other digital assets and to consider whether the law of England and Wales required reform to ensure that it can accommodate such assets. Our full terms of reference are set out at Appendix 1.

Call for evidence, interim update paper and consultation paper

1.10 We published a call for evidence on digital assets on 30 April 2021.[3] The purpose of our call for evidence was to give stakeholders and market participants an opportunity to input to us ahead of our formal consultation paper. It sought views about, and evidence on, the ways in which digital assets were being used, treated and dealt with by market participants. We received 37 responses.[4]

1.11 We published an interim update paper on our digital assets project on 24 November 2021.[5] This included an update on the scope and detail of our work, reflecting the responses to our call for evidence.

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stakeholders have argued that access to social media accounts, email accounts and other end user licence agreement-based accounts should also be capable of passing on succession. While we do not consider this issue in this report, it was suggested as part of our consultation exercise on our 14th programme of law reform that the Law Commission should undertake a separate project looking specifically at the rights of access on death and incapacity to such accounts.

3 Digital Assets (2021) Call for Evidence, available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/04/Call-for-evidence.pdf.

4 The responses to our call for evidence are available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/10/Digital-assets-call-for-evidence-responses.pdf.

5 Digital Assets (2021) Interim Update, available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/11/Digital-Assets-Interim-Update-Paper-FINAL.pdf.

1.12 We published our consultation paper on digital assets on 28 July 2022.[6] It included a detailed consideration of private law issues relating to digital assets. Our consultation paper described our provisional proposals for law reform and asked 47 specific questions relating to those provisional proposals.

1.13 We received 81[7] responses to our consultation paper from practising lawyers, academics, technologists, industry bodies, digital asset and crypto-related businesses and other commercial entities. Many responses were highly sophisticated, precise and persuasive. We considered the responses in detail and have developed our analysis to reflect many of the points raised by consultees. We think that it is important that the responses to our consultation paper are made publicly available so that market participants, the courts and legislators (both in England and Wales and globally) can consider the arguments for and against our ultimate recommendations and conclusions in this report. In this report, we refer both to consultee responses that support our ultimate conclusions and those that do not. We consider that our consultation paper, the responses and this report provide a detailed and comprehensive discussion of the complex and highly nuanced residual areas of legal uncertainty that we attempt to resolve through our recommendations and conclusions. The responses to our consultation paper are available on our website.[8]

1.14 The wider context in which we produced this report is also important. The issues we discuss inevitably and intentionally dovetail with the work of other public and private bodies and initiatives. This includes the judiciary itself, including senior and specialist judges who have, over many years, considered the issues we discuss in this report. It also includes the UK Jurisdiction Taskforce ("UKJT"),[9] international law reform initiatives such as the UNIDROIT Digital Assets and Private Law Working Group ("UNIDROIT Working Group"),[10] the American Law Institute and the Uniform Law Commission's Uniform Commercial Code and Emerging Technologies Committee ("UCC Committee"),[11] the Expert Reference Group on Digital Assets in Scots Private Law ("ERG")[12] and multiple regulatory initiatives.[13] We conducted this project in close

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6 Digital Assets (2022) Law Commission Consultation Paper No 256, available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/07/Digital-Assets-Consultation-Paper-Law-Commission-1.pdf.

7 A number of responses set out the aggregation of the positions of a group of consultees. Taking this into account, we received responses from over 100 consultees.

8 https://www.lawcom.gov.uk/project/digital-assets/.

9 https://lawtechuk.io/ukjt.

10 https://www.unidroit.org/work-in-progress/digital-assets-and-private-law/.

11 https://www.uniformlaws.org/viewdocument/final-act-164?CommunityKey=1457c422-ddb7-40b0-8c76-39a1991651ac&tab=librarydocuments.

12 We received a submission from ERG see Appendix of our consolidated consultee responses.

13 See, for example: HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023); "UK regulatory approach to cryptoassets, stablecoins, and distributed ledger technology in the financial markets: Response to the consultation and call for evidence" (2022); Bank of England, "The digital pound: A new form of money for households and businesses?" (2023); Bank of England Financial Policy Committee, "Financial Stability in Focus: Cryptoassets and decentralised finance" (2022); J Cunliffe, "Innovation in post trade services – opportunities, risks and the role for the public sector" (2022); Financial Conduct Authority, "Cryptoassets: our work" (2019). We have also engaged in regular and

alignment with some of that work, with team members either participating in, or acting as observers to, the work of the UKJT, the UNIDROIT Working Group, the UCC Committee and the ERG. We have also had regular and in-depth discussions with senior and specialist judges on many of the issues considered in this report. Members of the judiciary said that they would welcome further a detailed consideration of the highly complex and nuanced remaining areas of residual legal uncertainty, particularly where complex technological concepts are involved. The Master of the Rolls has, in particular, welcomed our analyses and we are equally grateful for the ongoing work of the UKJT (which he chairs) and their input into our process.

1.15 Our report is therefore the culmination of two years of consultation with market participants and experts in the area. Their views and their markets have developed significantly during that time. Our recommendations and conclusions aim to ensure that the highly iterative and innovative process of evolution of the digital assets markets can continue under the law of England and Wales.

Territorial extent

1.16 As the Law Commission of England and Wales, we can make law reform recommendations only for England and Wales. This paper considers matters of private law, which are devolved in Scotland and transferred in Northern Ireland. There are differences between the law of personal property in England and Wales and its equivalent in Scots law. This paper does not identify those differences and does not address Scots law or the law of Northern Ireland.

OTHER WORK ON DIGITAL ASSETS

1.17 Recently, several UK initiatives have analysed the implications of the development of digital assets, particularly cryptoassets.[14] The UK's approach to digital assets has been characterised by careful, iterative reform based on detailed consultation with market participants. Some such projects include:

(1) three publications by the UKJT:

(a) a legal statement on cryptoassets and smart contracts;[15]

(b) a set of digital dispute resolution rules;[16] and

(c) a legal statement on the issuance and transfer of digital securities;[17]

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detailed discussions with the Bank of England, the Financial Conduct Authority, the Ministry of Justice and HM Treasury.

14 As defined in those respective projects.

15 UKJT, "Legal Statement on cryptoassets and smart contracts" (2019), ("Legal Statement") available at: https://lawtechuk.io/insights/cryptoasset-and-smart-contract-statement.

16 UKJT, "Digital Dispute Resolution Rules" (2021), available at: https://lawtechuk.io/insights/ukjt-digital-disputes-rules.

17 UKJT, "Legal statement on the issuance and transfer of digital securities under English private law" (2023), ("Legal Statement on Digital Securities") available at: https://lawtechuk.io/insights/ukjt-digital-securities.

(2) HM Revenue and Customs' Cryptoasset Manual,[18] its call for evidence on the taxation of decentralised finance[19] and its consultation on extending the investment manager exemption to include cryptoassets;[20]

(3) the Bank of England and HM Treasury's joint consultation on central bank digital currencies;[21]

(4) the Financial Conduct Authority's guidance on cryptoassets;[22]

(5) HM Treasury's consultation on cryptoassets and stablecoins,[23] and its consultation on a future financial services regulatory regime for cryptoassets;[24] and

(6) the Bank of England's analysis of cryptoassets and financial stability.[25]

Related past and current Law Commission work

1.18 In addition to this work, we have completed or are working on four other digital asset related projects.

Past work

1.19 **Smart legal contracts**: We undertook a detailed analysis of the current law as it applies to smart legal contracts, highlighting any uncertainties or gaps, and identifying such further work as may be required now or in the future. We published our advice to Government in November 2021, concluding that the current legal framework in England and Wales is clearly able to facilitate and support the use of smart legal contracts.[26]

1.20 **Electronic trade documents**: We undertook a project to make recommendations to enable the legal recognition, in electronic form, of certain trade documents such as

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18 HM Revenue and Customs, *Cryptoassets Manual* (2021), available at: https://www.gov.uk/hmrc-internal-manuals/cryptoassets-manual.

19 HM Revenue and Customs, "Call for evidence: The taxation of decentralised finance involving the lending and staking of cryptoassets" (2022).

20 HM Revenue and Customs, "Expanding the Investment Transactions List for the Investment Management Exemption and other fund tax regimes" (2022).

21 Bank of England, "The digital pound: A new form of money for households and businesses?" (2023). See also the collaboration between HM Treasury, the Financial Conduct Authority and the Bank of England on the Financial Market Infrastructure sandboxes intended to allow participants to "test and adopt new technologies and practices": J Cunliffe, "Innovation in post trade services – opportunities, risks and the role for the public sector" (2022).

22 Financial Conduct Authority, "Cryptoassets: our work" (2023).

23 HM Treasury, "UK regulatory approach to cryptoassets, stablecoins, and distributed ledger technology in the financial markets: Response to the consultation and call for evidence" (2022).

24 HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023).

25 Bank of England Financial Policy Committee, "Financial Stability in Focus: Cryptoassets and decentralised finance" (2022).

26 More information and the latest updates are available at: https://www.lawcom.gov.uk/project/smart-contracts/.

bills of lading and bills of exchange. We published our final report with draft legislation in March 2022.[27] The Electronic Trade Documents Bill, based on our recommendations, was introduced into Parliament in October 2022 and is currently in the House of Commons' committee stage.[28]

Ongoing work

1.21 **Digital assets: which law, which court?**: We have agreed with the Government that we will undertake a project looking at the private international law questions associated with emerging technology, including digital assets and electronic trade documents, and consider whether reform is required. We are conducting initial research and scoping out this work.[29]

1.22 **Decentralised autonomous organisations ("DAOs")**: In simple terms, a decentralised autonomous organisation ("DAO") is a novel type of technology-mediated structure or organisation of participants made up of several composite elements. The Government asked the Law Commission to explore and describe the treatment of DAOs under the law of England and Wales and identify options for how DAOs should be treated in law in the future in a way which would clarify their status and facilitate their uptake. We published a call for evidence in November 2022.[30] We are analysing the responses to the call for evidence and preparing a scoping paper.

THE TEAM WORKING ON THIS PAPER

1.23 The following members of the commercial and common law team worked on this report: Laura Burgoyne (team manager), Matthew Kimber (team lawyer), Amila Kulasinghe (team lawyer), Daniella Lupini (team lawyer), Luke Broadway (research assistant), Joanna Connolly (research assistant) and Diana Stoean (research assistant). Additional support was provided by team lawyers Nathan Tamblyn and Peter Hunn and research assistant Thomas Wingfield.

ACKNOWLEDGEMENTS AND THANKS

1.24 In Appendix 2 to this report, we include a list of consultees who responded to our call for evidence and those who responded to our consultation paper, together with a list of stakeholders with whom we have met during the project. We are grateful to and would like to thank all those who took the time to respond to our call for evidence and/or our consultation paper or who have otherwise met with us or responded to other requests for assistance or information in support of this work.

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27 More information and the latest updates are available at: https://www.lawcom.gov.uk/project/electronic-trade-documents/.

28 As of June 2023: https://bills.parliament.uk/bills/3344.

29 More information and the latest updates are available at: https://www.lawcom.gov.uk/project/conflict-of-laws-and-emerging-technology/.

30 More information and the latest updates are available at: https://www.lawcom.gov.uk/project/decentralised-autonomous-organisations-daos/.

1.25 We are also grateful for the feedback and comments from our advisory panel of experts, who commented on drafts of our work and shared their expertise with us. The members of the advisory panel are listed in Appendix 2.

Chapter 2: Summary of our recommendations and conclusions

OUR TRIPARTITE APPROACH TO LAW REFORM IN THIS REPORT

2.1 In this report, we make very few recommendations for law reform. That is for two reasons. First, because we conclude that the common law of England and Wales is, in general, sufficiently flexible, and already able, to accommodate digital assets. Second, because we want our recommendations to be highly practicable and achievable, to impact the law of England and Wales in a positive way and to be as direct and as implementable as possible.

2.2 In this respect, we agree with the view of Sir Geoffrey Vos (speaking extra-judicially) that:[31]

> We should try to avoid the creation of a new legal and regulatory regime that will discourage the use of new technologies rather than provide the foundation for them to flourish.

2.3 We take a tripartite approach to law reform.

(1) We conclude that the common law of England and Wales is, in general, sufficiently flexible, and already able, to accommodate digital assets and therefore that any law reform should be through further common law development where possible.

(2) We recommend targeted statutory law reform only to confirm and support the existing common law position, or where common law development is not realistically possible.

(3) We recommend making arrangements for the provision of further guidance from industry experts which would support both the common law and statute.

2.4 We explain this approach below and summarise our conclusions and recommendations from paragraph 2.44.

Prioritising common law development

2.5 First, we use this report in large part to champion the common law of England and Wales and to draw its successes in the digital asset (including the crypto-token and cryptoasset) markets to the attention of market participants. Our analysis is intended to form the foundation on which further common law development can be based. We conclude that the law in this area is now relatively certain and that most areas of residual legal uncertainty are highly nuanced and complex. That complexity remains,

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[31] Sir Geoffrey Vos MR, "Cryptoassets as property: how can English law boost the confidence of would-be parties to smart legal contracts?" (2019), available at: https://www.judiciary.uk/wp-content/uploads/2019/05/Sir-Geoffrey-Vos-Chancellor-of-the-High-Court-speech-on-cryptoassets.pdf.

in part, because both the digital asset markets and the technology that supports them are evolving and will continue to do so. We discuss these remaining areas of residual legal uncertainty and draw conclusions as to the most appropriate way for the common law to develop.

Targeted statutory law reform

2.6 Second, we make two recommendations for statutory law reform. We conclude that, although some digital assets are not easy to place within traditional categories of things to which personal property rights can relate, this does not prevent them from being capable of attracting personal property rights, and that this is clearly the position at common law. Nonetheless, some consultees, including senior and specialist judges, said to us that it would be helpful to express this position in legislation. We recommend such legislation and conclude that it will confirm and support the existing common law position.

2.7 In addition, we conclude that there is one area where the common law cannot give market participants sufficient legal certainty: the development of a new regime for collateral arrangements involving crypto-tokens and cryptoassets. We acknowledge that this issue does not merely involve legal questions; it also involves policy-based judgments beyond the scope of our report. We recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

Support from industry-specific technical experts

2.8 Third, we acknowledge that increasingly advanced technology is likely to lead to a proliferation of digital assets over time, in terms of number, use-case, design and technological functionality. Many of those digital assets are likely to be complex, composable,[32] multi-faceted and use different technology, which in turn will give rise to diverse products and services that the law will have to accommodate. We conclude that common law development is better able to keep up with this change than statutory law reform. However, it is an enormous task for the judiciary to remain alive to such technological development. We recommend that the Government creates or nominates a panel of industry-specific technical experts,[33] legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly). We conclude that such detailed and technology specific guidance will

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[32] That is, they might be made up of different technological components that can be selected and assembled in various combinations to satisfy specific user requirements, which might change or be malleable over time. A good example in relation to the crypto-token ether is "The Merge", which was the joining of the original execution layer of Ethereum (the "Mainnet" that has existed since "genesis") with its new proof-of-stake consensus layer, the "Beacon Chain". This eliminated the need for proof-of-work based mining and instead enabled the network to be secured using staked ether. See https://ethereum.org/en/roadmap/merge/.

[33] This would need to include those with expertise in the crypto-token markets, and not just those with expertise in traditional finance markets or intermediated securities markets.

facilitate clear, logical and consistent applications of legal rules and reasoning over time.

THE PRINCIPLES UNDERLYING OUR APPROACH

2.9 In this section, we set out the principles and considerations behind our recommendations and conclusions as follows.

(1) Championing and supporting the inherent flexibility of the common law and making clear that, in general, it is sufficiently flexible, and already able, to accommodate digital assets.

(2) Statutory reform only to confirm the existing common law position or where the common law cannot develop the legal certainty the market requires.

(3) Applying technology-neutral principles in a way that is responsive to specific technology.

(4) The need for more input from experts and market participants on technical issues.

(5) Consistency with other legal and regulatory regimes where possible.

The common law of England and Wales is sufficiently resilient and flexible for digital assets

2.10 We conclude that the common law of England and Wales has already proven itself sufficiently resilient in the face of new technology and flexible enough to answer legal questions concerning digital assets. It is already developing a sophisticated legal regime that recognises and protects the nuanced features of those digital assets, providing the market with a good balance of certainty and flexibility. The jurisdiction of England and Wales is well placed to provide a coherent, globally relevant legal regime for existing and new types of digital asset.

2.11 This conclusion is based on:

(1) the research we undertook for our call for evidence, our consultation paper and this report;

(2) our consultation and discussions with a wide range of market participants;[34]

(3) our discussions with members of the judiciary of England and Wales at an open roundtable and our subsequent discussions with senior and specialist judges;

[34] We held three public roundtable discussions with market participants to discuss our consultation paper. These were well attended, with over 200 attendees across the three events. We also consulted with our advisory panel and over 100 market participants.

(4) our ongoing participation in other domestic and international law reform initiatives;[35] and

(5) the highly sophisticated, comprehensive and persuasive responses to our consultation paper.[36]

The interaction between common law development and statutory intervention

2.12 Many consultees said that the obvious benefit of leaving the law of personal property to develop incrementally through the common law is the flexibility to deal with rapidly developing technology giving rise to different factual scenarios. The courts of England and Wales have already recognised that new forms of digital assets are capable of being things to which personal property rights can relate at law and have accommodated those assets within the law of personal property without the need for statutory intervention. Many consultees also said that statutory intervention at this stage could undermine the high level of existing legal certainty, lead to undue complexity and create a significant risk of boundary issues. That is, statute might not be capable of distinguishing between different implementations of similar technology in the way the common law can.

2.13 We agree. We conclude that it is not necessary, appropriate or helpful for the law of England and Wales to adopt statutory definitions of digital things for the purposes of answering the question as to whether such things are capable of being objects of personal property rights.[37] We think that this logic applies equally to defining hard boundaries of a category of thing to which personal property rights can relate, distinct from things in possession and things in action.[38]

2.14 The flexibility of the common law is one of the greatest strengths of the law of England and Wales, as the UKJT makes clear:[39]

> English law (like other common law systems) does not necessarily require statutory intervention in order to support new asset classes or financial structures. As we have seen recently with cryptoassets, and as has been demonstrated over past decades and centuries with numerous once-novel asset classes, the common law has inherent flexibility that allows it to adapt to accommodate commercial need.

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35 Including the UKJT; the UNIDROIT Working Group on Digital Assets ("UNIDROIT Working Group"); the American Law Institute and the Uniform Law Commission's Uniform Commercial Code and Emerging Technologies Committee ("UCC Committee"); and the Expert Reference Group on Digital Assets in Scots Private Law ("ERG").

36 See Chapter 1 (Introduction), para 1.13, where we discuss the value of the responses received, and Appendix 2. Responses to our consultation are available on our website: https://www.lawcom.gov.uk/project/digital-assets/.

37 Although we recognise that this has been the approach of other law reform initiatives, including: (1) UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 2(1), p 16, available at: https://www.unidroit.org/wp-content/uploads/2023/04/C.D.-102-6-Principles-on-Digital-Assets-and-Private-Law.pdf; and (3) the Liechtenstein Token and Trusted Technology Service Provider Act 2019-301.

38 We discuss these categories and this categorisation issue in detail in Chapter 3 (Third thing). See also from para 3.17 below where we explain these terms.

39 UKJT, Legal Statement on Digital Securities para 6.

2.15 Formulating and implementing legislation can take a long time. This process itself could have the effect of preventing or stunting common law development, or delay experimentation by market participants while they anticipate new legal rules. When we considered recommending statutory law reform, we also considered the negative impacts of a legislative process that could take many years.

2.16 For those reasons, we conclude that statutory law reform in this area is only helpful where it either confirms and supports the existing common law position or where it is targeted at problems that cannot be solved more effectively by common law development. Our recommendations for statutory law reform therefore aim either to confirm the existing common law position so that it can continue to develop or to provide market participants with legal tools that do not yet exist in England and Wales, but which already exist in other jurisdictions.

Legislation to confirm and support the existing common law position so that the common law can continue to develop

2.17 Our first recommendation for statutory intervention seeks merely to confirm and support what we consider to be the existing position at law. That is, that being neither a thing in possession nor a thing in action does not prevent a digital asset from being capable of being a thing to which personal property rights can relate. We discuss our detailed reasoning for this in Chapter 3 (Third thing), but in summary, the use of confirmatory legislation will constitute a clear and unequivocal statement from Parliament on the point which will cement legal certainty under the law of England and Wales. It will also indicate to the judiciary that Parliament has decided that the development of parameters which describe when a digital asset is capable of being an object of personal property rights (and if that digital asset does in fact attract personal property rights) is a matter for the common law. Such a statutory confirmation will allow court time that might otherwise be spent on questions of categorisation of things to which personal property rights can relate to be used instead to focus on substantive issues. It will provide a strong platform from which common law development can proceed.

Focused, technical statutory intervention

2.18 In Chapter 8 (Collateral arrangements), we conclude that it is not possible for the common law alone to develop a legal framework that best facilitates the entry into, operation and enforcement of collateral arrangements for crypto-tokens and cryptoassets. We conclude that such a regime would be beneficial for the law of England and Wales and would provide market participants with important legal tools that do not exist today.

2.19 Designing such a regime is a highly technical, and market-specific process which has complex policy implications that require a wide-ranging cross-functional investigation and rigorous cost benefit analysis. We recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

Applying technology-neutral principles in a way that is responsive to specific technology

2.20 While our work seeks to support and facilitate the use and development of digital assets (including crypto-tokens and cryptoassets), it remains neutral as to the advantages and disadvantages of any single digital asset, crypto-token, protocol, system, network or technological feature. However, our work is not in its entirety "technology neutral", because it necessarily discusses existing technology used in relation to digital assets and crypto-tokens, most specifically cryptography. This is necessary because different technological arrangements give rise to different fact-patterns, with which the law must deal.

2.21 We conclude that the flexibility of the common law allows it to apply legal principles in a technology neutral way (that is, without favouring any one example of technology), while recognising and accommodating the distinct functionality of specific technologies.

2.22 Consultees agreed that this was a principal advantage of the common law. Many consultees said that, to analyse the proper application of the law, each digital asset needs to be considered on a case-by-case basis by reference to the particular features of the digital asset in question and, where applicable, the system which manifests it.

2.23 Each system might be constructed, or have developed, in different ways and the functional characteristics of that system will also differ depending on the ways in which different networks of participants participate in that system.[40] The law must retain the flexibility to accommodate and respond to those technological features, particularly where they constitute material facts of any given case, and therefore affect the legal principles that need to be applied. This is particularly the case where distinct objects of personal property rights are recognised at law as existing by virtue of the active operation of particular software by a network of participants.[41]

2.24 One of the principal conclusions in this report is that recognising the idiosyncrasies of distinct digital assets and digital asset systems will allow the law of England and Wales to develop legal principles and rules best suited to those particular digital assets. It can do so without being fettered by the wholesale application of imperfect analogies with other things with which the law has long been familiar.

2.25 The distinctive advantage of the common law in this context is already apparent at the Court of Appeal level. In *Tulip Trading v Van der Laan* ("*Tulip Trading*"), Lord Justice

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40 The wider network of participants in crypto-token systems are very different to those in traditional finance systems. For an introduction, see our call for evidence on Decentralised Autonomous Organisations, paras 2.3–2.28: Decentralised Autonomous Organisations (2022) Call for Evidence, available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/11/DAOs-Call-for-Evidence-LC.pdf. For a more detailed overview of the different crypto-token ecosystem functions performed by various participants, see G Shapiro, "A Functionalist Framework for DeFi Regulation" (2022), available at: https://lexnode.substack.com/p/a-functionalist-framework-for-defi.

41 For more detail and discussion on this point, see Chapter 3 (Third thing).

Birss was careful to acknowledge the differences between different forks of the original Bitcoin network, each of which manifest different crypto-tokens:[42]

> There are four bitcoin networks in issue in this case: BSV, BTC, BCH and BCH ABC… Each later network started life as a copy of the blockchain of a pre-existing network (which is after all public) *but by then applying different software thereafter*.

2.26 A similar approach is also evident in proposed UK regulation. HM Treasury recently closed a consultation and call for evidence on a future financial services regulatory regime for cryptoassets.[43] In that consultation, HM Treasury said that one of its core principles was recognising where technology either gives rise to, or mitigates, specific risks that might not be found (or might take a different form) in markets that do not rely on such technology.[44]

2.27 We decided on our approach, in part, to align with the approach taken by HM Treasury to regulatory law reform in this area: that maintaining the flexibility and agility of the law of England and Wales is important. HM Treasury said to us:

> As part of the Financial Services and Markets Bill, the UK is clarifying powers to bring stablecoin and cryptoasset activities into the existing financial services framework in an agile way via secondary legislation. Detailed firm-facing rules will be delegated to the UK's regulators.
>
> This means that the UK will be able to update regulation in an agile way to support innovation and address risks as the sector rapidly evolves, rather than hard-coding detailed rules into primary legislation.

2.28 We acknowledge the argument that legislation to change the operation of private law has the potential to provide greater legal clarity and predictability for market participants than common law principles. However, legislation is also more likely than the common law to create boundary issues in its application. Legislation might lack the agility required to reconcile the application of technology neutral principles with specific technological facts. The common law concerning digital assets has developed well to date. We conclude that there is significant risk that legislative intervention in this area (other than the targeted, confirmatory legislation we recommend)[45] could undermine existing legal certainty and could reopen settled points of law.

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42 [2023] EWCA Civ 83, [2023] 4 WLR 16 at [26] (emphasis added). The case before the Court of Appeal proceeded on the basis that the factual case advanced by the claimant could be assumed to be correct. However, the (potentially significant) distinctions between different forks of the original Bitcoin network are likely to be important in any future trial, particularly in relation to the concept of "decentralisation": see Lord Justice Birss' comments at [33]-[39], [72] and [77].

43 HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023).

44 Above at para 1.12.

45 We also recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements: para 8.161. That necessarily involves policy-related questions which are beyond the scope of

Greater input from specialist market participants on technical issues

2.29 The digital asset market is still evolving rapidly and the technology in question will evolve further. Both the technology and market practice are highly responsive to the ongoing social utility of particular products and use-cases. Put simply, the digital assets market — or at least elements of it — remains unpredictable.[46] This means that digital assets and the markets that involve those assets are currently more susceptible to change than other assets and markets. If the law is to respond to and reflect those developments, it must draw on the expertise of those who are most familiar with the technology.

2.30 The UK has to date been successful in both canvassing and listening to views from a range of market participants on private and regulatory law reform in respect of digital assets and has relied heavily on such input for legal and policy analysis and development.[47] We conclude that the jurisdiction of England and Wales should continue to allow and encourage market participants and the industry to contribute to the process of legal development. This will help to ensure that the law accurately reflects the underlying technology and the ways in which it is used in practice.

Consistency with other legal and regulatory regimes

2.31 The law of England and Wales has a global reach as the legal system of choice for many commercial parties.[48] Our recommendations and conclusions aim to ensure that the law of England and Wales remains a dynamic, globally competitive and flexible tool for market participants in the digital asset space. Reducing or removing residual areas of legal uncertainty should help market participants better to understand and quantify the risks involved in their activities. The Government has said that a similar approach also is likely to be reflected at the regulatory level, focusing on growth, innovation, competition and risk disclosures.[49]

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this report. As we discuss in Chapter 8 (Collateral arrangements), the need for a high level of legal certainty with respect to collateral arrangements led us to conclude that common law development would not be sufficient.

46 At one end of the spectrum, central banks are considering state-backed digital currencies and traditional finance markets are attempting to incorporate (some parts of) this new technology into their practices. Often, this is achieved through permissioned, centralised systems. At the other end of the spectrum is experimental, iterative technology and legal structuring, largely based on open source, public and permissionless systems. The markets that use technology remain relatively small (as compared to the traditional finance markets) and the assets involved can often be thinly-traded and subject to differing levels of control (including economic control over large amounts of value). The use-cases for the technology are still evolving and competing with existing products as the market grows. The technology also lends itself to competitive or creative destruction, given it is in many cases easily copyable or replicable and reliant on (sometimes) fickle or flighty capital or ongoing participation by network participants. Because of these features, it is difficult to predict how markets will integrate this technology, whether permissioned or permissionless systems will see greater success and how markets will evolve as they compete with (or embrace) the technology.

47 See paras 1.17 of Chapter 1 (Introduction).

48 The Law Society, *England and Wales: a world jurisdiction of choice* (2019).

49 See HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) para 1.11, which sets out four overarching policy objectives: (1) to encourage growth, innovation, and competition in the UK; (2) to enable consumers to make well-informed decisions, with a clear understanding of the risks involved; (3) to protect UK financial stability; and (4) to protect UK market

Consistency

2.32 Given that digital asset markets facilitate participation at a global level and reduce geographic or jurisdictional frictions, our recommendations and conclusions aim to be consistent with other international law reform initiatives where possible. Most specifically, we intend that our recommendations and conclusions are broadly consistent with the recommendations of the UNIDROIT Working Group on Digital Assets ("UNIDROIT Working Group") which recently published a set of international principles designed to facilitate transactions in digital assets.[50] However, while intended to be consistent as a matter of practical effect, our recommendations do not take the same form as the UNIDROIT Working Group principles.[51]

2.33 Our report also considers the work of the American Law Institute and the Uniform Law Commission's Uniform Commercial Code and Emerging Technologies Committee ("UCC Committee") in the United States. The UCC Committee recommended changes to the United States Uniform Commercial Code.[52] The recommendations include a new provision that, where implemented, would govern the transfer of personal property rights in relation to certain intangible digital assets that have been or may be created using new technologies.[53] Again, we intend that our recommendations are broadly consistent with the UCC Committee's recommendations as a matter of practical effect, albeit not as a matter of form. In addition, our recommendations aim to provide those using the law of England and Wales with similar legal tools to those available in states that implement the UCC Committee's recommendations.

Differentiation

2.34 We conclude that it is important that the law of England and Wales provides certainty within a clear, flexible legal environment for internationally mobile transactions and markets involving digital assets. In its report, *Economic value of English law*, Oxera said:[54]

> [Internationally mobile transactions and markets] have a tendency to 'tip', which means that once the use of a governing law reaches a critical mass in a given market, most market participants tend to use that law because of the benefit from using standardised contract and procedures.

2.35 We agree with Oxera that promoting the use of the law of England and Wales in fintech fits particularly well with the Government's overall strategy to attract more

integrity. See also "Keynote Speech by John Glen MP Economic Secretary to the Treasury, at the Innovate Finance Global Summit during Fintech Week 2022" (2022).

50 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023).

51 In this report, we describe the ways in which our approach differs, where relevant.

52 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.

53 Above art 12.

54 Oxera is an economics and finance consultancy and was commissioned by LegalUK to identify the economic value of the law of England and Wales to the UK. See Oxera, "Economic value of English law" (2021), available at: https://legaluk.org/wp-content/uploads/2021/09/The-value-of-English-law-to-the-UK-economy.pdf.

technological innovation in the financial services sector and to "cement the UK's position as the world's pre-eminent financial centre".[55]

2.36 More recently, the Government announced its intentions "to make the UK a global hub for cryptoasset technology", such that the "UK financial services industry is always at the forefront of technology and innovation."[56]

2.37 We also note that today no clear and consistent private legal and regulatory environment exists within which digital asset market participants can innovate, experiment and grow.

2.38 In the United States, the legal environment for digital assets has developed by a combination of sometimes contradictory, state-by-state statutory reform,[57] common law precedent and policy-led regulatory enforcement decisions and settlement negotiations.[58]

2.39 The legal environment in certain jurisdictions including Hong Kong, Singapore, China and Japan has sometimes experienced sudden or unexpected reversals in direction, attitude, or policy with regard to digital assets.[59]

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55 Above p 28.

56 HM Treasury, "Government sets out plan to make UK a global cryptoasset technology hub" (2022).

57 We note that there has even been negative reaction from digital asset markets where law reform initiatives seek to support digital asset markets. For a more detailed discussion, see C Reyes, "Emerging Technology's Unfamiliarity with Commercial Law" (2023), available at: https://ssrn.com/abstract=4388919.

58 See for example: *Securities and Exchange Commission v Plexcorps* (2017, Case Number 1:17-cv-07007-CBA-RML) (an enforcement action in relation to an initial coin offering, claiming this to be in violation of securities law); *In the Matter of Zachary Coburn* (2018, Release Number 84553) (an enforcement action against the founder and creator of a crypto-token trading platform, alleging that the defendant caused the platform to violate securities law); *Securities and Exchange Commission v Kik Interactive Ltd* (2019, Case Number 1:19-cv-05244) and *Securities and Exchange Commission v Telegram Group Inc* (2019, Case Number 1:19-cv-09439) (although no fraud was alleged in these actions, these cases represent the first major litigation decisions about whether a token is a security); *Securities and Exchange Commission v Ripple Labs* (2020, 1:20-cv-10832) (an ongoing enforcement action relating to 14.6 billion notional units of a crypto-token called XRP, allegedly sold unlawfully as a security by the defendant); *In the Matter of bZeroX* (2022, Release Number 8590-22) (a Commodity Futures Trading Commission action, which was subsequently settled, against a DeFi platform, alleging that the platform facilitated margined and leveraged retail commodity transactions without proper registration or diligence) – see also *Commodity Futures Trading Commission v Ooki DAO (formerly d/b/a bZx DAO)* (2023, Case Number 3:22-cv-05416); *Securities and Exchange Commission v Bittrex Inc* (2023, Case Number 2:23-cv-00580); *Securities and Exchange Commission v Beaxy Digital Ltd* (2023, Case Number 1:23-cv-1962); *Securities and Exchange Commission v Justin Sun* (2023, Case Number 1:23-cv-02433); and *Securities and Exchange Commission v Genesis Global Capital LLC* (2023, Case Number 1:23-cv-00287). For more information on these actions, as well as further examples, see Morrison Cohen LLP, "Cryptocurrency Litigation and Regulation Tracker" (2023), available at: https://www.morrisoncohen.com/news-page?itemid=471.

59 For example, in Hong Kong, regulators that had previously banned retail access to crypto-token investments have recently announced intentions to grant retail access to licenced exchanges. See Hong Kong Securities and Futures Commission, "Statement on regulatory framework for virtual asset portfolios managers, fund distributors and trading platform operators" (2018); Julia Leung, "Embracing Innovation, Regulation and the Future of Finance", Keynote Address at Hong Konh FinTech Week 2022 (2022). The Hong Kong Court of First Instance has also recently confirmed that a crypto-token is capable of being an object of personal

2.40 The legal environment in other European jurisdictions — many of which are civil law-based — is largely characterised by complex, comprehensive codification of rules relating to digital assets.[60] This approach has been continued in the regulatory sphere by the introduction in the European Union of the Markets in Crypto-assets Regulation ("MiCA"), which creates a complex regulatory regime specifically for digital assets.[61]

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property rights under Hong Kong law and is capable of being held on trust: *Re Gatecoin Limited* [2023] HKCFI 914.

China, which in 2021 introduced widespread bans on crypto-token trading is reportedly considering the option of softening this strict stance. See Library of Congress, "China: Central Bank Issues New Regulatory Document on Cryptocurrency Trading" (2021); People's Bank of China, "Circular on Further Preventing and Disposing of Speculative Risks in Virtual Currency Trading" (2021), available at: https://www.gov.cn/zhengce/zhengceku/2021-10/08/content_5641404.htm; and A Cuthbertson, "Bitcoin price poised for 'orthogonal' shakeup as China softens stance" (2023) *Independent*, available at: https://www.independent.co.uk/tech/bitcoin-price-latest-china-crypto-b2288046.html.

Singapore has recently put forward plans to reduce and mediate retail access to crypto-token markets despite the jurisdiction's earlier ambitions to facilitate a more hands-off – albeit cautionary – approach to crypto-token regulation. See Monetary Authority of Singapore, "Proposed Regulatory Measures for Digital Payment Token Services" (2022); and Monetary Authority of Singapore, "Keynote Speech by Mr Ong Chong Tee, Deputy Managing Director (Financial Supervision), Monetary Authority of Singapore, at Asia Securities Industry & Financial Markets Association (ASIFMA) Annual Conference 2018 on 1 November 2018" (2018).

In Japan in 2015, the Tokyo District Court held that bitcoin was not a thing capable of ownership within the Japanese Civil Code. Since that judgment, an amendment to the Japanese Payment Services Act added the concept of "Virtual Currency". Lee and Van de Looverbosch suggest that this intervention has brought crypto-tokens within the sphere of property law, as a form of "property value": J Lee and M Van de Looverbosch, *Property and Data: A Confused Relationship* (2021). See also J Lee and A Darbellay, *A Data Governance in AI, FinTech and RegTech: Law and Regulation in the Financial Sector* (2022), available at: https://ssrn.com/abstract=3995492 and paras 4.58–4.61 of our consultation paper.

60 In 2019, France enacted a comprehensive legislative framework for digital assets entitled "Plan d'Action pour la Croissance et la Transformation des Entreprises", available at: https://www.gouvernement.fr/action/pacte-le-plan-d-action-pour-la-croissance-et-la-transformation-des-entreprises.

In 2020, Switzerland introduced the Federal Act on the Adaptation of Federal Law to Developments in Distributed Ledger Technology, which broadly amended a number of existing statutory regimes to better incorporate digital assets, available at: https://www.newsd.admin.ch/newsd/message/attachments/60601.pdf.

In 2020, Liechtenstein introduced the Token and Trusted Technology Service Provider Act 2019-301, which provides for the tokenisation of assets and rights. This legislation creates a new legal object – a token – and a specific, separate regime for the regulation and use of those tokens.

In 2020, Germany introduced the Gesetz zur Umsetzung der Änderungsrichtlinie zur Vierten EU-Geldwäscherichtlinie which, among other things, introduced a new category of "crypto assets" into the definition of financial instruments for the purposes of German banking legislation. See also para 14.46 of our consultation paper.

In 2018, Malta introduced the Virtual Financial Assets Act which, alongside the Innovative Technology Arrangements and Services Act (2018) and the Malta Digital Innovation Authority Act (2018), comprehensively legislates on the issuance and use of virtual financial assets.

61 In the European Union, the Markets in Crypto-assets Regulation (MiCA) was recently passed by the European Parliament: Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets, and amending Directive (EU) 2019/1937; European Parliament, "Cryptocurrency dangers and the benefits of EU legislation" (2023). The regulation introduces requirements for organisations engaged in the issuance and trading of cryptoassets. The regime places a particular focus on asset-backed and e-money tokens and imposes licensing, incorporation and whitepaper publication obligations on certain cryptoasset issuers. As a regulation, MiCA is directly applicable in EU Member States (as specified in Article 288 of the Treaty on the Functioning of the European Union), and therefore has direct effect.

2.41 While codification projects in those jurisdictions have provided market participants with a high degree of legal certainty, and have been largely well received, we remain of the view that the UK's approach provides an excellent balance of flexibility and legal certainty.

2.42 The UK — and the law of England and Wales — therefore has an opportunity to provide a clear and consistent private legal and regulatory environment for digital assets and digital asset related activities. That legal and regulatory environment might in turn help to attract more technological innovation in the financial services sector.

2.43 Our recommendations and conclusions in this report aim to help achieve this goal, although they are explicitly limited to private law issues.[62]

SUMMARY OF OUR RECOMMENDATIONS AND CONCLUSIONS

2.44 This report comprises seven further chapters and two appendices. We summarise our recommendations and conclusions in each chapter below.

Chapter 3: A "third" category of thing to which personal property rights can relate

2.45 In Chapter 3 (Third thing), we conclude that some digital assets are neither things in possession nor things in action, but that nonetheless the law of England and Wales treats them as capable of being things to which personal property rights can relate. Some consultees, including senior and specialist judges, said that it would be helpful to express this position in legislation. They said that this would confirm the existing position at common law, facilitate the law's continued development on the point and lay to rest any lingering authority suggesting that there can be no "third" category of this nature. We recommend such legislation and conclude that it will confirm and support the existing common law position.

2.46 Although we recommend legislation to confirm the common law position, we conclude that it is not necessary or appropriate to define in statute the hard boundaries of this third category of things. We conclude that the common law is the better vehicle for determining those things that properly can (and should) be objects of personal property rights and which fall within the third category: third category things. These might not necessarily be digital things.[63] We refer to digital things within the third category as digital objects.

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62 Our report does not consider regulatory matters and does not seek to create any sort of regulatory regime for any particular type of digital asset. Instead, our goal is to create a facilitative and legally certain environment in which such assets can flourish. This is distinct from other initiatives — discussed in this report — which seek to regulate any resulting economic activity.

63 For example, milk quotas and certain types of carbon emission allowances might not necessarily be "digital" but might still fall within the third category.

Detailed overview of Chapter 3 (Third thing)[64]

2.47 The law of England and Wales traditionally recognised two distinct categories of personal property rights: rights relating to things in possession (tangible things) and rights relating to things in action (legal rights or claims enforceable by action).[65]

2.48 The legal concept of possession is traditionally limited to tangible things.[66] We recognise that it is therefore bound up with tangibility and has traditionally relied on the physical boundaries of a thing to help define the contours of legal duties in relation to that thing.[67] Digital assets are not tangible in the traditional sense.[68] We conclude that, given their vastly different functionality to tangible things, it is not necessary or appropriate for digital assets to be categorised as things in possession.

2.49 There exist certain digital assets that cannot be things in action in the narrow sense.[69] Indeed, some crypto-tokens and other intangible objects which the law recognises can be things to which personal property rights can relate are explicitly designed not to consist of a legal right or claim against a legal person. They can be, and are designed to be, used and enjoyed regardless of their legal recognition or enforceability.[70] We

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64 Chapter 3 (Third thing) considers issues set out in chapters 2 to 10, 14 and 15 of our consultation paper. It deals with consultation questions 1 to 15, 25, 27 and 28.

65 These are high-level descriptions and we discuss each in detail in our consultation paper, see from para 4.18 (things in possession) and from para 4.26 (things in action). Personal property rights do not refer to a thing but to a relationship between a person and a thing. Nevertheless, a necessary starting point is to identify what kind of "things" can be the object of personal property rights because the relationship is not one that can arise between persons and all things. Jeremy Bentham made this point long ago when he pointed out that "in common speech in the phrase 'the object of a man's property', the words 'the object of' are commonly left out." See J Bentham, *An Introduction to the Principles of Morals and Legislation* (1789) Ch 16 s 2 para XXVI n 35. Similarly, Professor Birks said that "a right *in rem* is one whose exigibility is defined by reference to the existence and location of a thing, the *res* to which it relates": P Birks, *An introduction to the law of restitution* (1985) p 49. See also chapters 2 and 4 of our consultation paper in general and para 4.100 where we discuss the point that other "categories" of things to which personal property rights can relate could be said to exist.

66 The exception to this is electronic trade documents which seek to replicate the legal functionality of a specific form of tangible thing — paper trade documents. We discuss our reasoning for this exception in detail from para 4.20 of our consultation paper and in our separate report (and subsequent Bill) on electronic trade documents: Electronic Trade Documents: Report and Bill (2022) Law Com No 405; Electronic Trade Documents Bill, the current version of which is available at: https://bills.parliament.uk/bills/3344. See also from para 3.20 below.

67 B McFarlane and S Douglas, "Property, Analogy and Variety" (2022) 42(1) *Oxford Journal of Legal Studies* 161, 166.

68 But digital assets such as crypto-tokens do have a tangible, albeit highly distributed, existence in that they rely on real physical infrastructure including hardware, the work of humans and/or machines, energy expenditure, network effects, liquidity and integration in existing social, economic or financial infrastructure.

69 Rights in things in action are often described in a narrow sense: "rights in things in action, denied physical enjoyment, are asserted by taking legal action or proceedings" although "the difference between the thing and rights in the thing is more elusive for things in action than for things in possession." M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 4.002.

70 Obvious examples are bitcoin and ether, although many other crypto-tokens are designed in similar ways. For a detailed consideration of this point (albeit in the context of United States regulatory laws), see L Cohen, G Strong, F Lewin and S Chen, "The Ineluctable Modality of Securities Law: Why Fungible Crypto Assets Are not Securities" (2022), available at: https://dx.doi.org/10.2139/ssrn.4282385. We also note that the explicit purpose of the Bitcoin whitepaper was to reduce the need for counterparties to rely on

conclude that it is not necessary, conceptually coherent or helpful for such things to be categorised as things in action, or for things in action to be treated as a wider, residual category of things that captures any object of personal property rights that is not a thing in possession.

2.50 This conclusion reflects the current state of the common law, which over the last ten years has clearly moved toward the explicit recognition of a third category of thing to which personal property rights can relate (and which includes many digital assets). The law has now moved on from the (arguably hollow)[71] debate on categorisation of digital assets to answering substantive questions as to the legal principles applicable to those digital assets. It is entirely appropriate for the common law of England and Wales to take this approach. Drawing analogies between (1) conventionally tangible things and digital assets; and (2) things in action and digital assets is helpful to a point but those analogies ultimately break down. This is particularly true in respect of those digital assets that rely on novel and idiosyncratic technology, such as publicly available open-source code, distributed consensus mechanisms and public key cryptography.

2.51 We conclude that it is not necessary or helpful for legislation to define the boundaries of a third category of thing to which personal property rights can relate. Whether or not a thing falls within the third category (and whether it is capable of attracting personal property rights under the law of England and Wales) is a complex and dynamic question, which is ill-suited to static definition in statute. As many consultees said, defining the parameters of digital assets, including identifying exactly what the "asset" consists of, can be extremely challenging and the answer will be different for different types of assets. Once the asset or thing is identified, the law can determine whether that thing can (and should) attract personal property rights. Specifying certain digital assets as capable of attracting personal property rights (or, alternatively, as incapable of attracting personal property rights) in statute simultaneously risks drawing parameters that are too narrow or too wide, and also risks opening up difficult definitional issues that could reduce, rather than increase, certainty in the law.

2.52 The third category of things includes a certain type of asset — namely crypto-tokens — that clearly satisfy the criteria we described in Chapter 5 of our consultation paper (see paragraph 4.5 below). Our proposed criteria accurately describe a certain "core" type of asset — namely crypto-tokens manifested by distributed, public, permissionless systems — that are things to which personal property rights can relate at law and which are neither things in possession nor things in action. But we conclude that it is not appropriate for those criteria to delimit absolutely the contours of such a category. Instead, it is better that the common law continues to (1) identify and

intermediaries for transactions, and to facilitate communication of value on a peer-to-peer basis: S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) pp 1 and 8, available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

71 In *Ruscoe v Cryptopia* [2020] NZHC 728, [2020] 22 ITELR 925 (High Court of New Zealand) at [123], Gendall J criticised the idea that a crypto-token must necessarily fall into one of the two categories of personal property for it to be an object of personal property rights, calling it a "red herring". The authors of *The Law of Personal Property* also suggest that engaging in a semantic debate on the characterisation of personal property is a "red herring": M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 8.049.

describe exactly what the thing in question consists of;[72] and (2) consider whether that thing can (and should) be capable of being an object of personal property rights. This will allow the law of England and Wales to continue its nuanced approach to recognising that things such as milk quotas, export quotas, waste management licences and different types of carbon emissions allowances[73] are capable of being objects of personal property rights. As such, we now treat our criteria (as modified by this report) as indicia.

2.53 We recommend legislation confirming that the fact that a thing is neither a thing in possession nor a thing in action does not prevent it from being a thing to which personal property rights can relate.[74] Such things include crypto-tokens like bitcoin or ether which are not rights or claims in themselves and which can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action. Over the last ten years the common law has clearly moved toward the explicit recognition of this position. However, some consultees, including senior and specialist judges, said to us that it would be helpful to express this position in legislation.[75] Although it would not change the common law position,[76] we conclude that such a statutory confirmation will provide greater legal certainty and will allow the law to develop from a strong and clear conceptual foundation. A statutory confirmation of the position might reduce the time spent by the courts on questions of categorisation of objects of personal property rights, and instead allow them to focus on the substantive issues before them. It gives explicit effect to:[77]

> The powerful case for reconsidering the dichotomy between [things] in possession and [things] in action and recognising a third category of intangible property… in a way that would take account of recent technological developments.

2.54 A statutory confirmation will also alleviate any concern of judges that recognising a third category is not an appropriate development for the common law to make.[78] In short, this recommendation lays to rest any lingering authority of *Colonial Bank v*

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72 Which in itself can be extremely challenging and is likely to result in a different answer for different types of assets.

73 None of them are things in action in the narrow sense and none of them are tangible. See Chapter 3 (Third thing), para 3.38 for more detail.

74 This recommendation is technology neutral in that it does not focus on any single or class of digital asset, crypto-token, protocol, system, network or technological feature. And it allows the common law to be technology specific and interrogate the idiosyncratic features of the asset in question when considering its proprietary status.

75 At our Judicial Roundtable on 19 January 2023, various members of the judiciary, including senior and specialist judges expressed support for a statutory confirmation of what they saw as the existing common law position. This point was subject to significant discussion and received broad support.

76 Nor would such a statutory confirmation prevent a thing from being deprived of legal status as an object of personal property rights for any other reason.

77 *Your Response v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] 1 QB 41 at [27], by Moore-Bick LJ.

78 See, for example, the concerns of Moore-Bick LJ in *Your Response v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] 1 QB 41 at [27], by Moore-Bick LJ.

Whinney[79] which suggested that there could be no third category thing and confines to history the "red herring"[80] of a circular and hollow debate on categorisation.

Chapter 4: Our third category recommendation and conclusions in practice

2.55 In Chapter 4 (Third thing in practice), we consider in detail consultees' concerns with defining hard boundaries for a third category of thing to which personal property rights can relate. Given that our recommendation in Chapter 3 (Third thing) amounts to a confirmation and restatement of the existing common law position that such a third category exists, we do not consider that it will cause any additional legal uncertainty. We demonstrate this by reference to a variety of digital assets, including crypto-tokens, private, permissioned blockchain systems, voluntary carbon credits ("VCCs"), in-game digital assets and digital files. We also discuss consultees' responses to the provisional criteria we proposed in our consultation paper for the third category. We make consequential modifications and clarifications to those criteria.

2.56 We do not make any recommendations for law reform in Chapter 4 (Third thing in practice).

Detailed overview of Chapter 4 (Third thing in practice)[81]

2.57 We discuss consultee responses to the provisional proposal in our consultation paper that a thing should be capable of falling within our proposed third category of things to which personal property rights can relate if:

(1) it is composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals;

(2) it exists independently of persons and exists independently of the legal system; and

(3) it is rivalrous.[82]

2.58 Based on consultee responses, we conclude that "composed of data" need not be a criterion in itself, because the criterion: (1) overly focuses the conceptualisation of the thing in question on data; and (2) potentially creates an unnecessary hard boundary for the third category.

2.59 We clarify the application and interpretation of our second criterion — that a thing must exist independently of persons and exist independently of the legal system — and respond to some concerns raised by consultees about this criterion.

2.60 We re-iterate and reconfirm our analysis of the criterion that a thing must be rivalrous. Specifically, we clarify that whether a thing is rivalrous is binary and we distinguish our

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79 (1885) 30 Ch D 261 at p 285, by Fry LJ.

80 See n 71 above.

81 Chapter 4 (Third thing in practice) considers chapters 6 to 10 of our consultation paper. It deals with consultation questions 7, 8, 9, 10, 11, 12, 13 and 14.

82 A thing is rivalrous if the use or consumption of the thing by one person, or a specific group of persons, necessarily prejudices the use or consumption of that thing by one or more other persons.

criterion that a thing must be rivalrous from the concepts of exclusivity of control and excludability.

2.61 We conclude that our criteria (as modified in this report and which we now treat as indicia) accurately describe a certain "core" type of asset that are things to which personal property rights can relate at law and which are neither things in possession nor things in action. The most obvious example of this type of digital asset is a crypto-token, so we discuss crypto-tokens by way of illustrative example.[83] Our indicia — specifically, the concept that a thing must be "rivalrous" as endorsed by the Court of Appeal in *Tulip Trading*[84] — usefully distinguish this type of digital asset from other digital things such as digital files[85] that are not (as currently designed) capable of attracting personal property rights as a matter of law.

2.62 We consider consultees' concerns about boundary issues in more detail. We discuss those concerns by reference to private, permissioned blockchain systems, voluntary carbon credits ("VCCs"), in-game digital assets and digital files by way of example. We conclude that pre-existing boundary issues will remain and that those boundary issues cannot be solved by (and indeed, would likely be exacerbated by) statutory law reform. We conclude that the common law is the most appropriate tool for dealing with difficult boundary issues relating to digital assets that are based on varied technologies and for determining whether such digital assets can (and should) attract personal property rights on particular sets of facts.

Chapter 5: Control

2.63 In Chapter 5 (Control), we describe (but do not define) the factual concept that best captures the ability to (1) exclude or to permit access to a third category thing; and (2) put the third category thing to the uses of which it is capable. We call this factual concept "control". We go on to discuss the legal significance of the concept of control over third category things. We conclude that both the factual concept of control and the legal consequences of control work differently for, and are highly complex in relation to, third category things — particularly digital objects.

2.64 We recommend that the Government creates or nominates a panel of industry-specific technical experts, legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).

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83 In chapters 6 to 10 of our consultation paper, we provisionally concluded that crypto-tokens satisfied our proposed criteria but digital files, digital records, email accounts, certain in-game digital assets, domain names and certain carbon emissions trading schemes did not.

84 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

85 As we discuss at para 4.35 below, when the concept of rivalrousness is diluted by references to excludability or exclusivity of control, it is no longer capable of delineating between different types of digital assets. By way of example, see Illustration 5 of the UNIDROIT Principles which explains that password protected Word and Excel files fall within the definition of controllable "electronic record": UNIDROIT Working Group, *UNIDROIT Principles on Digital Assets and Private Law* (2023) p 19 para 2.17.

Detailed overview of Chapter 5 (Control)[86]

2.65 We consider two related but distinct ways in which jurisprudence concerning a concept of control might develop under the law of England and Wales.

2.66 First, we conclude that common law jurisprudence will be enhanced and made easier to understand for market participants by focusing on better descriptions and real-world examples of factual control. Factual control in this context is a highly technology specific concept, in large part determined by the way in which the particular technology in question facilitates the imposition or creation of varying degrees of technical encumbrances in respect of the digital object in question. For example, in many decentralised systems, differing levels and types of control will be distributed across different participants.[87] Both the High Court and the Court of Appeal recognised this point in *Tulip Trading*.[88]

2.67 The broad concept of factual control might require significant refinement or malleability if it is properly to encompass the variety of possible relationships involving third category things including digital objects. We do not use the concept of factual control as a definitional characteristic of third category things.[89] Nor do we recommend that the concept of factual control should be defined in legislation.[90] Instead, we acknowledge that the common law has already begun to develop jurisprudence concerning the concept of control as it applies to third category things and conclude that it should continue to do so.

2.68 To assist with this process, we recommend that the Government creates or nominates a panel of industry-specific technical experts,[91] legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).[92] We envisage that the technical expert group would provide practical, considered and

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86 Chapter 5 (Control) of this report considers chapter 11 of our consultation paper. It deals with consultation questions 16, 17, 18 and 19.

87 For a good summary of the different participants within a given system, see G Shapiro, "A Functionalist Framework for DeFi Regulation" (2022), available at: https://lexnode.substack.com/p/a-functionalist-framework-for-defi. For a detailed consideration of the interaction between different types of control/power within decentralised systems, see for example: G Shapiro, "Defining Decentralization for Law" (April 2020) *Medium*, available at: https://lex-node.medium.com/defining-decentralization-for-law-58ca54e18b2a, J Garcia and J Leung, "Data Points to Measure Blockchain Network Centralization" (21 October 2020), available at: https://ketsal.com/wp-content/uploads/2020/10/Ketsal-Open-Standards-Measures-of-Blockchain-Network-Centralization-Oct-21-2020.pdf and B Srinivisan and L Lee, "Quantifying Decentralization" (28 July 2017), available at: https://news.earn.com/quantifying- decentralization-e39db233c28e.

88 *Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch) at [32]–[35], by Falk J and [2023] EWCA Civ 83, [2023] 4 WLR 16 at [31]–[36], by Birss LJ.

89 See also our discussion of that point in Chapter 3 (Third thing).

90 For our detailed discussion on why not, see paras 11.113–11.128 of our consultation paper and para 5.12 of this report.

91 This would need to include those with expertise in the crypto-token markets, and not just those with expertise in traditional finance markets or intermediated securities markets.

92 In our consultation paper, we suggested that one option for the name of this group would be the "Control Panel".

technology-specific guidance on a (semi-regular) and iterative basis over time. As technology changes and methods and mechanisms for control change, the technical expert group can update its guidance. Gradually, it will build up a body of useful factual examples without having to wait for or rely on specific factual scenarios being raised or disputed in court. We conclude that this approach strikes the most appropriate balance between creating legal certainty for the market and maintaining the dynamism and flexibility that characterises the law of England and Wales.

2.69 Second, the legal consequences of control are necessarily complex and varied. We do not think that the concept of control alone is sufficiently nuanced, refined, or sensitive to market specificities to determine adequately and definitively the consequences of complex legal arrangements. Instead, we see control as a composite part of more complex legal principles and mechanisms (such as legal transfers, intermediated holding arrangements, collateral arrangements and actions and remedies in respect of third category things including digital objects). There are also a vast number of technically distinct digital assets, some of which function more like "digital bearer instruments"[93] and some of which do not. Control works differently for those different digital assets, by virtue of the inherent features and functions of the technology itself. The application of control and its legal consequences will therefore be different for those different digital assets. Specifically, control works differently for things in possession, things in action and third category things (and, potentially, differently for different third category things). We conclude that the law should recognise and accept this reality. We discuss consultees' differences in views on this point, which were most acute in relation to whether concepts of relativity of title could apply to third category things. We do not make any recommendations for law reform but do conclude on what we consider to be the best way for the common law to develop in this area.

2.70 The work of the technical expert group will help to enhance common law jurisprudence by making it easier for courts to make decisions that are sensitive and responsive to specific technology. This will be particularly important for navigating the difficult boundary issues between (pre-existing) rights-based systems and emerging and novel systems which give rise to "bearer-like" objects that can attract personal property rights, and in cases where the two overlap or are linked.[94] The corollary of not defining the hard contours of a third category of thing to which personal property rights can relate is that the boundaries are less clear. However, we think that clarity can instead be achieved by applying general legal principles to the specific factual circumstances that arise as a result of specific technology.[95]

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93 UKJT, Legal Statement on Digital Securities Appendix 1 (p 44).

94 A crypto-token might be linked to a thing in action: see chapter 14 of our consultation paper. For example, in a securities context, an issuer might use a crypto-token to create a digital security, with the result that, "upon transfer of … [the token], the rights or interests associated with it (i.e. the actual security) might simultaneously and automatically be transferred, without the need for further act or formality": UKJT, Legal Statement on Digital Securities para 86.

95 Courts are adept at developing wider legal principles by reference to the specific set of factual circumstances before them. For example, in the context of crypto-tokens, the Court of Appeal considered only different implementations of bitcoin, but nonetheless recognised the broader principle that "a cryptoasset such as bitcoin is property": *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

Chapter 6: Transfers

2.71 In Chapter 6 (Transfers), we consider how legal transfers of crypto-tokens operate based on, among other things, how a crypto-token transfers as a matter of fact, and the different perspectives of consultees on this issue. While some third category objects things will transfer in similar ways to crypto-tokens, others will not. As we conclude elsewhere in this report, the law will need to recognise the idiosyncratic technological attributes of the third category object thing in question when considering legal issues relating to that third category thing. Because of that, and because crypto-token systems raise some specific questions as to transfers that are currently relevant to market participants, we generally discuss crypto-tokens (and not third category things) in Chapter 6 (Transfers).

2.72 We conclude that it is possible to effect a legal transfer of a crypto-token offchain, by a "change of control" (along with the requisite intention). An example might include the physical transfer of control through the transfer of hardware, or a transfer on a Layer 2 system.

2.73 We also conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things.

2.74 We do not make any recommendations for law reform in Chapter 6 but do conclude on what we consider to be the best way for the common law to develop in this area.

Detailed overview of Chapter 6 (Transfers)[96]

2.75 In Chapter 6 (Transfers), we do three things, by close reference to consultee responses.

2.76 First, we discuss our observation in our consultation paper that "a transfer operation within a crypto-token system will typically involve the replacing, modifying, destroying, cancelling, or eliminating of a pre-transfer crypto-token and the resulting and corresponding causal creation of a new, modified or causally-related crypto-token."[97] We discuss two opposing views put forward by consultees as to the legal characterisation of such a transfer operation that effects a state change. First, that such a transfer extinguishes a pre-transfer object of personal property rights and creates a "new", post-transfer object of personal property rights (the "extinction/creation analysis"). Second, that such a transfer involves the persistence of an object of personal property rights through the transfer (the "persistent thing analysis"). We conclude that there is no single correct answer. However, consultees offered a number of reasons as to why the most practically accurate analysis is that a notional quantity unit (or the ability/power in respect of the notional quantity unit) can persist through a transaction.

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96 Chapter 6 (Transfers) considers chapters 12 and 13 of our consultation paper. It deals with consultation questions 20, 21, 22, 23, 24 and 26.

97 See para 12.63 of our consultation paper.

2.77 Second, we consider the view of the majority of consultees that legal transfers of a crypto-token can, in certain circumstances, be effected by a "change of control" and should not be limited to a transfer operation that effects a state change. We agree with this view.

2.78 Third, we acknowledge that our recommendation for targeted, confirmatory legislation combined with common law development of the parameters of a third category of thing to which personal property rights can relate excludes the possibility of a statutory definition of such third category things (or some subset thereof). We acknowledge that this likely prevents a general statutory "innocent acquisition rule" in respect of such objects of personal property rights, because a statutory innocent acquisition rule would almost certainly need to define the objects of personal property rights in question that benefitted from the rule. We also recognise that the majority of consultees made strong arguments in favour of the recognition and development of a common law special defence of good faith purchaser for value without notice applicable to crypto-tokens (and third category things more broadly). We agree with the arguments made by consultees. We conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things.

Chapter 7: Intermediated holding arrangements

2.79 In Chapter 7 (Intermediated holding arrangements), we consider how intermediated holding arrangements in respect of crypto-tokens can be structured under the law of England and Wales. We consider crypto-tokens by way of example given the importance of intermediated holding arrangements to crypto-token markets. We compare different types of intermediated holding arrangements and the potential legal consequences of such arrangements.

2.80 We do not make any recommendations for law reform in Chapter 7 (Intermediated holding arrangements) but do conclude on what we consider to be the best way for the common law to develop in this area.

Detailed overview of Chapter 7 (Intermediated holding arrangements)[98]

2.81 First, we discuss consultee responses to the terminology in our consultation paper that we used to describe crypto-token specific intermediated holding arrangements, particularly our use of the term "custody". In light of consultee responses, we now draw a distinction between "custodial intermediated holding arrangements", "non-custodial intermediated holding arrangements" and "non-holding arrangements" based on the legal consequences of such arrangements. In particular, we highlight the risks that users of intermediated holding arrangements could be exposed to on the onset of insolvency proceedings of a holding intermediary.

2.82 Second, we consider the application of contract and trust law to crypto-token intermediated holding arrangements. We conclude that trusts can support a broad range of custodial intermediated holding arrangements, including where the underlying crypto-token entitlements are held on a consolidated unallocated basis for

[98] Chapter 7 (Intermediated holding arrangements) considers chapters 16 and 17 of our consultation paper. It deals with consultation questions 29, 30, 31, 32 and 33.

the benefit of multiple users. We confirm our preferred conceptual approach to the establishment of a such a trust arrangement under the law of England and Wales. We conclude that a presumption of trust for intermediated holding arrangements involving crypto-tokens is not necessary or appropriate.

2.83 We consider the potential impact of statutory formalities on the operation of trust-based crypto-token intermediated holding arrangements. We conclude that the existing common law is sufficiently certain in this area and that statutory law reform in respect of section 53(1)(c) of the Law of Property Act 1925 is not necessary at this time. We leave open the possibility that it might be necessary or warranted in future as the market evolves.

2.84 We consider but do not recommend a general *pro rata* shortfall allocation rule in respect of commingled unallocated holdings of crypto-tokens or crypto-token entitlements held on trust by a holding intermediary that enters insolvency proceedings. Instead, we conclude that a more extensive, in-depth assessment of the merits of potential insolvency law reform applicable to specific custodial holding intermediaries is more appropriate.

2.85 We discuss the possibility of the common law developing alternative and supplementary legal structures for custodial intermediated holding arrangements that do not rely on trusts. We conclude that this could take the form of holding intermediaries being recognised as acquiring a limited control-based proprietary interest in held crypto-token entitlements that is subject to a superior title retained by users, but do not make any recommendations to this effect. We also discuss the application of other private law principles including agency and fiduciary duties.

Chapter 8: Collateral arrangements

2.86 In Chapter 8 (Collateral arrangements), we consider how collateral arrangements in respect of crypto-tokens and cryptoassets can be structured under the law of England and Wales. Again, we specifically consider crypto-tokens and cryptoassets given their prominence in the digital asset markets.

2.87 We make two recommendations in Chapter 8 (Collateral arrangements), which we describe in more detail below.

Detailed overview of Chapter 8 (Collateral arrangements)[99]

2.88 First, we discuss how title transfer and non-possessory security-based arrangements can be used to structure crypto-token and cryptoasset collateral arrangements without the need for law reform. Second, we explain that possessory security-based arrangements do not apply to crypto-tokens and cryptoassets.

2.89 We then discuss how the recognition of a control-based proprietary interest to facilitate both the holding of and the grant of security over crypto-tokens and cryptoassets might be a beneficial development within the common law. We conclude that the common law could develop to recognise a control-based security interest in respect of crypto-tokens and cryptoassets (possibly by analogy with pledge).

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[99] Chapter 8 (Collateral arrangements) considers chapter 18 of our consultation paper. It deals with consultation questions 34, 35, 36, 37, 38 and 39.

However, the development of such a security interest would likely not be a complete solution given that such a security interest would likely be reliant on static, comprehensive notions of control.

2.90 We then consider the applicability of the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs") to crypto-tokens and other collateral that might use and/or be linked to public, permissionless crypto-token systems or private, permissioned blockchain systems (including Central Bank Digital Currencies ("CBDCs"), stablecoins, equity and debt securities and credit claims). We broadly subdivide our analysis into an analysis of crypto-tokens, cryptoassets and mere record/register tokens.

2.91 We conclude that many crypto-tokens are likely to fall outside of the scope of the FCARs regime. However, for collateral arrangements in respect of cryptoassets (including CBDCs, stablecoins, equity and debt securities and credit claims) or mere record/register tokens we think the answer is possibly different. For at least some of those things, there is a better argument that they fall within the scope of the FCARs regime. We recommend law reform to clarify this position, although we do not ultimately conclude on what the complete scope of the FCARs regime *should* be, given that question necessarily involves policy considerations.

2.92 As part of this discussion, we discuss the tokenisation of securities. We recommend that the laws governing the tokenisation of equity and other registered corporate securities by UK companies are reviewed. The aim of this review would be to confirm, and where appropriate extend, the range of technological facilities (including potentially to public, permissionless ledgers) and operational arrangements through which the valid creation, transfer and use of such tokenised equity and other registered corporate securities would be legally possible. This would require further legislative change.

2.93 We conclude that, although the law of England and Wales does provide options for granting security in respect of crypto-tokens and cryptoassets, those options are not adequate. As such, we recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

2.94 Chapter 8 (Collateral arrangements) therefore departs from much of the rest of this report in two ways. First, it concludes that there are existing problems with the law of England and Wales that cannot be solved or improved by further common law development. That is largely because we conclude that an effective collateral regime for (certain) crypto-token and (certain) cryptoasset collateral requires statutory intervention if it is to provide the level of certainty required by the market. Second, it recommends law reform, but acknowledges that identifying the optimal approach cannot solely be determined by reference to applicable private law principles or the mere technical feasibility of statutory commercial law reform (although both will be of central importance). Any such reform has complex policy implications that require a wide-ranging cross-functional investigation and rigorous cost benefit analysis. It will also require coordination with and the appropriate allocation of policy objectives

between other policy initiatives impacting the operation and development of crypto-token and cryptoasset markets and the conduct of market participants, such as changes in the regulatory environment.

2.95 Although this recommendation and the work required to implement it are significant, we conclude that there is a very high degree of support and demand for such law reform among consultees, markets participants and industry bodies.

Chapter 9: Causes of action and associated remedies

2.96 In Chapter 9 (Remedies), we consider causes of action and associated remedies in the context of third category things. We conclude that much of the current law concerning causes of action and remedies can be applied to third category things without law reform. Often, the law does not distinguish between causes of action and remedies that apply to things in possession, to things in action or to third category things and we identify where that is currently the case. In those cases there is no need for bespoke rules or for law reform. Instead, what is required is that the courts continue to recognise the nuances or idiosyncrasies of third category things (including their distinct functionality and technical characteristics) and apply existing legal principles to such things as appropriate.

Detailed overview of Chapter 9 (Remedies)[100]

2.97 First, we consider the application of various causes of action that arise in relation to contracts, with particular focus on the legal characterisation of an obligation to "pay" non-monetary units such as crypto-tokens. We also discuss the application of various vitiating factors to contracts involving third category things. We conclude that the vitiating factors of mistake, misrepresentation, duress and undue influence apply similarly to contracts involving third category things as they do to contracts involving things in possession and things in action. We also conclude that the legal principles relating to void contracts can apply to third category things, in the same way as they do to other objects of personal property rights, without law reform.

2.98 Second, we consider how the evidentiary processes of following and tracing might apply to third category things and discuss how the factual nature of third category things, particularly crypto-tokens, might complicate legal analysis in relation to those evidentiary processes.

2.99 Third, we consider the application of principles relating to breach of trust, equitable wrongs and constructive trusts. We conclude that, as regards breach of trust and fiduciary duty, the principles of equity are sufficiently flexible to be applied in situations involving third category things. In relation to constructive trusts, we conclude that the common law is perfectly able to evolve in a logical and clear way and we do not recommend law reform.

2.100 Fourth, we consider three key common law causes of action and how they apply to factual scenarios involving third category things: proprietary restitution; restitution for unjust enrichment; and conversion. We conclude that claims in proprietary restitution and restitution for unjust enrichment likely will be available in the context of third

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[100] Chapter 9 (Remedies) considers chapter 19 of our consultation paper. It deals with consultation questions 40 to 47.

category things, whereas a claim in conversion will not be available. This is because conversion only applies to things in possession.

2.101 However, despite the broad availability of claims in proprietary restitution and restitution for unjust enrichment, we conclude that such claims are unlikely to succeed in at least one specific factual scenario: where a claimant's crypto-token is burned by a defendant without consent. Burning involves irreversibly sending a crypto-token to an inaccessible "burn address", the result being that the token is removed from circulation.

2.102 Given the unavailability of a claim for proprietary restitution, restitution for unjust enrichment, or conversion following a defendant's burning of a claimant's crypto-token without consent, we conclude that there is a lacuna in the law relating specifically to certain things that fall within the third category (specifically, crypto-tokens). We do not consider that common law development of the principles of proprietary restitution or unjust enrichment would be the most appropriate means by which to fill this lacuna. Instead, we conclude it would be constructive for the courts to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things such as digital objects. However, this conclusion also acknowledges that the lacuna currently existing within the law is small and arises in situations where a claim based on unjust enrichment or proprietary restitution cannot be made out.

2.103 Finally, we consider some procedural aspects of the law, specifically the law relating to injunctions, enforcement, and monetary awards.

Chapter 3: A "third" category of thing to which personal property rights can relate

OVERVIEW

3.1 "Property" can be divided into real property (interests in land) and personal property (interests in other things). The law of England and Wales traditionally recognised two distinct categories of personal property rights: rights relating to things in possession (tangible things), and rights relating to things in action (legal rights or claims enforceable by action).[101]

3.2 In the 1885 case of *Colonial Bank v Whinney*, Lord Justice Fry said:[102]

> All personal things are either in possession or in action. The law knows no *tertium quid*[103] between the two.

3.3 That statement is no longer entirely correct (to the extent that it ever was).[104] Rather, the common law of England and Wales has over the last ten years clearly moved toward the explicit recognition of a "third"[105] category of things to which personal property rights can relate. Over time, the courts of England and Wales have deliberately and iteratively redefined the scope of things that the common law treats as capable of attracting personal property rights even where those things do not fall easily within either of the two traditionally recognised categories. Initially, this development was in response to emergent forms of intangible things such as milk

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101 These are high-level descriptions and we discuss each in detail in our consultation paper, see from para 4.18 (things in possession) and from para 4.26 (things in action). Because property rights are rights in relation to things, it is more accurate to refer to "rights in things in possession" and to "rights in things in action" to capture the divide between the property right and the object of the property right, see M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 4.002. See also chapter 2, n 77, chapter 2 in general and para 4.100 of our consultation paper, where we discuss the argument that other "categories" of things to which personal property rights can relate exist.

102 *Colonial Bank v Whinney* (1885) 30 Ch D 261 at 285, by Fry LJ.

103 That is, a third thing that is indefinite and undefined but is related to two definite or known things.

104 See discussion from para 3.38 below. We agree with the conclusion of the UKJT that *Colonial Bank v Whinney* is not good authority for limiting the scope of the categories of things to which personal property rights can relate. See UKJT, Legal Statement para 71. We also agree with the view expressed by Professor Fox and Professor Gullifer in their joint response to our call for evidence that: "The reasoning in [*Colonial Bank v Whinney*] turned on the interpretation of the bankruptcy statutes then in force. It has been taken out of context and used as authority for a proposition that it [was] not meant to support". See also the discussion at paras 5.115–5.122 of our consultation paper.

105 Even without recognising such a "third" category, there are arguments that other categories of things to which personal property rights can relate already exist at law: candidates include patents and statutory intellectual property rights. For a discussion on our use of the terminology "third" category, see para 3.65 below.

quotas;[106] more recently, it has been in response to crypto-tokens.[107]

3.4 One overarching purpose of our consultation paper was to explore whether consultees agreed with this analysis, whether law reform was necessary or useful to clarify or confirm the common law position and, if so, how to implement such law reform. A strong majority of consultees agreed that either a third category of things to which personal property rights can relate has already developed in England and Wales at common law, or that, to the extent it has not, one should be recognised as existing.[108] This was a clear theme throughout consultee responses, even in those that provided mixed or qualified views.

3.5 However, there was also clear and consistent recognition that it is difficult to define the boundaries of such a category. Much of the consistency in responses as to the existence and desirability of such a third category was lost as consultees suggested a variety of different options, support, criticisms and alternative approaches to defining the contours of that category.[109]

3.6 In this chapter, we discuss these issues in more detail. We conclude that some digital assets are neither things in possession nor things in action but are nonetheless capable of being things to which personal property rights can relate and that this is the existing position at law.

3.7 Some consultees, including senior and specialist judges, said to us that it would be helpful to express this position in legislation. They said that this would confirm the existing law, facilitate the law's future development and lay to rest any lingering doubt that there can be a third category of things to which personal property rights can relate. We recommend such legislation.

3.8 However, we conclude that it is not necessary or appropriate for legislation to define the boundaries of such a third category. Whether or not a thing amounts to a third category thing to which personal property rights can relate under the law of England

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106 *Swift v Dairywise (No 1)* [2000] 1 WLR 1177, [2000] BCC 642 concerned the question of whether a milk quota was "property" under Insolvency Act 1986, s 436.

107 Even since the publication of our consultation paper, the common law continued to refine its treatment of digital objects. See, for example: *LMN v Bitflyer Holdings Inc* [2022] EWHC 2954 (Comm) (November 2022); *Tulip Trading Ltd v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 (February 2023); *Osbourne v Persons Unknown Category A* [2023] EWHC 39 (KB) (January 2023); *Osbourne v Persons Unknown Category A* [2023] EWHC 340 (KB) (February 2023); *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch) (March 2023).

108 We received 66 responses to consultation question 1. Forty-one consultees agreed that the law of England and Wales should recognise such a third category. Seventeen consultees agreed with the proposition in our question but provided a qualified or mixed answer, most often drawing on the themes and difficulties summarised in our consultation paper. Seven consultees disagreed in some form.

109 Many consultees provided criticisms of the three criteria for "data objects" that we provisionally proposed in our consultation paper. See consultation question 6 and chapter 5 of our consultation paper for a detailed description of the criteria. For our discussion on the term "data object", see from para 3.62 below and for discussion on our proposed criteria and consultee responses, see Chapter 4 (Third thing in practice).

and Wales is a complex and dynamic question, which is ill-suited to static definition in statute. As we said in our consultation paper (in the context of crypto-tokens): [110]

> Once the thing that constitutes a crypto-token has been determined, the law can then apply existing concepts to determine whether property rights can relate to that thing.

3.9 Courts have not only recognised the existence of certain (third category) things but they have recognised that those things are capable of being objects of personal property rights at law.[111] In doing so, the courts have made a value judgment (either implicitly or explicitly). On balance, we agree with this value judgment, for the following reasons.

3.10 First, treating certain digital assets (including crypto-tokens) as things to which personal property rights can relate is a practical and effective means of meeting the legitimate expectations of those parties who interact with such digital assets.[112]

3.11 Second, this conclusion maintains consistency with the existing common law position,[113] and other international case law, statute and law reform initiatives.[114] Multiple courts worldwide, many different statutes and several law reform initiatives already treat certain digital assets (including crypto-tokens) as things to which personal property rights can relate. Each made (implicit or explicit) value judgments to come to that conclusion, but ultimately arrived at the same (or a similar) position. We do not in this report attempt to second-guess or unwind that consistent and diverse reasoning.

3.12 Third, this conclusion reflects the factual reality of how certain technology functions. Some digital assets (specifically, crypto-tokens) replicate some of the features of a property relationship between a person and an object. The functionality of crypto-tokens allows a person to control access to the crypto-token and gives that person the ability to exclude others from it.[115] We conclude that the law can recognise this factual state of affairs and strengthen this technical functionality by aligning it with the social (and legal) construct of personal property rights. In this way, digital things that are recognised by the law as being capable of attracting personal property rights would have some of the *functional qualities* of an object of personal property rights by technical design, underpinned by a social layer of legal recognition.[116] That more

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110 Para 10.53. See also the discussion in our consultation paper in chapter 2 and paras 10.1–10.53 where we discussed these concepts in more detail.

111 For a detailed discussion on the case law in this area, see paras 3.38–3.48 below.

112 For an overview of some of these practical reasons, see from para 1.3 of our consultation paper, and the reasons discussed by the UKJT in the Legal Statement at paras 36–41.

113 See paras 3.38–3.48 of this report.

114 See from para 4.48 of our consultation paper and paras 2.31–2.33 and 3.43–3.48 of this report.

115 This reflects Edelman J's concept of property rights as articulated in *Hocking v Director-General of the National Archives of Australia* [2020] HCA 19 at [205].

116 See our discussion from para 10.44 of our consultation paper.

accurately reflects commercial realities and the way in which market participants treat such digital things.

3.13 Fourth, as we identify in this report, the law of personal property is perfectly able to deal with such things/assets and there is a high degree of existing legal certainty as to how principles of personal property law should apply to such things. As many consultees said, most areas of residual legal uncertainty are highly nuanced and complex. Even so, we make very few recommendations for law reform in this report because of how well the common law has been able to accommodate new digital things. We conclude that it will continue to do so.

3.14 Fifth, consultees overwhelmingly supported the proposition that certain digital assets, including crypto-tokens, can and should be capable of being things to which personal property rights can relate.[117] This was the position not only in response to our consultation paper, but also in response to our call for evidence.[118]

3.15 Sixth, the idea that some digital assets such as crypto-tokens are capable of being an object/thing to which personal property rights can relate has been discussed and considered in detail for many years and is already widespread in legal and academic commentary.[119]

3.16 We conclude that the common law remains best placed to describe the parameters of third category things that are capable of being objects of personal property rights.[120] We describe those things that fall within such a third category as "third category things" and digital things that fall within the third category as "digital objects".

ARE CERTAIN DIGITAL ASSETS THINGS IN POSSESSION?

Things in action and things in possession

3.17 The first broad category of personal property rights are rights relating to things in possession. Under the current law, a thing in possession is any object which the law

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117 See n 108 above. On crypto-tokens, of the 48 consultees who responded to consultation question 15, 29 agreed outright and six provided qualified agreement. Nine consultees provided a mixed response, and four consultees disagreed outright.

118 Of the 29 consultees who responded to our call for evidence on this point, 25 agreed outright and three provided a mixed response. One consultee disagreed outright, arguing that a crypto-token should not be capable of being the object of personal property rights. The Digital Assets (2021) Call for Evidence is available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/10/Digital-assets-call-for-evidence-responses.pdf. The responses to our call for evidence are available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/10/Digital-assets-call-for-evidence-responses.pdf.

119 See our discussion of this point in paras 10.40–10.43 of our consultation paper. See also n 170 below where we discuss the academic commentary in more detail. Not everyone agrees with this position or this overall value judgment and some make different value judgments to support arguments that certain things (specifically crypto-tokens) should not attract personal property rights at law. See, for example, R Stevens, "Crypto is Not Property" (2023) *Law Quarterly Review* (forthcoming) pp 1–2, 18–20, available at: https://ssrn.com/abstract=4416200.

120 Including the exercise of identifying exactly what the thing consists of, which in itself can be extremely challenging, and is likely to result in a different answer for different types of assets.

considers amenable to possession.[121] This includes assets which are "tangible, moveable and visible and of which possession can be taken".[122] Since things in possession are capable of being physically possessed, rights in them can be asserted by use and enjoyment as well as by the exclusion of others from them.[123] An example of this is a bag of gold: possession of a bag of gold gives its possessor a property right which is enforceable against the world.[124]

3.18 The second broad category of personal property rights are rights relating to things in action. They are often described in a narrow sense: "rights in things in action, denied physical enjoyment, are asserted by taking legal action or proceedings".[125] Common examples of things in action are debts, rights to sue for breach of contract, and shares in a company. But some commentators have argued that the category of things in action is much broader.[126] Their argument is that the category of things in action can be treated as a residual category of things that captures any object of personal property rights that is not a thing in possession.

3.19 One distinctive feature of things in possession[127] is that they are things which exist regardless of whether anyone lays claim to them, and regardless of whether any legal system recognises or is available to enforce such claims. In contrast, things in action have no independent form and exist only insofar as they are recognised by a legal system. This means that the presence of a thing in action in the world is dependent on there being both a party against whom the thing in action (the right) can be enforced and a legal system willing to recognise and enforce that right.

Our recommendations on electronic trade documents

3.20 In our consultation paper, we said that the category of things in possession is limited to tangible things.[128] That statement has now been qualified by clause 3 of the Electronic Trade Documents Bill 2023, which allows a person to "possess, indorse

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121 While this might seem question-begging, the point is simply that the category is broad enough to encompass all of those things amenable to possession, as opposed to any subset.

122 M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 1.018; and *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [44], by Stephen Morris QC. See also Financial Markets Law Committee ("FMLC"), "Issues of legal uncertainty arising in the context of virtual currencies" (2016) p 6, available at: http://fmlc.org/wp-content/uploads/2018/03/virtual_currencies_paper_-_edited_january_2017.pdf.

123 M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 4.002.

124 This is the standard account of the effect of a property right. A full account also needs to recognise that, in the common law's system of relative title applicable to things in possession, this really means a right good against the whole world except against those with a superior, possessory right. For example, the finder of a gold watch has a legal right by virtue of their possession of the gold watch. This right is good against the world except against the person who lost the watch (and anyone with a right prior to the person who lost the watch, and so on).

125 M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 4.002 which also recognises that "the difference between the thing and rights in the thing is more elusive for things in action than for things in possession".

126 For more detailed discussion on this argument, see from para 4.29 of our consultation paper and para 2.32–3.37 below.

127 As opposed to the personal property rights in things in possession, which are of course legal rights.

128 See para 4.18 of our consultation paper.

and part with possession of an electronic trade document,"[129] provided that the document satisfies certain criteria.

3.21 Even so, possession is not defined in legislation.[130] It is a common law concept. We recognise that tangibility remains an important characteristic of things in possession: some physical control over a tangible thing is generally required to engage the factual and legal concepts of possession.[131]

3.22 But in our report on electronic trade documents we said that, while the concept of tangibility helps accurately to describe those things amenable to possession, it is not — nor should it be — a necessary criterion for the law's recognition of amenability to possession.[132] So, in the limited context of electronic trade documents, we recommended that it should be possible for electronic versions of trade documents to be treated as possessable things, provided that they meet certain criteria. We also identified elements of the concept of possession which we thought could be extrapolated to electronic trade documents, notwithstanding that they are things which are treated by the law as being intangible.[133]

3.23 As we explain in detail in our report on electronic trade documents, policy and practical considerations in that context led us to recommend that electronic trade documents should be treated as possessable things.[134] In summary, the concept of possession has a fundamental role in the functionality of paper trade documents such as bills of lading and bills of exchange, both at common law and in domestic statutes.[135] Possession of a trade document is crucial in establishing which party has certain rights and entitlements, how the documents are held and how they are used in collateral arrangements. Treating electronic trade documents as possessable things allows them to be plugged into an existing legal framework in respect of a limited category of documents that already enjoy a special status in law. In effect, this allows functionally equivalent documents to be treated by law in exactly the same way regardless of their medium.

3.24 The Electronic Trade Documents Bill explicitly engages the legal concept of possession for that limited group of electronic trade documents that fall within its

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129 Electronic Trade Documents Bill, clause 3(1).

130 Although, in 2011, the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs") were amended to incorporate a partial definition for "possession" (FCARs, reg 3(2)). The effect of this amendment was to clarify that for the purposes of the FCARs, intangible assets in the form of cash or intermediated securities entitlements booked to an account in the name of the collateral taker were capable of being "possessed", as opposed to defining the concept of possession more broadly.

131 See para 4.19 of our consultation paper and see also D Fox, "Cryptocurrencies in the Common Law of Property", in S Green, D Fox, *Cryptocurrencies in Public and Private Law* (2019) para 6.29.

132 Electronic Trade Documents (2022) Law Com No 405, para 5.9.

133 Above. See related discussion in Chapters 5 (Control), 7 (Intermediated holding arrangements), and 9 (Remedies).

134 Electronic Trade Documents (2022) Law Com No 405 from para 2.61.

135 See for example Bills of Exchange Act 1882, s 2.

scope.[136] Electronic trade documents are not tangible in the conventional sense.[137] Under the Bill, the concept of possession is not limited in its application to tangible things.[138] But we recognise that the legal concept of possession is nonetheless bound up with tangibility. It has traditionally relied on the physical boundaries of a thing to help define the contours of legal duties in relation to that thing.[139]

Our approach to third category things and possession

3.25 Some consultees questioned the distinction between electronic trade documents (which are to be treated as possessable things as a matter of statute) and third category things which we do not recommend are categorised as things in possession.[140]

3.26 As we discussed in detail in chapter 11 of our consultation paper, we do not think that the arguments for using possession as the operative concept in respect of electronic trade documents are as persuasive in respect of other forms of third category things. One reason is that other third category things, in general, do not seek to replicate the legal functionality of a specific form of tangible thing in the same way that electronic trade documents attempt to replicate exactly the legal functionality of paper trade documents.[141] Indeed, many third category things were designed to avoid replicating some of those features. Most obviously, crypto-tokens were designed to facilitate communication of value on a global and trust-minimised basis, without the need for physical exchanges of tangible things.[142]

3.27 Our approach does not require third category things to be treated as possessable things, which confirms the current legal position. We think that drawing analogies between tangible things and third category things is helpful to a point but, inevitably, those analogies are not perfect. This is particularly true in respect of those third category things that rely on novel or idiosyncratic technology, such as open-source code, public, distributed ledgers and public key cryptography.

3.28 Our preferred approach is for the law to develop (by a combination of common law and statute, informed by non-binding guidance) specific legal rules and principles which apply to third category things and are responsive to the specific technology that

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136 Clause 3(1) of Electronic Trade Documents Bill.

137 See n 66. See also the explanatory notes to the Electronic Trade Documents Bill at para 65, available at: https://bills.parliament.uk/Publications/47902/Documents/2302.

138 And, in the limited context of the FCARs, possession applies to intangible things, see para 8.91 below.

139 B McFarlane and S Douglas, "Property, Analogy and Variety" (2022) 42(1) *Oxford Journal of Legal Studies* 161, 166.

140 See COMBAR and the Chancery Bar Association at p 338 (para 1.5). COMBAR and the Chancery Bar Association generally argued in favour of third category things being amenable to possession see, for example, pp 353–357 (paras 15.1–15.20). On electronic trade documents, see also the responses of Melih Esmer pp 788–789, and Ilias Ioannou pp 583-584.

141 For some digital assets that might do this, such as digital bearer securities, see UKJT, Legal Statement on Digital Securities. We note that, in that paper, the UKJT applied the concept of negotiability — traditionally applicable to tangible negotiable instruments — to digital bearer securities. We discuss this in more detail in Chapter 6 (Transfers).

142 S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) at pp 1 and 8, available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

they use. We conclude that the law should not attempt directly to apply legal principles applicable to things in possession or things in action to third category things. For this reason and for the reasons we discuss in Chapter 5 (Control), we conclude that, instead of directly applying the concept of possession, the law of England and Wales can develop jurisprudence around a concept of control which is better suited to the functions of third category things and the technology they use. We think that control will form an important constituent part of the legal rules and principles that apply to complex interactions with third category things. In particular, we conclude that control should be considered as a core constituent element within a range of higher-level organising or framing principles such as legal concepts of transfer, intermediated holding arrangements, collateral arrangements and causes of action and associated remedies.[143] This is consistent with international developments which also focus on control and not possession.[144] Moreover, control might be a more suitable concept for assets that are global in nature, given that, very broadly speaking, many civil law systems require a thing to have a tangible or physical form for it to be recognised as an appropriate object of certain property rights such as "ownership".[145]

3.29 Things in possession, things in action and third category things are different. They function in different ways. Control in the digital context, as applicable to third category things, is highly composable and nuanced, and remains open to technological evolution. Possession of conventional tangible objects and control over things in action, however, are perhaps more limited. Different markets and market practices have arisen in relation to tangible things, to things in action and to third category things.

3.30 For these reasons — and to the extent that third category things remain an important part of the global economy — we conclude that the law should develop legal principles specific to third category things. Those principles are likely to diverge, either significantly or in small ways, from the existing legal principle of possession and the associated legal constructs applicable to possessable things, such as bailment, pledge, lien, and the tort of conversion.[146] This report concludes that it is entirely appropriate for the law to do so and reinforces the legal foundations for that process.

ARE CERTAIN DIGITAL ASSETS THINGS IN ACTION?

3.31 Broadly, there are two arguments that might be made in favour of characterising certain digital assets as things in action. The first argument is that the digital asset in question exists as a right or claim in action. Or, alternatively, that rights or claims in relation to the digital asset in question are rights or claims enforceable only by action (and that they cannot be asserted merely by use and enjoyment as well as by the

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143 See Chapters 6 (Transfers), 7 (Intermediated holding arrangements), 8 (Collateral arrangements) and 9 (Remedies) of this report respectively.

144 For more detailed discussion on this point, see paras 5.9 and 5.16.

145 See paras 4.55–4.66 of our consultation paper for more detailed discussion on this point.

146 We make this point repeatedly in this report. For discussion of each of these points, see 7.111, 8.37 and 9.77.

exclusion of others from them as is possible with things in possession).[147] The second argument is that the category of things in action can be treated as a wide, residual category of things that captures any object of personal property rights that is not a thing in possession. Below, we explain why we do not agree with either argument.

Crypto-tokens as things in action?

3.32 Almost all consultees agreed that there exist certain intangible things that are not things in action in the traditional, narrow sense, but that those intangible things should nevertheless be things to which personal property rights can relate. Specifically in respect of crypto-tokens, almost all consultees said that crypto-tokens cannot be conceived of as rights or claims in themselves and that they can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action.[148]

3.33 However, one consultee, Professor Low, made two contrary arguments. First, that crypto-tokens could be narrowly conceived as "the right to the unique data strings on a particular distributed ledger, or put slightly differently, the right to have unspent transaction output (UTXO) locked to a public address with a particular ledger".[149] Second, that the category of things in action is in any case not limited to things which consist of rights or claims enforceable only by action.[150]

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147 Things in action are, in general, things in relation to which rights "are asserted by taking legal action or proceedings", although "the difference between the thing and rights in the thing is more elusive for things in action than for things in possession". M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 4-002. See also the Singaporean case of *Janesh s/o Rajkumar v Unknown Person* [2022] SGHC 264 at [56]–[68] where the court discussed the concept of a wider or residual class of things in action, but concluded only that the term thing in action as it is used "may not be entirely clear" (at [67]). See also our detailed discussion of this point at paras 4.29–4.38 of our consultation paper.

148 Of the 51 consultees who considered this point, 45 consultees agreed, either explicitly or impliedly (by their descriptions of crypto-tokens), that crypto-tokens cannot be conceived of as rights or claims in themselves and that they can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action. The remaining six consultees thought that crypto-tokens might be potentially rights-based, although this was said with specific reference to private, permissioned systems, or intermediated holdings. As we express elsewhere, we think that such systems or holding arrangements could give rise to things in action as against the system operator or intermediary — see Chapter 7 (Intermediated holding arrangements). See also n 149.

149 See K Low and M Hara, "Cryptoassets and property" in S van Erp and K Zimmermann, *Edward Elgar Research Handbook on EU Property Law* (forthcoming), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4103870. See also K Low, "Cryptoassets and the Renaissance of the *Tertium Quid*?" (2023), available at: https://ssrn.com/abstract=4382599, which usefully discusses the history of things in action. For completeness, one other consultee did suggest that a crypto-token could be conceptualised as a "right to have the ledger updated … in accordance with the relevant protocols of the distributed ledger": Crypto Council for Innovation at p 398 (emphasis removed). However, protocol rules generally do not convey rights on participants to have the ledger updated, but instead specify how valid transaction instructions can be authenticated, see para 10.91 and Appendix 4 of our consultation paper. Our view is that the concept put forward by this consultee is consistent with our description of a crypto-token from para 4.13 below. We do not think that this consultee intended to suggest that crypto-tokens constitute rights or claims in themselves.

150 Professor Low, p 688. See also the discussion in *Janesh s/o Rajkumar v Unknown Person* [2022] SGHC 264 at [56]–[68] referencing K Low "Bitcoins as Property: Welcome Clarity?" (2020) 136 *Law Quarterly Review* 345 and K Low, "Cryptoassets and the Renaissance of the *Tertium Quid*?" (2023), available at: https://ssrn.com/abstract=4382599.

3.34 On the first argument, we disagree that this is an analysis that can properly be applied to crypto-tokens. In this report, we describe crypto-tokens as composite things: notional quantity units manifested by the combination of the active operation of software by a network of participants and network-instantiated data.[151] Although those notional quantity units themselves can be considered "abstract" and can have "value", that explanation is not complete because the software and data together manifest a "thing" that is *necessarily* independent of any rights that may be claimed over that thing. For a crypto-token, the thing itself (the token) is not therefore co-extensive with the right in relation to it in the way that a thing in action is. Crypto-tokens would continue to exist even if the law were to fail to recognise them as objects of personal property rights and even were a law to prohibit their existence.[152] Their useful characteristics and the ability of people to use, enjoy and interact with them (and exclude others from them) would also continue to exist: the functionality of the crypto-token system would remain unaffected. For example, in Japan, the proprietary status of crypto-tokens was considered after the bankruptcy of the Mt. Gox crypto exchange in 2014. In August 2015, the Tokyo District Court held that bitcoin was not a thing that was capable of ownership within Article 85 of the Japanese Civil Code.[153] That finding prevented the potential argument that customers of the exchange had a proprietary right or interest in the bitcoin held by the exchange (as opposed to merely a personal claim against the exchange). Regardless of that finding, the bitcoin in question (and its functionality and utility) continued to exist and distributions of the remaining Mt. Gox held bitcoin to creditors of Mt. Gox are scheduled for 2023.[154] We conclude, therefore, that the better view is that a crypto-token is a thing in itself to which personal property rights can relate.[155] Indeed, that was also the conclusion that the Japanese legislature came to after initially rejecting the analysis that bitcoin could be an object of personal property rights.[156]

Things in action as a residual category

3.35 On the second argument, we consider that it would be possible for the courts to recognise the category of things in action as a wider, residual category of things encompassing everything that is not a thing in possession. It would also then be possible to develop, as Professor Low suggested:[157]

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151 See Chapter 4 (Third thing in practice) from para 4.13, for a detailed discussion on this point.

152 Of course, such a law might impact the use of and treatment by the market of such crypto-tokens.

153 For a detailed consideration of this case and a translation of the judgment, see: L Gullifer, M Hara, C Mooney, "English translation of the Mt. Gox judgment on the legal status of bitcoin prepared by the Digital Assets Project", available at: https://www.law.ox.ac.uk/business-law-blog/blog/2019/02/english-translation-mt-gox-judgment-legal-status-bitcoin-prepared.

154 See Mt. Gox, "Notice of Expiration of Deadline for Selecting Repayment Methods and Registering Payee Information" (2023), available at: https://www.mtgox.com/img/pdf/20230407_announcement_en.pdf. See also from para 4.58 of our consultation paper and paras 2.39 and 3.46 of this report where we discuss Japan's change in stance toward the property status of crypto-tokens.

155 We explain why in detail from para 4.13 below.

156 See n 184 below.

157 K Low, "Cryptoassets and the Renaissance of the *Tertium Quid*?" (2023) p 688 (para 20.1), available at: https://ssrn.com/abstract=4382599.

a sub-classificatory system distinguishing certain kinds of [things] in action (such as contractual rights) from others (such as intellectual property rights).

3.36 However, it is not entirely clear how this would be practical or helpful for the development of the law. Nor is it obvious why, if such an approach were desirable, it has not been the position taken by the common law for the last ten years, despite the fact that the courts have considered the issue directly on multiple occasions.[158] Moreover, we conclude that such an approach risks creating additional legal uncertainty, particularly if certain third category things such as crypto-tokens were inadvertently conceptualised as "rights" to which personal property rights could relate (or were co-extensive with). It also risks diluting or confusing the defining features of things in action (in the narrow sense), which at the moment can (for the most part) be clearly identified, and would mean that different things in action would be subject to different treatment. We conclude that, if different things are to be treated differently, it is cleaner to recognise a separate third category rather than multiple "sub-categories" of a broad residual category. Our recommended approach is more direct and reflects the views of a strong majority of consultees that the more conceptually coherent position is to recognise a third category of things to which personal property rights can relate. Our approach is also consistent with and does not disrupt a clear — and ever increasing — line of case law (which we discuss in detail at paragraph 3.38 below).

3.37 For that reason, we conclude that the better argument is reflected in the submission made by Linklaters LLP:[159]

> It is clear from the consultation paper and the UKJT Legal Statement that there is already a high degree of legal certainty that there exist certain types of intangible property that are not things in action (in the strict sense). Given this, we strongly agree that the law of England and Wales should recognise a third category of property (in our view, it already does). We agree that it is not conceptually coherent or helpful for crypto-tokens and other intangible assets that do not consist of a legal claim by the property holder against another legal person to be treated as things in action (or at least not things in action to which the legal principles applicable to things in action in the strict sense apply). Treating them as such implicitly limits the flexibility of the common law to develop legal principles that are best suited to such intangible assets, including in relation to transfers, security and relative title. Put another way, if such intangible property were to be included in a category of things in action, it would be necessary to bifurcate the legal principles applicable to things in action between those that consist of a legal claim by the property holder against another legal person and those that do not, so that the common law develops appropriate legal principles for this new sub-category. This seems tantamount to acknowledging a third category of property. Similar considerations apply to suggestions that intangible assets that do not consist of a legal claim by the property holder against another legal person should, instead, be characterised as things in

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158 For a more detail overview of the case law, see paras 3.38–3.48 below.

159 Linklaters LLP pp 743–744 (para 1.2). See also responses from The Law Society p 708; International Digital Assets Counsel Association and CryptoUK ("IDAC and CryptoUK") pp 592–593; the Centre for Commercial Law at the University of Aberdeen pp 245–246; and ISDA pp 633–636 (para 2.1).

possession, which is a suggestion made by other commentators that consider that such property should be subject to possessory-style legal concepts.

The position at common law

3.38 Our conclusion is consistent with the existing position at common law which has over the last ten years clearly moved toward the explicit recognition of a third category of thing to which personal property rights can relate.

3.39 Courts have consistently concluded that certain things (often digital assets) are capable of being objects of personal property rights, even where the thing in question does not neatly fit within either of the traditionally recognised categories of thing to which personal property rights can relate.[160] The courts have done so, either expressly or impliedly, in respect of milk quotas,[161] European Union carbon emission allowances ("EUAs"),[162] export quotas,[163] waste management licences,[164] and a wide variety of crypto-tokens, including NFTs.

3.40 Indeed, since the publication of our consultation paper, the Court of Appeal said that "a cryptoasset such as bitcoin is property" under the law of England and Wales.[165] This is also affirmed (or necessarily implicit) in at least 23 other cases decided at first

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160 In this context, A Ray, Dr Clifford and Dr Roberts suggest that "that traditional legal rules and principles may not apply easily into online realms": see D Clifford, A Ray, and H Roberts, "The Rise and Rise Again of Digital Assets – Reconceptualising Data as Property" in N Mrockova, A Nair, and L Rostill, *Modern Studies in Property Law: Volume 12* (2023) (forthcoming).

161 *Swift v Dairywise (No 1)* [2000] 1 WLR 1177, [2000] BCC 642 concerned the question of whether a milk quota was "property" under s 436 Insolvency Act 1986.

162 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156. This case considered, among other things, the proprietary status of carbon emission allowances in the context of claims for restitution and knowing receipt. The court concluded that a carbon emission allowance was "not a [thing] in action in the narrow sense, as it cannot be claimed or enforced by action" at [60], by Stephen Morris QC.

163 *A-G of Hong Kong v Chan Nai-Keung* [1987] 1 WLR 1339, (1987) 3 BCC 403 at p 1342 where the Privy Council said: "Their Lordships have no hesitation in concluding that export quotas in Hong Kong although not 'things in action' are a form of 'other intangible property'".

164 *Re Celtic Extraction Ltd* [2001] Ch 475, [2000] 2 WLR 991. In this case, Morritt LJ had to decide whether a waste management licence could constitute property for the purposes of the Insolvency Act 1986. Focusing on transferability as a key component of property, the Court of Appeal held that a waste management licence could be "property". However, this was either by virtue of being a thing in action, or falling within the meaning of "every description of property".

165 *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24]–[25], by Birss LJ who also described the thing to which the property right can relate.

instance,[166] although most were decided in connection with interim relief.[167]

3.41 Since the judgment in *AA v Persons Unknown*[168] was handed down in 2019, courts in at least 14 of those 24 cases, including the Court of Appeal,[169] have cited that judgment in support of the proposition that the digital asset in question is a thing which is capable of being an object of personal property rights. In *AA v Persons Unknown*, Mr Justice Bryan said that it would be "fallacious" to proceed on the basis that the law of England and Wales recognises no form of property other than things in possession and things in action. He explicitly recognised the difficulty in the classification of crypto-tokens (which, on their face are things which are neither things in action nor things in possession). Citing the full reasoning of the UKJT Legal Statement on the point, he held that a crypto-token could be an object of personal property rights even if it was not a thing in action in the narrow sense.[170]

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166 *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch); *Osbourne v Persons Unknown Category* A [2023] EWHC 340 (KB); *Osbourne v Persons Unknown Category A* [2023] EWHC 39 (KB); *D'Aloia v Persons Unknown* [2022] EWHC 1723 (Ch); *Amir Suleymani v Nifty Gateway LLC* [2022] EWHC 773 (Comm); *Nicholls v Little* [2022] EWHC 2344 (QB); *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm); *Tulip Trading Ltd v Van Der Laan* [2022] EWHC 667 (Ch); *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm); *Danisz v Persons Unknown and Huobi Global Ltd* [2022] EWHC 280 (QB); *LMN v Bitflyer Holdings Inc* [2022] EWHC 2954 (Comm); *Jones v Persons Unknown* [2022] EWHC 2543 (Comm); *R v Wright (Nigel)* [2022] EWCA Crim 882; *DPP v Briedis* [2021] EWHC 3155 (Admin); *Wang v Darby* [2021] EWHC 3054 (Comm); *Fetch.ai Ltd v Persons Unknown* [2021] EWHC 2254 (Comm); *Litecoin Foundation Ltd v Inshallah Ltd* [2021] EWHC 1998 (Ch); *Reyes v Persons Unknown* [2021] EWHC 1938 (Comm); *Marian Toma, David True v Ciaran Murray* [2020] EWHC 2295 (Ch); *Ion Sciences vs Persons Unknown* (unreported, 21 December 2020, Commercial Court); *AA vs Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35; *Liam David Robertson v Persons Unknown* (unreported, 15 July 2019); *Vorotyntseva v Money-4 Ltd* [2018] EWHC 2596 (Ch).

167 Most cases involve interim applications in which a party seeks an order or directions before the substantive hearing of a claim. They are therefore concerned with specific preliminary issues (such as whether the court has, or should accept, jurisdiction), and subject to rules which limit the extent to which these issues are argued before the court. Jurisdictional facts may only need to be proved to the standard of a "good arguable case", and certain issues may not be in dispute for the purposes of the application although not determined finally. In *Tulip Trading Ltd v Van Der Laan* [2022] EWHC 667 (Ch), for example, there was no dispute at first instance that the bitcoin in issue was property (at [141]), and no argument on the point on appeal.

168 [2019] EWHC 3556 (Comm), [2020] 4 WLR 35 at [55]–[61].

169 *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

170 *AA v Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35 at [58], [55], [59] respectively. Bryan J considered the UKJT's analysis "compelling" (at [57]). The UKJT Legal Statement drew on a long line of case law and academic commentary, which supported an understanding of crypto-tokens as things to which personal property rights could relate. The idea that crypto-tokens are capable of being objects or things in themselves (and are best described in those terms) is now widespread in legal and academic commentary, to the extent that it is standard in authoritative practitioner texts and textbooks: G Virgo, *The Principles of Equity & Trusts* (5th ed 2023), para 4.3.1; L Gullifer, *Goode and Gullifer on Legal Problems in Credit and Security* (7th ed 2022), para 1.58; M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 8-049. This approach is not new but builds on longstanding scholarship, which describes various digital assets in similar terms (see paras 10.40–10.43 of our consultation paper which sets out commentary back to 1993). Over the last ten years, commentators have increasingly coalesced around this view and, in that sense, the development of commentary and scholarship is broadly consistent with the trajectory we identify in the case law. See, for example: J Allen, "Cryptoassets in private law" in I Chiu and G Deipenbrock, *Routledge Handbook of Financial Technology and Law* (1st ed 2021); D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.05; J G Allen, "Property in Digital Coins" (2019) 8(1) *Environmental*

3.42 Taken together, the case law demonstrates that the courts of England and Wales now recognise crypto-tokens as distinct things which are capable of being objects of personal property rights. Further, through the consistent application of *AA v Persons Unknown* (as opposed to any contrary approach),[171] courts have deliberately proceeded in a manner that carves out a third common law-based category of thing to which personal property rights can relate.

3.43 Courts in other jurisdictions have reached the same (or a similar) conclusion. Courts across the common law world now consistently proceed on the basis that crypto-tokens are capable of being objects of personal property rights and are therefore susceptible to the various consequences that follow. This includes recognition that crypto-tokens can be subject to an interlocutory proprietary injunction, are capable of being held on trust and fall within certain broad statutory definitions of "property". See, for example, cases in Australia,[172] Canada,[173] Hong Kong,[174] New Zealand,[175]

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and Planning Law Journal 76, 95; A Hinkes, "Throw away the key, or the key holder? Coercive contempt for lost or forgotten cryptocurrency private keys, or obstinate holders" (2019) 16(4) *Northwestern Journal of Technology and Intellectual Property* 225; J Perkins and J Enwezor, "The legal aspect of virtual currencies" (2016) *Journal of International Banking and Financial Law*, 569; L Chambers, "Misappropriation of cryptocurrency: propelling English private law into the digital age?" (2016) 5 *Journal of International Banking and Financial Law* 263.

171 The case of *Fetch.ai v Persons Unknown* [2021] EWHC 2254 (Comm) involved crypto-tokens held on a crypto-token exchange called Binance. The court held that crypto-tokens were capable of being objects of personal property rights. In contrast to the judgment in *AA v Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35, Judge Pelling QC described the "assets credited to the first applicant's accounts on the Binance Exchange" as "[things] in action", at [9] (emphasis removed). This has been referred to as a "marked departure from the reasoning set out in the UKJT Legal Statement (endorsed in *AA v Persons Unknown*)": J G Allen, H Wells, and M Mauer, "Cryptoassets in Private Law: Emerging Trends and Open Questions from the First 10 Years" (2022), available at: https://ssrn.com/abstract=4206250. However, given that Binance Exchange generally operates as a non-custodial holding intermediary, we consider that the better interpretation of the *Fetch.ai* judgment is that the court correctly classified the applicant's right against Binance Exchange as a thing in action (broadly, a personal contractual claim to the return of assets equivalent to those held). This interpretation is partially supported by the description of a Binance account in *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch) at [8], by Trower J.

172 *Chen v Blockchain Global Ltd* [2022] VSC 92 (application for preservation of property in respect of Bitcoin); *Commissioner of the Australian Federal Police v Bigatton* [2020] NSWSC 245 (order of restraint of crypto-tokens held in digital wallets). See generally A Lane and L Adam, "Crime and Cryptocurrency in Australian Courts" (2022) 48(3) *Monash University Law Review* (forthcoming), available at: https://bridges.monash.edu/articles/journal_contribution/Crime_and_Cryptocurrency_in_Australian_Courts/22207720.

173 *Shair.Com Global Digital Services Ltd v Arnold* [2018] BCJ 311. See also *Copytrack Pte Ltd v Wall* [2018] BCSC 1709 in which Skolrood J considered the crypto-tokens in question to be the "property" of the claimant, notwithstanding the court's conclusion that the status of the crypto-tokens as a type of "good" could not be determined on summary judgment.

174 *Re GateCoin Ltd (In Liquidation)* [2023] HKCFI 914, HCCW 18/2019 (confirming the availability of trust). Courts have granted interlocutory proprietary injunctions over crypto-tokens without any party suggesting that crypto-tokens are not "property": *Nico Constantijn Antonius Samara v Stive Jean-Paul Dan* [2021] HKCFI 1078 at [41]; *Yan Yu Ying v Leung Wing Hei* [2021] HKCFI 3160; *Huobi Asia Limited v Chen Boliang* [2020] HKCFI 2750.

175 *Ruscoe v Cryptopia Ltd (In liquidation)* [2020] NZHC 728, [2020] 22 ITELR 925 at [69], by Gendall J.

Singapore,[176] and the United States,[177] including in substantive proceedings.[178] In those cases, courts have also referred to or relied on the analysis in *AA v Persons Unknown*,[179] the UKJT Legal Statement,[180] and our consultation paper.[181]

3.44 Moreover, as we discussed in more detail our consultation paper,[182] we consider that it is possible that over time, civil law systems will also move toward a broader recognition of some type of third category of thing to which personal property rights can relate.

3.45 As Professor Allen, Henry Wells and Marco Mauer suggest in the context of civil law systems:[183]

> We may have reached the point [where] 'native' digital objects demand recognition in their own right, however disruptive this may be for the dogmatic structure of inherited legal categories.

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176 *Algorand Foundation Ltd v Three Arrows Capital Pte Ltd* (HC/CWU 246/2022) (May 2023) (the Singapore High Court held that the claimant was a "creditor" within s 124(1)(c) of the Insolvency, Restructuring and Dissolution Act 2018 but that an obligation to re-transfer loaned stablecoins (USDC) could not constitute a monetary debt for the purposes of a statutory demand under s 125(2)(a) of that Act); *CLM v CLN* [2022] SGHC 46 (application for proprietary injunction); *B2C2 Ltd v Quoine Pte Ltd* [2020] SGCA(I) 02; *B2C2 Ltd v Quoine Pte Ltd* [2019] SGHC(I) 03. At first instance, Simon Thorley J sitting in the Singapore International Commercial Court considered that crypto-tokens satisfied the *Ainsworth* criteria, and so were capable of attracting personal property rights. But he left open the question of the categorisation of crypto-tokens. The Singapore Court of Appeal found that there was no intention to create a trust, so did not need to rule on whether crypto-tokens could be objects of personal property rights.

177 In the United States, courts repeatedly affirm that cryptoassets can attract proprietary rights albeit often in a specific statutory context. See a brief summary of US case law in our consultation paper at paras 4.52–4.54.

178 *Algorand Foundation Ltd v Three Arrows Capital Pte Ltd* (HC/CWU 246/2022) (May 2023); *Re GateCoin Ltd (In Liquidation)* [2023] HKCFI 914; HCCW 18/2019 (Hong Kong) in which the Hon Linda Chan J held that cryptocurrency is "property" and is capable of being held on trust at [82](3).

179 *Osbourne v Persons Unknown* [2023] EWHC 39 (KB) at [18], by Lavender J; *Jones v Persons Unknown* [2022] EWHC 2543 (Comm) at [23], by Nigel Cooper QC; *DPP v Briedis* [2021] EWHC 3155 (Admin), [2022] ACD 19 at [10], by Fordham J.

180 *DPP v Briedis* [2021] EWHC 3155 (Admin), [2022] ACD 19 at [10], by Fordham J*; Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch) at [16], by Falk J; *AA v Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35 at [56]–[58], by Bryan J.

181 The bankruptcy court presiding over the Chapter 11 cases of Celsius Network LLC and its affiliates referred to our consultation paper: "Legal principles that are applicable in the United Kingdom are not binding on courts in the United States, but they may be persuasive in addressing legal issues that may arise in this case. In the future the [US Bankruptcy Court] may consider the [Law Commission's Consultation Paper] in connection with the legal issues in this case.": Celsius Network LLC, Case No. 22-10964 (MG), 17 October 2022, United States Bankruptcy Court Southern District of New York. *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

182 See paras 4.55–4.66.

183 J G Allen, H Wells, and M Mauer, "Cryptoassets in the Courts: Emerging Trends and Open Questions in Private Law from the First 10 Years" (2022) *SMU Centre for AI & Data Governance Research Papers*, referencing P Palka, "Virtual Property: Towards a General Theory" (2017) p 150, available at: cadmus.eui.eu/handle/1814/49664.

3.46 Examples of this can already be seen in some civil law-based systems, including Japan,[184] Liechtenstein,[185] and Switzerland,[186] each of which we discuss in more detail in our consultation paper.

3.47 Our conclusions are also consistent with international law reform developments, including those that are intended to be applicable in civil law jurisdictions. The UNIDROIT Working Group recently published a set of international principles,[187] which set out a proprietary framework applicable to digital assets.[188] The UNIDROIT Working Group Principles apply to "electronic records", of which digital assets are a sub-set.[189] In effect, the Principles apply proprietary concepts to a category of things distinct from things in possession and things in action.

3.48 In England and Wales, across the common law world, and in other jurisdictions, there is now a persuasive, clear, and well-reasoned body of case law that concludes that certain digital assets are capable of being objects of personal property rights. Much of the reasoning in that case law relies on analysis that supports or is consistent with our approach that recognises there is a third category of thing to which personal property rights can relate. As such, our conclusion and recommendation that the law of England and Wales either already does recognise, or should explicitly recognise, such

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184 The Japanese Payment Services Act has been amended to include the concept of "Virtual Currency", with effect from 1 April 2017. An unofficial English translation of the Japanese Payment Services Act is available at: https://www.japaneselawtranslation.go.jp/en/laws/view/3078/en. Commentary suggests that the statutory definition squarely includes many crypto-tokens. For consideration of the amendment and case see: J Lee and M Van de Looverbosch, *Property and Data: A Confused Relationship* (2021) in J Lee and A Darbellay, *A Data Governance in AI, FinTech and RegTech: Law and Regulation in the Financial Sector* (2022), from p 8, available at: https://ssrn.com/abstract=3995492; see also paras 4.58–4.61 of our consultation paper.

185 In 2019, Liechtenstein enacted The Liechtenstein Token and TT Service Provider Act. The Act creates a new legal object – a token – and a specific, separate regime for regulation and use of those tokens. An unofficial translation of the Report and Application of the Government to the Parliament of the Principality of Liechtenstein concerning the Creation of a law on Tokens and TT Service Providers is available at: https://impuls-liechtenstein.li/wp-content/uploads/2021/02/Reportand-Application-TVTG-extract.pdf.

186 In 2020, Switzerland implemented the Federal Act on the Adaption of Federal Law to Developments in Distributed Ledger Technology. The statute amends various pieces of legislation, and enables the tokenisation of rights, claims and financial instruments through "ledger-based securities". These reforms effectively create a technology specific regime which applies existing legal principles and rules to new types of object without significant adaption: Art 973d Federal Act on the Adaptation of Federal Law to Developments in Distributed Ledger Technology 2020 https://www.newsd.admin.ch/newsd/message/attachments/60601.pdf.

187 The principles are intended to facilitate an international standard of best practice and framed such that they can be applied by member states regardless of their underlying conceptual foundations of property law: "Background", Digital Assets and Private Law Project, available at: https://www.unidroit.org/work-in-progress/digital-assets-and-private-law/; therefore, these principles should also be applicable by member states whose domestic legal systems are civil law-based.

188 The UNIDROIT Working Group explicitly recognises the difficulties that some member states face when dealing with questions as to the proprietary status of new things, particularly intangible things. Nonetheless, principle 3(1) provides that "A digital asset can be the subject of proprietary rights", with accompanying commentary clarifying that while the principle "does require that digital assets must be susceptible to proprietary rights, it does not prescribe, for instance, the specific requirements for a valid right of ownership in a digital asset or for a valid transfer of the same": UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 3(1) and pp 23–24 para 3.3.

189 "'Electronic records' comprise a class of which 'digital assets' ... form a subset": UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 17 para 2.1.

a category is intended to be confirmatory only. We conclude that the common law has already moved on from the question as to the proprietary status of certain digital assets, and how best to categorise them. The more difficult and important residual areas of legal uncertainty relate to the legal principles applicable to those things that fall within the third category.

A THIRD CATEGORY THING — ANALOGIES WITH BOTH THINGS IN POSSESSION AND THINGS IN ACTION

3.49 We think it wrong implicitly (or explicitly) to limit the flexibility of the common law to develop legal principles specific to third category things. Rather, we conclude that the common law should remain free to develop, where appropriate, legal principles specific to third category things, including but not limited to, crypto-tokens, cryptoassets,[190] "digital bearer securities"[191] and to the specific technology that manifests them.

3.50 Some of the fundamental, defining features and purposes of these types of thing are that they function differently to both things in possession and to things in action. As Timothy Chan and Professor Low argue:[192]

> it is crucial that courts faced with cryptoasset disputes avoid the simplistic analogy between the tangible and intangible.

3.51 We agree. We think the better approach is for the law to develop by analogy with principles applicable to things in possession or things in action where appropriate, while also recognising that those analogies will be imperfect. The law should instead focus on the attributes or characteristics of the thing with which it is concerned in a particular case. It should not attempt rigidly to apply to third category things legal principles that were formulated by reference to other things that are capable of being objects of personal property rights.

3.52 As a specific example, some crypto-tokens were explicitly designed to remove the need for trusted intermediaries and instead to facilitate peer-to-peer communication of value. They function in some ways like "digital bearer instruments",[193] and are in some ways tangible object-like in nature. Crucially, they can be self-held ("self-custodied")[194] by a person and they exist independently of the legal system. In other words, they are not rights in themselves but are instead things to which rights can relate. They can be

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190 A cryptoasset in this sense refers to a crypto-token which has been "linked" or "stapled" to a legal right or interest in another thing. Linking or stapling refers to a legal mechanism whereby the holder of a legal right or interest in a thing is identified by reference to a crypto-token. See Chapter 8 (Collateral arrangements), para 8.12.

191 UKJT, Legal Statement on Digital Securities paras 26–70.

192 T Chan and K Low, "Post-Scam Crypto Recovery: Final Clarity or Deceptive Simplicity?" (2023), available at: https://ssrn.com/abstract=4394820, referring to B McFarlane and S Douglas, "Property, Analogy and Variety" (2022) 42(1) *Oxford Journal of Legal Studies* 161.

193 Albeit many crypto-tokens do not embody any legal rights or obligations, whereas existing physical bearer instruments are an embodiment of the right to claim performance of the obligations recorded in the document. UKJT, Legal Statement on Digital Securities Appendix 1 (p 44).

194 For a more detailed discussion on our use of these terms, see Chapter 7 (Intermediated holding arrangements).

used and enjoyed independently of whether any rights or claims exist in relation to them and any rights in them can be asserted by use and enjoyment as well as by the exclusion of others from them.[195]

3.53 This is all achieved through software.[196] Such third category things are, in general, not tangible in the conventional sense and so analogies with tangible things are imperfect. For example, transfers of tangible things (by delivery) work in a very different way to transfers of third category things.[197]

3.54 Equally, analogies with things in action are imperfect and misunderstand the nature and functionality of digital objects such as crypto-tokens. Things in action, such as debts, have no existence independent of persons or legal systems and, as such, are not involuntarily alienable. The use or enjoyment of a thing in action is dependent only on the enforceability of the right or claim of which it is constituted. That is not true of digital objects. This is the crucial distinction that needs to be made for proprietary classification purposes. The susceptibility of something to involuntary alienation is relevant to a proprietary classification because it helps to distinguish the different functional characteristics of the thing in question. A debt, for example, cannot be effectively alienated from a person without a legal process (usually one which requires that person's consent). A crypto-token, on the other hand, like a car or a watch, can as a matter of fact be alienated from a person without a legal process and without their consent. A crypto-token can be used, enjoyed and interacted with without the need to rely on the enforceability of any rights or claims in relation to the token. The functional characteristics of a digital object and a thing in action are therefore fundamentally different. To apply analogies between things in action and digital objects would therefore be a legally erroneous step.

3.55 This is an important point because it helps to identify a way of dealing with legal and policy questions that have practical implications for the law of England and Wales. For example, the UKJT Legal Statement on Digital Securities started by asking how new digital objects are different:[198]

> The starting point of our analysis is therefore, as it was in the First Legal Statement, to identify what, if anything, might genuinely be novel and distinctive from a legal perspective about the use of blockchain and DLT in such structures.

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195 However, we agree with the conclusion of the UKJT that crypto-tokens could be used in a similar way to physical bearer instruments: as an embodiment of the right to claim performance of the obligations recorded by the crypto-token. Other things, including legal rights can also be linked to such third category things. See Chapter 14 of our consultation paper for detailed discussion on this point.

196 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

197 For more detail on transfers of crypto-tokens, see Chapter 6 (Transfers). See also our discussion on analogies with existing methods of legal transfer in our consultation paper from para 13.114.

198 UKJT, Legal Statement on Digital Securities para 22.

3.56 Similarly, HM Treasury grounds its proposed regulatory framework on the view that crypto-tokens can function differently to both things in possession and to things in action, and might give rise to different risks:[199]

> Over recent years cryptoassets and the activities underpinning their use (or 'crypto') has evolved into an extensive, complex, and rapidly evolving ecosystem. It features a myriad of different activities and business models, each generating different types of opportunities and risks for the actors involved.

3.57 We conclude that precise, technology-specific analysis of where particular digital assets, networks or systems remove or ameliorate some risks and introduce other risks is the most appropriate method for developing a comprehensive, fair and competitive legal and regulatory framework for the benefit of all participants. Our view is that such analysis is not possible where legal principles applicable to tangible things, or legal principles applicable to things in action, are applied directly to third category things without modification.

3.58 Sophisticated markets have already developed for third category things such as crypto-tokens, NFTs and VCCs, and it is likely that those markets will grow and develop over time. That said, it is not a foregone conclusion that third category things will continue to be used in markets.[200] To the extent they are not, the third category of things to which personal property rights can relate will remain ancillary and of limited importance. But in the meantime, there will likely be a period of uncertainty as the value proposition and competitiveness of third category things are tested against other existing markets, structures and arrangements which achieve similar functionality. Private law should not stand still in this period.

AVOIDING UNNECESSARY BOUNDARY ISSUES

3.59 In our consultation paper, we provisionally proposed that a thing which satisfies certain criteria should be recognised as falling within our proposed third category of things to which personal property rights can relate. These criteria were that a thing (which we called a "data object")[201] must:

(1) be composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals;

(2) exist independently of persons and exist independently of the legal system; and

(3) be rivalrous.

3.60 In Chapter 4 (Third thing in practice), we discuss consultee responses to our proposed criteria and make consequential modifications and clarifications to them. We also

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199 HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) para 1.1.

200 The success of such assets will also be affected by, among many other things, policy decisions and the continued interest in and use of such assets by market participants.

201 See below from para 3.62 for a discussion on terminology.

explain why we no longer recommend the creation of hard boundaries for such a third category, and now treat our criteria as indicia.

3.61 Given that we do not recommend the creation of bright line limits to such a third category, no new boundary issues should arise as a consequence of our recommendation. However, there are bound to be things that might remain difficult to categorise. Courts will also have to determine whether new things can (and should) be capable of being objects of personal property rights.

TERMINOLOGY: DATA OBJECTS, DIGITAL OBJECTS AND THIRD CATEGORY THINGS

Data objects and digital objects

3.62 In our consultation paper, we used the term "data objects" to describe the things we proposed should fall within a third category of thing to which personal property rights can relate.

3.63 Consultees made helpful comments on the term "data object" which highlighted two broad points. First, that the use of the term "data" implied an overly data-centric approach to the conceptualisation of the asset in question.[202] Second, that the term "data object" already has a specific use in programming and it would be sensible to avoid confusion between the two. Taking consultees' responses on board, we no longer use the term "data object".

3.64 Instead, in this report, we use the term digital asset in a very broad, descriptive sense. We use the term "third category thing" for those things that fall within the third category. We now use the term "digital object" to refer to a digital asset within the third category (examples include a crypto-token or an NFT). Where appropriate or where greater specificity is required, we use more precise, asset and technology-specific terms, such as crypto-token, cryptoasset, NFT or the name of the crypto-token in question.

"Third" category

3.65 We use the term "third category" to describe a category of thing distinct from both things in possession and things in action. In adopting this terminology, we acknowledge the argument that other distinct categories of thing to which personal property rights can relate might already exist at law (including patents and statutorily created intellectual property rights).[203] However, we nonetheless adopt the term third category as shorthand: in part, as a direct reference to Lord Justice Fry's judgment in *Colonial Bank v Whinney* and the longstanding practice among lawyers and judges of referring to the things in possession/things in action dichotomy;[204] in part, as an intuitive, convenient and readily understandable term, which almost all consultees were comfortable with; and in part, because we consider that this distinct third

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202 For example, some consultees argued that existing third category things, such as carbon emissions allowances are not "composed of data" – see ISDA pp 633–636 (para 2.1). We discuss this feedback in more detail in Chapter 4 (Third thing in practice) at paras 4.6–4.21.

203 See, eg, M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 9.007.

204 (1885) 30 Ch D 261 at 285.

category of thing that is better suited to encompassing new assets (including new digital assets) will become increasingly important to the modern world.

OUR RECOMMENDATION: MINIMALIST STATUTORY CONFIRMATION

3.66 In an increasingly online and digital world, we expect that other intangible things and assets whose parameters are difficult to predict and define in the abstract are bound to develop.[205]

3.67 We conclude that the parameters of those things[206] that the law treats as third category things capable of attracting personal property rights should continue to be defined by the common law. As such we conclude that there is no need to define the boundaries of such a third category in statute.

3.68 Instead, we recommend that the law explicitly recognise that a thing will not be deprived of legal status as an object of personal property rights merely by reason of the fact that it is neither a thing in action nor a thing in possession. Such things include crypto-tokens like bitcoin and ether. Those things do not exist as rights or claims in themselves (they instead exist independently). They also can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action.

3.69 We conclude that over the last ten years the common law has clearly moved toward the explicit recognition of a third category of thing to which personal property rights can relate. This conclusion is supported by over 24 cases.[207] In that sense, our recommendation amounts only to a confirmation and restatement of the existing common law position.

3.70 However, some consultees, including senior and specialist judges,[208] said to us that it would be helpful to express this position in legislation.

3.71 Although it would not change the common law position,[209] we conclude that such a statutory confirmation will provide greater legal certainty and will allow the law to develop from a strong and clear conceptual foundation. Such confirmatory legislation will also indicate to the courts that Parliament has decided that the exact parameters which describe a digital asset, and the circumstances in which such a digital asset is capable of being an object of personal property rights, is a matter for common law.

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205 Linklaters LLP pp 744–746 (para 1.3.1).

206 See above n 120

207 And arguably, the line of case law dates back even further to 1987. In *Armstrong*, Stephen Morris QC referred back to three decided cases of particular relevance to the issue of proprietary classification: *A-G for Hong Kong v Nai-Keung* [1987] 1 WLR 1339, (1987) 3 BCC 403; *Re Rae* [1995] BCC 102, [1995] CLY 421; and most significantly *Re Celtic Extraction* [2001] Ch 475, [2000] 2 WLR 991. A fourth case, *Swift v Dairywise Farms Ltd* [2000] 1 WLR 1177, [2000] BCC 642 also involved third category things. See paras 3.38–3.48 and in particular n 166 above.

208 At our Judicial Roundtable on 19 January 2023, various members of the judiciary, including senior and specialist judges, expressed support for a statutory confirmation of what they saw as the existing common law position. This point was subject to significant discussion and received broad support.

209 Nor would such a statutory confirmation prevent a thing from being deprived of legal status as an object of personal property rights for any other reason.

There are centuries of case law considering the factors that make a thing an appropriate object of personal property rights, which the courts can continue to apply in this context so that the third category does not become inappropriately broad. We consider this to be the most effective and least interventionist recommendation that we can make to facilitate the law's development on this point.

3.72 A statutory confirmation will emphatically recognise the reality of the modern world that intangible things which are not rights or claims enforceable only by action exist and that the law is capable of treating those things as objects of personal property rights. This in turn will allow the law of England and Wales to discuss crypto-token systems (and other systems that might manifest third category things) more directly in terms of powers and incentives/incentive mechanisms of participants, rather than in terms of claims/rights, corresponding duties and obligations.[210] It permits things in action to remain as a usefully distinct and descriptively accurate category.[211]

3.73 Moreover, our recommendation and the minimalist statutory confirmation we envisage are technology neutral in that they do not focus on any single or class of (digital) asset, crypto-token in particular, or any protocol, system, network or technological feature. Our recommendation allows the law to interrogate the idiosyncratic features of the asset in question when considering its proprietary status. It avoids drawing arbitrary boundaries or creating rigid definitional issues. It emphasises the success, and trusts in the continued ability, of the common law to develop sensitively and flexibly in the face of rapidly developing technology. It maintains the common law's position at the heart of the law of personal property. It distinguishes the law of England and Wales as a flexible and open system that is alive to the particular characteristics and design features of specific technology.

3.74 A statutory confirmation will reduce the time spent by the courts on questions of categorisation of objects of personal property rights, and instead allow them to focus on the substantive issues before them. It gives explicit effect to:[212]

> [the] powerful case for reconsidering the dichotomy between [things] in possession and [things] in action and recognising a third category of intangible property … in a way that would take account of recent technological developments.

3.75 A statutory confirmation will also alleviate any judicial concern that recognising a third category is not an appropriate development for the common law to make.[213] In short,

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210 If the law of England and Wales is adequately and sensitively to consider issues relating to decentralised finance (DeFi) systems, and more complex crypto-token systems, including Layer 2 applications, then it is important to recognise this reality as soon as possible. See G Shapiro, "A Functionalist Framework for DeFi Regulation" (2022), available at: https://lexnode.substack.com/p/a-functionalist-framework-for-defi. We discuss this point in more detail in Chapters 5 (Control) and 8 (Collateral arrangements).

211 Leaving the legal principles applicable to rights or claims in action which are enforceable only by action to apply to those things that fall squarely within the category of things in action. See Linklaters LLP, pp 743–744 (para 1.2).

212 *Your Response v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] 1 QB 41 at [27], by Moore-Bick LJ.

213 See, for example, the concerns of Moore-Bick LJ in *Your Response v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] 1 QB 41 at [27].

this recommendation lays to rest the lingering authority of *Colonial Bank v Whinney*[214] which suggested that there could be no third category thing and confines to history the "red herring"[215] of a circular and hollow debate on categorisation. The law can instead focus on answering substantive questions as to the proper application of legal principles to third category things. We discuss some of those legal principles in the rest of this report.

Recommendation 1.

3.76 We recommend statutory confirmation that a thing will not be deprived of legal status as an object of personal property rights merely by reason of the fact that it is neither a thing in action nor a thing in possession.

[214] (1885) 30 Ch D 261 at 285, by Fry LJ.

[215] See n 71 above.

Chapter 4: Our third category recommendation and conclusions in practice

INTRODUCTION

4.1 In Chapter 3 (Third thing), we conclude that the common law of England and Wales now recognises certain digital assets, including crypto-tokens, as distinct things which are capable of being objects of personal property rights. We conclude that such things should be regarded as falling within a third category of things to which personal property rights can relate, rather than being categorised as things in action or things in possession.

4.2 In this chapter, we consider the types of things that fall within such a third category.

4.3 We set out the criteria for third category things that we proposed in our consultation paper and discuss consultees' comments in response to them. We make consequential modifications and clarifications to those criteria (which we now treat as indicia).

4.4 We then consider consultees' concerns about boundary issues. We discuss crypto-tokens, private, permissioned blockchain systems, voluntary carbon credits ("VCCs"), in-game digital assets and digital files by way of example. We explain why we conclude that it is not appropriate to recommend criteria definitively to delimit the boundaries of an exhaustive third category of things to which personal property rights can relate. Instead, we conclude that the parameters of this category of things should continue to be developed by the common law, guided by the indicia we set out.

OUR PROPOSED CRITERIA

4.5 In our consultation paper we provisionally proposed that a thing should be recognised as falling within our proposed third category of things to which personal property rights can relate[216] if:

(1) it is composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals;

(2) it exists independently of persons and exists independently of the legal system; and

(3) it is rivalrous.[217]

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216 We provisionally called such things "data objects". As we discuss from para 3.62, we no longer use the term "data objects".

217 A thing is rivalrous if the use or consumption of the thing by one person, or a specific group of persons, necessarily prejudices the use or consumption of that thing by one or more other persons.

Data

4.6 Our first provisional criterion was that a thing must be:

> Composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals.

4.7 We said that this was a wide gateway criterion, unable on its own to distinguish "data objects" from information in a broader sense. That distinguishing role was instead performed by our third criterion that a thing must also be rivalrous.[218]

4.8 Although many consultees agreed with our first criterion, many did not.[219] Those who did not agree said that "composed of data" resulted in an overly data-centric approach to conceptualising the digital asset in question and could potentially create a hard boundary for the third category.[220] Those consultees acknowledged that data was important part of these digital assets but said that they are not mere data alone. As the UKJT Legal Statement put it, "it is not what the data tells you but what it allows you to do".[221]

4.9 We did not intend our criterion to focus enquiry on data alone because we conceptualise certain digital assets, such as crypto-tokens, as composite things, not mere data.[222] The intention was:

(1) to use this criterion to distinguish digital assets from tangible things;[223] and

(2) to acknowledge that the instantiation of data within a crypto-token system is a core part of the object in question but that data alone is not the thing which is the object of personal property rights.[224]

4.10 Given what we see as valid criticism of this criterion, we conclude that the better argument is simply to acknowledge that such digital assets are not entirely analogous with conventional tangible things, thus distinguishing them from tangible things in possession.[225] And we reiterate our conclusion that the informational and functional

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218 See from para 4.27 below.

219 We received 55 responses to consultation question 2. Twenty-eight consultees agreed with our proposed criterion. Twenty-seven either disagreed, provided a qualified response or suggested alternative or new phrasing for the criterion.

220 See for example, Linklaters LLP p 746 (para 1.3.2); Clifford Chance LLP p 285; Professor Cutts pp 967–968; Crypto Council for Innovation p 398; Dr Jayathilaka and Dr Lee p 269; and Timothy Chan p 981.

221 UKJT, Legal Statement para 60.

222 For more detail on this point, see from para 4.13.

223 See para 5.15 of our consultation paper.

224 See paras 5.18 and 10.29 of our consultation paper. See also D Fox, "Digital Assets as Transactional Power" (2022) 1 *Journal of International Banking and Financial Law* 3, 3: "[A crypto-token's] outward manifestation is a string of data generated by transactions between participants on a distributed ledger system. But to see the asset as mere data would ignore its larger functionality …".

225 We still consider that the technical elements required to constitute working digital asset systems do have a tangible, albeit highly distributed, existence (see n 68 above and para 5.18 of our consultation paper). However, both notional quantity units and the ability/power in respect of a certain notional quantity unit that

qualities of network-instantiated data provide the substance to the concept of rivalrousness.[226] This means that rivalrousness can function as our principal criterion and that "composed of data" need not be a criterion in itself.[227]

4.11 We develop this point further by reference to crypto-tokens below, with the benefit of the persuasive Court of Appeal authority in *Tulip Trading*.[228] That case has brought a high degree of certainty to the law of England and Wales: it recognises that crypto-tokens can be things to which personal property rights can relate, that they can be rivalrous and that their characteristics are manifested by the active operation of software.[229] In short, the judgment demonstrates the practical advantages of our conclusion that the common law of England and Wales remains the appropriate forum for development and resolution of the legal issues discussed in Chapter 3 (Third thing) and this chapter.

4.12 Consistent with the reasoning in *Tulip Trading*, our approach remains directly to characterise crypto-tokens as composite things (as outlined in our consultation paper).[230]

Crypto-tokens as composite things

4.13 By way of example, for crypto-tokens, we broadly view the thing, the asset or the object in the following way:

> A crypto-token exists as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data.

4.14 This conceptualisation has been expressed in very similar terms by expert market participants, legal academics and the Court of Appeal:

(1) Linklaters LLP: "For crypto-tokens, we view the asset as the power to effect a state change within the crypto-token system, as instantiated in that system. This

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we discuss from para 4.13 below are clearly intangible, even if recorded data — which is necessary to manifest the thing — is not.

226 For a further detailed discussion on the "form" and the "function" of data instantiated in a system, see paras 10.26–10.27 of our consultation paper.

227 As noted at para 4.8, the need for "composed of data" as a separate criterion for a third category of thing also potentially creates a hard boundary for the category, which we seek in this report to avoid.

228 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16. The judgment had not been handed down at the time of publication of our consultation paper (nor had the appeal been heard). As we note in Chapter 3 (Third thing), the statements on the proprietary status of crypto-tokens in that case were made in the context of a claim for permission for service out of the jurisdiction (and the proprietary status of crypto-tokens was not in dispute). Nonetheless, they are persuasive and add to the increasing body of common law on this point.

229 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ. The case was specifically about bitcoin and other notional quantity units manifested by forks of the original Bitcoin Core code, but the judgment was expressed to include cryptoassets more broadly. See paras [24] and [72].

230 See, for example, para 10.25: "[A] data structure achieves functionality only as a result of, and within, a particular actively operating crypto-token system. On its own, neither the data structure that constitutes the crypto-token nor the crypto-token system as an inert abstract entity is capable of achieving this functionality." See also para 10.62: "We consider that the law is capable of treating a crypto-token, being a composite of a specific data structure and commonly-understood process or functionality, as a thing."

power is not composed of data, although it is instantiated in the system through the combination of certain data (including cryptographic keys) and the system protocol (including the embedded cryptography), which ensure that the 'crypto-token' (an ideational construct) cannot be double spent."[231]

(2) Professor Fox: "A [crypto-token is] an ideational thing containing different components. It is more complex than the £1 coin since it lacks any tangible basis and its most significant properties are matters of digital functionality rather than legal attribution. Like the coin, however, it comprises more than one component. It is grounded in, but not confined to, the technical features of its own digital design. Its outward manifestation is a string of data generated by transactions between participants on a distributed ledger system. But to see the asset as mere data would ignore its larger functionality, just as we would fail to appreciate the full economic or legal significance of a coin by treating it as a mere metal disc. If the law is to recognise digital assets as property for private law purposes, then it would benefit from analysing them as composite things. The asset is more than mere data. It is a set of transactional functionalities. The most important of these is the capacity of the person who holds the private key to effect new transactions which will be recognised as valid by the technical rules of the system. Analysed in this way, the asset can be viewed as a specific transactional power over unique data entries on the ledger."[232]

(3) Clifford Chance LLP: "The thing that comprises the property could be characterised as the notional thing which is recorded in the distributed ledger, but is not the data (or data strings or data structures) which form the ledger."[233]

(4) The Court of Appeal: "The unusual factual feature of the present case is that literally all there is, is software. A physical coin has properties which exist outside the minds of people who use it and in that sense is tangible. Bitcoin is similar. It also has properties which exist outside the minds of individuals, but those properties only exist inside computers as a consequence of the bitcoin software. There is nothing else."[234]

(5) See also our consultation paper at paras 1.8, 10.16, 10.26, 14.3 and Appendices 3 and 4.

4.15 So, a crypto-token exists as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data.

4.16 It is this combination of the active operation of software by a network of participants and network-instantiated data which gives rise to certain functionalities of crypto-

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231 Linklaters LLP p 746 (para 1.3.2).

232 D Fox, "Digital Assets as Transactional Power" (2022) 1 *Journal of International Banking and Financial Law* 3, 3.

233 Clifford Chance LLP p 282.

234 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [72], by Birss LJ.

tokens that manifest characteristics which make them distinct from other digital assets.[235] As we said in our consultation paper: [236]

> While [a crypto-token's] form relies on its technical instantiation as a data structure, its function is derived not merely from the abstract existence of the technical system in which it persists, but fundamentally by the active operation of that system by a network of users. A crypto-token is consequently an object that has both, and is a composite of, technical and social dimensions — crypto-tokens exist as instantiations in socio-technical systems.

4.17 One of the functions of the network-instantiated data is to track the "state" — the canonical and chronological order of transactional events as recorded within the transaction-based ledger or record — of the crypto-token system.[237] However, the record is neither the crypto-token system nor the asset itself. The crypto-token system is a "transaction-based state machine" or "state transition system".[238] The active operation of the specific system protocol software by a network of participants gives a crypto-token intrinsic functionality by specifying, among other things, how consensus is reached to introduce a valid "state transition" into the canonical system state.[239]

4.18 A principal operative functionality of a crypto-token is the ability/power[240] uniquely to perform an operation (or an action)[241] within the crypto-token system in respect of that notional quantity unit. Neither the notional quantity unit (as an ideational thing) nor this ability/power is composed of data itself. However, form and the functional qualities of the notional quantity unit, including the ability/power in respect of such notional quantity unit, only arise (and continue to exist) as a result of the crypto-token system.

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235 See PG Hunn, "Only Binary? Atoms and Bits as Objects of Property" (2023), available at: https://papers.ssrn.com/abstract=4419662. In particular, crypto-token systems create objects/things which replicate the characteristics of other things that can be the object of personal property rights, such as tangible things. The protocol rules and the crypto-token system work together to provide factual (as opposed to legal) recognition and protection for those objects/things that mimic some of the functionality of property rights. See also our discussion at paras 10.44–10.54 of our consultation paper.

236 See our consultation paper at para 10.29.

237 We discuss the "state" of the system in more detail in Chapter 6 (Transfers) from para 6.5.

238 Ethereum, "Ethereum Whitepaper" (2023), available at: https://ethereum.org/en/whitepaper/#ethereum-state-transition-function, and G Wood, "Ethereum: A Secure Decentralized Generalised Transaction Ledger" (2014), available at: https://github.com/ethereum/yellowpaper/blob/master/BRANCHES.md.

239 Above.

240 We think it is correct to use the terms ability/power and not the term right. As we discuss at para 3.32 above, crypto-tokens are not rights-based: they cannot be conceived of as rights or claims in themselves and they can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action. Nonetheless, sometimes consultees and commentators do use the term right as opposed to ability/power: see Crypto Council for Innovation p 398 and Clifford Chance LLP pp 282–283.

241 Such as authenticating a message or composing a valid transaction instruction which is intended to effect a state change. We do not describe this as an "ability/power to *transact*", although recognise that is a suitable short-form way of summarising our position. In general, a validly composed and cryptographically signed transaction will be recognised as valid by other participants in the crypto-token system and eventually will be recorded as a state change (or state changes). However, this is subject to a number of externalities outside of the ability/power of a tokenholder, including (but not limited to) the transaction being included in the ledger (such as in a block by miners or validators) within the crypto-token system and the recorded state change becoming probabilistically irreversible (in the context of some proof of work-based systems) or finalised (in the context of some proof of stake-based systems).

This means that the functional qualities arise through the combination of network-instantiated data[242] and the active operation of the system by participants in the network (that run the specific system protocol software).[243] A core purpose of the crypto-token system is to ensure that the notional quantity units cannot be double spent — by specifying how consensus as to "state" (including state transitions) is reached — meaning that the notional quantity unit in question is rivalrous.[244]

4.19 So, as Professor Fox says: "If the law is to recognise digital assets as property for private law purposes, then it would benefit from analysing them as composite things".[245] A crypto-token is not a record or representation of something; it *is* a distinct and independent thing.

4.20 This description recognises the reality that a crypto-token is a digital object that has both, and is a composite of, technical and social dimensions. It is crypto-tokens as notional quantity units, arising from a composite of technical form, technical function and social participation/recognition, that the market and the legal system treat as a thing, and to which society has chosen to attach legal consequences.[246]

4.21 But there is an easier way of describing this: simply by referring to the notional quantity unit itself, or to "tokens".[247] Market participants and non-lawyers settled on this terminology long ago. In fact, colloquial use provides a perfectly adequate general-purpose abstraction of the legal concept we describe here. We think for

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242 For example, the distributed ledger/structured record of transactions which evidences changes to the state of structured or distributed records once consensus is reached between participants in the network and technical encumbrances and associated spending conditions over notional assets (such as the association of a specific quantity of notional assets with a receiving public key address).

243 See above paras 4.13–4.16.

244 See S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), pp 1 and 5, available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf. As the Court of Appeal said in *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [19], by Birss LJ: "The point of the [Bitcoin] White Paper was to propose a scheme using cryptographic methods to solve the double spending problem and create a form of electronic cash which does not rely on third party financial institutions." We discuss the concept of rivalrousness in more detail from para 4.27 below.

245 D Fox, "Digital Assets as Transactional Power" (2022) 1 *Journal of International Banking and Financial Law* 3.

246 Such as recognising the liberty of a person to use the asset, thing or resource — the liberty to transact. Or the right of a person either to exclude or allow access by another person to that particular asset, thing or resource (see our consultation paper at para 2.16). We think this concept also gets closest to Satoshi Nakamoto's description of Bitcoin, as the archetypal example of a crypto-token system, as a "communications channel" which creates a "system for electronic transactions", see: S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), pp 1 and 5, available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf. See also paras 10.12–10.51 of our consultation paper.

247 See J Allen, "Cryptoassets in private law" in I Chiu and G Deipenbrock (eds), *Routledge Handbook of Financial Technology and Law* (1st ed 2021), n 14, discussing the use of the term "token": "[In computer science] a 'token' is a programming object that represents the ability to perform an action in a software system. To this extent, 'token' is entirely appropriate."

example that it is both accurate and precise to say "1 bitcoin",[248] "10 ether",[249] "100 UNI"[250] or "1 Bored Ape".[251] In the vast majority of cases, there is little need to say more. Indeed, courts in general simply refer to a specific quantity of the particular notional quantity unit/crypto-token in question.[252]

Independent of persons and independent of the legal system

4.22 Our second criterion was that a thing must exist independently of persons and exist independently of the legal system.

4.23 The first part of this criterion was intended to ensure that our proposed third category admitted only those things that are properly identified as distinct things, existing independently from any particular person.[253] The second part of this criterion aimed to prevent things in action (and statutorily created property rights, such as intellectual property rights) from satisfying the criteria for our proposed third category of thing to which personal property rights can relate.[254]

4.24 We asked consultees whether they agreed with this criterion. Consultee responses were evenly split on this point, although a slight majority agreed outright.[255] Broadly, those in favour agreed that certain digital assets exist both independently of persons and independently of the legal system, as described in our consultation paper. Most of

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248 So long as it is understood that what is being referred to is the notional quantity unit itself. We note that it is perhaps even more accurate (albeit inconvenient) to refer to the integer denomination of the smallest notional quantity unit — satoshis in the case of bitcoin.

249 Ether is the notional unit for transmitting value on the Ethereum network denominated in integer units, the base unit being wei. Each ether equals the value of 10^18 wei. 10 ether would therefore equal 100^18 wei. It is therefore also appropriate (albeit rarer) to refer to the notional unit in terms of wei. See https://ethereum.github.io/yellowpaper/paper.pdf.

250 UNI is an example of a token on Ethereum. Tokens are a notional unit that can be treated as things in themselves and additionally, can be used to represent assets, ideational constructs, or other things within or external to a crypto-token system. UNI conforms to the ERC-20 standard for fungible tokens on Ethereum. The standard defines technical constraints that enable a universal approach for manifesting and transferring a token such that it is interoperable between applications using the crypto-token system. See https://eips.ethereum.org/EIPS/eip-20.

251 A "Bored Ape" (BAYC) is a (popular) form of non-fungible token (NFT). Like a fungible token, a non-fungible token places similar constraints in token smart contracts but for the management of uniquely trackable (and thus "non-fungible") tokens. Specifically, NFTs on Ethereum commonly implement the ERC-721 standard interface which includes a "tokenId" variable that creates a unique pair between the tokenId and the smart contract address. See https://eips.ethereum.org/EIPS/eip-721. The BAYC token smart contract can be viewed at: https://etherscan.io/token/0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d.

252 For example, "96 [b]itcoins": *AA v Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35 at [1], by Bryan J; "two NFTs": *Osbourne v Persons Unknown* [2023] EWHC 340 (KB) at [4], by James Healy-Pratt.

253 See para 5.24 of our consultation paper.

254 Even if a particular right has become so readily assignable that it is treated, in effect, as if it were an independently existing object to which personal property rights can relate.

255 We received 50 responses to consultation question 3 on this criterion. Of these, 29 agreed outright and four provided qualified agreement. Two consultees provided a mixed response, and 15 disagreed outright. Of the 17 consultees who either provided a mixed response or disagreed, one argued principally from the perspective of legal certainty, one disagreed with the criterion's role as a gateway, two preferred a spectrum-like application of the criterion, and the remaining 13 highlighted other conceptual concerns.

those consultee responses centred around crypto-tokens, distinguishing crypto-tokens from other existing things and other digital assets.

4.25 However, some consultees criticised this criterion. The principal criticisms were:

(1) Existence independent of persons should not exclude those things — such as crypto-tokens — that rely on a set of network participants for their continued existence.[256]

(2) Some third category things, such as crypto-tokens, are tangentially related to the legal system. For example, crypto-tokens might be controlled or operated via smart contracts and these smart contracts might contain arbitration mechanisms.[257] Further, crypto-tokens have been recognised as things to which personal property rights can relate by court judgments and various statutes.[258]

(3) Digital assets recorded in a private, permissioned blockchain or DLT-based system may not be clearly independent of the legal system. As the Financial Law Committee of the City of London Law Society ("CLLS–FLC") said:[259]

> Such systems will be operated, managed and administered under contractual and/or statutory rules and protocols. They will or are likely to create private law rights and obligations as between participants and the operator/administrator in relation to the maintenance of the distributed ledger/structured record and settlement processes (for the holding and transfer of title to the digital assets recorded in the systems). The existence of such private rights and obligations is likely to obfuscate the analysis as to whether the digital assets themselves (issued, held and transferred by means of such a system) can properly be considered as existing "independently of the legal system".

4.26 We acknowledge the potential strength of these criticisms and clarify the operation of this criterion to reflect the concerns of consultees in the following ways.

(1) The primary intention of this criterion was to distinguish third category things from things in action.[260] We do not think, nor did we intend, that those crypto-tokens which rely on a network of participants for their continued existence should be excluded by this criterion. We conclude that it remains accurate to

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256 Norton Rose Fulbright LLP pp 836–837; CLLS-FLC pp 507–508.

257 Norton Rose Fulbright LLP pp 836–837. See for example the UKJT, Digital dispute resolution rules, which are used by some market participants.

258 CLLS-FLC pp 507–508. For cases recognising crypto-tokens as capable of being objects of personal property rights, see n 166. For legislation, see (for example) the proposed amendments to the Proceeds of Crime Act 2002 under the Economic Crime and Corporate Transparency Bill 2022, discussed below in Chapter 9 (Remedies) n 1280. See also the various international legislative developments set out from paraas 2.31–2.43, as well as the work of international law reform bodies such as UNIDROIT: UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 2, p 16.

259 CLLS-FLC p 508. See also Linklaters LLP pp 746–747 (para 1.3.3) and Ashurst LLP p 72 (para 4.4).

260 In the sense that third category things are not rights in themselves and they can be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action before a court.

describe those things as existing independently from any *particular* person. We explain our reasoning for distinguishing things in action in Chapter 3 (Third thing).

(2) A thing's recognition by a legal system (including a legal system's recognition of things to which personal property rights can relate) is not the same as that thing's reliance on a legal system for its continued existence. Anything can be recognised by a legal system, but things in action can only come into being by virtue of, and can only function within, a legal system. Bags of gold, for example, exist independently of the legal system, and rights in relation to them might subsequently receive legal recognition. The same is true of crypto-tokens within crypto-token systems. Crypto-tokens are not rights in themselves and they exist independently of any rights or claims in that might also exist in relation to them. They can also be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action. In contrast, the same is not true of debts: their existence is not anterior to legal recognition; rather it is co-extensive with it. This means that they cannot function, be used or enjoyed without that legal recognition.[261]

(3) We acknowledge that private, permissioned blockchain or DLT-based systems work differently from public, permissionless systems. We also acknowledge that even public, permissionless systems can be used in different ways by market participants — for example, merely as a method of recording certain "offchain" things using tokens.[262] However, given that we no longer propose that our criteria define the hard boundaries of the third category of things to which personal property rights can relate, we do not see this as problematic. Legal rights (as opposed to digital objects) that are created within private, permissioned blockchain or DLT-based systems or multi-lateral contractual frameworks will be treated as things in action by the law.[263] Those things in action will therefore be different from, and will attract different legal treatment to, third category things.[264]

(4) Some third category things have an even closer relationship with the legal system than crypto-tokens. Specifically, European Union carbon emission allowances ("EUAs") and carbon emission allowances ("CEAs") rely on statutory provisions for their continued existence, yet have been categorised by

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261 See, for example, paras 10.75–10.77 of our consultation paper where we discuss the case of *Re Lehman Brothers International (Europe) (in administration) (LBIE)* [2017] UKSC 38, [2018] AC 465, in which the Supreme Court ruled that the foreign currency creditors of LBIE did not have non-provable claims to recover "losses" arising from currency fluctuations following the start of LBIE's administration, overturning the decisions of both lower courts.

262 See Chapter 14 of our consultation paper; UKJT, Legal Statement on Digital Securities paras 26–70. See also Chapter 8 (Collateral arrangements).

263 This was also the conclusion of the CLLS–FLC at p 504: "with particular regard to private, permissioned systems, the claimant is likely to have some form of [thing] in action in the traditional sense in relation to the digital asset held and transferred through the system; and, to that extent, the subject-matter of that claim will be recognised under traditional English law concepts as a form of incorporeal property."

264 This point was explicitly recognised by the UKJT, Legal Statement on Digital Securities para 68: "Such a power [to have ultimate control over the register or record] may, depending on the structure, be incompatible with the recognition of any tokens deployed in the system as the object of property."

the courts as intangible things that are not a thing in action in the narrow sense.[265] In our consultation paper, we said that EUAs would not satisfy our proposed criteria because their existence relies on statutory provisions.[266] However, we no longer use our criteria to define the hard boundaries of the third category of thing to which personal property rights can relate and as such, our recommendation and conclusions do not seek to change the existing common law position.

Rivalrous

4.27 Our third criterion was that a thing must be rivalrous.

4.28 A thing is rivalrous if the use or consumption of the thing by one person, or a specific group of persons, necessarily prejudices the use or consumption of that thing by one or more other persons.[267]

4.29 Many consultees said that whether a thing is rivalrous is at the heart of the proprietary nature of the thing in question.[268] Consultees also said that, where a thing is rivalrous (even if that thing is intangible), it is distinguishable from pure information. Clifford Chance LLP said:[269]

> Rivalrousness seems to be a suitable concept for inclusion in the definition of the third category. It acts as a useful separator between pure information and cryptoassets. It follows from the reasoning given in *Ruscoe v Cryptopia*,[270] with which we agree, in which cryptocurrencies were distinguished from other digital assets such as databases or photographs where the information could be "infinitely duplicated". The idea of cryptocurrencies is to create an item of tradeable value, not simply to impart information.

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265 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156. The court concluded that an EUA was "not a chose in action in the narrow sense" at [61], by Stephen Morris QC.

266 For further discussion on this point, see Chapter 9 of our consultation paper.

267 See paras 5.48 and 5.79 of our consultation paper. See also T Cutts, "Crypto-Property? Response to Public Consultation by the UKJT of the LawTech Delivery Panel" (2019) p 2, available at: https://ssrn.com/abstract=3406736.

268 Professor Cutts pp 967–968; Centre for Commercial Law at the University of Aberdeen p 247; Clifford Chance LLP pp 285–286; D2 Legal Technology p 414; DeCaDe p 432; Professor Sheehan pp 476–477; Hugh James LLP p 571; Law Society p 709; Linklaters LLP p 762; Dr Crawford p 801; Stephan Smoktunowicz p 932. Of the 51 consultees who responded to consultation question 4 on rivalrousness, 30 agreed outright and 11 provided qualified agreement. Two consultees provided a mixed response, and eight disagreed outright. Of the two consultees who provided a mixed response, one asked for further clarification, and the other disagreed only with our application of the rivalrousness criterion (rather than disagreeing with the criterion itself). Of the eight consultees who disagreed, two disagreed principally with the role of rivalrousness as a gateway criterion, three gave no substantive reasons for disagreeing, and three gave other reasons: CLLS-FLC pp 508-509; Queen Mary Intellectual Property Research Institute p 871; and Professor Low p 689.

269 Clifford Chance LLP pp 285–286.

270 [2020] NZHC 728.

4.30 Other consultees made similar points, although they noted that the concept is complex. Linklaters LLP said:[271]

> While we agree that "rivalrousness" is central to the question of whether or not something constitutes property under common law principles, this is a complex and nuanced issue and not something that is suited to definition in statute.

4.31 Moreover, in *Tulip Trading*, Lord Justice Birss said that cryptoassets such as bitcoin are things to which personal property rights can relate and endorsed the concept:[272]

> As a result it is meaningful to describe bitcoin not merely as something which is transferable but as "rivalrous" (see the Law Commission's recent Digital Assets: Consultation Paper). For a transferable thing to be rivalrous, the holding of it by one person necessarily prevents another from holding that very thing at the same time. Because the holder cannot double spend their bitcoin, such that it is rivalrous, the cryptoasset can be said to be capable of assumption by a third party (see the definition of property in *National Provincial Bank v Ainsworth*).[273] Thus, as Mr Justice Bryan held in *AA v Persons Unknown*[274] citing *Ainsworth*, a cryptoasset such as bitcoin is property.

4.32 While the concept has therefore been adopted as a matter of common law at Court of Appeal level,[275] some consultees did offer minor criticism. The idea that a digital asset can be rivalrous is fundamentally important both to the market itself through solving the "double spend" problem[276] and to the question of whether the digital asset can be a thing to which personal property rights can relate. As such, we deal with consultees' criticisms below.

4.33 Professor Low's response discussed the relationship between rivalrousness and control.[277] To give context to this discussion, we summarise here two distinct but related concepts that we discussed in our consultation paper.[278]

(1) Fragile rivalrousness: Crypto-tokens are rivalrous by design. However, while crypto-tokens can be rivalrous, that quality could be thought of as "fragile"

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271 Linklaters LLP p 762. Ashurst LLP made a similar point at p 65 (para 2.9) of their response. We agree that it is appropriate for particular technological systems that manifest particular tokens to be treated differently, and not all systems will manifest things that are rivalrous. The Court of Appeal took great care to take a system-specific approach in *Tulip Trading* (see para 4.14(4)). The judgment dealt with the question of rivalrousness very succinctly (much more so than this report or our consultation paper). As such, while we consider that the issue is complex, it can be answered very simply in certain circumstances, by reference to specific technology.

272 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

273 [1965] 1 AC 65.

274 [2019] EWHC 3556 (Comm), [2023] 4 WLR at [55]–[61], by Bryan J.

275 Albeit, as we note above at para 4.11 and n 228, as persuasive, but not binding authority.

276 See S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

277 Professor Low pp 689–690; this point was expanded on in a subsequent article. See: P Watts and K Low, "The Case for Cryptoassets as Property" (2023) pp 5–6, available at: https://ssrn.com/abstract=4354364.

278 See our consultation paper from para 10.100.

because it is contingent on the existence of robust technical authentication and validation mechanisms which ensure that the same crypto-token cannot be consumed twice or associated with two public addresses. That quality is also contingent on the continued active operation of the system by a network of participants.

(2) Dynamic excludability: The factual ability of a person to exercise control over access to a crypto-token (its excludability) will, to some extent, be determined by the continued efficacy of the system rules and the active operation of the system itself. Therefore, the practical ability to exclude others from a rivalrous crypto-token is likely to exist as a graduated quality that manifests on a continuum. Indeed, the factual ability of a person to exercise control over the access to a crypto-token (its excludability) might be dynamic over time.[279] For example, the technical mechanisms from which a rivalrous crypto-token obtains its excludability could be degraded to such an extent that the crypto-token is no longer practically excludable. A hypothetical example would be if the hashing mechanism used to derive public keys from private keys failed or was rendered less effective by other technological advancements. In such a scenario, while the crypto-tokens within the system might still be rivalrous in that they could not be double-spent,[280] their factual excludability could be degraded to such an extent that it was no longer possible to exclude others from the use or enjoyment of those tokens.

4.34 Professor Low and Peter Watts KC said that the discussion of fragile rivalrousness in our consultation paper implied that rivalrousness is not an absolute concept.[281] We disagree. Whether a thing is rivalrous is a binary question and we attempted to make this clear in our consultation paper.[282]

4.35 We recognise however that it might have been confusing to discuss the concept of fragile rivalrousness in the same section as dynamic excludability. As we say above, while rivalrousness is absolute, excludability is clearly not. And as we discuss in our consultation paper,[283] excludability is not absolute in relation to tangible things. The

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279 A good example being the susceptibility over time of certain hash functions (for example, SHA-256) to brute-force attacks.

280 Assuming the continued active participation in the network by participants, which might also be unlikely in such a scenario.

281 The Centre for Commercial Law at the University of Aberdeen (at p 247) also said that while they agreed with the concept of rivalrousness, they considered that our consultation paper implied that rivalrousness is not absolute. This report clarifies that we see rivalrousness as an absolute concept.

282 At para 10.101 of our consultation paper, we describe rivalrousness as "a quality that data objects can gain and lose over time". This was intended to emphasise the binary nature of rivalrousness. At para 5.74 of our consultation paper we also said that rivalrousness "exists on a spectrum". However, that is simply a reference to the fact that different things are used or consumed in different ways. The Queen Mary Intellectual Property Research Institute, Queen Mary University of London, made a good observation on this point. They said that the concept which our consultation paper described as rivalrousness existing "on a spectrum" is in fact better described as the economic concept of "congestibility": one's ability to enjoy the thing depends on the number of users. See Queen Mary Intellectual Property Research Institute p 871. We agree. See also R D Adams and K McCormick, "Private goods, club goods, and public goods as a continuum" (1987) 45(2) *Review of Social Economy* 192.

283 At paras 2.70–2.73.

threshold for excludability is not always determined by reference only to the factual characteristics of a thing. It also involves the exercise of legal and social value judgments.

4.36 It is for this reason that we distinguish our criterion that a thing must be rivalrous from those criteria that combine rivalrousness and control, or excludability.[284]

4.37 The concepts of rivalrousness and excludability are often intertwined.[285] Sometimes, the concepts of rivalrousness and excludability are instead described or defined by a concept of (exclusive) control. For example, both the UNIDROIT Working Group[286] and the UCC Committee define a digital asset as an electronic record which is capable of being subject to control.[287]

4.38 We consider that the two approaches are very similar and, in practice, are likely to lead to functionally similar results.[288] However, we think it is worth repeating why we ultimately chose to focus on whether a thing is rivalrous.

4.39 First, discussion in terms of rivalrousness tends to concentrate the enquiry directly on the characteristics of the thing itself. Discussion of possession or control instead focuses attention on the ability to use the thing which is exercised by the person who holds it. Framing the question in terms of rivalrousness is analytically more direct. This is particularly helpful when considering digital assets, given the complex, technology-specific and highly composable[289] way in which control works with respect to particular digital assets.

4.40 Second, while rivalrous resources are likely to be (factually) excludable, not all excludable resources are rivalrous. Nor are all controllable resources rivalrous. A criterion that required either some level of exclusivity of control or some level of excludability would therefore need some additional element to narrow the scope of objects that satisfy the criterion. This is the function of limbs (ii) and (iii) in the UNIDROIT Working Group and the UCC Committee's definition of control.[290] And even those limbs do not exclude from the UNIDROIT definition things that are

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284 See for example P Watts and K Low, "The Case for Cryptoassets as Property" (2023), available at: https://ssrn.com/abstract=4354364, which talks of legal rivalrousness, non-rivalrous control, rivalrous control, imperfect and rivalrous control, imperfect and non-rivalrous control and extra-legal control.

285 See our consultation paper at para 5.56.

286 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 17, para 2.3.

287 These assets are defined as "controllable electronic records" and include, for example, certain types of virtual currency and NFTs: UCC Committee, *Amendments to the Uniform Commercial Code (With Prefatory Note and Comments)* (2023) p 1.

288 See our consultation paper at para 5.61.

289 A highly composable system provides components that can be selected and assembled in various combinations to satisfy specific user requirements. Many crypto-token systems and ancillary products combine different elements of technology to manipulate how control works within those systems.

290 In this way, the test of exclusivity of control indirectly determines whether the thing can be treated as rivalrous in nature. For example, if Alice's assertion of exclusive control over a thing necessarily excludes Bob from any comparable degree of control, then we might say that the thing is rivalrous in nature. In this example, however, we would be using the practicality of asserting control over a thing, as opposed to directly considering the rivalrous nature of the thing itself.

generally considered as non-rivalrous, such as Excel or Word files.[291] We discuss how we think rivalrousness excludes Excel or Word files (even where password protected) in our consultation paper.[292]

4.41 Third, there may be differing degrees of simultaneous control or use that can be made of a thing. For example, while a large sofa is rivalrous, more than one person can still sit on it at once.[293] This nuance is reasonably easy to recognise where the discussion in framed in terms of rivalrousness. However, it is more complex to express where the discussion is framed in terms of (exclusivity of) control or excludability. Differing degrees of simultaneous control or excludability might exist, which might give rise to further definitional difficulties.[294] Control and exclusion are not absolute concepts, unlike rivalrousness. Adams and McCormick say:[295]

> The feasibility, cost, efficiency and equity of exclusion is separable from rivalry in consumption.

4.42 Moreover, (exclusivity of) control or excludability in the specific context of digital objects must be considered by reference to the technical characteristics of the digital object/system in question. As we discuss in Chapter 5 (Control), these technical characteristics can be difficult to describe or define and are not uniform across different third category things including digital objects. That makes defining a third category thing by reference to (exclusivity of) control or excludability much more difficult.

Rivalrousness in the context of third category things

4.43 To reiterate, we see the concept of rivalrousness working in the context of third category things (specifically crypto-tokens) as follows.

4.44 The criterion requires that it is possible to specify a rivalrous thing that is different from mere information and different from the physical medium on which that information is recorded. Otherwise, there exists no thing to which a personal property right can relate.

4.45 We say above that a crypto-token is best conceptualised as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data. That means that a particular crypto-token

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291 See Illustration 5 of the UNIDROIT Principles which explains that password protected Word and Excel files fall within the definition of controllable "electronic record": UNIDROIT Working Group, *UNIDROIT Principles on Digital Assets and Private Law* (2023) p 19, para 2.17.

292 See paras 6.38–6.41. See also para 6.30 where we note that physical storage media is rivalrous and said that a digital file would only satisfy our criterion of rivalrousness if the physical attributes of the storage medium on which it is recorded are considered, as opposed to the characteristics of the file itself. See also from para 4.84 below.

293 See also our discussion on congestibility in n 282 above.

294 Deloitte Legal (UK) made this point in their response at pp 448–449. However, we see some of the difficulties described in the Deloitte response as relating to control or excludability, and not the rivalrousness or otherwise of the object itself.

295 R D Adams and K McCormick, "Private goods, club goods, and public goods as a continuum" (1987) 45(2) *Review of Social Economy* 192, 198.

has a form and function that together imbue it with a rivalrous quality.[296] A core function of the crypto-token is that it manifests the ability/power uniquely to perform an operation[297] within the crypto-token system in respect of a certain notional quantity unit. Considered in this way, crypto-tokens are rivalrous. The use or consumption of the crypto-token by one person, or a specific group of persons, necessarily prejudices its use or consumption by one or more other persons. The technology ensures this. In other words, the technology ensures that a crypto-token cannot be double-spent.[298] And while the data that gives rise to the crypto-token can be copied,[299] its function within the relevant crypto-token system, as regulated by the inherent rules of the protocol, cannot. This means that crypto-tokens can be created such that they are mathematically scarce.[300]

4.46 A crypto-token is designed to achieve this functionality by the active operation of software by a network of participants, a point explicitly recognised by the Court of Appeal in *Tulip Trading*:[301]

> The signing of the hashed transaction record with users' private keys in the first place, and the incorporation of these records into a hashed chain of blocks produced by the proof of work, solves the double spending problem. This characteristic of bitcoin does not emerge as a matter of law or convention, it is a characteristic which arises as a matter of fact from the way the software works. As a result it is meaningful to describe bitcoin not merely as something which is transferable but as "rivalrous".

4.47 "Forks"[302] in crypto-token networks (broadly where subsets of network participants choose to run a substantively similar or the same protocol) further support the concept

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296 See our consultation paper at paras 10.27–10.28.

297 See n 241 above.

298 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [16]–[24], by Birss LJ; S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

299 Importantly, each element of the technical layer of the Bitcoin system, and, by extension, its notional quantity unit, bitcoin, when considered in isolation, consists of data. See for example, Gigi, "Implications of Outlawing Bitcoin" (available at: https://dergigi.com/2021/08/02/implications-of-outlawing-bitcoin): "the basic building blocks of Bitcoin are: numbers, math, and the exchange of messages", and "Every aspect of Bitcoin is text. The whitepaper is text. The software which is run by its nodes is text. The ledger is text. Transactions are text. Public and private keys are text."

300 Although crypto-tokens might be scarce as a technical matter, achieving this technical scarcity is not difficult or rare. See Cobie, "Tokens in the attention economy" (2021), in which the author recognises that crypto-tokens as an asset class are not scarce. The article goes on to contrast the technical scarcity of crypto-tokens with the scarcity of crypto-tokens that achieve widespread (and continued) social use and recognition, available at: https://cobie.substack.com/p/tokens-in-the-attention-economy.

301 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [24], by Birss LJ.

302 A hard fork (a split into more than one network) can result from the use of incompatible software by different network participants within a crypto-token system. A hard fork means that a blockchain continues following the path established by the current set of rules, but the fork gives rise to a bifurcated, second path following a new set of rules, as determined by the new software that is incompatible with the original. In contrast, a soft fork can result from the release of new software to the network that is compatible with prior versions so that the network as a whole continues to produce a single blockchain, albeit with participants running different versions of the protocol. See B Biais and others, "The blockchain folk theorem" (2018*) Toulouse*

that a crypto-token is rivalrous. Even though each of the individual data elements of the crypto-token can be copied — in the sense that the information can be reproduced on an equivalent medium — the copier does not get the same discrete instance of a crypto-token. Instead, what the copier gets is data in a different system. In addition to pure information and mathematics, crypto-tokens rely on their respective protocol rules, real physical infrastructure, the work of humans and/or machines, energy expenditure,[303] network effects, liquidity, and integration in existing social, economic or financial infrastructure.[304] Each of these elements would need to be replicated in full to "copy" the thing that is a crypto-token. But even an exact recreation of all of the elements of a particular crypto-token would result in the creation of a materially identical, yet distinct, network, populated by materially identical but distinct, rivalrous crypto-tokens.[305]

DIFFERENT DIGITAL ASSETS — APPLYING TECHNOLOGY NEUTRAL PRINCIPLES IN A WAY THAT IS RESPONSIVE TO SPECIFIC TECHNOLOGY

4.48 A principal concern of consultees was that delineating hard boundaries of a third category of thing to which personal property rights can relate risked being either overly exclusive or overly inclusive.[306] Consultees were concerned that the digital assets with which they were most involved might be incorrectly categorised by the rigid application of hard boundaries, which could lead to the incorrect application of existing common law principles. This concern was most apparent in relation to private, permissioned blockchain systems,[307] various carbon emission allowances[308] and in-game digital assets.[309]

4.49 Our recommendation and conclusions therefore do not seek to delineate hard boundaries of a third category of thing to which personal property rights can relate. Instead, we use our criteria (which we now treat as indicia) to describe a certain "core" type of assets — namely crypto-tokens manifested by distributed, public, permissionless systems — that are things to which personal property rights can relate at law and which are neither things in possession nor things in action. Rather than being determinative exclusionary criteria, therefore, our criteria can function instead as indicia of such things from which analogical, incremental categorisation can

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School of Economics Working Paper No 17-817. SegWit is an example of a Bitcoin soft fork (see https://github.com/bitcoin/bips/blob/master/bip-0091.mediawiki and https://github.com/bitcoin/bips/blob/master/bip-0148.mediawiki) and Segwit2x is an example of an attempted Bitcoin hard fork that ultimately led to the creation of the distinct Bitcoin and Bitcoin Cash networks (each of which manifest different, rivalrous crypto-tokens).

303 At least for proof-of-work based consensus mechanisms.

304 Each crypto-token system is likely to have a significantly different combination of those elements.

305 See *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [26], where Birss LJ was careful to acknowledge the differences between different forks of the original Bitcoin network.

306 See, for example, Linklaters LLP pp 743–744 (para 1.2) and CLLS-FLC pp 505-508.

307 CLLS-FLC pp 507–508; The Association for Financial Markets in Europe and the Association of Global Custodians ("AFME and AGC") pp 11–12.

308 ISDA pp 633–636 (para 2.1); Linklaters LLP pp 744–746 (para 1.3.1).

309 Meta pp 795–796; Professor Cutts p 969.

proceed.[310] This is no different from what already happens in relation to the established categories of things to which personal property rights can relate. Indeed, this was one of the questions in dispute in *Colonial Bank v Whinney*,[311] in which the court considered whether shares in an incorporated company were "things in action" within the meaning of the Bankruptcy Act 1883. Given that we do not recommend the creation of hard boundaries for a third category, no new boundary issues should arise as a consequence of our recommendation. However, there will of course be things that might remain difficult to categorise. Courts will also have to determine whether new things can (and should) be capable of being objects of personal property rights at law.

4.50 We think that this allows the common law to remain technology neutral by ensuring that its principles are not based on any particular technology. Instead, the common law can apply technology neutral principles in a way that is responsive to specific technological forms, both now and in the future. For example, the mere use of a blockchain will not in itself be determinative as to the existence or otherwise of a third category thing. The nature and composition of the system and network that incorporate the blockchain will be the more relevant question and will therefore require reference to the specific technology used by the system and network.

Private, permissioned blockchain systems and different uses of blockchain technology

4.51 Some consultees[312] said that blockchain technology can be used to structure instruments and relationships in different ways, and that some of those structures might not necessarily give rise to distinct third category things.

Private, permissioned blockchain or DLT-based systems that do not manifest third category things

4.52 A principal example given by consultees was that of private, permissioned blockchain or DLT-based systems. Consultees made two broad points. First, that such systems might simply function as electronic registers or records of other things. As we said in our consultation paper, and as we discuss in more detail below, we think it possible that third category things could themselves be used merely to register or record information.[313] However, consultees also argued — and we recognise — that private, permissioned systems might not give rise to third category things at all. In some systems, the register or record would not be a third category thing at all and would instead simply be a digital record or piece of information, like a database entry.

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310 Our conclusions in this report, which provide a guide as to how the common law might develop in the future, should increase legal certainty. This is particularly so given the weight which historically attached to reports of the Law Commission on the state of the common law by the courts. In this regard see, for example, *Patel v Mirza* [2016] UKSC 42, [2017] AC 467, considering: Illegal Transactions: The Effect of Illegality on Contracts and Trusts (1999) Law Commission Consultation Paper No 154; The Illegality Defence: A Consultative Report (2009) Law Commission Consultation Paper No 189; The Illegality Defence (2010) Law Com No 320.

311 *Colonial Bank v Whinney* (1885) 30 Ch D 261 at 285, by Fry LJ.

312 CLLS-FLC pp 502–504, 514–518; Ashurst LLP p 79 (para 4.37); Professor Milne p 39; and Clifford Chance LLP p 285.

313 See our detailed analysis on this point at paras 14.19–14.43 of our consultation paper.

4.53 Second, consultees said that many private, permissioned blockchain or DLT-based systems function as multi-lateral contractual frameworks (in direct contrast to distributed, public, permissionless blockchain systems that manifest crypto-tokens such as bitcoin or ether, which are not based on multi-lateral contracts). Those complex multi-lateral contractual frameworks might give rise to only contractual rights between the participants that are properly characterised as things in action (and might not manifest any third category thing). But equally, it remains possible that contractual or statutory rights could be used within systems that *are* intended to manifest third category things.[314] Some consultees were concerned that our proposed criteria were potentially too rigid to allow for or to recognise these distinctions, which could lead to mischaracterisation of some private, permissioned blockchain or DLT-based systems, or the tokens that they (do or do not) manifest.[315]

4.54 We agree, and we recognise consultees' concern. We think this concern applies equally to other attempts to define the hard boundaries of new digital assets. By way of comparative example, we think "records" within private, permissioned blockchain or DLT-based systems would be captured by the definition of controllable "electronic record" in both the UCC Committee's Article 12 and the UNIDROIT Working Group's Principle 2.[316] This means that such records would be things to which personal property rights can relate, broadly akin to third category things.[317] Indeed, this is the explicit intention.[318] We have chosen not to follow that path, due to, in part, the concerns raised in consultee responses.[319] As we discuss in Chapter 3 (Third thing), we conclude that the best answer to this difficulty is to maintain the existing common law position, with all the flexibility and nuance that comes with it. In short, the design of systems will affect the characterisation of the rights and/or relationships between participants in those systems and the (proprietary) characterisation of the tokens that they (do or do not) manifest.

4.55 That said, we also agree with the UKJT that cases involving permissioned, centrally managed, blockchains or DLT-based systems, where all participants are contractually bound to a common rulebook, are generally unproblematic and are unlikely to give rise to novel legal issues.[320] The law is already clear in relation to pure information not

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314 Linklaters LLP pp 746–747 (para 1.3.3) said: "There seems to be no reason why an arrangement supported by mere social consensus merits a greater recognition as [manifesting a third category thing] compared to an arrangement (which may also benefit from the same social consensus) that is supported by a legal arrangement." See also our discussion on this point in para 10.103 of our consultation paper.

315 For further discussion of this point, see CLS-FLC p 508, UKJT, Legal Statement on Digital Securities paras 68 and n 264 above.

316 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) Principle 2, p 16.

317 UCC Committee, *Amendments to the Uniform Commercial Code (With Prefatory Note and Comments)* (2023) p 1; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) Principle 2, p 16.

318 Uniform Law Commission, "Summary: Uniform Commercial Code Amendments" (2022) pp 2–3, available at: https://www.uniformlaws.org/committees/community-home/librarydocuments/viewdocument?DocumentKey=1f2381d0-d879-4137-93f5-36d7341b36d8; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) paras 6.16–6.17, p 41.

319 Including, specifically, feedback from the CLLS-FLC pp 507–508. See also Linklaters LLP pp 746–747 (para 1.3.3), Ashurst LLP p 72 (para 4.4), and Crypto Council for Innovation pp 399–400.

320 UKJT, Legal Statement on Digital Securities para 18.

being an appropriate object of personal property rights and in relation to things in action.

Different use-cases for third category things

4.56 Broadly speaking, commercial practice has over time resulted in certain types of document being elevated beyond a mere *record* of obligations in writing to something more — an *embodiment* of the right to claim performance of the obligations recorded in the document.[321] These types of documents can be issued either as "bearer documents" or as "order documents". This determines the method of transfer used to transfer the document.[322] Critically, the transfer of such a document does not require the consent of any other party, nor does it require any actions to be taken other than those described above.[323] In the case of both bearer documents and order documents, the right to claim performance of the relevant obligation simply "travels with the document".[324]

4.57 Some digital objects which are manifested by a distributed, public and permissionless system and are capable of transmission without the need for centralised intermediaries function in some ways like "digital bearer instruments".[325] As we conclude in Chapter 3 (Third thing), those digital objects are treated by the common law of England and Wales as third category things to which personal property rights can relate.

4.58 Such digital objects can be used in a variety of ways. Many such digital objects (often crypto-tokens) are not linked to anything external to the (crypto-token) system in which they are manifested. In crypto-token systems, for example, the crypto-token itself — as a distinct thing[326] — is often the asset of interest or value. However, a crypto-token — as a distinct thing — can also be "linked" or "stapled" to something external to the crypto-token system, or indeed another crypto-token.[327] For example, a crypto-token

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321 The right to claim performance of the obligations recorded in the document is generally transferable, either by way of pledge or by means of delivery of the document itself. See M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 5.001. For more detail see Electronic Trade Documents (2022) Law Com No 405 ch 3. Similarly, art 3 Uniform Commercial Code reifies payment rights in certain paper "negotiable instruments", providing that a person in possession of the paper has the right to enforce the payment right evidenced by that instrument: see § 3-301 of the Uniform Commercial Code. See also J Moringiello and C Odinet, "The Property Law of Tokens" (2022) 74 *Florida Law Review* 607.

322 In a bearer document, the obligation is owed to whoever is in possession of the document. To transfer a bearer document, the bearer simply delivers the document to another party. In an order document, the obligation is owed to a person named on the document. To transfer an order document, the person in possession of the document must indorse the document. M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 5-008. For a discussion on analogies between transfers of crypto-tokens and other types of transfer see chapter 12 of our consultation paper. See also Electronic Trade Documents (2022) Law Com No 405 paras 3.59–3.63.

323 See n 322 above.

324 R Goode and E McKendrick, *Goode and McKendrick on Commercial Law* (6th ed 2020) para 2.58. For more detail and discussion see paras 14.83–14.97 of our consultation paper.

325 UKJT, Legal Statement on Digital Securities Appendix 1 (p 44).

326 See from para 4.13 above.

327 "Stapling" refers "to a legal mechanism whereby the holder of a legal right or interest in an asset is identified by reference to a cryptoasset, or to another digital object of property or a ledger record that is not itself an

might purport to link to an intangible thing in action (like an equity or debt security, a contractual debt or a commercial licence), or to a tangible thing (like goods or land), or to another crypto-token or interest therein. A crypto-token itself — as a distinct thing — can also be used merely as part of a register or record (albeit a register or record composed of things to which personal property rights can relate, like the beads on an abacus).[328]

4.59 In the context of commercial financial markets, the UKJT made the same point and said that public, permissionless and decentralised blockchain or DLT-based systems could facilitate the issue of digital bonds in a number of different forms:[329]

(1) an issuer could use crypto-tokens on a blockchain or DLT-based system (with each crypto-token being a distinct thing), instead of physical bearer instruments, creating "digital bearer instruments"; or

(2) an issuer could issue a bond using a blockchain or DLT-based system as a register or record of interests instead of a conventional database (with each crypto-token being a distinct thing, but used simply to record or register something system-external).

4.60 The unavoidable technological reality is that some digital assets — specifically crypto-tokens that rely on public, permissionless crypto-token systems — function in some ways like digital bearer instruments. A principal and fundamental design feature of these digital assets is that they are object-like in nature: they can be self-held or "self-custodied" by a holder and they are things that exist independently of any legal rights that they might embody or be linked to.

4.61 Nonetheless, it is important not to overstate the impact of that technological reality or the impact of the law recognising that such digital assets are things to which personal property rights can relate. As we discuss above, many digital assets do not function as digital bearer instruments and many private, permissioned blockchain or DLT-based systems might not even manifest third category things at all. Where such systems create only legal rights and obligations as between participants and the operator/administrator, existing legal principles currently applicable to things in action will apply.[330] And even where the distinct features of third category things justify and require different legal treatment, in this report we conclude that the common law is perfectly able to achieve this. There are only two qualifications to this:

(1) Our recommendation in Chapter 3 (Third thing) for a statutory confirmation that a thing will not be deprived of legal status as an object of personal property rights merely by reason of the fact that it is neither a thing in action nor a thing in possession.

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object of property (in the case of registered or similar structures)": UKJT, Statement on Digital Securities para 31. See also Chapter 8 (Collateral arrangements) para 8.12 and Chapter 14 of our consultation paper.

328 See from para 14.19 of our consultation paper.

329 UKJT, Legal Statement on Digital Securities paras 26–70.

330 CLLS-FLC p 504.

(2) Our recommendation in Chapter 8 (Collateral arrangements) that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

Increased optionality in legal structuring using third category things

4.62 Some consultees said that the distinction between third category things and things in action allows for greater legal structuring optionality, especially where things in action are linked to third category things.[331] They said that greater legal structuring optionality might lead to greater complexity in terms of the legal principles applicable to a particular structure. The legal analysis might be complex where a third category thing is used to embody or is linked to a thing in action, or where combinations of different technology and legal structures (such as direct holding and intermediated holding arrangements) are used.[332]

4.63 We agree with these observations, but think that increased optionality in legal structuring using third category things is an inevitable (and intentional) consequence of the creation of new technology. The alternative is for the law to ignore the conscious technological decision-making and fundamental design features of third category things and instead treat them as directly akin to things in action, limiting the legal structuring options available. Such an approach would simply not reflect the commercial expectations of market participants.[333]

4.64 Nevertheless, we also consider that the risk is small that the law of England and Wales — or market participants — will not be able to deal with this increased optionality in legal structuring using third category things. Even the hugely diverse crypto-token markets are dominated by a very limited number of crypto-token systems with large market capitalisations, with few dominant smart contract standards having emerged on each. Many decentralised finance market applications rely on the relative stability and inflexibility of such systems and token standards for their ongoing functionality. Similarly, where crypto-token markets involve intermediated holding arrangements, they replicate much of the legal structuring of the intermediated securities markets (albeit on a largely unregulated basis). The novel legal structuring optionality is that such markets can also facilitate self-holding/"self-custody"[334] options and decentralised trading options (and sometimes users can quickly switch between the two). We expect that over time those markets are likely to mature and develop their own best practices, which are likely to be distinct from the intermediated securities market in some ways but replicate its features in others. We expect this will

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331 Ashurst LLP p 66 (n 2).

332 See, for example, Ashurst LLP p 68 (para 2.20), which describes some of the different combinations currently available to market participants.

333 See also our discussion of this point in Chapter 3 (Third thing), paras 3.52–3.53 and Chapter 5 (Control) paras 5.86–5.87.

334 In our consultation paper, we used the term "self-custody" but now refer to these practices as "self-holding": see Chapter 7 (Intermediated holding arrangements) para 7.21.

in part be driven by the products in question and their user base, in part by legal structuring optionality and in part by regulatory intervention.

4.65 In addition, while we accept that there is currently some residual legal uncertainty in the market, in this report we suggest that this is largely confined to highly nuanced and specific areas. We also consider that the market will, in general, gravitate towards legal structuring of arrangements where existing legal certainty is high, and develop and test edge-case products over time. Edge-case products which test areas of legal uncertainty are the likely places for litigation, which should eventually result in further common law development, leading to growing pools of legal certainty. Much remaining uncertainty will therefore be transient and will eventually diminish through the operation of markets. In addition, the areas of uncertainty that cause actual, practical issues which might give rise to litigation or might be worth litigating are hard to predict. For the law to ignore the distinct features of third category things based on theoretical uncertainty as to the future development of markets involving those things would be to prevent or stifle competitive innovation.

4.66 Our recommendation recognises that new technology is likely to continue to develop mechanisms for how value can be communicated online. Our recommendation simply allows the courts to continue to recognise that there is a separate third category of things to which personal property rights can relate, the boundaries of which can be incrementally developed over time. It permits the law of England and Wales to take the logically coherent, and flexible, position that different legal principles might then apply to different types of thing.[335] This is of course likely to lead to greater legal structuring optionality.

Carbon emissions allowances and voluntary carbon credits

4.67 In our consultation paper, we discussed CEAs and VCCs. We provisionally concluded that CEAs did not satisfy our proposed criteria and therefore that they fell outside our proposed third category of things to which personal property rights can relate. However, we concluded that the common law already recognises that CEAs are things to which personal property rights can relate.[336]

4.68 Similarly, we provisionally concluded that most VCCs (as currently structured) did not satisfy our proposed criteria and therefore that they fell outside our proposed third category.[337] Even so, we said that the prevailing view in most jurisdictions (including under the law of England and Wales) is that VCCs are "a form of intangible

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335 Leaving the legal principles applicable to rights or claims enforceable by action to apply to those things that fall squarely within the category of things in action: Linklaters LLP pp 743–746 (paras 1.2–1.3.1).

336 See Chapter 9 of our consultation paper, referring to *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 (which concerned European Union Allowances).

337 We note that some consultees, including Linklaters LLP and ISDA, made strong arguments that VCCs could be treated as "rivalrous" and so VCCs would fall within the proposed criteria in our consultation paper. See Linklaters LLP pp 744–746 (para 1.3.1) and ISDA pp 633–636 (para 2.1): "VCCs achieve 'rivalrousness', due to a complex myriad of factors. This includes the fact that there are a limited number of carbon reducing projects that meet the carbon standard rules and a limited number of independent entities capable of verifying compliance with the carbon standard rules. The systems through which VCCs are recorded and traded ensure the asset cannot be double spent, through multilateral contractual frameworks which place certain obligations on the registrar."

property"[338] — they are capable at law of being things to which personal property rights can relate.[339]

4.69 We also said that other intangible things such as milk quotas, export quotas and waste management licences are capable at law of being things to which personal property rights can relate.[340]

4.70 A number of consultees, including International Swaps and Derivatives Association (ISDA), Linklaters LLP, Deloitte, Professor Cutts, Dr Crawford and Kings College London[341] said they did not agree with delineating hard boundaries of a third category things to which personal property rights can relate, because doing so risked excluding from the category things such as VCCs. ISDA explicitly tied this comment to a question as to the status of VCCs. They said:[342]

> Defining the third category of property as "data objects" raises (without necessarily addressing) questions as to whether EUAs and VCCs constitute property at all, and if so, whether a fourth category of property exists under English law.

4.71 We agree with these observations. As such, we conclude that our criteria are best used as indicia to guide the incremental population of the third category of thing to which personal property rights can relate, rather than as hard exclusionary boundaries that, over time, are likely to become less effective. EUAs of the sort that formed the basis of the claim in *Armstrong*[343] provide an illustration of this point.

4.72 In *Armstrong*, the EUAs in question were removed by one party from the claimant's account and transferred to another, thereby depriving the claimant of their use. This demonstrates that they are both rivalrous and exist independently of persons. They are rivalrous because their use (by transfer) necessarily resulted in the claimant no longer being able to use or benefit from them. They exist independently of persons because they were clearly, in a factual sense, involuntarily alienable. A true thing in action such as a debt is not involuntarily alienable because a person cannot be divested of it without a legal process (which usually requires their consent, implicit or otherwise, such as via assignment or novation). As such, EUAs do not function like things in action.[344]

4.73 It might however be argued that EUAs, while fully independent of persons, are not fully independent of the legal system because their function and therefore their value lies in their (statutorily created) legal status and effect. But there is a difference between things or assets which are "causally connected to legal networks, services, and relationships", and things or assets which are *only* legal relationships, existing

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338 ISDA, *Legal Implications of Voluntary Carbon Credits* (2021) p 13.

339 See, for example, above at pp 9–10.

340 See para 4.15 of our consultation paper and Chapter 3 (Third thing), para 3.39 of this report.

341 See ISDA pp 633–636 (para 2.1); Linklaters LLP p 743 (para 1.1); Deloitte Legal (UK) p 443; Professor Cutts pp 969–970; Dr Crawford p 803; and King's College London pp 675–677.

342 ISDA pp 633–636 (para 2.1).

343 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156.

344 As the court explicitly concluded above at [61].

only insofar as they are rights or claims enforceable by action.[345] The significance of that distinction often manifests as the first type of thing being involuntarily alienable as a matter of fact. So, while EUAs are causally connected to legal networks (specifically a statutory framework), they do not exist as only a legal relationship. Whether this is true of other types of carbon emissions allowance will be context dependent, according to the way in which any particular allowance or credit is set up, configured and administered. EUAs therefore provide an example of "grey area" things which are not things in action and which, on an application of our indicia, are clearly more analogous to third category things.

4.74 We conclude in this report that it is important that the law of England and Wales can be responsive to specific technology and interrogate the idiosyncratic features of the asset in question when considering its proprietary status. We think this is equally true of carbon emission allowances, including VCCs. While the VCC market matures, it is important that each VCC arrangement can be considered on a case-by-case basis, by reference to the specific technology and legal structuring arrangements in question. Nonetheless, for completeness and to help increase legal certainty within the market, we consider that it is possible to structure VCCs such that they are capable of being a third category thing in themselves (even where VCCs are not "tokenised"). In that respect, we agree with ISDA that:[346]

> VCCs can be seen as representing exclusive access to a finite resource – namely, an independently verified certification that the holder either directly or indirectly has reduced or removed from the atmosphere one metric ton of carbon dioxide equivalent, in accordance with relevant carbon standards and registry rules. They therefore constitute an intangible asset that is distinct from any underlying register in which entitlements to such VCCs are recorded.

4.75 We think that the law of England and Wales therefore provides a high degree of legal certainty with respect to VCCs. At the same time, it retains the inherent flexibility of the common law to be responsive to particular technologies when considering the question of proprietary status. Together, we think that this should help to cement the law of England and Wales as a highly competitive law of choice for structuring arrangements involving VCCs.

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345 Professor Cutts pp 968–969.

346 ISDA pp 633–636 (para 2.1). See also B Holligan, "Commodity or Propriety? Unauthorised Transfer of Intangible Entitlements in the EU Emissions Trading System" (2020) 83 *Modern Law Review* 979. The article considers in detail how property rules enable market activity through the creation of an "abstract carbon commodity", describes how that "abstract carbon commodity" could benefit from technology specific considerations and considers the complex interrelationship between public and private law in carbon markets.

In-game digital assets and domain names

4.76 In our consultation paper, we said that, in general, email accounts[347] and in-game digital assets (as they are currently constructed) are unlikely to satisfy our proposed criteria.

4.77 We said that, in general, email accounts and in-game digital assets are structured such that the account holder, or the player, has (contractual) rights against the service provider of the email account or the in-game digital asset. Moreover, we said that when considering an in-game digital asset, it is extremely difficult to point to a standalone thing that is rivalrous and that could be the object of personal property rights. Instead, the in-game digital asset exists as the result of a combination of infrastructure, intellectual property, and servers which enable a network of players to play together in the same ecosystem.

4.78 We went on to discuss a number of emerging use-cases where in-game digital assets are already testing the boundaries of the law of personal property, and the boundaries of whether and how rights relating to those in-game digital assets are properly characterised. We said that legal structuring in this area remains at an early stage of development. However, we anticipated that the ability of market participants to use digital assets that are object-like in some of their functionalities — such as NFTs — in novel ways to help govern, or as part of wider, online relationships will become increasingly important. In particular, we said that such digital objects might facilitate greater participation by users worldwide, the more efficient allocation to users of online resources that are considered valuable by market participants and online arrangements that have the potential to "fractionate existing power structures".[348]

4.79 Digital assets that rely on public, permissionless and decentralised systems are particularly interesting in this respect because they allow the creation of global, standardised, user-controlled and potentially cross-application methods of communicating/transmitting value and recording provenance.[349] We said that the law of England and Wales is well-placed to facilitate this experimentation, innovation and iterative development.[350]

4.80 Notwithstanding this, some consultees expressed concern that in-game digital assets might not satisfy our proposed criteria. Here, we discuss some of the issues raised by consultees.

4.81 First, a number of consultees said that NFTs or other digital assets with object-like qualities can now be used within in-game environments in a variety of ways. Games

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347 We analysed email accounts broadly, as opposed to mailboxes directly. We think that mailboxes themselves are more likely to satisfy our proposed criteria. See also the responses from Queen Mary University of London (Cloud Legal Project) pp 888–889 and Deloitte Legal (UK) pp 444–445 which discuss the legal analysis directly in relation to mailboxes.

348 See https://cobie.substack.com/p/wtf-is-web3.

349 We expect that the recording of provenance will become increasingly essential, particularly as large language models and other forms of machine learning become increasingly able to create, replicate and iterate content.

350 For example, in the context of machine learning, see Department for Science, Innovation & Technology, "A pro-innovation approach to AI regulation" (2023) CP 815.

could permit self-holders of NFTs certain benefits (such as visual representations of clothing or weaponry within in-game environments).[351] The platform or provider could itself hold the NFT (possibly under some form of intermediated holding arrangement) with the user being given a temporary right of use.[352] In-game environments could integrate with crypto-token systems to offer bespoke trading environments for specific NFTs or crypto-tokens, which themselves might be interchangeable with in-game currency or items that were more centralised in nature.[353] We agree that these structuring options are possible under the law of England and Wales.

4.82 Second, some consultees said that certain in-game digital assets might exist in environments that could potentially give rise to things to which personal property rights can relate. Many in-game digital assets are constituted by a multimedia arrangement where a processing engine interacts with user devices, user accounts, a data store, a user and — perhaps — an operator.[354] Deloitte, Meta, Professor Cutts, Russell-Cooke LLP and The Cloud Legal Project[355] all said that there are potential combinations of these arrangements which could give rise to a rivalrous thing that should be capable of being an object of personal property rights. They said that in those situations, although legal agreements might be used as part of the overall multimedia arrangement, the in-game digital asset could still be considered as an independently existing thing. On this point, Professor Cutts said that there is a difference between assets which are "causally connected to legal networks, services, and relationships",[356] and assets which are *only* legal relationships, existing only insofar as they are rights or claims enforceable by action. Some consultees made similar arguments in respect of domain names.[357] The argument is that even though these digital assets depend on legal relationships, they exist as more than the legal relationships themselves.[358]

4.83 Our conclusions in this report do not preclude this argument. Instead, we conclude that it is important that the law of England and Wales can be technology responsive and interrogate the idiosyncratic features of the asset in question when considering its

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351 We expect that this could be achieved by certain end-user licence agreement-based access rights being granted in respect of (or linked to) a distinct object of personal property rights, such as an NFT. For a more detailed discussion on this point and a practical example, see from para 7.61 of our consultation paper. See also Meta, pp 795–797.

352 DeCaDe pp 437–439.

353 Gunnercooke LLP p 560; Russell-Cooke LLP p 899.

354 Deloitte Legal (UK) pp 445–446.

355 Deloitte Legal (UK) pp 445–446; Meta pp 795–797; Professor Cutts pp 968–969; Russell-Cooke LLP pp 899; Queen Mary University of London (Cloud Legal Project) pp 892–893.

356 Professor Cutts p 968. We also adopt this reasoning. See from para 4.67 above in relation to various CEAs.

357 Professor Cutts pp 968–969; Deloitte Legal (UK) pp 446–447; Dr Crawford pp 802–803; Queen Mary University of London (Cloud Legal Project) pp 892–893; CLLS-FLC p 512.

358 We acknowledge this argument and that we made a similar argument in the context of centralised crypto-token systems at para 10.103 of our consultation paper. We also discuss the argument in detail in Chapter 7 on in-game digital assets and Chapter 8 on domain names of our consultation paper. See also our discussion on our criterion of independent of persons and independent of the legal system at paras 4.22–4.26.

proprietary status. That is as true of novel and evolving in-game digital assets as it is of crypto-tokens, VCCs and domain names.

Digital files and digital records

4.84 In our consultation paper, we provisionally concluded that digital files did not satisfy our proposed criteria and we did not propose that the law should treat them as things to which personal property rights can relate. However, we noted that, in future, digital files might be designed in such a way that they did satisfy our proposed criteria. We also said that market participants should be able to structure their arrangements such that things that do not fall within our proposed third category could be linked in some way to things that do. In this way, we considered that our provisional proposals allowed the greatest degree of flexibility for market participants to structure their arrangements as they choose.

4.85 Most consultees agreed.[359] However, some consultees said that digital files are now so advanced in their construction that they are rivalrous and that logical access controls mean that a person can exclude others from, and so make exclusive use of, a digital file. The Cloud Legal Project said:[360]

> Digital files are excludable by design through access controls at the logical layer. This typically includes an identity and access management system, often in the form of user accounts with associated privileges and passwords.

4.86 The Cloud Legal Project also said that the UNIDROIT Working Group concluded that password protected Word and Excel files fall within the definition of controllable "electronic record" in the UNIDROIT Principles, meaning that they are, under those principles, things to which personal property rights can relate.[361]

4.87 We consider that the provisional conclusion in our consultation paper that digital files are not, in general, things to which personal property rights can relate remains correct. But we acknowledge that — as with other types of intangible things — it might be possible now or in future to construct digital files such that they are appropriate objects of personal property rights.[362] Much will depend on the specific technology and design of the digital file in question.[363] For example, it might be possible now or in

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359 Twenty of 35 consultees agreed with our provisional conclusion that digital files did not satisfy our proposed criteria. Seven consultees disagreed, and eight expressed mixed views. However, 17 consultees said generally that digital files should not attract property rights, while 12 said that they should.

360 Queen Mary University of London (Cloud Legal Project) p 885.

361 We note, however, that the UNIDROIT Principles also say that "Principles law may have no material impact or utility for such assets": UNIDROIT Working Group, *UNIDROIT Principles on Digital Assets and Private Law* (2023) p 19, para 2.17.

362 See, for example, Queen Mary University of London (Cloud Legal Project) pp 884–887. For arguments on how blockchain-system based digital media could be appropriate objects of personal property rights and the interaction of such digital objects with copyright, see J Durham, "Creating True Digital Ownership with the 'First Sale' Doctrine" (2023) 23 *Wake Forest Journal of Business and Intellectual Property Law Journal* 3.

363 We acknowledged this point at para 6.61 of our consultation paper.

future to structure digital files so that they are rivalrous in a way that, historically, digital files were not.[364]

4.88 For completeness, we note that this area has attracted renewed academic interest since the publication of our consultation paper as digital files continue to develop from a technological perspective.[365]

[364] For example, there is case law on the point that digital files are not appropriate objects of personal property rights, but those cases considered digital files constructed using technology available at the time. See, for example, *Your Response v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] 1 QB 41.

[365] For more on this debate, see the responses of Queen Mary University of London (Cloud Legal Project) at pp 884–887, and Dr Hayward at pp 106–108. See also J D Michels and C Millard, "The New Things: Property Rights in Digital Files" (2022) 81 *Cambridge Law Journal* 323, and in response: D K B Seng and K Low, "Data Objects: New Things or No-Thing More Than Ignis Fatuus" (2022), available at: https://ssrn.com/abstract=4308631. See also J Grimmelmann and C Mulligan, "Data Property" (2022), available at: https://ssrn.com/abstract=4251825, and J Fairfield, "Virtual property" (2005) 85 *Boston University Law Review* 1047.

Chapter 5: Control

INTRODUCTION

5.1 The factual ability either to exclude or to permit access to a thing is fundamental to the law of personal property. As Professor Gray suggests, property rights have more to do with control over access to a thing than with enjoyment of the thing.[366]

5.2 In this chapter, we describe (but do not define) the factual concept that best captures the ability to (1) exclude or permit access to a third category thing; and (2) put a third category thing to the uses of which it is capable. We call this factual concept "control".[367] We go on to discuss the legal significance of the concept of control over third category things.

5.3 There is scope within the third category for a variety of different types of things. We consider that the concept of control is likely to be appropriate for the vast majority of these third category things. However, we do not think that third category things should be defined by the concept of control directly. The concept of control might not always map neatly or consistently onto those third category things: control is highly complex, composable[368] and multi-faceted in the context of third category things; and different technology, products and services use control in different ways.

5.4 As such, our principal (and only) recommendation in this chapter is that the Government creates or nominates a panel of industry-specific technical experts,[369] legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).

FACTUAL AND LEGAL CONTROL

5.5 Most consultees agreed that that the law of England and Wales should develop jurisprudence concerning a concept of control, as applicable to third category things.[370]

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366 K Gray, "Property in Thin Air" (1991) 50 *Cambridge Law Journal* 251, 294. See also our discussion on excludability in our consultation paper at paras 2.70–2.73 and in this report from para 4.33.

367 Sometimes, this concept is thought of or referred to as "holding" or "having" a third category thing.

368 A highly composable system provides components that can be selected and assembled in various combinations to satisfy specific user requirements. For example, many crypto-token systems and ancillary products combine different elements of technology to manipulate how control works within those systems.

369 This would need to include those with expertise in the crypto-token markets, and not just those with expertise in traditional finance markets or intermediated securities markets.

370 Of the 45 consultees who responded to consultation question 16, 23 agreed outright and 11 provided qualified agreement. Three consultees provided a mixed response, and eight disagreed. Of those that provided mixed responses or disagreed, four argued in favour of a concept involving possession: CILEX

5.6 Many consultees also said that there is a useful distinction to be drawn between factual control and the legal consequences of that factual control.[371]

5.7 We discuss both factual control and its legal consequences in more detail below. Two core areas of inconsistency emerged from consultee responses. First, consultees did not give uniform descriptions of factual control itself, and those descriptions were often different depending on the specific technology to which the response referred. Second, consultees did not all have the same view as to what should be the legal consequences of factual control when considered in the context of transfers, intermediated holding arrangements, collateral arrangements and causes of action and associated remedies in relation to third category things.

FACTUAL CONTROL

5.8 We describe control as a factual matter. *Factual* control functions as an important constituent element of more complex *legal* mechanisms or structures.

5.9 This mirrors the position taken by the UNIDROIT Working Group:[372]

> The … requirements … contemplate that 'control' assumes a role that is a functional equivalent to that of 'possession' of movables. However, 'possession' in this context is a purely factual matter and not a legal concept. Moreover, because a digital asset is intangible, this functional equivalence to possession involves only the dominion and power over a digital asset but does not involve the physical situs dimension applicable to possession of movables. Whether 'control' … exists is a matter of fact and does not depend on a legal conclusion. However … the presence of control gives rise to legal consequences.

pp 276–277; LawFiDAO p 729; King's College London pp 674–677; and COMBAR and the Chancery Bar Association pp 345–357 (paras 15.1–15.20). Conversely, three consultees disapproved of applying the concept of possession to third category things, but also disagreed with the formulation of control set out in our consultation paper: CLLS-FLC p 505; Professor Low p 691; and Professor Sheehan pp 477–480.

Of the 37 consultees who responded to consultation question 18, eighteen agreed outright and four provided qualified agreement. Seven consultees provided a mixed response, and eight disagreed. Those who gave mixed responses or disagreed did not necessarily disapprove of the concept of control, but instead considered that it should be introduced through statute, rather than common law development. See Centre for Commercial Law at the University of Aberdeen p 253; Stirling & Rose LLP p 962; Dr Hayward pp 109–110; Eversheds Sutherland LLP p 496; Professor Tettenborn p 53; Deloitte Legal (UK) p 449; CLLS-FLC p 519; CILEX pp 276–277; LawFiDAO p 729; AFME and AGC pp 16–17; Lewis McAuley-Jones p 738.

[371] We did not consult on this specific point but this point was raised by many consultees largely in their responses to consultation questions 16, 17, and 18. We consider the responses to these consultation questions in greater detail below.

[372] UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 38 para 6.2.

5.10 In our consultation paper, we said that, broadly speaking, the person in control of a [digital] object[373] at a particular moment in time[374] is the person who is able sufficiently to:

(1) exclude others from the [digital] object;

(2) put the [digital] object to the uses of which it is capable;[375] and

(3) identify themselves as the person with the abilities specified in (1) to (2) above.

5.11 We explained our reasoning for the language in these limbs in detail in paragraphs 11.90 to 11.101 of our consultation paper.

5.12 Based on consultee responses, we do not recommend a statutory definition of factual control. Instead, we conclude that the common law is best placed to develop jurisprudence concerning a concept of control, for the following reasons.

Factual control over digital objects is complex and technology specific

5.13 While consultees broadly agreed with our high-level description of factual control,[376] they set out a number of ways in which factual control can be more complex than our description recognises. Many consultees gave examples of situations in which factual control is not well covered by this description, because of how it is mediated by specific technological arrangements. Many consultees focused their discussion on digital objects, including crypto-tokens and NFTs, by way of example.

5.14 The most obvious and most-cited area of complexity was the (common) situation in which multi-signature arrangements are used in respect of digital objects such as crypto-tokens.[377] Consultees also said that participant activities within crypto-token systems and/or DeFi arrangements can add complexity to the concept of factual control and gave examples related to mining, validator staking and associated arrangements, other types of non-validator staking,[378] and the operation and

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373 Our consultation paper referred to "data objects". We discuss this term in more detail in Chapter 3 (Third thing), from para 3.62.

374 We discuss the concept of "time" in Appendix 3 and 5 of our consultation paper in the context of Layer 2 implementations of crypto-tokens, and Appendix 4 in the context of our short-form, tentative description of a crypto-token. As we suggest, the concept of time might have to take on a level of nuance if it is accurately to apply to, for example, crypto-token systems which may use different methods of establishing a canonical and chronological order of transactional events or state-changes.

375 Including, if applicable, to effect a passing of, or transfer of, that control to another person, or a divestiture of control.

376 Of the 38 consultees who responded to consultation question 17, 17 agreed outright and 13 provided qualified agreement. Two consultees provided a mixed response, and six disagreed.

377 See, for example Deloitte Legal (UK) pp 448–449; ISDA p 636 (para 2.2.1); Hugh James LLP p 573; and Linklaters LLP pp 750–751 (para 1.5.4).

378 For a discussion on the differences between validator staking and non-validator staking, which are beyond the scope of this report, see: J Burnie and M Kimber, "What's at stake? The legal treatment of staking" (2022) 37 *Journal of International Banking and Financial Law* 594, also available at: https://gunnercooke.com/whats-at-stake-the-legal-treatment-of-staking/.

Matthew Kimber is the lead lawyer on this project.

deployment of smart contracts.[379] Further situations which could give rise to added complexity include the receipt of unexpected (or unknown) crypto-token airdrops,[380] and crypto-token system or network downtime.[381]

5.15 This illustrates that digital objects in the third category give rise to a fundamental challenge that the law will have to acknowledge. That is, technology now facilitates the creation of intangible[382] things of value which are programmable, are rivalrous and which can be transferred, stored or traded electronically on permissionless and public global systems.[383] Because this facilitating technology is often open-source, it is more likely than not that these types of digital object will proliferate over time, in number, use-case, design and technological functionality.[384] If that happens, the law will find it increasingly difficult to maintain and uniformly apply rigid definitions to different types of technology or to different digital objects. We conclude that this is equally true of a broad, all-inclusive definition of control.

Rivalrousness is preferable to control when defining the thing in question

5.16 Both the UNIDROIT Working Group and the UCC Committee define the digital assets to which their provisions relate by reference to the concept of control. They use the principle of a controllable "electronic record".[385] Therefore, it makes sense that those provisions also define the concept of control. In contrast, and for the reasons we discuss in Chapter 4 (Third thing in practice), we decided not to define the digital assets in question by reference to control. Instead, we conclude that, when defining the thing in question, it is more appropriate for the law of England and Wales to focus on the rivalrous nature of a thing, rather than its excludability or susceptibility to (exclusive) control. This means that a rigid definition of control is not required. Instead, we treat control as an important constituent part of a relationship that a person can have with the thing in question.

Consistency with the law of possession

5.17 Our proposals treat control as a (factual) relationship that a person can have with a third category thing — an analogous (but distinct) concept to possession. In our consultation paper, we acknowledged the layers of complexity to the concept of possession. While we do not necessarily see this complexity as desirable in the context of third category things, it might be inevitable. But although it is complex, the concept of possession has remained a remarkably flexible tool for the law of England and Wales, able to deal with myriad things in possession and parties' relationships

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379 COMBAR and the Chancery Bar Association pp 345–357 (paras 15.1–15.20), and Linklaters LLP pp 747–751 (para 1.5), made points to this effect.

380 Raised by Linklaters LLP pp 749–750 (para 1.5.2).

381 Raised by Deloitte Legal (UK) p 448.

382 See n 68 for our discussion on intangibility.

383 Stirling & Rose LLP p 949.

384 That is not to comment, however, on whether any current example will continue to hold any social or market value.

385 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 2, p 16; UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.

with them. The law would almost certainly not have been able to develop the necessary nuance had possession been defined in legislation.[386]

5.18 We want to keep this same flexibility for third category things, and ensure that the law does not ask more of third category things than the law asks of things in possession. We consider that defining a concept of control in statute would risk undermining this position.

COMMON LAW DEVELOPMENT AND TECHNICAL EXPERT GROUP

5.19 We conclude that the common law will work as the principal driving force in developing accurate and nuanced jurisprudence concerning control that can apply to digital objects for the following reasons.

5.20 We think that the courts will turn to the concept of control as a matter of default. The broad concept of factual control can apply to both things in possession[387] and to things in action,[388] so ought equally to be able to apply to third category things as a matter of default (given that possession will not apply). The courts will also be able to draw on,[389] if necessary, analogous case law in other jurisdictions, and international law reform initiatives, such as the UNIDROIT Working Group's Control Principle, to help them develop the concept of control under the law of England and Wales. Indeed, the UNIDROIT Working Group does not explicitly recommend that Member States adopt a statutory definition of control: it instead frames its Control Principle as a broad guiding principle.[390]

5.21 We prefer this approach because it is most consistent with existing law. The common law has developed the principles of possession (and factual control) over time, in response to market developments and legal challenges. It is certainly able to do so again in the context of digital objects. In essence, we conclude that questions of factual control are essentially akin to any complex finding of fact, which courts are more than capable of reaching.

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386 See our discussion in n 462 below, and Chapter 8 (Collateral arrangements) from para 8.90, regarding the partial definition of possession provided in the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs").

387 As we discuss at para 11.29 of our consultation paper, factual control plays an important role in the concept of possession. In brief, there are two elements to possession: sufficient control/custody and an intention to use that control/custody on one's own behalf: see for example *The Manchester Ship Canal Co Ltd v Vauxhall Motors Ltd* [2019] UKSC 46, [2020] AC 1161 at [42] and [55], by Lord Briggs, approving *The Manchester Ship Canal Co Ltd v Vauxhall Motors Ltd* [2018] EWCA Civ 1100, [2019] WLR 330 Ch 331 at [59], by Lewison LJ.

388 Control over things in action is important for a variety of different legal concepts but does not work in the same way as control over tangible things. For example, control is important when identifying a charge as fixed or floating: "charges have to be characterised as one or the other against the background of a graduated scale of control, ranging from tight restriction to extreme freedom to deal", M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 16.082.

389 But not be fettered or bound by.

390 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 6 (and associated guidance).

5.22 This will also allow legislative reform to focus on highly nuanced and market-specific areas of law such as regulating aspects of intermediated holding arrangements[391] or developing a statutory regime for the provision of (certain) crypto-tokens and (certain) cryptoassets as collateral.[392] Those areas are likely to need to use the concept of factual control as a constituent element within a range of higher-level organising or framing principles. For example, the more appropriate focus of regulation in respect of custodial intermediated holding arrangements might be "safeguarding" assets rather than simply "controlling" them.[393] And, as we discuss in Chapter 8 (Collateral arrangements), a perfection requirement for security interests could incorporate factual control as a core constituent element, but could be defined in terms of a more flexible, higher order framing principle, such as "the provision of collateral".[394] We think that innovation and incremental development in those areas might be hampered by prescribing a concept of factual control that could not, in itself, recognise the nuance and market-specificity of those types of complex arrangements.

A technical expert group on factual and legal issues relating to control and other issues relating to digital asset systems and markets

5.23 We recognise that the courts will still encounter difficulties in making complex findings of fact where control works differently for different third category things and through different technological implementations. In anticipation of those difficulties, we recommend that the Government creates or nominates a panel of industry-specific technical experts, legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).

5.24 There are already many parallels with this approach. For example, the UKJT Legal Statement, although non-binding, was integral to the development of the law of England and Wales (and many other common-law jurisdictions) in respect of crypto-tokens. The UKJT continues to innovate in this area: in 2021 it published the UKJT digital dispute resolution rules and in 2023 it published its Legal Statement on Digital Securities. It has proven that technology-specific, detailed, practical and industry-led legal guidance is fundamental to the facilitation and development of legal principles relating to novel technology. And, in this vein, Government has recognised the importance of a high-level industry group, the Cryptoasset Engagement Group, to help

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391 We discuss intermediated holding arrangements, including custodial intermediated holding arrangements in Chapter 7. Regulation is out of the scope of our report. However, we note that the regulatory aspects of custodial intermediated holding arrangements were considered by HM Treasury in their recent consultation and call for evidence paper: HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) ch 8.

392 Which we discuss in Chapter 8 (Collateral arrangements) from para 8.104.

393 Although safeguarding would likely include *some* form of control. This seems to have been (at least provisionally) recognised by HM Treasury, in setting out its regulatory outcomes for a potential cryptoasset custody regime: "Custodians should ensure adequate arrangements to *safeguard* investors' rights to their cryptoassets when it is responsible for them such that, if and when the custodian becomes insolvent, those assets are returned to investors promptly and as whole as possible": HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) p 50.

394 Chapter 8 (Collateral arrangements) para 8.114.

guide policy development.[395] We think that either body could potentially take on the role of the technical expert group, although we think it should be a separate sub-committee/panel with additional members drawn from industry who have technical and practical experience of the crypto-token markets if it is to provide detailed, ongoing guidance. Alternatively, the technical expert group could be formed as a separate group and could potentially draw from both the UKJT and the Cryptoasset Engagement Group, as well as wider industry participants.

5.25 Similarly, in our report on Electronic Execution of Documents,[396] we concluded that electronic signatures were valid for the vast majority of business transactions and legal processes. Nevertheless, that report also recognised that many uncertainties existed which have hindered the use of electronic signatures and limited the confidence of professionals and individuals in their use. For those reasons, we recommended that a multi-disciplinary group of business, legal and technical experts should be convened to consider the practical and technical issues involved, and to identify potential solutions. In response, an Industry Working Group was set up in 2021 and its task was to produce best practice guidelines and make proposals for further reform and development. That group published an interim report in February 2022[397] and a final report in February 2023.[398] We think that a similar approach would be helpful in the context of control, and other issues relating to third category things more broadly. Such guidance, while remaining non-binding, should be useful for a court that is considering a case involving similar issues. For example, in *AA v Persons Unknown,* Mr Justice Bryan referred to the guidance of the UKJT and said:[399]

> It follows that 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 and, as I shall come on to, 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.

5.26 Consultees overwhelmingly agreed with our provisional proposal that a technical expert group would be beneficial.[400] Consultees said that similar technical expert

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395 See Keynote Speech by John Glen, Economic Secretary to the Treasury, at the Innovate Finance Global Summit during Fintech Week 2022, available at: https://www.gov.uk/government/speeches/keynote-speech-by-john-glen-economic-secretary-to-the-treasury-at-the-innovate-finance-global-summit.

396 Electronic execution of documents (2019) Law Com No 386.

397 Industry Working Group, "Electronic Execution of Documents: Industry Working Group Interim Report" (2022), available at: https://www.gov.uk/government/publications/industry-working-group-on-esignatures-interim-report.

398 Industry Working Group "Electronic Execution of Documents: Industry Working Group Final Report" (2023), available at: https://www.gov.uk/government/publications/industry-working-group-on-esignatures-final-report.

399 [2019] EWHC 3556 (Comm), [2023] 4 WLR 35 at [57].

400 Of the 42 consultees who responded to our provisional conclusion (which suggested the establishment of a technical expert group), 31 agreed outright and four gave qualified agreement. One consultee gave a mixed response, and six disagreed.

groups have proven helpful in other areas of law.[401] Our discussions with senior and specialist judges also indicated that the guidance of the technical expert group would be helpful for the development of principles of private law in this context.[402]

Possible scope and output of the technical expert group

5.27 We conclude that common law jurisprudence will be enhanced and made easier to understand for market participants by focusing on better descriptions and real-world examples of factual control. The technical expert group could describe the different factual ways in which control is used in the market today (and, crucially, update those descriptions as the market and technology evolves). It could undertake this exercise on the specific understanding that its output will be helpful for the judiciary when considering legal issues relating to control. It would therefore need to balance technical accuracy with accessibility for legal professionals.

5.28 A good pre-existing example is the set of Appendices to the UKJT consultation paper, which considered highly technology-specific issues, including the differences between UTXO-based and Account-based systems.[403] Similar work would need to be undertaken for new and evolving token standards and technical implementations, and for the principal ways in which both public, permissionless crypto-token systems and private, permissioned blockchain systems manifest, manipulate and use control. Much of this work is already underway and is, as experience in other areas has shown, eminently achievable.

A control example

5.29 By way of specific example, control in the context of transfers within crypto-token systems is different for UTXO-based systems like Bitcoin and Account-based systems like Ethereum. Ethereum, for example, has a different way of: (a) signing a transaction operation to a Bitcoin transaction operation; and (b) composing the transaction data structure. Bitcoin transactions are composed from UTXOs that reference a particular way of unlocking/spending a notional unit of account — bitcoin/satoshis. They are composed from select UTXOs across the transactions on the blockchain which have a reference to a public address (as opposed to Ethereum transactions where a value is directly associated in an account). The UTXOs used as inputs to a transaction are usually determined by the wallet software being used.

5.30 And even within Bitcoin, control can work differently. For example, transactions can also be composed from discrete UTXOs (“coin selection”) and UTXOs can be encumbered in different ways (for example, through hashlocks and timelocks). Hash Time Locked Contracts are used for atomic swaps (that is, swaps between

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401 Such as the UN Convention on the International Sale of Goods Advisory Council (Dr Hayward pp 110–111) and, in the tax avoidance context, the General Anti-Abuse Rule Advisory Panel (D2 Legal Technology pp 417–418 and The Law Society pp 713–714).

402 We think that the guidance of a technical expert group might also be helpful for the ongoing development of a nimble and proportionate regulatory regime.

403 Appendices 2 and 3 of the UKJT, “Public consultation: The status of cryptoassets, distributed ledger technology and smart contracts under English private law” (UKJT Consultation Paper) (2019) are reproduced in appendix 6 of our consultation paper, from p 510. See further our consultation paper, which discusses UTXO-based systems (paras 12.13–12.35), Account-based systems (paras 12.36–12.40), as well as both fungible and non-fungible token standards (paras 12.45–12.60).

blockchains) and in payment channels (such as on the Lightning Network).[404] These architecture differences and different forms of technical encumbrance can significantly change the analysis of control relative to the conception of a transaction as simply authenticating a data structure using a private key.

Other examples of control

5.31 Control is also used in different ways by different market participants and service providers. It would be useful for the technical expert group to describe practical, real-world examples of how control works in different circumstances.

5.32 Principal areas which we consider could be covered in due course include:[405]

(1) The factual operation of control within different types of (public, permissionless) Layer 1 protocols, such as Bitcoin, Ethereum, Solana and Avalanche.[406]

(2) The factual operation of control within different types of (private, permissioned) blockchain systems, such as Hyperledger Fabric and Corda.[407]

(3) The factual operation of control in relation to the principal token standards (common interfaces for contracts)[408] deployed to different protocols. Well known examples are the ERC-20 and Solana SPL token standards, and the ERC-721 and Tezos FA2 token standards.[409]

(4) How factual control operates and is used within some of the principal smart contract protocols that are used for DeFi activities. Describing how this control

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404 Hash Time Locked Contracts ("HTLCs") can be developed as a class of conditional transactions that require the recipient to acknowledge receipt by generating cryptographic proof prior to a stipulated deadline to receive the payment. A HTLC is a combination of two encumbrances that can be added to a transaction — a hashlock and a timelock. A hashlock is a type of encumbrance that restricts a transaction until a hashed version of a public key generated by the initiator of that transaction is unlocked with the associated private key. A timelock is a similar form of constraint that specifies the earliest time or block when that transaction can be added to the blockchain. Conditional payments of this nature are used for escrow-like arrangements in Layer 2 solutions such as the Lightning Network (https://lightning.network/lightning-network-paper.pdf#page=30) in which transactions are completed through a process known as network routing.

405 While we provide real-world examples for illustrative purposes, the technical expert group might decide to frame its analysis in general terms, as was done in the Appendices to the UKJT Consultation Paper.

406 For Layer 1, Bitcoin, and Ethereum, see Glossary. For Solana, see: https://solana.com/. For Avalanche, see: https://www.avax.network/.

407 For Hyperledger Fabric, see: https://www.hyperledger.org/use/fabric. For Corda, see: https://corda.net/.

408 A Antonopoulos and G Wood, *Mastering Ethereum* (2018) p 227.

409 Token standards are minimum, descriptive standards, and each token smart contract is likely to be implemented in different ways. The internal functioning of the smart contract is not relevant to the standard. The ERC-20 token standard is available at Ethereum, "EIP-20 Token Standard": https://eips.ethereum.org/EIPS/eip-20. Well-known ERC-20 tokens include Chainlink (LINK), Tether (USDT) and Wrapped Bitcoin (WBTC). The Solana SPL token standard is available at: https://michaelhly.github.io/solana-py/spl/token/client/. The ERC-721 token standard is available at Ethereum, "EIP-721: Non-Fungible Token Standard": https://eips.ethereum.org/EIPS/eip-721. Many (but not all) Ethereum-based "NFTs" use the ERC-721 standard for their implementation. The Tezos FA2 token standard is available at K Ivanov, "tz1p-12.md": https://eips.ethereum.org/EIPS/eip-721, and can be used to implement both fungible and non-fungible tokens. Further information on the Tezos FA2 token standard is available at: https://wiki.tezos.com/build/create-a-tezos-token/fa2.

works will help to distinguish the functionality of those systems from the functionality of existing traditional finance systems. Broad areas of focus could be:

(a) systems that mimic or recreate some of the functionality or results of traditional financial services such as "loan" markets (examples include Maker and Aave);[410]

(b) systems that facilitate peer-to-peer, or decentralised, swapping or trading of tokens using automated market maker protocols (examples include Uniswap and Curve);[411] and

(c) various "lock and mint" arrangements which involve relinquishing control over one form of crypto-token (the "locked" token), and the related receipt of control of a different form of crypto-token, which is the "minted" token.[412] These types of arrangements are commonly used for varied and important purposes within DeFi ecosystems. Examples include "liquid staking derivative" systems related to validator staking (such as Lido and Rocket Pool); token bridges and wrapping protocols (such as the Wormhole bridge protocol and wrapped bitcoin); and NFT fractionalisation programs.[413]

(5) How factual control operates and is used for different types of staking mechanisms, arrangements and services, including (but not limited to) direct, individual validator staking, delegated validator staking (or "staking as a service" mechanisms), pooled validator staking arrangements and "liquid staking derivative" systems related to validator staking (to the extent not covered above).[414] Examples of providers of some such services include Allnodes, Coinbase and P2P Validator.[415]

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410 For Maker, see: https://makerdao.com/en/. For Aave, see: https://aave.com/.

411 For Uniswap, see: https://uniswap.org/. For Curve, see: https://curve.fi/#/ethereum/swap.

412 Note that we use the term lock and mint broadly, to describe in accessible and consistent language the technical encumbrances and corresponding creation of new tokens that characterise such facilities or arrangements. This is not a term of art within the crypto-token and cryptoasset markets, which generally use more precise and technical terms to refer to the specific features or functionality of the facilities or arrangements in question.

413 For Lido, see: https://lido.fi/. For Rocket Pool, see: https://rocketpool.net/. For the Wormhole bridge protocol, see: https://wormhole.com/. For wrapped bitcoin, see: https://wbtc.network/. For an example of an NFT fractionalisation program, see: https://fractional.art/.

414 For a brief overview of some of the distinctions, see J Burnie and M Kimber, "What's at stake? The legal treatment of staking" (2022) 37 *Journal of International Banking and Financial Law* 594, also available at: https://gunnercooke.com/whats-at-stake-the-legal-treatment-of-staking/. Matthew Kimber is the lead lawyer on this project.

415 For Allnodes, see https://www.allnodes.com/. For Coinbase, see https://www.coinbase.com/earn. For P2P Validator, see: https://p2p.org/. See also: https://www.stakingrewards.com/providers/.

(6) How factual control operates and is used within Layer 2 protocols, rollups and other "scaling" solutions, including "modular" blockchain systems.[416] Examples include Optimism, Arbitrum, zkSync, the Lightning Network, Cosmos and Celestia.[417]

(7) How factual control operates and is used within wallet provider software, and how security features such as "social recovery" might change the operation of control in those circumstances. Examples of such software include Metamask and Argent.[418]

(8) How factual control can be changed or manipulated through "account abstraction" techniques. That is, the addition of arbitrary logic to smart contracts to control crypto-tokens or other assets and perform transactions or state transitions that might change the functional role of private keys through principles of "account abstraction".[419]

(9) How factual control operates and is used or secured through physical hardware wallets. Examples include private key storage on internet connected devices such as computers or mobile phones, paper wallets, Ledger and Trezor hardware wallets and Opendime USB sticks.[420]

(10) How factual control operates and is used within intermediated holding arrangements, including both custodial intermediated holding arrangements and non-custodial intermediated holding arrangements (as we use those terms in Chapter 7 (Intermediated holding arrangements)). This might include how the books and records of such holding intermediaries typically reflect and record crypto-tokens and crypto-token entitlements, how such holding intermediaries themselves secure tokens, the interrelationship between "hot", "warm" and "cold" storage and how any "sweeping" or transfers between such storage occurs. Examples of holding intermediaries (often referred to as crypto-token exchanges) include Coinbase, Binance and Kraken.[421]

(11) How other providers of software-as-a-service in non-holding relationships manipulate factual control. Such services might be provided by service providers who do not themselves hold tokens on an intermediated basis but do,

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416 Generally, blockchain systems require four functions: execution, settlement, consensus, and data availability. Traditional blockchain systems implement all four functions together in a single base consensus layer. Conversely, modular blockchain systems split these functions among multiple separate layers. See Celestia, "Monolithic vs. modular blockchains" (2023), available at: https://docs.celestia.org/concepts/how-celestia-works/monolithic-vs-modular/.

417 For Optimism, see: https://www.optimism.io/. For Arbitrum, see: https://arbitrum.io/. For zkSync, see: https://zksync.io/. For the Lightning Network, see: https://lightning.network/. For Cosmos, see: https://cosmos.network/. For Celestia, see: https://celestia.org/.

418 For Metamask, see: https://metamask.io/. For Argent, see: https://www.argent.xyz/.

419 See https://ethereum.org/en/roadmap/account-abstraction/.

420 For Ledger, see https://www.ledger.com/. For Trezor, see https://trezor.io/. For Opendime, see: https://opendime.com/.

421 For Coinbase, see: https://www.coinbase.com/. For Binance, see https://www.binance.com/en. For Kraken, see https://www.kraken.com/en-gb.

for example, “safeguard” private keys or parts thereof. Examples include Copper and Gnosis Safe.[422]

5.33 These questions are not hypothetical. For example, the High Court of England and Wales recently had to consider some of the legal consequences of token bridges and wrapping protocols in the context of claims and applications for injunctive relief following a hack of the Wormhole bridge protocol.[423] And in *Piroozzadeh v Persons Unknown* the court had to consider the operation of non-custodial intermediated holding arrangements provided by a crypto-token exchange.[424]

5.34 The purpose of the technical expert group considering these different types of control is to provide the legal market and the judiciary with a common toolkit and factual reference point from which to develop clear and consistent legal analysis. Rather than relying on inaccurate analogies (such as an analogy with a physical object in a warehouse, the door to which has multiple keys; or a traditional bank account; or a bag of gold), market participants and courts will benefit from an analysis of the actual technology in question.[425] This will force claimants and defendants more accurately to disclose and present their cases, which should lead to clearer, more logical and more consistent applications of legal rules and reasoning over time. This is fundamental to our conclusion that the common law is the most appropriate mechanism for legal development with respect to the nuanced features of digital objects. A principal goal of the technical expert group could be to maintain a repository of material that considers different factual scenarios and ensures that technological analysis is in line with existing market practice and proposed future developments.

5.35 Our recommendation is based on our conclusion that the law of England and Wales must remain sufficiently flexible to recognise and respond to the idiosyncratic features of digital objects. Specifically, it must recognise that control over third category things is manifested and mediated by software and works differently to control over things in possession and things in action. To ignore the fundamental design-features of third category things (particularly crypto-tokens that exist by reference to public, permissionless and distributed crypto-token systems) risks the law evolving at odds with the expectations and intentions of market participants. Instead, it is better for the law to accept the reality of modern technology and to adapt to it in a way that is responsive to the peculiar features of different technology, with the help and guidance of experts.

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422 For Copper, see: https://copper.co/. For Gnosis Safe, see: https://safe.global/.

423 See the order of Judge Pelling KC in *Tai Mo Shan Limited v Oazo Apps Limited* (2023) (unreported) in the context of the New York County Supreme Court case *Tai Mo Shan Limited v. John Doe Nos. 1-100* (651017/2023), available at: https://iapps.courts.state.ny.us/nyscef/DocumentList?docketId=PE6l_PLUS_YSqugbfDL9/PNYAxQ==&display=all&courtType=New%20York%20County%20Supreme%20Court&resultsPageNum=1.

424 [2023] EWHC 1024 (Ch).

425 Or at least technology that is a much closer analogue.

Recommendation 2.

5.36 We recommend that the Government creates or nominates a panel of industry-specific technical experts, legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).

5.37 This panel would need to include those with expertise in the crypto-token markets, and not just those with expertise in traditional finance markets or intermediated securities markets.

THE LEGAL CONSEQUENCES OF CONTROL

5.38 In our consultation paper, we said that the legal consequences of control are complex and varied. Factual control operates as a composite part of more complex legal principles and mechanisms (such as transfers, intermediated holding arrangements, collateral arrangements and causes of action and associated remedies in respect of digital assets). We described control by reference to a subset of digital assets — those that satisfied our proposed criteria — "data objects". However, as we discuss in Chapter 3 (Third thing), consultees said that the criteria for "data objects" could create unnecessary boundary issues. In part, this is also likely to have informed consultees' approaches to the potential legal consequences of control.

5.39 Two broad arguments emerged from consultee responses. On the one hand, a first group of consultees said that control should have similar legal consequences for crypto-tokens (and other third category things) as possession does for tangible things, in various respects.[426] But many of those consultees said that there is merit in treating control as a distinct concept from possession, because:[427]

> It allows for subtle but important differences to develop without diluting or distorting the concept of possession as a physical construct or automatically importing all the "baggage" that comes with the concept of possession.

5.40 On the other hand, a second, smaller group of consultees preferred to treat control in respect of crypto-tokens (and other third category things) as having similar legal consequences to control over things in action.[428] Any jurisprudential development of control[429] to recognise the bearer-like features of third category things was seen by

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426 Examples include Linklaters LLP pp 748–749 (para 1.5.1); COMBAR and the Chancery Bar Association pp 353–357 (paras 15.10–15.20); Norton Rose Fulbright LLP p 840; Dr Hayward pp 108–109; Eversheds Sutherland LLP p 496; and Gunnercooke LLP p 561; Charles Kerrigan and Susan Draper pp 265–266; IDAC and CryptoUK p 592; Professor Akseli pp 854–855; and Ilias Ioannou p 584. See, however, Professor Sheehan pp 477–480.

427 Linklaters LLP pp 748–749 (para 1.5.1).

428 CLLS-FLC pp 514–518; Stephan Smoktunowicz pp 935–936.

429 Or, more accurately, the legal consequences of factual control.

those consultees as developing a concept of control that shared many features of possession, which they considered undesirable.[430]

5.41 Broadly, the position of the first group of consultees is perhaps more reflective of legal issues relevant to the effective operation of markets in — or use-cases that draw on the particular characteristics and functionalities of — crypto-tokens manifested by public, permissionless crypto-token systems.[431] The position of the second group is perhaps more reflective of legal issues relevant to the effective operation of applications that utilise the capabilities of private, permissioned blockchain systems.[432] This dissonance is compounded further by the fact that the crypto-token and cryptoasset markets make use of two distinct structuring mechanisms: one based largely on traditional intermediated securities markets and one based on the technological capabilities of crypto-token systems (which partly reflects some of the features of the market for negotiable bearer instruments).[433] Often these structuring mechanisms are used interchangeably. For example, many holding intermediaries offer both self-holding or "self-custody" holding arrangements for crypto-tokens and intermediated holding arrangements (either custodial or non-custodial) and users can quickly and easily transfer between the various options (often at no cost).

5.42 The view of the first group of consultees was more holistic in that it sought to accommodate both public and private system applications (while recognising their differences). The second group of consultees focused more on private, permissioned blockchain systems and existing intermediated securities structures and markets and sought to explain the legal operation of public, permissionless crypto-token systems and crypto-token markets exclusively by reference to those structures and markets.[434]

5.43 Consultees therefore had fundamentally different views, which broadly centred around their conceptualisation of the digital asset in question and the particular technology with which they were most concerned. As we discuss in Chapter 4 (Third thing in practice), those different views were also apparent in consultees' concerns about creating hard boundaries of a third category of thing to which personal property rights can relate.

5.44 Despite this difference in approach, consultee responses were aligned on the legal consequences of control in most circumstances. Below, we describe the areas where consultees were aligned and then highlight the remaining differences. We return to those differences in later chapters on transfers, intermediated holding arrangements,

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430 An example is CLLS-FLC pp 514–518.

431 See, for example, Gunnercooke LLP p 561; Linklaters LLP pp 748–749 (para 1.5.1); Clifford Chance LLP Industry Group p 330; COMBAR and the Chancery Bar Association pp 353–357 (paras 15.10–15.20); IDAC and CryptoUK pp 604 and 607; Charles Kerrigan and Susan Draper pp 265–266; and ISDA pp 633–636 and 637 (paras 2.1 and 2.2.2).

432 CLLS-FLC pp 517–518, and generally AFME and AGC. For further consideration of the distinction between permissionless and permissioned systems, see Professor Milne p 39.

433 This reflects the two broad categories into which arrangements involving crypto-tokens are generally divided: "CeFi" and "DeFi". We discuss and define these in Chapter 8 (Collateral arrangements).

434 Above. For example, CLLS-FLC (at pp 514–518) illustrate their argument by reference to bank account mandates and many of their other examples reference private, permissioned blockchain systems or include broad references to "intangibles" without any specific reference to public, permissionless crypto-tokens or crypto-token systems.

collateral arrangements and causes of action and associated remedies. Many consultees focused their discussion on digital objects, including crypto-tokens and NFTs, by way of example.

The legal consequences of control — areas of alignment

Situations in which "ownership" and "control" are separated

5.45 Almost all[435] consultees agreed that there are situations in which superior legal title (sometimes referred to as "ownership")[436] to a digital object can be separated from (factual) control over that digital object. Consultees gave a variety of practical examples, including void transfers, some types of intermediated holding arrangements and agency relationships.

Defects in transfers rendering the transfer void

5.46 Some consultees gave examples of defects in the transfer of a digital object that would render the transfer void at law. Examples included situations where a thief steals a digital object outright,[437] where there has been a fundamental mistake in a transfer,[438] or when the transferor lacked the mental capacity to make a valid legal transfer.[439]

5.47 In those scenarios, the transferor will, in general, retain legal title to the digital object, but the transferee will obtain control over the digital object. This has been recognised or referred to by the courts in cases including *Tulip Trading* (in relation to bitcoin),[440]

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435 Of the 33 consultees who responded to consultation question 24, 24 agreed. Two consultees disagreed, while seven provided a qualified or mixed response.

436 The term ownership is generally used to designate the best interest in an object that exists, and the ability to carve-out lesser interests from that (superior) interest. The person with the best interest in an object is accordingly described as the object's owner. See for example J Penner, *The Idea of Property in Law* (1997) p 151; D Sheehan, *The Principles of Personal Property Law* (2nd ed 2017) p 6. However, this has been challenged in S Green and J Randall, *The Tort of Conversion* (2009) p 81: "In a system where title is relative, there is no room for the concept to which non-lawyers would refer as 'ownership'". We return to this discussion in para 5.74 below.

437 See from para 13.35 of our consultation paper, as well as the responses of Norton Rose Fulbright LLP pp 846–847, and Dr Maddox and Dr Richardson pp 833–834. See, more broadly, Dr Crawford p 805.

438 See para 13.35 of our consultation paper, as well as King's College London pp 680–681 and Dr Maddox and Dr Richardson pp 833–834. See further Smart Legal Contracts (2021) Law Com No 563 paras 5.34–5.76.

439 See para 13.35 of our consultation paper, and Professor Sheehan, p 478. See also B Haecker, "Proprietary Restitution after Impaired Consent Transfers: A Generalised Power Model" (2009) 68 *Cambridge Law Journal* 324–360: "only few defects are serious enough to nullify the transferor's intention altogether. They prevent title passing." See also D Fox, *Property Rights in Money* (2008) paras 3.06–3.07.

440 *Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch) at [3], by Falk J.

Osbourne (in relation to NFTs),[441] and *Armstrong* (in relation to EUAs).[442] We discuss this in more detail in Chapter 9 (Remedies).[443]

5.48 In these scenarios, the level of *factual* control over a digital object that a thief or a transferee in a void transaction obtains is the exact same level of factual control that a transferee would obtain in a voidable transaction or in a valid transaction. It is the operation of the law of derivative transfers of title and other principles of private law, rather than differences in the level of factual control obtained, which determine the legal consequences. We return to this point in more detail at paragraph 5.71 below, because not all consultees gave uniform responses on what should be the legal consequences of the factual situation.

Intermediated holding arrangements and agency

5.49 Some consultees said that intermediated holding arrangements (and agency) are a good example of where superior legal title to a digital object might be separated from factual control over the digital object.[444]

5.50 We discuss various intermediated holding arrangements, non-holding arrangements where control is manipulated, and agency in detail in Chapter 7 (Intermediated holding arrangements). In complex intermediated holding arrangements involving digital objects, the level of control obtained by the holding intermediary will be an important factor but might not be determinative of the legal consequences of the arrangement.[445] It is not the *fact* of control alone, but its implications within the law of personal property, contract, trust, agency and representation which determine the legal consequences of the arrangement.

5.51 This is an area in which the technical expert group could give practical guidance, referencing real-life technological implementations and intermediated holding arrangements (involving both public, permissionless crypto-token systems and private, permissioned blockchain systems).

Transfers by a change of control

5.52 In our consultation paper, we provisionally proposed that the law should be clarified to confirm that a transfer operation that effects a state change[446] is a necessary (but not sufficient) condition for a legal transfer of a crypto-token. However, we also

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441 *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm) at [26], by Judge Pelling QC which considered whether assets "stolen" by persons unknown could be held by the persons unknown on constructive trust for the victim.

442 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [287], by Stephen Morris QC. See, however, n 473 below.

443 See Chapter 9 (Remedies) para 9.22 and from 9.39.

444 Norton Rose Fulbright LLP pp 846–848; Linklaters LLP pp 748–749 (para 1.5.1); and COMBAR and the Chancery Bar Association p 377 (paras 34.1–34.4).

445 As we discuss in detail in Chapter 7 (Intermediated holding arrangements), the level of control obtained by a holding intermediary might also be different depending on the arrangement.

446 For more detail, see our discussion in Chapter 6 (Transfers), from para 6.5 and in our consultation paper at from para 13.141.

considered the possibility that a potentially wider condition could apply — namely a "change of control".[447]

5.53 Consultees were broadly aligned in arguing that it was possible as a matter of law to effect a transfer of a digital object by a change of control as opposed to the potentially more limited transfer operation that effects a state change.[448] Many consultees said that intention would be a necessary element in this change of control analysis.[449]

5.54 We discuss transfer operations that effect a state change, transfers by a change of control, derivative transfers of title and the development of a common law special defence of good faith purchaser for value without notice for third category things in detail in Chapter 6 (Transfers).

Intention

5.55 In our consultation paper, we considered the factual concept of possession applicable to tangible things by analogy with the concept of control applicable to third category things including digital objects. There are two elements to the concept of possession: (1) a sufficient degree of custody and control; and (2) an intention to exercise such custody and control on one's own behalf and for one's own benefit.[450] We said that the intention element of the concept of possession is potentially harder to apply in the digital or online context than in the physical world.[451] This is particularly the case when questions of intention relate to systems, technology and digital objects that rely on the deterministic operation of software or computer code.

5.56 Notwithstanding this difficulty, consultees said that intention is likely to remain important in determining the legal consequences of control in the context of transfers of a digital object (either by a transfer operation that effects a state change, or by a change of control).[452]

5.57 We agree. We conclude that intention should form part of the jurisprudential consideration of how control applies to third category things including digital objects.

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447 For more detail, see our discussion in Chapter 6 (Transfers), and at consultation question 26 and para 13.145 of our consultation paper.

448 Which, as we discuss in Chapter 13 of our consultation paper, itself would result in a change of control (although not necessarily a change of controller). Thirty-five consultees answered question 26. Seventeen consultees agreed although many also referred to a change of control; eleven disagreed. Seven consultees gave a qualified or mixed answer.

449 CLLS-FLC p 516; Linklaters LLP pp 749–750 (para 1.5.2); IDAC and CryptoUK pp 594–596; Dr Zhang p 650; COMBAR and the Chancery Bar Association pp 355–356 (para 15.17); Deloitte Legal (UK) p 451; Eversheds Sutherland LLP p 498; Gunnercooke LLP p 563; Norton Rose Fulbright LLP p 844; Professor Sheehan p 477. We discuss intention in more detail below.

450 *The Manchester Ship Canal Co Ltd v Vauxhall Motors Ltd* [2019] UKSC 46, [2020] AC 1161 at [42] and [55], by Lord Briggs, approving *The Manchester Ship Canal Co Ltd v Vauxhall Motors Ltd* [2018] EWCA Civ 1100, [2019] Ch 331 at [59], by Lewison LJ.

451 See our discussion in Chapter 11 of the consultation paper, and (on intention) from para 5.55 below.

452 CLLS-FLC p 516; Linklaters LLP pp 749–750 (para 1.5.2); IDAC and CryptoUK pp 594–596; Dr Zhang p 650; COMBAR and the Chancery Bar Association, pp 355–356 (para 15.17); Deloitte Legal (UK) p 451; Eversheds Sutherland LLP p 498; Gunnercooke LLP p 563; Norton Rose Fulbright LLP p 844; Professor Sheehan p 477. See also D Fox, *Property Rights in Money* (2008) ch 4, where the author discusses what effect the vitiation of a payer's intention has on the validity of payments of corporeal money.

However, we re-iterate our caution that always to search for an element of human intentionality risks introducing an unreal human element to what can often be automatic or deterministic processes.[453]

5.58 We conclude that the common law will again need to develop such that intention is considered in the context of the specific technology or application in question. Consultees said that this is already the case in other areas of law where intention is an objective test that is equally capable of being applied in the context of automated processes.[454]

5.59 Equally, the common law will need to develop principles that allow it to recognise how control (and intention) are used as part of processes and arrangements within DeFi systems. Linklaters LLP explained this point well:[455]

> If there is no person that can be found to have the requisite intention, it may be appropriate to conclude that there is no person with Control of the asset and/or that a particular arrangement has given rise to a relinquishment of Control rather than a transfer of Control. This could potentially be the case in certain circumstances where crypto-tokens are deposited in certain token contracts governed on a completely decentralised basis or with addresses in respect of which no person has knowledge of the private key. We do not see any policy rationale for excluding that possibility.

5.60 We conclude that intention will help to resolve disputes where legal consequences flow from control[456] over a digital object. For example, as Linklaters LLP noted, crypto-tokens can be airdropped[457] to public addresses over which a person has factual control but where that person had no knowledge of the existence of the tokens and/or had no desire to use them. If that change in factual control resulted in a transfer of superior legal title or a control-based legal proprietary interest, the person could potentially suffer adverse tax, regulatory or criminal consequences, where such consequences flow from "ownership" or "control".

5.61 Again, considering how intention might be analysed in a range of different real-world factual scenarios could be an important function of the technical expert group.

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453 See Professors Fox and Gullifer in their joint response to our call for evidence, extracted at para 11.66 of our consultation paper.

454 See Linklaters LLP pp 749–750 (para 1.5.2 and their n 15), which we replicate here: "See, for example, *Software Solutions Partners Ltd, R (on the application of) v HM Customs & Excise* [2007] EWHC 971 (Admin), [2007] BTC 5699, in which the court considered whether an intention to create legal relations existed in the context of an automated electronic process of contracting between insurers and insurance brokers (on behalf of customers). On the basis that all the information necessary for contract formation was pre-programmed in the software according to the parameters laid down by the insurer, the court found that the insurer had invited the insurance broker to use the software as the medium for contract formation and undertook to be bound by the automatically generated policy contract, even if the insurer was temporarily unaware of it ([65] and [67]). More recently, the decision was supported and followed by the Singapore Court of Appeal in *Quoine Pte Ltd v B2C2 Ltd* [2020] SGCA(I) 02 [94]–[103], which involved a cryptocurrency trading platform."

455 Linklaters LLP pp 749–750 (para 1.5.2).

456 Either in itself or as part of a higher-order organising framework or principle.

457 See Glossary.

Perfection requirement for qualifying non-possessory security interests

5.62 In Chapter 8 (Collateral arrangements), we consider how collateral arrangements in respect of crypto-tokens and cryptoassets can be structured under the law of England and Wales. We conclude that although the law of England and Wales does provide options for granting security in respect of crypto-tokens and cryptoassets, those options are not adequate. As such, we recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

5.63 As part of that recommendation, we discuss the concept of "provision" — a flexible and responsive perfection requirement for qualifying non-possessory security interests that incorporates factual control as a core constitute element but is not defined exclusively by reference to factual control.[458]

5.64 We think that this concept of "provision" could be more flexible and better able to deal with the complex way in which collateral arrangements work in respect of digital objects. As the CLLS-FLC argues, it is useful to distinguish control for different purposes, and defining control in legislation (as opposed to a more flexible concept, such as provision), might not facilitate this:[459]

> While the concept of control is prima facie attractive, unfortunately English law precedent in the context of the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs"), has declared that the concept of control (for the purpose of perfecting a financial collateral arrangement) has the same [or similar] characteristics as when the term is used in English law to distinguish a fixed charge from a floating charge [subject to certain qualifications of uncertain scope]. Lesser measures of factual or legal control, which are almost inevitable in the context of the practical operation of control arrangements in a blockchain or DLT-based system, would run the risk of not being recognised by the English courts as constituting sufficient control to found a legal or equitable proprietary title to a relevant digital asset (in the third category). And this area would remain unsatisfactory with regard to taking security over [third category things], as well as over other forms of financial collateral (i.e. financial instruments, cash and credit claims).

5.65 For those reasons (and as we discuss in more detail in Chapter 8 (Collateral arrangements), we model our concept of "provision" on CLLS-FLC's proposed changes to the FCARs to deal with existing uncertainties in the context of financial instruments and cash.[460]

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458 Chapter 8 (Collateral arrangements), paras 8.114–8.126.

459 CLLS-FLC p 518.

460 We are grateful for the detailed and persuasive CLLS-FLC paper which contains the proposed changes to the FCARs and a detailed description of the concept of provision. The paper is available in our collated document of responses, and at: https://www.citysolicitors.org.uk/clls/consultations-responses-2/.

The difficulties with rigid legislative definitions

5.66 Where the concept of control appears in legislation and is then interpreted by the courts, it has sometimes led to further confusion.[461] An example is the Financial Collateral Arrangements (No 2) Regulations 2003 (FCARs).[462] Professors Fox and Gullifer said in their response to our call for evidence on digital assets that:

> The concept of control, as [used] by the FCARs and the courts, has caused a great deal of difficulty.

5.67 We consider that defining the concept of control in legislation could potentially increase uncertainty in the context of digital objects. This is for three principal reasons.

5.68 First, defining control in legislation could either risk undermining the law's flexibility to apply control to different technologies, or risk the definition becoming so vague and subject to so many carve-outs that it becomes too complex or practically useless (or both).

5.69 Second, in the context of digital objects, control is likely to be an evolving concept. For example, in the context of security features, users currently manipulate control through physical security, hardware wallets, multi-signature arrangements, software-as-a-service based security features or intermediated holding arrangements. But new safety and security arrangements continue to be designed and tested. For example, social recovery wallets and account abstraction techniques are now available.[463] Defining control in legislation risks crystallising the concept by reference to technology available today.

5.70 Third, we conclude that the concept of control is often most useful as an important constituent element of higher-level organising or framing principles. For example, and as we discuss in Chapter 7 in relation to intermediated holding arrangements, the concept of control might not be the only determining factor in the legal analysis of the arrangement. Similarly, in Chapter 8 (Collateral arrangements) we discuss how a concept of "provision"[464] might improve on the concepts of possession and control used in the FCARs.

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461 See also paras 11.119–11.123 in our consultation paper.

462 The FCARs include but do not define the concept of "control" and provide a partial definition for "possession" (from which courts have attempted to extract the meaning of "control"). What constitutes "possession or control" for the purposes of the FCARs is not entirely settled, and has been subject to criticism. We return to this in Chapter 8 (Collateral arrangements) where we discuss how control might work in the context of collateral arrangements in respect of crypto-tokens and cryptoassets.

463 Broadly, a social recovery wallet allows for a single "signing key" that can be used to approve transactions, with the added layer of "guardians", of which a majority can cooperate to change the signing key of the account. See V Buterin, "Why we need wide adoption of social recovery wallets" (2021), available at: https://vitalik.ca/general/2021/01/11/recovery.html. Account abstraction allows users to enhance the security, accessibility and general flexibility of their user accounts by programming them with smart contracts. See Ethereum, "Account abstraction" (2023), available at: https://ethereum.org/en/roadmap/account-abstraction/.

464 Broadly, a flexible and responsive perfection requirement for qualifying non-possessory security interests that incorporates factual control as a core constitute element but is not defined exclusively by reference to factual control.

The legal consequences of control — remaining differences

5.71 Consultee responses were therefore broadly aligned on how superior legal title and factual control over a digital object can be separated, on how a change of control can effect a legal transfer of a digital object and on the importance of intention to the analysis. Those responses that considered the issue were also broadly aligned on the difficulties with using control as a standalone and determinative principle for the purposes of a flexible and responsive perfection requirement for qualifying non-possessory security interests.

5.72 However, below we identify remaining differences in the views of consultees, which focus on one principal conceptual issue. That is whether the law should treat a certain level of control of a digital object as giving rise to a legal proprietary interest in that digital object (which can, in some circumstances, be a lesser interest than a superior legal title).

5.73 Below, we explain the differences in more detail and conclude on what we consider to be the better view. We accept that it is likely not possible to reconcile the difference in approach between consultees.

Relative title

5.74 Almost all consultees agreed that superior legal title and control over a digital object can be separated. However, a small number of consultees[465] said that control over a third category thing should not be capable of founding some form of legal proprietary interest in the thing short of (that is, lesser than) a superior legal title. On the other hand, a greater number of consultees[466] said that treating third category things in the same way as things in action (that is, as incapable of a relative title analysis) implicitly limits the flexibility of the common law to develop legal principles that are best suited to third category things.

5.75 Below, by way of example, we describe some scenarios in which the superior legal title to a crypto-token[467] can be separated from either: (i) the recorded state of the distributed ledger or structured record (for example, where there is an offchain transfer by a change of control); or (ii) a factual controller of the crypto-token (for example, following a void transfer). We also explain that it is common for a person to apply technical encumbrances and conditions within a crypto-token system to regulate how a particular crypto-token can be controlled. Examples include multi-signature arrangements, and some DeFi arrangements such as validator staking and other types of non-validator staking, and the operation and deployment of certain smart contracts.

5.76 We conclude that disputes are likely to arise as to the legal consequences of a person having factual control over a crypto-token (and the actions taken, or inaction, by such

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465 CLLS-FLC pp 514–518; Professor Low p 694; Professor Sheehan p 479.

466 Linklaters LLP pp 748–751 (para 1.5); Professor Tettenborn p 50; FMLC p 541 (para 4.4.1); Ilias Ioannou p 585; Law Society p 760.

467 Although these examples are crypto-token system specific, similar scenarios could also arise in relation to other digital objects or third category things.

controllers). Some particularly difficult scenarios could involve circumstances where the person with control:

(1) is not the same as the person that is recorded within the state of the crypto-token system as having control (offchain transfers of control could give rise to this scenario);

(2) is not the person with superior legal title; and/or

(3) exercised some level of joint, split, or otherwise encumbered factual control and took (or failed to take) certain action(s).

5.77 We think that some of those disputes might need to be resolved by reference to "title". For these purposes, we adopt the explanation of Professor Fox that:[468]

> Title is best understood as referring to a claim to an asset arising from a proprietary interest. In its strict sense, title does not refer so much to the content of the claimant's proprietary interest — i.e., to the incidents of practical enjoyment which his interest in the asset confers on him — but to the strength of his claim to that enjoyment, relative to other people who have similar interests in the same asset. Inherent in the notion of title is the question whether one person's claim to those incidents is stronger or weaker than that of other potential claimants. Professor Goode has expressed the point as depending on the difference between the quantum of the claimant's right to the asset and the strength of that right as against others...
>
> To summarise then, relativity of title is about the respective enforceability of competing claims to vindicate the incidents of enjoyment inherent in some particular proprietary interest.

5.78 The fundamental difficulty with third category things is that they are neither things in possession (to which principles of relativity of title apply) nor are they things in action (to which principles of relativity of title do not apply).

5.79 Professor Fox continues:[469]

> The relativity principle has no part to play in determining competing legal claims to [things] in action, except where the [thing in action] is embodied in a documentary intangible or in those rare instances where the title arises from an unauthorised substitution of an original asset. In general, the relativity principle illustrates the pragmatic interaction in common law reasoning between the rules of evidence and procedure, and the substantive principles governing the creation and transfer of property interests.

5.80 We agree with the view of Professor Fox and the authors of *The Law of Personal Property* that to conceive of a sort of relative title to things in action — rights or claims

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468 D Fox, "Relativity of title at law and in equity" (2006) 65(2) *Cambridge Law Journal* 330, 333–334.

469 Above, 365.

enforceable by action — is "a concept which is alien, illogical and contrary to authority".[470]

5.81 But third category things are different to things in action, as this report makes clear. Almost all consultees recognised that superior legal title and factual control over third category things can be separated. And, in the context of crypto-tokens, almost all consultees acknowledged that a controller might not be the same person as recorded by the state of the crypto-token system[471] and that control can be joint, split, or otherwise encumbered in a variety of different ways.[472] Once this is recognised, a fundamental question remains as to whether control can found a legal proprietary interest in a third category things such as a digital object which, in certain circumstances can be separated from (and be inferior to or short of) a superior legal title.

5.82 We conclude that it can, for the following reasons.

5.83 First, there is existing (albeit criticised)[473] authority[474] that the common law of England and Wales does not absolutely exclude the possibility of concepts of relativity of title applying to third category things.[475]

5.84 Second, regardless of the way in which factual control is acquired, it gives the person in control many of the incidents of a proprietary interest.[476] The controller will obtain

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470 See M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 15.127.

471 33 consultees responded to consultation question 24. Of these, 24 agreed outright. Seven consultees provided qualified agreement or a mixed answer, and two respondents disagreed.

472 Deloitte Legal (UK) pp 448-449; ISDA p 636 (para 2.2.1); Hugh James LLP p 573; Linklaters LLP pp 748–749 (paras 1.5.1–1.5.4); IDAC and CryptoUK pp 594–596; Stirling & Rose LLP p 958; Joshua Tjeransen p 662; DeCaDe p 434; Clifford Chance LLP p 295; and Clifford Chance LLP Industry Group p 330 (para 4.1–4.2).

473 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156. The court in *Armstrong* held that the fraudsters in question were capable of being constructive trustees of EUAs (being an intangible thing to which personal property rights can relate). The EUAs were said to be capable of being held on constructive trust for the claimant on the basis that the fraudster's ministerial control over the EUAs after the taking of the EUAs gave it "some form of de facto legal title". We note however that some consultees, including the CLLS, consider that *Armstrong* was wrongly decided, notwithstanding that it has received positive judicial treatment, specifically in the context of crypto-tokens: *LMN v Bitflyer Holdings Inc* [2022] EWHC 2954 (Comm) at [19], by Butcher J; *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm) at [113], by Henshaw J; *AA v Persons Unknown* [2019] EWHC 3556 (Comm), [2020] 4 WLR 35 at [58], by Bryan J. See also *Goff & Jones: The Law of Unjust Enrichment* (9th ed 2016) para 8-67 onwards, and L Chambers and C Buckingham, "Intangible Property and Proprietary Restitution in the High Court" [2013] *Lloyd's Maritime and Commercial Law Quarterly* 296, 302 in the context of *Armstrong* and constructive trust.

474 See also, *Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch), in which Falk J at [3] refers to "digital currency assets that TTL claims to own but is currently unable to control or use". Although this does not strictly support a relativity of title analysis, it does support the view that a superior legal title can potentially persist in relation to third category things even when control is obtained by another person (and lost by the superior legal title holder).

475 We expect that this type of claim/claimant is most likely to arise where control of a digital object has been transferred by one or more controllers against the wishes of one or more other controllers.

476 Indeed, CLLS-FLC said at p 516: "Where the distributed ledger or structured record recording a digital [object] is not constituted as the primary record of entitlement to the digital [object], the best evidence of

the factual ability to (1) exclude or permit access to a third category thing; and (2) put the third category thing to the uses of which it is capable. If an innocent acquisition rule applies, a controller will also be able to transfer good legal title to an innocent acquirer. Under the article 12 of the UCC and principle 16 of the UNIDROIT Principles, a secured creditor that perfects its security right by control will take priority over a creditor that perfects it security right by another method.[477] It is odd for the law to recognise this factual state of affairs and to acknowledge that some legal consequences (such as perfection of a security interest) can flow from that factual state but not describe it as giving rise to some form of legal interest or "title".[478] We conclude that the better view is that the law should recognise the factual state of affairs and that control does give the controller some form of legal proprietary interest — and therefore some form of title — to the third category thing in question. The nuance on the relative strength of that title will remain to be determined by other legal principles. For example, the relative strength of that title will depend on the way in which factual control was acquired. A lawful acquisition would in many circumstances give the acquirer the superior legal title to the asset (good against the whole world), while factual control acquired under a transaction that is void or has been avoided would be good against the whole world except the person from whom control was acquired. This is a function of the system of relative title, which is capable of recognising multiple concurrent interests in the same asset.

5.85 Third, in this report we distinguish things in action from third category things and conclude that things in action function differently to third category things. Our conclusions are based on our view that the law of England and Wales must remain flexible enough to recognise and respond to the idiosyncratic features of third category things. Specifically, the law must recognise that control over third category things is manifested and mediated by software and works differently to control over things in possession and things in action. We said above that control gives a person in control of a third category thing many of the incidents of a proprietary interest. This is a feature of the way in which third category things are designed.

5.86 Market participants intuitively understand this and expect to be able to "self-hold" or "self-custody" their crypto-tokens.[479] Crypto-token systems utilise software which permits the imposition or creation of varying degrees of technical encumbrances in respect of the crypto-token.[480] Imposing or creating such technical encumbrances within a crypto-token system makes it possible for a person to have a factual relationship of control[481] with a crypto-token. Crypto-token systems and the

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legal title to the asset is determined by reference to the person who (in accordance with the rules and protocols of the blockchain or DLT-based system) can in fact exercise (as against the other participants in the system and other third parties) the incidents of ownership e.g. the power of disposal and the privileges, benefits or rewards attached to or arising from the relevant digital [object]. This is the person who has factual control of the private key associated with the public address under which the relevant asset is recorded."

477 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 16, p 68.

478 In the sense that Professor Fox describes title in the extract at paras 5.77, 5.79 above.

479 For more detailed discussion on this point, see Chapter 7 (Intermediated holding arrangements), para 7.21.

480 Most commonly, the association of the crypto-token with the receiving public key address.

481 For a detailed discussion of control, see chapter 11 of our consultation paper.

decentralised finance markets which have evolved around them recognise this core feature and allow the layering of further technical encumbrances, including the splitting or distribution of control. These markets and many related products are also more often designed by reference to control and the powers and incentives/incentive mechanisms of participants, rather than in terms of claims/rights, corresponding duties and obligations.[482]

5.87 To treat third category things as directly akin to things in action would be to ignore the core underlying reason why such third category things were created in the first place and to overlook their principal functionality, both in terms of their distinguishing practical purpose and their technical operation. Moreover, it would risk blunting their unique functionality by directly applying legal concepts that evolved solely by reference to things in action that do not have that functionality. We conclude that this would be a retrograde step for the law of England and Wales. While the law might benefit from increased certainty in the short-term, its lack of flexibility and its failure to recognise the defining features of new third category things would eventually lead to reduced international competitiveness. This is particularly so in the face of law reform initiatives worldwide which do recognise the defining features of new digital objects.[483]

5.88 Fourth, in the context of third category things, it is important that the law permits market participants to make assumptions as to the superior legal title of a controller of a third category thing. This is most obviously important for onchain transfers, where a recipient may be unaware (or unable) to find evidence as to the superior legal title conferred by an (anonymous or pseudonymous) chain of conveyances. It might also be helpful for offchain transfers: without more a recipient ought to be able to rely on the presumption of a superior legal title from the fact of control (plus intention). Professor Fox suggests (albeit in the context of things in possession and land) that when supported by rules on the limitation of actions,[484] a presumption of title by possession helps to reduce the risk of competing claims, whether spurious or well founded.[485] This is also likely to be true in the context of third category things, where the risk of competing claims could otherwise act as a disincentive to transfers.

5.89 Fifth, relativity of title is important because in the absence of a conclusive system of title registration, it may be difficult for a claimant to prove that they have the superior title to the disputed thing. As we said in our consultation paper and as we discuss in more detail in Chapter 6 (Transfers), we do not consider that crypto-token systems operate as conclusive legal title registration systems. The functionality that they manifest relates to control. To force a claimant to establish that they are the superior legal title holder could require an extremely high level of proof: that there is no other

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482 If the law of England and Wales is adequately and sensitively to consider issues relating to decentralised finance (DeFi) systems, and more complex crypto-token systems, including Layer 2 applications, then it is important to recognise this reality as soon as possible.

483 For example: (1) UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12; UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 2(1), p 16; and (3) the Liechtenstein Token and Trusted Technology Service Provider Act 2019-301.

484 Principally those set out in the Limitation Act 1980.

485 D Fox, "Relativity of title at law and in equity" (2006) 65(2) *Cambridge Law Journal* 330, 338.

person with a title superior to theirs.[486] This is unlikely to be possible or practicable in crypto-token systems which permit use by anonymous or pseudonymous persons, facilitate complex relationships of control and interactions with smart contract systems or DeFi protocols and which are global, public, open and permissionless in nature. What participants *are* likely to be able to demonstrate however, is some form of control.

5.90 Sixth, as Professor Fox argues (albeit again in the context of land), the rule that allows a person to sue on a merely relative title to land shows the preference of the common law for discouraging the social disruption that comes when one person unjustifiably interferes with the settled possession of another. The presumption of title in a mere controller of a third category thing could be very helpful for many of the difficult cases involving wrongdoers and new technology.[487] For example, there seems little sense in a legal system which does not permit a holding intermediary who holds digital objects on behalf of a large number of users to pursue a hacker who wrongfully removed assets from the control of that holding intermediary.[488] Indeed, one might consider that large, well-funded holding intermediaries would be better placed than individuals to pursue such actions.

5.91 Seventh, as we discuss in more detail below and in Chapter 9 (Remedies), allowing for a relativity of title analysis will assist with the protection of the personal property rights of individuals in relation to their things (including their third category things). This might be important in relation to unlawful or wrongful interference (whether by a hacker or by a government or other legal body acting beyond their powers).

5.92 Eighth, to accept this position in relation to third category things is not simply to apply the rules relating to things in possession. Instead, the common law will need to develop rules for the resolution of disputes between claimants who assert equivalent proprietary interests in third category things. We think that it is well placed to do so.

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[486] The UNIDROIT Principles recognise this problem at para 7.1, with explicit reference made to relativity of proprietary interests: "Principle 7(1)(a) makes it clear (although it would be implicit in any event) that a person asserting that it has control of a digital asset establishes a presumption that it has the specified abilities. It need not prove the negative—that no one else has the abilities—in order to prove that it has control. … Of course, a person who was previously (rightfully) had control may demonstrate under applicable domestic law that it has a better proprietary interest than the person who currently has control by proving that the change of control was wrongful": UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 42 para 7.1.

[487] D Fox, "Relativity of title at law and in equity" (2006) 65(2) *Cambridge Law Journal* 330, 339.

[488] However, as we discuss in Chapter 7 (Intermediated holding arrangements), current intermediated holding structures will generally follow either a full title transfer model or a trust-based model. In either circumstance, a holding intermediary would also obtain superior legal title to the digital objects held. See also the arguments made in a summons filed by Tai Mo Shan Ltd against unknown defendants in the US *Tai Mo Shan Limited v John Doe Nos 1-100* litigation (Case Number 651017/2023), available at: https://iapps.courts.state.ny.us/nyscef/ViewDocument?docIndex=0fXwxvv5v163bEmNzYobww==. In this case, the Wormhole Protocol brought the claim against the unknown defendants notwithstanding the hack was in respect of user assets (albeit after a purported assignment of user claims). As we discuss at para 5.33 above, this case involved related English High Court proceedings.

Shared control

5.93 The question of who has factual control might not always be easy to determine. Many consultees gave examples of where this could be the case (see from paragraph 5.13 above).

5.94 In some (but not all) of those situations, multiple parties might share control, no single party might have control, or control might be split in a variety of different ways. Sometimes this is achieved by reference to the protocol rules of a crypto-token system itself, and sometimes through additional software that is used externally to a crypto-tokens system (often for security reasons).[489]

5.95 However, we do not think these issues are insurmountable for the law.

5.96 As we discuss above, the concept of intention will be a helpful factual element which will likely assist courts in distinguishing between the "relativity" or "priority" of control-based legal proprietary interests, particularly where parties are acting in concert or share control. As with intention in other areas of the law, intention can readily be inferred by analysing the contractual and other arrangements between the parties, including by looking to the laws of agency and representation.[490]

5.97 We also note that, as a purely practical matter, where factual control is shared by two (or more) competing parties, in practice one party will most likely deploy a self-help remedy, by effecting a transfer operation that effects a state change, thus extinguishing the factual control of the other competing parties.[491] But in those situations, distinguishing between the "relativity" or "priority" control-based legal proprietary interests[492] will still be important as doing so will determine whether any causes of action exist against the party that effected the transfer operation, or whether any remedies are otherwise available.

5.98 More broadly, we acknowledge that similar issues around shared control apply equally in relation to the law of possession, even if they are less common in practice. An often-cited example is a physical object in a warehouse the door to which has multiple keys held by different people. We think that this analogy can only go so far in the context of digital assets. Nevertheless, the point is that in the context of things in

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489 See para 6.44(3) where we note that providers of software-as-a-service in non-holding relationships might manipulate factual control in different ways.

490 See, for example, our discussion on certain of these issues in our advice to government on smart legal contracts: Smart Legal Contracts (2021) Law Com No 563, paras 3.63–3.75.

491 On this point, the UNIDROIT Principles say: "As a practical matter, there is little chance that another person would appear in a contested proceeding to claim that it has the relevant exclusive [control] abilities without the putative control person's consent. Under the criteria, that other person also would not have control. Any concern about such a person (e.g. hacker, thief, or finder) appearing to make such a claim seems unwarranted. Moreover, experience has shown that in situations in which the relevant abilities have been obtained wrongfully the abilities have quickly been exercised and the assets have been removed from the control of the original control person. This reflects a set of risks that are inherent in digital assets": UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 42 para 7.2.

492 Professor Fox suggests that "The distinction between competing titles and priority rules is a loose one, but, for the most part, it is not important to try to draw it sharply. For once the differences in terminology are stripped away, it will be seen that disputes over competing titles necessarily depend on rules of priority": D Fox, "Relativity of title at law and in equity" (2006) 65(2) *Cambridge Law Journal* 330, 337.

possession, the courts have developed complex and nuanced principles that can help resolve disputes in a multitude of different situations involving different types of physical thing.[493] We think the courts are well-placed to do so again in relation to digital objects. The factors applicable to digital objects are likely to differ in many ways from those applicable to physical things, but that should not prevent the courts from undertaking that task. Again, the technical expert group will be well-placed to provide guidance on these complex issues, which could assist the courts in identifying what control looks like in relation to different technological forms.

Interference with control

5.99 Perhaps the clearest difference of opinion in consultee responses was not on the circumstances in which superior legal title and factual control could be separated in respect of a digital object. Nor was it necessarily the application of the concept of relativity of title (or priority)[494] itself. Rather, the differences in opinion centred on the possible causes of action and associated remedies available to a person with a control-based legal proprietary interest in a digital object (that was subject to a superior legal title of another person).

5.100 As we discuss in detail in this chapter, it is difficult to discuss control in the abstract, without reference to specific technology or facts. We also recognise that if the law of England and Wales is to adapt to new technology in a way that preserves its international competitiveness, it should do so incrementally.[495] As such, we conclude as follows.

5.101 There was strong support among consultees for the proposition that factual control (and intention, see paragraph 5.55 above) can be taken together to provide "best evidence" of the superior legal title to a digital object. This conclusion is limited to digital objects within the third category, and does not affect rights or claims enforceable by action. We think the better and more practical view — supported by those consultees who are closely involved in markets involving such digital objects, and market practice[496] — is that factual control (plus intention) can found a legal proprietary interest in a digital object. We conclude that in certain circumstances such a control-based legal proprietary interest can be separated from (and be inferior to or short of) a superior legal title.

5.102 We think that in certain circumstances, claims involving third parties asserted by or against a person with a control-based legal proprietary interest (that was subject to a superior legal title of another person), could be based on and determined by reference to the controller's control-based legal proprietary interest. We discuss this in more

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493 See Professor Donald Harris' 1961 essay, in which he identified nine factors which the courts have considered in the context of identifying possession: D R Harris, "The Concept of Possession in English Law" in A G Guest (ed), *Oxford Essays in Jurisprudence* (1961) p 70. The nine factors are set out in M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 11.009.

494 See discussion from para 5.74 above.

495 We note that CLLS-FLC response suggested that drastic change could potentially undermine the attractiveness of the law of England and Wales (pp 503, 505), although other consultees made the same point in favour of such change.

496 IDAC and Crypto UK pp 593–594; ISDA pp 636–638; Linklaters LLP pp 747–751 para (1.5); Gunnercooke LLP p 561.

detail in Chapter 7 (Intermediated holding arrangements) in relation to intermediated holding arrangements and in Chapter 9 (Remedies) in relation to available causes of action and associated remedies.

5.103 In coming to that conclusion we acknowledge that the courts are best placed to develop the law by reference to the facts and technology in front of them (and in cases where genuine disputes arise). We think in this area, common law development is a more appropriate way for the law to evolve than by reference to the less nuanced hypothetical factual scenarios discussed in this paper and in academic and market commentary. Indeed, as we discuss in more detail in Chapters 7 (Intermediated holding arrangements) and 9 (Remedies), it has already begun to do so.[497]

Conclusion 1.

5.104 We conclude that factual control (plus intention) can found a legal proprietary interest in a digital object. We conclude that in certain circumstances such a control-based legal proprietary interest can be separated from (and be inferior to or short of) a superior legal title.

[497] For example, in February 2023 Oasis, a platform for decentralized finance, received an order from the High Court of England and Wales "to take all necessary steps that would result in the retrieval of certain assets involved with the wallet address associated with the Wormhole Exploit", a major exploit that occurred in February 2022: https://blog.oasis.app/statement-regarding-the-transactions-from-the-oasis-multisig-on-21st-feb-2023/. In considering whether to grant the order, the High Court heard evidence on the potential availability of, among other things, causes of action under New York law in replevin and conversion. Of course, that is not to say that the High Court of England and Wales would entertain such causes of actions under the law of England and Wales. See a summons filed by Tai Mo Shan Ltd against unknown defendants in the *Tai Mo Shan Limited v John Doe Nos 1-100* litigation (Case Number 651017/2023), available at: https://iapps.courts.state.ny.us/nyscef/DocumentList?docketId=PE6l_PLUS_YSqugbfDL9/PNYAxQ==&display=all&courtType=New%20York%20County%20Supreme%20Court&resultsPageNum=1.

Chapter 6: Transfers

INTRODUCTION

6.1 In this chapter, we discuss legal issues specific to the transfer of crypto-tokens. While some other third category things will transfer in similar ways, some will not. Because of that, and because crypto-token systems raise some specific questions as to transfers that are currently relevant to market participants, we generally refer to crypto-tokens (and not third category things) in this chapter.

6.2 Consultees were not uniform in their characterisation of crypto-tokens, or the legal consequences which they considered ought to flow from factual transfers of crypto-tokens. In this chapter, we discuss two alternate views of consultees as to how best to characterise transfers and consider the practical and legal consequences of those views.

6.3 We discuss offchain transfers and conclude that it is possible to effect a legal transfer of a crypto-token offchain by a "change of control" (along with the requisite intention).

6.4 We also discuss the application and rationale for an "innocent acquisition" rule and conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things.

BACKGROUND TO CONCEPTS USED IN THIS REPORT

A transfer operation that effects a state change

6.5 In general, an onchain[498] factual "transfer"[499] of a crypto-token occurs by way of a state change within a crypto-token system.[500] A state change is, broadly speaking, a valid modification of the data recorded by the distributed ledger or structured record within a crypto-token system effected by a (transfer) operation conforming to the protocol rules of the system.

6.6 Typically, when a crypto-asset is "transferred", the transfer operation will result in the imposition or creation of varying degrees of technical encumbrances in respect of the crypto-token (most commonly, the referencing or association of the crypto-token with a receiving public key address). Imposing or creating such technical encumbrances within a crypto-token system makes it possible for a person to have a factual relationship of control with a crypto-token. It is typically also possible for that person to

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498 We discuss offchain transfers at para 6.39 below.

499 For a more detailed description of the complex processes that involve a "transfer" see LeXpunK Response to HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) paras 19–25, available at: https://drive.google.com/file/d/1RmlkWsGiOODeXxmZVFcyeHJdMjIy72oy/view.

500 See also Chapter 12 of our consultation paper for more detail.

divest themselves of the factual relationship of control with the crypto-token.[501] Again (and in general), this will be achieved by the technical completion of a transfer operation that effects a state change in accordance with the protocol rules of the relevant crypto-token system. So, in typical cases, a transfer operation that effects a state change will result in a change of control.[502]

6.7 The transfer operation, once confirmed, results in a change of state of the distributed ledger or structured record according to the protocol rules of the crypto-token system. We use the terms "state" to refer to the canonical[503] and chronological order of transactional events as recorded within the distributed, transaction-based ledger or structured record of a crypto-token system (and "change of state" to changes to that record). This is consistent with technical descriptions authored by designers of crypto-token systems. For example, in the Ethereum White Paper, Vitalik Buterin refers to the Bitcoin system as a "state transition system":[504]

> From a technical standpoint, the ledger of a cryptocurrency such as Bitcoin can be thought of as a state transition system, where there is a 'state' consisting of the ownership status of all existing bitcoins and a 'state transition function' that takes a state and a transaction and outputs a new state which is the result.

6.8 He goes on to describe the state within Ethereum as follows: [505]

> In Ethereum, the state is made up of objects called 'accounts', with each account having a 20-byte address and state transitions being direct transfers of value and information between accounts.

6.9 We therefore referred to "state", "changes of state" and a "transfer operation that effects a state change" in our consultation paper.[506] We also noted that a change of state or a transfer operation that effects a state change does not necessarily happen instantaneously in crypto-token systems.[507] In addition, depending on the system involved, it may take some time for the transfer operation that effects a state change

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501 See chapter 12 of our consultation paper for more detail. We discuss in detail in chapter 11 of our consultation paper and Chapter 5 (Control) of this report why we think it is appropriate for the law of England and Wales to develop jurisprudence concerning a concept of control that can be applied to third category things, including crypto-tokens.

502 Although not necessarily a change of controller/controlling person.

503 That is, the source that is accepted by network participants as authoritative in accordance with the consensus mechanism specified by the protocol rules of the system.

504 Ethereum, "Ethereum Whitepaper" (2023), available at: https://ethereum.org/en/whitepaper/#ethereum-state-transition-function.

505 Above.

506 See, in particular, consultation paper chapters 12 and 13, paras 12.63–12.66.

507 Unconfirmed transactions are stored by nodes (system participants) in a memory list called a memory pool or transaction pool. Nodes use this pool to keep track of transactions that are known to the network but are not yet included in the distributed ledger or structured record. A number of variables, such as the fee included in the transaction data structure, affect when the transaction will be included in the distributed ledger or structured record. See A Antonopoulos, *Mastering Bitcoin* (2nd ed 2018) ch 8.

to become probabilistically irreversible (in the context of some proof of work based systems) or finalised (in the context of some proof of stake based systems).[508]

A system for state transitions, not "just a record"

6.10 In our consultation paper, we said that the state of a distributed ledger or structured record within a crypto-token system should not necessarily be regarded as a definitive record of superior legal title to a crypto-token.[509] We said that the state of the distributed ledger or structured record "may provide a definitive record of the links between discrete [factual states][510] within the [crypto-token] system, but it cannot be a record of their legal effect".[511]

6.11 However, the state of the crypto-token system does not merely record the factual situation; that is, it does not only show with which address a particular crypto-token is referenced or associated. It also records and enforces the technical encumbrances and conditions that regulate how crypto-tokens referenced or associated with that address can be used or spent.[512] So the state of the crypto-token system cannot realistically be separated from its functionality such that it can be thought of as a record alone — it is not simply "a distributed database".[513] The composite of recorded data and the functionality of that data within the crypto-token system give crypto-tokens characteristics that are very different to mere entries in a database.

6.12 As we discuss in more detail in Chapter 4 (Third thing in practice), a crypto-token system manifests notional quantity units which the law of England and Wales treats as things to which personal property rights can relate. The crypto-token system relies on the active operation of software over network-instantiated data to manifest the operative functionality of crypto-tokens within the system. Specifically for the purposes

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508 Within some crypto-token systems, transactions effected by entries on the distributed ledger or structured record are not described as achieving "empirical finality". Instead, they are referred to as becoming "probabilistically irreversible". This is because it might be theoretically or mathematically possible to modify or reverse a transaction retroactively. For some systems, this is only possible temporarily (based on our current technology), because the probability of a transaction being reversible decreases as more blocks are added on top of the block containing the transaction. See L Gullifer and R Hay, "How final is final? Settlement finality, blockchains and DLT" (2020) 1 *Journal of International Banking and Financial Law* 8, 8. Note, however, that this article refers largely to proof of work-based systems and that proof of stake-based systems do achieve finality in a different way based on validator consensus.

509 See para 13.7 of our consultation paper. Most consultees agreed. Some agreed explicitly, such as Eversheds Sutherland LLP p 497. Some agreed impliedly (such as those consultees who argued for a relativity of title analysis): FMLC p 545; IDAC and CryptoUK p 592. Other consultees gave qualified or nuanced agreement: Clifford Chance LLP p 299; Professor Sheehan p 478; Simon Deane-Johns p 914. AFME and AGC disagreed at p 5 (and 19): "An entry on the ledger should represent definitive direct rights against issuers".

510 Note that the original quote refers to "transactions", and not "factual states". However, we think the better description is to refer to factual states and state changes, given our conclusion that state changes do not necessarily constitute legal "transactions".

511 D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.49; consultation paper para 13.8.

512 For more detail on this point, see Chapter 10 and Appendices 3 and 6 of our consultation paper.

513 See UKJT, Legal Statement on Digital Securities para 33. Of course, a blockchain, distributed ledger or structured record does form part of a crypto-token system and, in itself, is in many ways like a database. We note that the point the UKJT was emphasising when it used this language was specifically limited to record-keeping functionality of crypto-token systems.

of transfers, that functionality is the ability/power of a controller of the crypto-token uniquely to perform an operation (or an action)[514] in respect of that crypto-token.

6.13 In that sense, crypto-token systems are better described as manifesting functional crypto-tokens as distinct things. It is an incomplete analysis to say that crypto-token systems merely record a factual state of affairs — specifically the state of the system as a matter of fact at any particular time (by reference to a particular block height).[515]

Factual consequences of a transfer operation that effects a state change

6.14 In our consultation paper we made the following three observations on the factual characteristics of a transfer operation that effects a state change within a crypto-token system.[516]

(1) Such a transfer operation will typically involve the replacing, modifying, destroying, cancelling, or eliminating of a pre-transfer crypto-token and the resulting and corresponding causal creation of a new, modified or causally-related crypto-token.[517]

(2) Such a transfer operation will typically involve the imposition or creation of varying degrees of technical encumbrances in respect of the causally-related crypto-token, which will typically amount to a change of control as between the pre-transfer crypto-token and the causally-related crypto-token.[518]

(3) Such a transfer operation will typically result in a change of state of the distributed ledger or structured record in accordance with the protocol rules of the crypto-token system.

6.15 Consultees broadly agreed with this factual description.[519] Some consultees were however critical of the language used in sub-paragraph 6.14(1) above and its potential legal consequences. We discuss this point in detail from paragraph 6.21 below.[520]

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514 See para 4.18 and associated footnote for more detail on this point.

515 Although the record itself is of course an integral constituent part of the functionality of the system. The system should be understood as a state transition system which implements a series of states, inputs, transition functions between states based upon inputs, and outputs. The software systems maintain a consensus-based state and transition to a new canonical state according to the system software, typically through the form of cryptographically authenticated transactions. See PG Hunn, "Only Binary? Atoms and Bits as Objects of Property" (2023), available at: https://papers.ssrn.com/abstract=4419662.

516 See para 12.67 of our consultation paper.

517 Consultees were largely critical of the language used in this observation and its potential legal consequences, and we discuss it in detail from para 6.21 below.

518 Although not necessarily a change of controller/controlling person.

519 For example, Linklaters LLP pp 751–752 (para 1.6); CLLS-FLC pp 520–521; Stephan Smoktunowicz p 936; and Gunnercooke LLP p 562.

520 See Norton Rose Fulbright LLP pp 842–843; Professor Low p 693; Ashurst LLP p 77 (para 4.33); COMBAR and the Chancery Bar Association pp 359–360 (paras 21.1–21.3); IDAC and CryptoUK pp 594–596; and Clifford Chance LLP p 286 (and also pp 296–297), the latter responding that it is "unhelpful to place emphasis on the technical modalities of transfer and the change of state that is effected when a crypto-token is transferred … the feature of state change may be considered an indicator of a data object but should not affect its legal characterisation beyond that."

Legal consequences of a transfer operation that effects a state change

6.16 Consultees were less uniform in their views as to how the law should best accommodate the factual reality we describe above.

6.17 In general, consultees considered that the formulation of our first criterion[521] (and, as a consequence, our conception of a crypto-token as described in our consultation paper) risked being overly data-centric.[522] We think that a more or a less data-centric approach to conceptualising a crypto-token can potentially give rise to different analysis when applying legal principles to transfers of crypto-tokens.[523]

6.18 As we discuss in detail in Chapter 4 (Third thing in practice), we have taken on board consultees' criticisms of our first criterion. We also reiterate our characterisation of a crypto-token as a composite thing.[524] Specifically, in Chapter 4 (Third thing in practice) we summarise our conclusion as follows:

> A crypto-token exists as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data.

6.19 We conclude in this chapter that this characterisation is consistent with consultees' views as to the legal characterisation of transfers of crypto-tokens and remains consistent with the reasoning in our consultation paper. Broadly, consultees — even those with differing views — chose to focus their legal analysis on the ability/power of persons uniquely to perform an operation (or an action)[525] within the crypto-token system in respect of notional quantity units.

6.20 Below, we address three different legal issues relating to a transfer of a crypto-token. First, we discuss two alternate views put forward by consultees as to how best to characterise transfers. Second, we discuss offchain transfers and conclude that it is possible to effect a legal transfer of a crypto-token offchain, by a "change of control" (along with the requisite intention). Third, we discuss the application and rationale for an "innocent acquisition" rule and conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law.

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521 That a third category thing must be composed of data represented in an electronic medium, including in the form of computer code, electronic, digital or analogue signals.

522 Linklaters LLP p 746 (para 1.3.2); Clifford Chance LLP p 282; Professor Cutts pp 967–968. See further from para 4.6.

523 See below from para 6.21 below for more discussion on this point.

524 See our consultation paper at para 5.18, and also 10.29: "as a consequence of having both form and function, a crypto-token does not exist solely as a technical construct or as pure data. While its form relies on its technical instantiation as a data structure, its function is derived not merely from the abstract existence of the technical system in which it persists, but fundamentally by the active operation of that system by a network of users. A crypto-token is consequently an object that has both, and is a composite of, technical and social dimensions — crypto-tokens exist as instantiations in socio-technical systems." See also chapter 3 of our consultation paper.

525 See para 4.18 on this point.

A TRANSFER OPERATION THAT EFFECTS A STATE CHANGE

6.21 When a crypto-token is transferred onchain, what the transferee receives is not (at least technically speaking) exactly the same thing as the transferee transferred, unlike when a tangible object is handed from one person to another. That is because the record within the crypto-token system is updated to reflect the transfer and a new factual state of affairs. Specifically, the state of the system is transitioned, updating the chain of cryptographically signed and validated transactions relating to the relevant entry in the distributed ledger or structured record.

6.22 This fact was perhaps on the mind of Lord Justice Birss when he discussed transfers of crypto-tokens after concluding that bitcoin was a notional quantity unit manifested by software:[526]

> Since every transaction relating to that token adds to its chain, some would say a fresh piece of property is created every time bitcoin is transferred, but there is no need on this appeal to get into that debate.

6.23 We refer to this analysis as the "the extinction/creation analysis".

6.24 In our consultation paper, we broadly agreed with the extinction/creation analysis and said that a transfer operation within a crypto-token system typically involves the replacement, modification, destruction, cancellation, or elimination of a pre-transfer crypto-token and the resulting and corresponding causal creation of a new, modified or causally-related crypto-token.[527] We explained this analysis by reference to a variety of crypto-tokens.

6.25 While many consultees agreed with this analysis,[528] many did not.[529] Those who disagreed did not dispute the factual analysis of a transfer operation that effects a state change — that new data is added post-transaction and that the state changes.[530] Instead, they rejected the description of the legal consequences of the updated state — most specifically the use of the terms "destruction", "cancellation", "elimination" and "new" to describe a post-transfer crypto-token.[531] In short, they rejected the proposition that a transfer operation that effects a state change extinguishes a pre-transfer object of personal property rights and creates a "new", post-transfer object of personal property rights.

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526 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [72], by Birss LJ.

527 Consultation paper at para 12.10.

528 Linklaters LLP pp 751–752 (para 1.6); CLLS-FLC pp 520–521; Stephan Smoktunowicz p 936; and Gunnercooke LLP p 562.

529 Norton Rose Fulbright LLP pp 842–843; Professor Low p 693; Clifford Chance LLP pp 286, 296–297; Ashurst LLP p 77 (para 4.33); COMBAR and the Chancery Bar Association pp 359–360 (para 21.1–21.3); and IDAC and CryptoUK at pp 594–596.

530 That is, they agreed with our descriptions in our consultation paper as to how transfers typically operate.

531 See, for example, Norton Rose Fulbright LLP pp 842–843; Professor Low p 693; Clifford Chance LLP pp 296–297; and Ashurst LLP p 77 (para 4.33).

6.26 Many consultees instead argued that a transfer operation that effects a state change involves the persistence of an object of personal property rights through the transfer. We refer to this as the "persistent thing" analysis.

6.27 We asked consultees for feedback on this issue directly.[532] As is clear from the responses analysed below, consultees considered that the issue was important. The reasoning behind the two differing analyses can be summarised as follows.

6.28 **The extinction/creation analysis:** The first argument recognises that a crypto-token is a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data. The technological implementation of the system *necessarily ensures* that the functionality of that crypto-token as a notional quantity unit is extinguished and re-created by a transfer operation that effects a state change. This is an intentional design choice taken precisely to avoid the double-spend problem.[533] On that basis, the extinction/creation analysis describes a core (or perhaps *the* core) feature of a crypto-token system. Any ability/power uniquely to perform an operation (or an action) within the crypto-token system in respect of that crypto-token as a notional quantity unit is therefore also necessarily extinguished and re-created on transfer because the ability/power relates to different data instantiated within the system pre- and post-transaction.[534]

6.29 **The persistent thing analysis:** The alternative argument also recognises that a crypto-token is a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data. It also recognises that a crypto-token as a notional quantity unit is manifested through different data instantiated within a system pre- and post-transaction. However, the legal analysis focuses more on a crypto-token as a notional quantity unit manifested at the system level, rather than on the changing recorded data. Because of this, it is possible to treat a crypto-token as a notional quantity unit (and the ability/power in respect of the notional quantity unit) as *persisting through* a transaction. The argument is that a core (or perhaps *the* core) feature of the system is that it tracks and records the location of notional quantity units as they persist and flow through the system — tracking and recording value as it flows through the system.[535]

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532 See consultation question 20.

533 Simply put, this is the concern that a digital asset may be transferred from Alice to Bob, yet retained by Alice, who can then also transfer it to Caroline. It is a feature of assets that are not divested on transfer. For example, information can be "double-spent". Alice can tell Bob a joke, and then subsequently tell Caroline the same joke. In contrast, tangible objects cannot be "double-spent". If Alice gives Bob an apple, Alice cannot then subsequently give the same apple to Caroline. Double-spending would be particularly problematic in a digital payment context. Consider a digital asset that is used as a means of payment. If Alice can pay a digital asset (such as a unit of a digital currency) to Bob, but then also pay the same digital asset to Caroline, her capacity to double-spend the digital asset will undermine trust in the payment system.

534 See UKJT, Legal Statement para 45 and Linklaters LLP pp 751–752 (para 1.6).

535 A Delgado and A Kulasinghe, "Response to the Law Commission's *Call for Evidence on Digital Assets*" in Law Commission, *Digital assets: Responses to the call for evidence* (2021) pp 291–300, specifically pp 293–294, available at: https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/10/Digital-assets-call-for-evidence-responses.pdf; consultation paper paras 12.24–12.29.

6.30 Each analysis characterises the object of personal property rights in broadly the same way: as a notional quantity unit. Each analysis also recognises that the data instantiated within the system — and so the means of manifesting the object — changes pre- and post-transaction. The extinction/creation analysis simply places a greater analytical focus on data at the blockchain level, while the persistent thing analysis places a greater analytical focus at the system level.

6.31 We conclude that there is no "correct" analysis; both could be said to be accurate in their own ways. However, consultees offered a number of arguments as to why the most practically accurate analysis is the persistent thing analysis.

6.32 First, as we said in our consultation paper, users might treat transfers of their crypto-tokens as transfers of (persistent) value,[536] or as transfers of persistent things.[537] Users are certainly likely to treat transfers of NFTs as transfers of persistent things.[538]

6.33 Second, in respect of UTXO-based systems,[539] it is more accurate to focus on the notional quantity units that persist through transactions than the UTXO data. COMBAR said:[540]

> There can be no UTXO without there being basic units from which it is calculated. In the case of the Bitcoin system, the basic unit is the satoshi. The satoshi is a construct by the system, as is the UTXO. Both are defined by the software of the system (the information attribute). The function of the satoshi (the functional or operational attribute) is an object that can be the subject of instructions to the system, to be recorded on the blockchain… What they are sending are satoshis, not the UTXO.

6.34 Third, the way in which UTXO-based transactions are constructed is better recognised by a focus on (persistent) notional quantity units. Very broadly speaking, a UTXO-based transaction can be constructed to include both a quantity of notional units to be sent to the transferee and a quantity of notional units to be sent back to the composer of the transaction as "change".[541] As COMBAR argued, such a transaction should be regarded as simply transferring the net quantity of notional quantity units. Indeed, this

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536 Ashurst LLP p 78 (para 4.35(c)).

537 See Chapter 12 of our consultation paper. See also the response of Professor Low at p 693: "Cryptoassets not only need not be conceived of as claims against particular persons, they cannot be so conceived. Accordingly, it is unnecessary for the law to conceive of distinct ledger entries as distinct assets. Rather, it is entirely possible to conceptualise the right as one to maintain one's control over particular abstract value within a distributed ledger. Since control is effectively transferred upon a cryptoasset transfer, the law can simply conceive of what has been transferred as the right of control, which is not distinct but one and the same. Doing so greatly simplifies the resolution of disputes because it is consistent with the expectations of the majority of lay participants."

538 Linklaters LLP pp 751–752 (para 1.6).

539 See "Unspent transaction output (UTXO)" in our glossary, and Appendix 3 of our consultation paper.

540 COMBAR and the Chancery Bar Association pp 347–348 (paras 15.5.4–15.5.5).

541 COMBAR and the Chancery Bar Association p 348 (para 15.5.5). See also A Antonopoulos, *Mastering Bitcoin* (2nd ed 2018) ch 6.

position is reflected in HM Revenue & Customs' approach to capital gains tax on transactions[542] and pooling.[543]

6.35 Fourth, the fact that Account-based tokens[544] are necessarily mixed on transfer to a single public address (where that address already is associated with a quantity of the same tokens) is better reflected by a focus on notional quantity units that persist through transactions, as opposed to discrete tokens associated with various specific data parameters. This is to some extent also true of UTXO-based tokens,[545] but is not true of NFTs. Nonetheless, the persistent thing analysis might be important in the context of DeFi arrangements such as deposits into a liquidity pool smart contract that forms part of an automated market maker protocol.[546] The analysis might also be important in DeFi collateral arrangements.[547]

6.36 Fifth, as we discuss at paragraph 6.92 below, an extinction/creation analysis might not, without more, provide a *legal* method by which new, indefeasible title to a thing can arise at law (at least in the context of bank account money).[548] As we discuss

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542 COMBAR and the Chancery Bar Association pp 348–349 (para 15.5.7); HM Revenue & Customs, *Cryptoassets Manual* (2022), available at: https://www.gov.uk/hmrc-internal-manuals/cryptoassets-manual.

543 COMBAR and the Chancery Bar Association p 350 (para 15.5.9); HM Revenue & Customs, *Cryptoassets Manual* (2022), available at: https://www.gov.uk/hmrc-internal-manuals/cryptoassets-manual. This analysis is supported by the fact that certain crypto-token systems cap the supply (or potential future supply) of tokens in circulation and have specific mechanisms for the creation of new tokens regulated by their protocol rules. Only certain transactions create "new" tokens (a "coinbase" transaction in the Bitcoin system, for example). For more detail, see A Antonopoulos, *Mastering Bitcoin* (2nd ed 2018) ch 8. To describe a transfer as necessarily involving a creation of new crypto-tokens as a matter of law would therefore seem to conflict with the technical specifications of the relevant system as a matter of fact. See further S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) p 4, available at: https://nakamotoinstitute.org/bitcoin/; Liquid, "Understanding Cryptocurrencies With Limited Supply" (2021), available at: https://blog.liquid.com/limited-cryptocurrency-supply.

544 See Glossary. See also paras 12.36–12.40 of our consultation paper and Appendix 2 of UKJT Consultation Paper (reproduced in Appendix 6 of our consultation paper, from p 510).

545 See, for example, the discussion in D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) paras 6.81–6.96. However, also note that the Ordinals Protocol enables inscriptions on specific bitcoin satoshis (the smallest notional unit of account within the Bitcoin system). The Ordinals Protocol assigns each satoshi a sequential number. Once these satoshis are numbered and identified, individual satoshis can be inscribed with arbitrary content, creating unique Bitcoin-native digital artifacts that can be held in Bitcoin wallets and transferred using Bitcoin transactions. See https://docs.ordinals.com/.

546 In high-level terms, an automated market maker is a smart contract-based mechanism which mathematically defines the price of certain pairs of crypto-tokens and provides liquidity for those pairs of tokens (in "pools"). If a person wants to swap one crypto-token for another, they can make a trade directly with the automated market maker smart contract, using the relevant liquidity pool(s). The deposit of tokens into a liquidity pool as a liquidity provider — and the subsequent reacquisition of tokens — could however be a good example of where an "independent acquisition" analysis might be more appropriate, and therefore could also support the extinction/creation analysis.

547 COMBAR and the Chancery Bar Association pp 356–357 (para 15.19). Some DeFi arrangements rely upon the functionalities of crypto-token networks themselves to automate certain processes that replicate the substantive economic effect of collateralised loans, but the "collateral" might not always be locked or provided to segregated accounts.

548 Professor Cutts pp 971–972. In this respect, see also UKJT, Legal Statement para 52 n 39, commenting on *Trustee of the Property of FC Jones & Sons v Jones* [1996] EWCA Civ 1324. One explanation is that the acquisition of a token in a transaction is some form of independent acquisition: see our consultation paper,

below, an extinction/creation analysis is in any case not necessary to protect a good faith purchaser for value without notice of a crypto-token, given that we conclude that the common law could provide such protection.[549]

6.37 Sixth, the persistent thing analysis would potentially allow for the application of the evidential process of following to digital objects. We discuss this further in Chapter 9 (Remedies). Following is "the process of pursuing assets from one location to another", as opposed to tracing, which involves the identification of substitute assets.[550] While substitute assets will still be relevant (for example, where a self-held digital object was deposited into a non-custodial intermediary holding account), the broader argument is that "we need not draw any automatic conclusions from changes in physical (electronic or other) constitution."[551] A less rigid approach to the applicability of rules concerning following/tracing to digital objects would allow the courts to engage in more complex evidentiary processes to characterise the result of (multiple) transactions involving digital objects.

6.38 Seventh, the persistent thing analysis better reflects the characterisation of a crypto-token as a composite thing. It does not narrowly focus on only the data or the state of the record but instead recognises how a crypto-token system can manifest a notional quantity unit through the *combination* of the active operation of software by a network of participants and network-instantiated data.[552]

TRANSFERS BY "A CHANGE OF CONTROL"

6.39 In our consultation paper, we provisionally proposed that the law should be clarified to confirm that a transfer operation that effects a state change is a necessary (but not sufficient) condition for a legal transfer of a crypto-token. However, we also considered the possibility that a potentially wider condition could apply — namely, a "change of control".[553]

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paras 13.14–13.15. Although we considered that mining or validator rewards could constitute an independent acquisition, we did not extend that reasoning to the output of transfers. See also n 546 above in the context of deposits of tokens into a liquidity pool as a liquidity provider.

549 We conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. Such a special defence might provide a legal method by which new, indefeasible title to a crypto-token can arise at law. See discussion on this point in D Fox, *Property Rights in Money* (2008) at paras 8.22–8.23.

550 Professor Cutts p 971. The courts have not always made this distinction clear. See, for example, *FHR European Ventures LLP v Cedar Capital Partners LLC* [2014] UKSC 45; [2015] AC 250 at [44], by Lord Neuberger.

551 Professor Cutts, p 972. See also Ashurst LLP p 88 (para 4.76): "By reason of the Law Commission's approach to the transfer of crypto-tokens, the Law Commission also appears to view the options between following and tracing as binary in relation to the much wider category of data objects. We consider such a restrictive approach to be unnecessary. Both following and tracing are evidential processes. Both may be applicable. The applicability of one over the other is to be determined by the facts of a given case to determine the most appropriate analytical process."

552 Norton Rose Fulbright LLP pp 841–3; Ashurst LLP pp 77–79 (para 4.35); and our consultation paper at paras 10.29 and 10.33.

553 See consultation paper question 26 and para 13.142.

6.40 By change of control, we broadly mean a change of "control" (as described in Chapter 5 (Control)) to another person.[554]

6.41 Consultees largely said that it is possible to effect a legal transfer of a crypto-token offchain by a "change of control".[555] They also said that it was possible to effect a legal transfer of a crypto-token onchain by a transfer operation that effects a state change (which, as we discuss above, itself would result in a change of control). In each case, most consultees said that intention would be a necessary element in determining whether a valid legal transfer occurred.[556]

6.42 We agree, and conclude that it is possible (with the requisite intention) to effect a legal transfer of a crypto-token offchain by a "change of control"[557] or onchain by a transfer operation that effects a state change.

6.43 Consultees said that recognising that a "change of control" (plus the requisite intention) could effect a valid transfer at law accurately reflects the current use of crypto-tokens in the market.[558] Limiting legal transfers to a transfer operation that effects a state change would focus the law too closely on particular data within a crypto-token system — specifically, the state of the distributed ledger or structured record. Consultees expressed a clear preference for the law of England and Wales to also facilitate and support offchain transfers.[559]

6.44 Other arguments in support of a change of control (rather than a transfer operation that effects a state change) being a necessary (but not sufficient) condition for the transfer of title include the following.

(1) Supporting sufficient flexibility within the law of England and Wales for market participants to structure their transfers as they see fit (including over the counter or offchain transfers, which are common in the market).[560]

(2) The varying degrees of technical encumbrances that can relate to crypto-tokens within crypto-token systems facilitate new ways in which control can be

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554 See para 5.10. This description mirrors the definitions provided by UNIDROIT and the UCC: UNIDROIT Working Group*, Principles on Digital Assets and Private Law* (2023) principle 6, p 38; UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.105.

555 An example might include the physical transfer of control through the transfer of hardware, or a transfer on a Layer 2 system.

556 See, for example, CLLS-FLC pp 515–517, 520, 525; Linklaters LLP pp 749–750 (para 1.5.2); IDAC and CryptoUK pp 594–596; COMBAR and the Chancery Bar Association pp 353–357 (paras 15.10–15.20); Dr Zhang p 650; and Hin Liu, who in response to our consultation paper provided an early draft of "Transferring legal title to a digital asset" (2023) 5 *Journal of International Banking and Financial Law* 317. For a more detailed discussion of intention, see Chapter 5 (Control).

557 Albeit that it is possible that legal title from such a transfer could be susceptible to being defeated by a subsequent (and conflicting) onchain transfer in certain circumstances (see Linklaters LLP pp 748–749 (para 1.5.1).

558 See, for example, Hin Liu, who in response to our consultation paper provided an early draft of "Transferring legal title to a digital asset" (2023) 5 *Journal of International Banking and Financial Law* 317. See in particular pp 318 and 320.

559 See Linklaters LLP pp 748–749 (para 1.5.1).

560 Linklaters LLP pp 748–749 (para 1.5.1); IDAC and CryptoUK pp 594–596.

manipulated. In particular, there exist certain business models that enable parties to transfer exclusive control offchain, including (but not limited to) multi-signature[561] and key-sharding[562] techniques that relate to private keys, private pin numbers,[563] the transfer of physical control over/access to private keys,[564] and certain Layer 2 (or other scaling solution) functionalities.[565]

(3) Many DeFi products focus on the manipulation and transfer of control. Examples given by consultees include smart contracts used for making offers on NFT platforms,[566] DeFi related collateral arrangements, staking arrangements[567] and various different software-as-a-service arrangements[568] which manipulate control in some way.

(4) Other international law reform initiatives focus on a change of control. For example, both the UNIDROIT Working Group[569] and the UCC Committee[570] acknowledge that a transfer of a crypto-token can be made by a change of control.

6.45 In Chapter 5 (Control), we explain our reasoning for not defining control in a static way. Nonetheless, we think it is entirely appropriate for the courts to develop jurisprudence concerning a concept of control (and intention) which would properly reflect technology-neutral principles while being responsive to the specific technological implementation question, including on what constitutes a valid transfer at law. This has long been the way in which the law relating to relationships between parties and things has developed.

6.46 We conclude that our recommended technical expert group will be able to build up practical, technology-specific guidance over a period of time. Cumulatively, that guidance would help develop certainty under the law of England and Wales as to the

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561 Deloitte Legal (UK) pp 448–449, ISDA p 636 (para 2.2.1), Hugh James LLP p 573, and Linklaters LLP pp 750–751 (para 1.5.4) raised points in this regard.

562 Linklaters LLP pp 748–749 (para 1.5.1).

563 Linklaters LLP pp 748–749 (para 1.5.1).

564 See OpenDime, available at: https://opendime.com/. Also of relevance is the simple passing of control over private keys, for example, revealing the private keys in a will on death – see Gunnercooke LLP p 562. See also *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm), where private keys were sent over email.

565 For example, the Lightning Network, available at: https://lightning.network/. See IDAC and CryptoUK pp 594–596. for detailed argument on this point. We note, however, that not all Layer 2 (or other scaling solutions) function in the same way, and each technology would have to be considered based on its own functionality.

566 COMBAR and the Chancery Bar Association p 356 (para 15.18).

567 J Burnie, M Millward and M Kimber, "What's at stake? The legal treatment of staking" (2022) 37 *Journal of International Banking and Financial Law* 594, also available at: https://gunnercooke.com/whats-at-stake-the-legal-treatment-of-staking/.

Matthew Kimber is the lead lawyer on this project.

568 For software as a service, see Gunnercooke LLP p 561.

569 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 6, p 38.

570 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.105.

precise elements of a "change of control" which are required as a necessary (but not sufficient) condition for the transfer of title. Neither the courts nor the technical expert group should be fettered by a static, incomplete or blunt definition of control. Most consultees were entirely confident in the ability of the courts in this respect as were members of the judiciary in our discussions with them. As COMBAR and the Chancery Bar Association said:[571]

> If [a concept of control and intention specific to digital objects][572] is available, then the consequences can be worked out by the court as necessary to resolve the disputes before them. The courts have not shied away from deciding novel points.

Conclusion 2.

6.47 We conclude that it is possible (with the requisite intention) to effect a legal transfer of a crypto-token offchain by a change of control or onchain by a transfer operation that effects a state change.

DERIVATIVE TRANSFERS OF TITLE

6.48 The majority of legal interests that persons acquire in things or objects are said to be dependent or derivative. That is, a person who acquires an object does not normally acquire a new, original interest in that object. Instead, a person will receive by transfer the interest that pre-existed in another (for example, through a sale or by taking delivery of a gift), or acquire some lesser interest, carved out of the better interest of another (as when a person becomes a pledgee).[573] The acquirer's rights in relation to the object will not be independently acquired rights,[574] but instead rights that derive from the rights of others.

6.49 We conclude that the rules of derivative transfer of title can apply to crypto-tokens. In our consultation paper, we said that the rules of derivative transfer of title can apply to crypto-tokens notwithstanding the extinction/creation analysis argument that an onchain transfer of a crypto-token involves the acquisition of a new, causally-related thing by the transferee. We also discuss above that there are good arguments for the persistent thing analysis — that the law could conceptualise crypto-tokens as persisting through transfers. The persistent thing analysis would make the argument

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571 COMBAR and the Chancery Bar Association p 357 (para 15.20).

572 Note that COMBAR and the Chancery Bar Association pp 345–357 (at paras 15.1–15.20) used the term "digital possession" and made a persuasive argument for the concept of possession applying directly to digital objects. However, for the reasons we discuss in this report, particularly in Chapter 4 (Third thing in practice), we think it is appropriate to distinguish possession and a concept of control and intention specific to digital objects.

573 In a pledge, the pledgor transfers various elements (but not all) of their property interest to the pledgee, including the right to possession: S Douglas, *Liability for Wrongful Interference with Chattels* (2011) p 37.

574 We discuss independent acquisition of rights in relation to digital objects at paras 13.14–13.16 of our consultation paper.

that the rules on derivative transfers of title apply to onchain transfers even stronger (given that the crypto-token would not be extinguished/created on transfer).[575]

6.50 We conclude that it does not make a difference that notional quantity units (or even a power/ability in respect of such notional quantity units) are necessarily intangible. As Professor Fox says (in the context of incorporeal money):[576]

> … incorporeal money can indeed be transferred. To speak of incorporeal transfers gives full effect to the principle that the law should aim for functionally equivalent outcomes regardless of whether money is paid in corporeal or incorporeal form. Moreover, on a closer investigation, the principle of derivative transfer of title can never have entailed that the payer's possession or ownership of a corporeal asset actually passed, physically, to the recipient. That would be to take an extreme, and unrealistic, approach to the reification of property interests. On balance… it is justifiable to treat the incorporeal transfer [of money by means of an inter-bank payment] as involving a derivative means of acquiring title. First, the creation of the recipient's title depends on the expression of the payer's will at the outset. It is the payer who initiates the payment instruction. Secondly… the fact that the recipient's claim against his or her bank is newly created does not necessarily entail that he or she takes it free from competing titles. Indeed, it would take an extreme and unrealistic conception of derivative means of acquiring title to sustain the view that transfers of incorporeal money should be treated differently from corporeal transfers. Even in the simplest case of a transfer of ownership by delivery of a chattel, the network of jural relations constituted by the transferee's possession and ownership of the chattel is different from that constituted by the transferor's former possession and ownership.[577] The transferee does not in fact succeed to the same possession and ownership as the transferor. Possession and ownership are legal constructs. Unlike the corporeal assets they relate to, they cannot be transferred in space from one person to another.

6.51 On that basis, we reiterate our provisional conclusion from our consultation paper that this line of reasoning can be extended to the transfer of crypto-tokens where such a transfer is effected by a transfer operation that effects a state change, or a change of control.[578] We also think that the concepts of possession described by Professor Fox in the passage above can apply by analogy to a concept of control and intention specific to crypto-tokens. Our starting point is that such a transfer (either onchain or offchain) is a necessary (but not sufficient) condition for the transfer of superior legal title to a crypto-token.

6.52 Such a transfer is not sufficient in itself to transfer superior legal title to a crypto-token for two reasons. First, in general, a transferor can confer no better title to a transferee

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575 We discuss the arguments for and against this in detail from para 6.21 above.

576 D Fox, *Property Rights in Money* (2008) paras 1.101, 1.106 and 1.107.

577 Referencing W N Hohfeld, *Fundamental Legal Conceptions* (1964) ch 2 and W W Buckland, *Textbook of Roman Law* (3rd ed 1963) at p 204.

578 As we discuss in more detail from para 6.39 above, we now recognise based on feedback from consultees that a transfer of legal title to a crypto-token could be effected (i) onchain, through a transfer operation that effects a state change coupled with a change of control; or (ii) offchain, through a change of control.

than they have (the "*nemo dat* principle").[579] Second, the transaction between the transferor and the transferee must be legally valid in terms of the common law and equitable rules governing derivative transfers of title.[580]

6.53 The *nemo dat* principle is codified in law in relation to goods by section 21(1) of the Sale of Goods Act 1979. As a general principle, it is subject to statutory exceptions, as well as the common law special defence of good faith purchaser for value without notice that applies to money and to negotiable instruments, and the equitable principle of good faith purchaser for value without notice.[581]

6.54 The common law special defence of good faith purchaser for value without notice that applies to money creates a fresh, indefeasible legal title in a purchaser of money in good faith and for value. The common law special defence operates to make the purchaser immune from the claim (legal or equitable) of any previous holder who might otherwise have retained a proprietary interest in the money.[582] The common law special defence of good faith purchaser for value without notice that applies to negotiable instruments such as bills of exchange and promissory notes[583] operates in a similar way. It creates a fresh, indefeasible legal title in a transferee (a "holder in due course") who takes the negotiable instrument in good faith and for value, and without notice of any defect in the title of the person who negotiated it. Possession of the negotiable instrument is required for a holder to enforce the right to claim performance of the obligations embodied by the negotiable instrument.[584]

6.55 Below we conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things. As we discuss below, this would significantly limit the application of the *nemo dat* principle to crypto-token transfers. However, for a number of reasons we conclude that such a development would represent only a limited *practical* extension to the legal position were a common law special defence not available.

A COMMON LAW SPECIAL DEFENCE OF GOOD FAITH PURCHASER FOR VALUE WITHOUT NOTICE

6.56 In our consultation paper, we provisionally proposed that a common law special defence of good faith purchaser for value without notice should apply to a transfer of a

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579 A general principle of the law of England and Wales which is traditionally expressed in Latin as follows: *nemo dat quod non habet*. It is sometimes referred to as the "nemo dat" principle. The nemo dat principle is "the basic rule in relation to title in English law … that no one can give what they do not have". See M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 31.002.

580 D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.48.

581 We discuss these exceptions and defences in more detail in our consultation paper from para 13.23.

582 D Fox, *Property Rights in Money* (2008) at 2.11 and D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.59.

583 *Miller v Race* (1758) 1 Burr 452; *Clarke v Shee* (1774) 1 Cowp 197; Bills of Exchange Act 1882, s 29.

584 See M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 26.004 and onwards for more detail on the categories of "holder" and the types of possession required.

crypto-token by a transfer operation that effects a state change.[585] Given that we mooted the possibility of codifying such a rule in statute, we referred to the concept as an "innocent acquisition rule".

6.57 We provisionally proposed that an innocent acquisition rule should apply to both "fungible" and "non-fungible" technical implementations of crypto-tokens.[586] We said that an innocent acquisition rule could not and should not apply automatically to things (such as legal rights) that are linked to a crypto-token.

6.58 We said that it is possible that the common law could develop an innocent acquisition rule in respect of crypto-tokens by way of analogy with the existing common law special defences of good faith purchaser for value without notice that apply in respect of money and negotiable instruments. However, we provisionally concluded that market participants would benefit from a statutory provision which explicitly recognised an innocent acquisition rule in respect of transfers of crypto-tokens by a transfer operation that effects a state change. We noted that this is the approach recommended by both the UCC Committee[587] and the UNIDROIT Working Group.[588]

6.59 Consultee responses to this set of consultation questions[589] were strongly in favour of an innocent acquisition rule. This was one of the topics in our consultation paper that received the most consistent and strongly argued set of responses.[590]

6.60 We agree with the views of the majority of consultees. However, based on consultee responses and the recommendations that we make in the rest of this report, our conclusion is different from the provisional proposal in our consultation paper in two principal ways.

6.61 First, we now conclude that the law should recognise that it is possible for a transfer of a crypto-token to be made offchain, through a change of control (along with the requisite intention).[591] As we discuss from paragraph 6.39 above, this is a wider concept than the more limited concept of a transfer operation that effects a state change (an onchain transfer). As such, the application of any common law special defence of good faith purchaser for value without notice would not in principle be limited to situations involving an onchain transfer. The common law special defence could also apply to a transfer of a crypto-token made offchain, through a change of

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585 See consultation question 22 and paras 13.23–13.94.

586 For our discussion on the concept of fungibility, see from para 15.9 of our consultation paper.

587 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.102(2).

588 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 8, p 43.

589 Consultation questions 22 to 24.

590 Of the 38 consultees who responded to this question, 21 agreed outright and eight provided qualified agreement. Four consultees provided a mixed response, and five disagreed.

591 Albeit that it is possible that the title from such a transfer could be susceptible to being defeated by a subsequent (and conflicting) onchain transfer in certain circumstances (see Linklaters LLP pp 748–749 (para 1.5.1).

control, although difficult evidential issues could arise where a subsequent (and conflicting) onchain transfer occurs.[592]

6.62 Second, we do not recommend[593] a hard definition of "data object", "digital object", "crypto-token", controllable "electronic record" or any other type of digital asset,[594] in contrast to the definitions proposed by the UCC and UNIDROIT[595] (and in contrast to our proposals in our consultation paper).

6.63 This means that there is and will be no hard definition under the law of England and Wales on which to base a statutory innocent acquisition rule for crypto-tokens or other third category things. Therefore, while many consultees said it would be preferable or useful to implement a statutory innocent acquisition rule, we do not recommend that at this time.

6.64 Instead, we conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law.

6.65 Below, we (1) discuss how our conclusion might take effect at common law; (2) discuss how our conclusion represents only a limited *practical* extension to the legal position were a common law special defence not available; and (3) reiterate the policy rationale for our conclusion.

The provisional proposal in our consultation paper

6.66 In our consultation paper we said that as far as the law currently stands, we do not consider that crypto-tokens or third category things benefit from the existing common law special defences of good faith purchaser for value without notice applicable to money or to negotiable instruments. We said that because crypto-tokens are generally not considered to be either money or negotiable instruments, the existing defences would not apply. We said however that this would not prevent the courts from developing a similar defence by analogy with the existing defences applicable to money or negotiable instruments:[596]

> We think that the best way to avoid any lingering uncertainty as to the application of the common law special defence of good faith purchaser for value without notice is explicitly to recognise its application in relation to transfers of crypto-tokens.

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592 Not all consultees agreed with this. See, for example, Professor Tettenborn, p 55. See further UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 6, p 38.

593 As explained in Chapters 3 (Third thing) and 4 (Third thing in practice).

594 Nor do we suggest defining the contours of a third category of thing to which personal property rights can relate.

595 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 2, p 16; UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.

596 Consultation paper para 13.52.

6.67 Most consultees agreed with this position, but some took it one step further and argued that an applicable special defence already exists as a matter of common law.[597]

How our conclusion might take effect at common law

6.68 For the reasons discussed in our consultation paper[598] and which we discuss below, we conclude that the common law special defences of good faith purchaser for value without notice that apply to money and to negotiable instruments do not apply directly to crypto-tokens or to other third category things.

6.69 Instead, we think that it is more appropriate for the common law to recognise, refine and develop a similar special defence of good faith purchaser for value without notice that applies to crypto-tokens and to other third category things. That defence can be recognised and developed by analogy with the existing defences applicable to money and negotiable instruments. As the Crypto Council for Innovation said:[599]

> We do not advocate the wholesale importation of the law of negotiable instruments as it currently stands into the law of cryptoassets... However, the concepts which lie behind the law of negotiable instruments match closely the structural elements which a law of cryptoassets should achieve, and this body of law provides some useful conceptual scaffolding which could be relatively easily adapted to the position in respect of cryptoassets.

6.70 The benefit of this approach is that crypto-tokens and other third category things need not be characterised as either money or negotiable instruments for a person to benefit from legal protection when they are a purchaser in good faith for value and without notice.

Analogy with the common law special defence of good faith purchaser for value without notice that applies to money

6.71 The characterisation of crypto-tokens as money or otherwise is outside the scope of this report. However, we make three observations on the point. First, the debate on whether a crypto-token is "money" has largely focused on a specific sub-set of crypto-tokens over the last few years (that is, those that are intended to function in a similar way to money), rather than on crypto-tokens in general.[600] However, other crypto-

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597 See Linklaters LLP pp 752–757 (para 1.8). At pp 255–256, the Centre for Commercial Law at the University of Aberdeen considers the possibility that such a defence might exist at law, although does not make a conclusive argument either way. Compare with the response of Clifford Chance LLP, pp 297–299. At pp 401–402 the Crypto Council for Innovation highlight that crypto-tokens could be brought within the regime for negotiable instruments, because "the concepts which lie behind the law of negotiable instruments match closely the structural elements which a law of cryptoassets should achieve". ISDA at p 613 (para 2.2.2) makes a similar point.

598 Consultation paper para 13.50.

599 Crypto Council for Innovation p 402.

600 This is in part because the first use-cases for crypto-tokens were, to a greater or lesser extent, as a means of exchange, a store of value or a unit of account. While some crypto-tokens are still primarily used for these purposes, crypto-tokens now have many different use-cases. In particular, they are no longer confined to "money" or "money-like" use-cases, and most jurisprudence and regulatory and legal commentary on crypto-tokens treats them as objects of personal property rights, without answering the question as to whether they are or can be money.

tokens are not designed to replicate the functionality or characteristics of money. So the special defence applicable to money would remain inapplicable to those types of crypto-token.

6.72 Second, whether a crypto-token (or specific crypto-token) is characterised as money is likely to depend on the law of the particular jurisdiction in question and this characterisation might be different across different jurisdictions. Indeed, some crypto-tokens are already recognised as legal tender in some jurisdictions.[601] It is also possible that some jurisdictions will adopt central bank digital currencies, which might be given "monetary" status by legislation.[602]

6.73 Third, "the property regime applying to money is just one of a number of legal devices by which the state can support the efficiency of monetary functions".[603] It is therefore less accurate to ask "are crypto-tokens money?" than to ask the specific question as to whether the law is able to characterise crypto-tokens as something that should enjoy a privileged proprietary status which other kinds of assets or things do not enjoy. This question can be asked separately for each distinct "legal device" by which the state can support the efficiency of monetary functions, including for the application of a common law special defence.

6.74 Crypto-tokens therefore do not need to be "money" to benefit from a special defence of good faith purchaser for value without notice.

6.75 This is the approach taken by the UCC Committee in Article 12 of the UCC,[604] which does not comment on the monetary status of crypto-tokens but still:[605]

> Preserve[s] the decentralized nature of bitcoin and other cryptocurrencies, enable[s] secured lenders to enjoy legal benefits of their existing commercial practices, and protect[s] the negotiability of bitcoin by allowing onward transferees to take bitcoin and cryptocurrencies free of existing encumbrances.

6.76 While it does not apply directly, the common law special defence of good faith purchaser for value without notice that applies to money can be used as a useful analogy for a similar common law special defence that could be developed for crypto-tokens. The analogy is particularly apt given that money can exist as an intangible

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601 Such as El Salvador: S Perez, C Ostroff, "El Salvador Becomes First Country to Adopt Bitcoin as National Currency" (September 2021): https://www.wsj.com/articles/bitcoin-comes-to-el-salvador-first-country-to-adopt-crypto-as-national-currency-11631005200.

602 *Hansard* (HL), 2 February 2023, vol 827, col 811; Bank of England, "The digital pound: A new form of money for households and businesses?" (2023).

603 See D Fox, *Property Rights in Money* (2008) para 2.09.

604 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12.

605 C Reyes, "Emerging Technology's Unfamiliarity with Commercial Law" (2023) p 9, available at: https://ssrn.com/abstract=4388919.

thing in action — bank account money — or as a physical thing in possession in the form of coins (or, in the case of a bank note, a combination of the two).[606]

Analogy with the common law defence of good faith purchaser for value without notice that applies to negotiable instruments

6.77 Many consultees[607] made a strong argument that analogies could be drawn between crypto-tokens and negotiable instruments for the purpose of an innocent acquisition rule. This is the approach taken by the UNIDROIT Working Group and the UCC Committee, both of whom refer explicitly to the concept of negotiability.[608]

6.78 For negotiable instruments, the common law requires evidence of a mercantile practice of the relevant instrument "passing by delivery from hand to hand"[609] and historically only tangible things have acquired negotiable status through mercantile custom.

6.79 In addition, the law on negotiable instruments developed based on the transfer of a right to sue an obligor (that is, a transfer of a thing in action) being embodied in a physical instrument capable of physical delivery (that is, a thing in possession). As we discuss in Chapters 3 (Third thing) and 4 (Third thing in practice), a crypto-token in general does not confer or consist of such a right (it is not a thing in action), and it is not tangible (it is not a thing in possession).

6.80 Applying the concept of negotiability to crypto-tokens therefore necessarily requires analogy. The analogy is between tangible things such as paper documents which are used as "tokens [tangible embodiments] of abstract rights"[610] on the one hand (that is, negotiable instruments), and intangible things used as tokens of notional quantity units (which exist independently of any rights in relation to them) on the other. Crypto-tokens are an example of the latter. When a crypto-token is linked in some way to a right or claim enforceable by action (such as when creating a "digital bearer instrument")[611] the analogy with negotiable instruments is much clearer. Nevertheless, that situation still raises the question as to whether the focus should be on the transfer of the legal rights, or the transfer of the thing that embodies those legal rights.

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606 Bank of England banknotes are promissory notes within the meaning of s 83 of the Bills of Exchange Act 1882. They are legal tender under the Currency and Banknotes Act 1954 s 1(2). They are physical things which embody a thing in action: a promise by the issuer (the Bank of England) to pay the bearer in currency — albeit since sterling is no longer backed by physical assets such as gold, the obligation is merely to pay the bearer in its own notes. See C Proctor, *Mann on the Legal Aspect of Money* (2019) at paras 2.20–2.23.

607 Crypto Council for Innovation, p 402; Linklaters LLP pp 752–757 (para 1.8); Centre for Commercial Law at the University of Aberdeen pp 255–256; Clifford Chance LLP pp 297–299; D2 Legal Technology p 418; FMLC p 541; ISDA p 613 (para 2.2.2).

608 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) pp 43–44 paras 8.1–8.2; UCC Committee, *Amendments to the Uniform Commercial Code (With Prefatory Note and Comments)* (2023) p 1. This is also consistent with the view we expressed in our consultation paper at para 13.56.

609 *Bechuanaland Exploration Co v London Trading Bank Ltd* [1898] 2 QB 658; *Goodwin v Robarts* (1875) LR 10 Ex 337.

610 J S Rogers, "Negotiability, property, and identity" (1990) 12(2) *Cardozo Law Review* 471, 508; see also *Bullard v Bell* (1817) 4 F Cas 624 at 627, by Story J.

611 UKJT, Legal Statement on Digital Securities paras 26–39 and Appendix 1 (p 44).

6.81 We think the better approach is to focus on the transfer of the thing that embodies the rights.[612] This must be correct, because we know that crypto-tokens can exist as things in themselves and not as legal rights: they are not things in action.[613] With a negotiable instrument, the rights to claim performance of the obligations that the negotiable instrument embodies move with the holder in due course of the negotiable instrument. The promise from the maker can be considered as "an original and direct promise to the bearer".[614] This is not the case for crypto-tokens: the crypto-token as a thing to which personal property rights can relate is much better analogised as a token with some inherent bearer-like qualities, but not as a promise from any person or issuer. So focusing on the transfer of a "right" does not work with a crypto-token.

6.82 Instead, we consider that the appropriate exercise is critically to analyse the mercantile custom that has arisen in respect of crypto-tokens. The question is whether the mercantile custom that has arisen in respect of crypto-tokens is sufficiently similar to the mercantile custom in relation to negotiable instruments so as to justify the application of a common law special defence to crypto-tokens.

6.83 It is clear that the law of England and Wales will treat crypto-tokens as a thing to which society attaches legal consequences (including the recognition that property rights can relate to that thing).[615] In this way, the law is responsive to the actions and intentions and expectations of parties and recognises that (much of) society regards such assets as socially and economically important.

6.84 With this in mind, it is difficult to see why the law should treat crypto-tokens as things to which personal property rights can relate, but not treat them as "negotiable"[616] where this is the clear intention and developed custom of users. Indeed, crypto-token systems are "state transition systems"[617] designed to facilitate the communication of value[618] on a trust-minimised (and often pseudonymous or anonymous) basis. As such, the technology is arguably explicitly designed such that the notional quantity units within the system mimic some of the functionality of negotiable bearer

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612 As we discuss above, we do not consider that tangibility is a barrier to recognition of digital objects as objects of personal property rights. Nor should tangibility alone be a barrier to development of an innocent acquisition rule applicable to digital objects. See also Linklaters LLP: "the historical association of negotiable instruments with things in action embedded in things in possession is merely a historical accident as opposed to a fundamental design feature" (at p 754–757 (para 1.8.3)). Linklaters LLP said that they do not "see any policy rationale for limiting negotiability status to tangible things" (at p753–754 (para 1.8.2).

613 Crypto-tokens are not rights in themselves and they exist independently of any rights or claims in that might also exist in relation to them. They can also be used and enjoyed independently of whether any rights or claims in relation to them are enforceable by action.

614 *Bullard v Bell* (1817) 4 F Cas 624 at 627 by Justice Story; J S Rogers, "Negotiability, property, and identity" (1990) 12(2) *Cardozo Law Review* 471, 508.

615 See Chapter 3 (A "third" category of thing to which personal property rights can relate).

616 We use that term in a limited sense to express the idea under the law of England and Wales that digital objects can benefit from a common law special defence of good faith purchaser for value without notice. However, as we discuss in this chapter, we think it is better to draw analogies with negotiable instruments rather than simply to treat digital objects as negotiable instruments.

617 Ethereum, "Ethereum Whitepaper" (2023), available at: https://ethereum.org/en/whitepaper/#ethereum-state-transition-function.

618 S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) at pp 1 and 8, available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

instruments.[619] This distinguishes crypto-tokens from physical things in possession which are not explicitly designed to facilitate peer-to-peer transfers of value on a global and online basis. In respect of those physical things in possession, there is a better argument that the law should prioritise the personal property rights of individuals in respect of their physical things over the sanctity of transactions involving an innocent acquirer of those things.[620]

6.85 In short, drawing an analogy with the common law special defence of good faith purchaser for value without notice that applies to negotiable instruments is apt. The category of negotiable instruments (or, for our purposes, those third category things including crypto-tokens that are treated by market participants as "negotiable" by analogy) is not closed.[621] The category of negotiable instruments has not always necessarily required significant time to develop, and so the relative nascence of crypto-token markets should not be a barrier to common law development.[622] Indeed, the common law is highly responsive to market practice[623] and it is a simple fact that markets for crypto-tokens exist today, regardless of how quickly they developed.[624]

6.86 Crypto-tokens are not, in any case, brand new.[625] The Bitcoin whitepaper was published in 2008[626] and the Ethereum Yellow Paper in 2014.[627] Further, crypto-tokens are used in a large number of transactions, by a large number of people, and in high total volumes.[628] The number of transactions on the Bitcoin network regularly exceeds five million per month, with monthly volumes ranging significantly between $200 billion and $8 trillion since 2020.[629] Since 2018 the number of active addresses (monthly) (not active persons) on the Bitcoin network ranged between 18 million and 35 million. The number of transactions on the Ethereum network regularly exceeds 30

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619 Linklaters LLP also made this point explicitly in a detailed consideration of the evolution of the law merchant with respect to negotiable instruments, which we recommend reading in full at pp 754–757 (para 1.8.3) of their response.

620 For further, and alternative, arguments in this area, see A Tettenborn, "Transfer of chattels by non-owners: still an open problem" (2018) 77(1) *Cambridge Law Journal* 151.

621 See *Goodwin v Robarts* (1876) LR 10 Ex 337 at 352 (and in the House of Lords (1876) 1 App Cas 476), as well as Kennedy J in *Bechuanaland Exploration Company v London Trading Bank* [1898] 2 QB 658 and Bigham J in *Edelstein v Schuler & Co* [1902] 2 KB 144.

622 See broadly Linklaters LLP pp 752–757 (para 1.8).

623 Above.

624 And regardless of one's views on the nature or purpose of those markets.

625 See also our discussion on crypto-tokens and cryptography at paras 10.40–10.43 of our consultation paper.

626 S Nakamoto*, Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), available at: https://nakamotoinstitute.org/static/docs/bitcoin.pdf.

627 G Wood, "Ethereum: A Secure Decentralized Generalised Transaction Ledger" (2014), available at: https://github.com/ethereum/yellowpaper/blob/master/BRANCHES.md.

628 The following data uses "onchain" data and so does not tell the full story when it comes to adoption and usage because (1) this data relates only to Layer 1 usage and does not account for any Layer 2 use; and (2) this data does not account for any offchain activity (although, of course, offchain activity is likely to involve intermediated holding arrangements/book-entry activity and therefore not bearer-like instruments so would not support the argument in favour of mercantile custom arising).

629 The Block, "On-chain Metrics: Bitcoin" (2023), available at: https://www.theblock.co/data/on-chain-metrics/bitcoin.

million per month, with recent monthly volumes since 2020 ranging significantly between $6.5 billion and $404 billion.[630] Since 2018 the number of active addresses (monthly) (not active persons) on the Ethereum network ranged between five million and 20 million.[631] In contrast, some existing negotiable instruments are used much less today: in 2022, nearly 131.5 million cheques with a total value of around £187 million were processed by the image clearing system.[632]

6.87 We conclude that this level of adoption is evidence that mercantile custom has arisen in respect of such crypto-tokens — particularly because users (or the software they rely on) must comply with the protocol rules of the system as designed to be able to transact. In that respect, we agree with Linklaters LLP that:[633]

> It would be a relatively straightforward incremental step for the courts to recognise a mercantile custom treating onchain transfers of crypto-tokens as negotiable, where such a custom can be demonstrated. … We believe such custom is highly evident in the case of many frequently traded crypto-tokens. … We see no reason why the same kind of technical extension to the common law to recognise a global mercantile custom should not also apply in the case of crypto-tokens. We also believe that market practice established in relation to certain crypto-tokens can easily (and very quickly) be extended to similar crypto-tokens by analogy.

6.88 Lord Devlin said in *Kum v Wah Tat Bank*[634] that the function of the commercial law is to allow, so far as it can, commercial people to do business in the way in which they see fit. If the law of England and Wales is to navigate the technological changes of the 2020s, 2030s and beyond,[635] it will need to adapt quickly. This is not a new phenomenon for the law. Over 120 years ago, Mr Justice Bigham in *Edelstein v Schuler & Co* said:[636]

> It is no doubt true that negotiability can only be attached to a contract by the law merchant or by a statute; and it is also true that, in determining whether a usage has become so well established as to be binding on the courts of law, the length of time during which the usage has existed is an important circumstance to take into consideration; but it is to be remembered that in these days usage is established much more quickly than it was in days gone by; more depends on the number of the transactions which help to create it than on the time over which the transactions are

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630 The Block, "On-chain Metrics: Ethereum" (2023), available at: https://www.theblock.co/data/on-chain-metrics/ethereum.

631 Above.

632 Image Clearing System enables digital images of cheques and credits to be exchanged between participant banks and building societies across the whole of the UK for clearing and settlement. See https://newseventsinsights.wearepay.uk/data-and-insights/payment-statistics-overview/. We note however that this statistic applies only to the UK image clearing system, whereas statistics for crypto-tokens are global.

633 Linklaters LLP p 753 (para 1.8.2).

634 [1971] 1 Lloyd's Rep 439, 444.

635 While beyond the scope of this report, it is almost certain that the rate of technological change will accelerate significantly in the coming years, particularly given the development of artificial intelligence and large language models.

636 [1902] 2 KB 144 at 154–155 (footnotes omitted).

> spread; and it is probably no exaggeration to say that nowadays there are more business transactions in an hour than there were in a week a century ago. Therefore, the comparatively recent origin of this class of securities in my view creates no difficulty in the way of holding that they are negotiable by virtue of the law merchant; they are dealt in as negotiable instruments in every minute of a working day, and to the extent of many thousands of pounds. It is also to be remembered that the law merchant is not fixed and stereotyped; it has not yet been arrested in its growth by being moulded into a code; it is, to use the words of Cockburn CJ in *Goodwin v Robarts*, capable of being expanded and enlarged so as to meet the wants and requirements of trade in the varying circumstances of commerce,[637] the effect of which is that it approves and adopts from time to time those usages of merchants which are found necessary for the convenience of trade.

6.89 The common law special defence of good faith purchaser for value without notice that applies to negotiable instruments is therefore particularly useful as a reference point for recognising a similar common law defence applicable to crypto-tokens.

A limited development

6.90 We conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. This reasoning can also be extended to other third category things. We consider this to be only a limited *practical* extension to the legal position were a common law special defence not available. That is for five reasons.

6.91 **Such a defence might already exist for third category things**: First, in *Armstrong v Winnington*, Stephen Morris QC (sitting as Deputy High Court Judge) held that the common law special defence of good faith purchaser for value without notice is a defence to a proprietary restitutionary claim.[638] The court recognised that the common law special defence could apply to a purchase for value of the legal title of intangible objects of personal property rights ("EUAs"). While there is debate as to the correct characterisation of an EUA,[639] in that case Stephen Morris QC clearly characterised an EUA as "not a chose in action in the narrow sense, as it cannot be claimed or enforced by action."[640] Instead, he described an EUA as "intangible property".[641] The judgment is therefore possible authority for the proposition that the common law special defence of good faith purchaser for value without notice is available in respect

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637 *Goodwin v Robarts* (1874-75) LR 10 Ex 337 at 346, by Cockburn CJ.

638 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156.

639 See the case itself above, as well as commentary by authors such as KFK Low and J Lin, "Carbon Credits as EU Like It: Property, Immunity, TragiCO2medy?" (2015) 27(3) *Journal of Environmental Law* 377; M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 15–127; and N McBride, 'mcbridesguides: *Armstrong v Winnington Networks Ltd*' (2013), available at: http://mcbridesguides.com/wp-content/uploads/2013/08/armstrong-v-winnington-networks-ltd.pdf.

640 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [61].

641 Above at [58].

of intangible objects of personal property rights, such as crypto-tokens and other third category things.[642]

6.92 **The extinction/creation analysis**: Second, if the extinction/creation analysis in respect of crypto-tokens is correct, then "a fresh piece of property is created every time [a crypto-token] is transferred".[643] As we said in our consultation paper, market participants might assume that the extinction/creation analysis is correct and that the practical consequences of an innocent acquisition rule already apply. This expectation of market participants is likely to derive, in part, from the conclusions of the UKJT Legal Statement that "We do not think the [*nemo dat*] principle applies in the case of [crypto-tokens]" and that "The general [*nemo dat*] rule does not anyway apply to a [crypto-token] because each onchain transfer creates new property with a new title".[644] We discuss but do not definitively conclude on this point at from paragraph 6.21 above. However, while the extinction/creation analysis can explain a transfer of a right to enforce performance of an obligation embodied in a negotiable instrument, it is less clear that it accurately explains why the transfer of notional quantity units within a crypto-token system gives rise to fresh, indefeasible legal title.[645] Nonetheless, given that the UKJT Legal Statement was published in 2019 and that the analysis was re-affirmed in 2023,[646] it is likely that market participants understand the practical consequences of an innocent acquisition rule already to apply as a matter of common law. It would be unfortunate for either this report or a court to suggest otherwise.

6.93 **Mercantile custom**: Third, as we discuss from paragraph 6.82 above, there is an argument that mercantile custom has already developed to treat crypto-tokens as negotiable. If this is correct, then a court recognising the existence of a common law special defence of good faith purchaser for value without notice would be reflecting the mercantile custom that has *already* arisen.

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642 In *Armstrong*, Stephen Morris QC (sitting as Deputy High Court Judge) (at [100]–[102]) placed express reliance on *Lipkin Gorman v Karpnale Ltd* [1991] 2 AC 548, a case which supported the availability of the defence to proprietary restitutionary claims. The thing in question in *Lipkin Gorman* was money. In principle, the common law special defence of good faith purchaser for value without notice should not have been available to clear the title to the EUAs of any previous legal interests, because EUAs are not money (and it is not clear from the judgment that the court considered them to be money). There are two potential ways in which the *Armstrong* approach might be justified. First, the court might have taken the common law special defence of good faith purchaser for value without notice as it operates in relation to money and/or negotiable instruments and either extended the application of such a defence or applied a new special defence by analogy, such that it was available for "intangible property" (at [58]). However, this was not made express in the judgment. Alternatively, the judgment could be read as acknowledging the existence of a separate and more limited good faith purchaser for value without notice principle which operates as a distinct defence to proprietary restitutionary claims.

643 *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [25], by Birss LJ. See above from para 6.21.

644 UKJT, Legal Statement paras 47 and 124.

645 But see footnotes 548 and 549 above where we discuss how it might.

646 UKJT, Legal Statement paras 1–2.

6.94 **Transfers into mixtures**: Fourth, many transfers of crypto-tokens will involve crypto-tokens becoming "mixed"[647] on transfer — with the result that it is no longer possible to separate the pre-transfer components of the product from the post-transfer mixture. This will be the case where crypto-tokens are transferred to a public address where that address already is referenced or associated with a quantity of the same tokens, because the state of the relevant crypto-token generally only tracks *amounts* referenced or associated with a public address, and not specific tokens. The "mixture" analysis is even clearer when crypto-tokens are conceptualised as notional quantity units represented and manifested by instantiated data and the active operation of software by a network of participants: it is not realistically possible to separate distinct notional quantity units. At common law, a claimant can follow their property into a mixture, for example if their cotton bales[648] or oil[649] are mixed with another's, provided that it is possible to separate the components of the product. Moreover, in general at common law, a claimant cannot in general follow or trace money through a mixture where it is not possible to separate the components of the mixture of money.[650] The mixture of money (or in this case, crypto-tokens which were not separable) would confer on the recipient an indefeasible legal title to the money (or in this case, crypto-tokens) whether or not the transaction would have been effective to pass a derivative title.[651] Therefore, in cases where a thief stole a crypto-token (and the victim retained legal title to that crypto-token) which was subsequently irretrievably mixed with other crypto-tokens, the mixing would likely defeat the victim's claim at law.[652] Only where the thief transferred the crypto-tokens into "clean" public addresses would a mixing

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647 This is particularly the case with Account-based tokens and crypto-tokens based on "fungible" token standards, although it is arguably less likely with UTXO-based tokens and is not the case with NFTs. See D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.76, where the point is made that: "the unique transactional history recorded in some crypto-coins, such as bitcoins, may mean that it can never be mixed in an absolute sense".

648 *Spence v Union Marine Insurance Co Ltd* (1868) LR 3 CP 427.

649 *Indian Oil Corp Ltd v Greenstone Shipping SA (Panama)* [1988] QB 345.

650 *Trustee of the Property of FC Jones v Jones* [1997] Ch 159 at 168, by Millett LJ. However, some case law suggests that when money is withdrawn from a bank account, thus converting the thing in action (the bank account debt) into drawn money, a claimant might be able to trace at common law from the bank account into the drawn money (even where that drawn money was mixed with other money): *Lipkin Gorman v Karpnale Ltd* [1991] 2 AC 548. *Agip (Africa) Ltd v Jackson* [1990] Ch 265 at 286, by Millett J, upheld [1991] Ch 547 at 566, by Fox LJ; *Snell's Equity* (34th ed 2019) para 30-053. Professor Smith has previously argued against mixing defeating tracing at common law: L Smith, *The Law of Tracing* (1997) pp 71, 162–174.

651 See D Fox, *Property Rights in Money* (2008) paras 4.05 and 7.16–7.24, referring to *Westdeutsche v Landesbank Girozentrale v Islington London Borough Council* [1994] 4 All ER 890 at 917, by Hobhouse J; *Lipkin Gorman v Karpnale Ltd* [1991] 2 AC 548 at 572, by Lord Goff; and *First National Bank of Southern Africa v Perry No* 2001 (3) SA 960 at 967, by Schutz JA.

652 As we note in our consultation paper, if tracing into a mixture were possible at law, the victim might still retain legal title to the crypto-tokens (or maybe entitlements to crypto-tokens) in the mixture, and might be able to bring a proprietary claim at law (although common law remedies to vindicate property rights are essentially limited to personal remedies). See G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 629. As the UKJT note, this also applies to money: "an original owner can, it appears, trace legal title to money through a straight substitution, not involving a mixture, against a transferee that is not a bona fide purchaser for value without notice (see *Trustee of the Property of F C Jones & Sons (A Firm) v Jones* [1997] Ch 159 (CA))": UKJT, Legal Statement on Digital Securities para 52, n 39.

issue not arise.[653] The common law concept that legal title to money (and crypto-tokens) is extinguished once the money (or the crypto-tokens) ceases to be specifically identifiable in a mixture is a good partial explanation of the UKJT proposition that an onchain transfer creates new, indefeasible legal title in the recipient. However, given that mixing will not be relevant in all circumstances,[654] and given the ongoing criticism of the differences between common law and equitable tracing through a mixture, our preference is to focus on the good faith acquisition of a purchaser for value without notice.

6.95 **The equitable principle of good faith purchaser for value without notice already applies**: Finally, as we said in our consultation paper, the equitable principle of good faith purchaser for value without notice, which can extinguish an equitable interest in a thing following purchase of the legal title, applies to crypto-tokens.[655] This principle can only extinguish a prior equitable (rather than legal) interest and will therefore likely be available for many good faith purchasers for value without notice, but not all.[656] For example, in some circumstances, a perpetrator of a fraud or scam could obtain the superior legal title to a crypto-token (subject to the victim's mere equity).[657] In that case, the victim's mere equity would be extinguished against a subsequent good faith purchaser for value without notice. In contrast, a perpetrator of a "wrench attack"[658] is unlikely to obtain the superior legal title to the crypto-token. This is because, in a theft or misappropriation of that nature, the legal title is unlikely to pass because there

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653 T Chan and K Low, "Post-Scam Crypto Recovery: Final Clarity or Deceptive Simplicity?" (2023), p 4, available at: https://ssrn.com/abstract=4394820. See also *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm) at [113], by Henshaw J, where the issue did not arise as there was no evidence of mixing: "The cryptoassets in the Account were transferred there directly or indirectly, without any evidence of any relevant mixing, from other Nexo corporate cryptocurrency accounts. Nexo therefore has title to the cryptoassets in the Account, alternatively (if necessary) can follow its title into those assets and recover them as owner (cf *Trustee of the Property of FC Jones & Sons v Jones* [1996] EWCA Civ 1324; *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10)".

654 As in *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm) at [113], by Henshaw J, considered in the note above.

655 See paras 13.47–13.49 and 13.73–13.75 of our consultation paper. See also H Pugh, "Crypto fraud and the bona fide purchaser for value defence" (2023) 1 *Journal of International Banking and Financial Law* 5 at 6, referring to *Ellis v Digit Europe Ltd* (CL-2021- 000753) (unreported), in which the High Court "implicitly accepted that the equitable bona fide purchaser defence could apply to transferees of cryptocurrency".

656 See also H Pugh, "Crypto fraud and the bona fide purchaser for value defence" (2023) 1 *Journal of International Banking and Financial Law* 5, 6.

657 This might occur where the defendant induces the victim to transfer a thing by making a fraudulent misrepresentation. In such a case, although the victim's consent is defective, its presence at the point of transfer means that superior legal title passes, albeit subject to the victim's mere equity. In general, a mere equity is a claimant's inchoate (imperfectly formed) right to rescind or to claim an equitable interest which is binding on specific object of property rights. That inchoate right will transform into an equitable proprietary claim (an equitable interest) if and when the person chooses to enforce it. In other words, the person must perform some other act to cause their mere equity to crystallise as an equitable interest. See *Snell's Equity* (34th ed 2019) para 2.006. See also from para 9.39 below.

658 A wrench attack is where an attacker physically coerces a holder of crypto-tokens either to transfer those crypto-tokens or to give up control of those crypto-tokens (for example by giving over their private key). It is called a wrench attack because a wrench might be a suitable object with which physically to coerce someone (as immortalised by the famous XKCD comic, see https://xkcd.com/538/). Such attacks are also sometimes referred to as "rubber hose cryptanalysis", where the chosen object is instead a rubber hose (see https://en.wikipedia.org/wiki/Rubber-hose_cryptanalysis).

would not be any legally effective consent to the transfer from the victim.[659] In such a case, in the absence of a broad innocent acquisition rule, a third party who acquires the crypto-token from the perpetrator might be vulnerable to a claim by the victim.[660]

6.96 This means that there is a difference in the legal protection available to good faith purchasers for value without notice depending on the exact nature of the wrongdoer's acquisition of the crypto-token (that is, whether the wrongdoer acquired good legal title or not). However, in the majority of cases, it will not be possible for a good faith purchaser for value without notice to determine that a wrongful acquisition occurred in relation to a crypto-token, let alone the exact nature of the acquisition (and the complex legal consequences). From a fairness and consistency perspective, it seems odd that a purchaser could "take free" of certain interests but not others simply because of the specific nature of a wrongful acquisition that the purchaser (i) was not involved in; (ii) did not know about; and (iii) had no reasonable ability to investigate.

6.97 We understand that frauds, scams, and social-engineering attacks in which the victim willingly transfers or shares their ability to control their crypto-token(s) are far more prevalent than wrench-attacks or hacks.[661] In practice, therefore, in many situations, innocent acquirers will already be able to benefit from the equitable principle of good faith purchaser for value without notice. On that basis, we consider that recognising a common law special defence of good faith purchaser for value without notice in respect of crypto-tokens would only effect a modest practical extension of the effect of current law.[662] It would, however, increase consistency and fairness of the application of the *nemo dat* principle and its exceptions within the crypto-token markets.[663]

6.98 Moreover, the differences in the operation of the equitable principle of good faith purchaser for value without notice and a common law special defence of good faith purchaser for value without notice could lead to different results in other circumstances.

6.99 In *Piroozzadeh v Persons Unknown*[664] the High Court discharged an interim proprietary injunction against Binance (a crypto-token exchange). The interim proprietary injunction had required Binance to preserve certain crypto-tokens that the

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659 See further Chapter 9 (Causes of action and associated remedies).

660 We discuss this in more detail in our consultation paper at chapter 19 and in this report in Chapter 9 (Remedies).

661 See, for example, Crystal Blockchain, "Crypto & DeFi Hacks & Scams Report" (2021) p 7, available at: https://crystalblockchain.com/security-breaches-and-fraud-involving-crypto/. Hacks might, however, involve large quantities of tokens.

662 To the extent that the special defence does not already apply by analogy with the special defence in the context of money or negotiable instruments.

663 We also note that, to the extent that market participants operate on the basis of the analysis in the UKJT Legal Statement, this proposal actually represents an amelioration of the existing law — only in certain circumstances will a good faith purchaser for value without notice "take free" of existing (legal and equitable) interests, rather than on every transfer.

664 [2023] EWHC 1024 (Ch).

claimant (a victim of an alleged fraud) claimed to be able to trace to the accounts held at Binance. In that case, Mr Justice Trower said:[665]

> Once the Tether [a crypto-token/stablecoin] had been swept from the user accounts into the [Binance central unsegregated pool address] the users were then granted credit in the amount of the value swept which would then constitute [Binance] a purchaser and no longer susceptible to any remedy at the suit of the claimant so long as it acted [in good faith and without notice].

6.100 In *Piroozzadeh* the claimant claimed that its proprietary interest in the crypto-tokens was a beneficial interest under a constructive trust. As such, it is likely that the court was referring to the application of the equitable principle of good faith purchaser for value without notice. Although equity requires the recipient to provide executed consideration if he or she is to be a "purchaser", on the facts the Binance accounts had been emptied and so it seems there was executed consideration. Conversely, had the Binance accounts not been emptied, it is possible that the credit in the Binance account in the amount of the value swept would not constitute executed consideration.[666] In that scenario, the only defence that would succeed likely would be a common law special defence of good faith purchaser for value without notice (where either executed *or* executory consideration suffices for a person to constitute a "purchaser").[667] This distinction could lead to different results depending on the actions of unrelated third parties (that is, whether those third parties draw down their account balances or not), were a common law special defence of good faith purchaser for value not available.

Good faith purchase for value and notice

6.101 We recognise that a common law special defence of good faith purchaser for value without notice in respect of crypto-tokens favours innocent acquirers over victims of theft. In effect, the application of the common law special defence prioritises the sanctity of transactions involving an innocent acquirer over the personal property rights of victims of theft.[668]

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665 [2023] EWHC 1024 (Ch) at [26], by Trower J.

666 See D Fox, *Property Rights in Money* (2008) paras 8.39–8.42.

667 On this point, s 27 and s 29 of the Bills of Exchange Act 1882 codify the previous common law position applying to all kind of negotiable instruments, including banknotes, but the equivalent rule applying to money "must be inferred by analogy" with those sections, see D Fox, *Property Rights in Money* (2008) para 8.33. We say that crypto-tokens are neither money nor negotiable instruments, so whether only executory consideration suffices for the purposes of a common law special defence applicable to crypto-tokens would have to be inferred by analogy with the position for money and negotiable instruments. It is not possible to say that *Piroozzadeh* provides any authority or support for this, given the point was not raised or argued in that case.

668 Although likely not most fraudulent acquisitions, given that in most of those cases the fraudster will acquire good legal title.

6.102 Professor Fox and Helen Pugh both recognise that one of the core purposes of crypto-token systems is to develop a high level of anonymity and fungibility in digital transactions, so as to reduce transaction costs.[669] As Professor Fox says:[670]

> The price of that development is the elimination of adverse titles that might have otherwise been recognised in the victims of fraud. The development favours an extreme form of security of transaction over security of interest, achieved by technical design rather than by legal rules.

6.103 There are two approaches to this factual reality. Both seek to apply the concept of "notice" to new technology. The first, taken by Pugh, is to suggest technology-specific rules applicable to certain sub-types of crypto-tokens which would be relevant to the standard of notice relevant to payments of crypto-tokens.[671] The second, taken by the UCC Committee and the UNIDROIT Working Group, is to apply rules similar to those which determine whether a recipient of a bill of exchange or promissory note is a holder in due course.[672] The cases interpret this standard as actual notice.

6.104 Given that we recommend a common law special defence of good faith purchaser for value without notice in respect of crypto-tokens, we think it is appropriate that the applicable standard of notice reflects the common law position — actual notice.[673] That is, the recipient takes subject to any defect in the title of the transferor only if they actually know of that defect, or if the recipient knows facts which raise their suspicions and wilfully avoids making inquiries which would reveal the defect. We think this will be important in the future to protect the privacy of those transacting in the digital realm.[674]

6.105 While we do not think that simply transacting in a chain that involves "privacy coins" or "mixers" would be enough to raise such a suspicion for the purposes of this test, we expect that market practice will continue to evolve to help identify "tainted" or suspicious transactions. Indeed, this is already the case. For example, many NFT trading sites now "flag" those NFTs that might have been acquired by theft or

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669 D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.100; H Pugh, "Crypto fraud and the bona fide purchaser for value defence" (2023) 1 *Journal of International Banking and Financial Law* 5, 7.

670 D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.100. As Professor Fox sets out at n 143 (para 6.100), this distinction is a classic theme in the literature on commercial law: M Franklin, "Security of Acquisition and Transaction" (1931) 6 *Tulane Law Review* 589; L Ellis, "Transfer of Movables by a Non-Owner" (1980) 55 *Tulane Law Review* 145.

671 H Pugh, "Crypto fraud and the bona fide purchaser for value defence" (2023) 1 *Journal of International Banking and Financial Law* 5, 7.

672 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 8, pp 43–45; UCC Committee, *Amendments to the Uniform Commercial Code (With Prefatory Note and Comments)* (2023) p 245. See also Bills of Exchange Act 1882 s 29(1)(b).

673 See *May v Chapman* (1847) 16 M&W 355 at 361, per Parke B; *Jones v Gordon* (1877) 2 App Cas 616 at 635, per Lord Gordon; *London Joint Stock Bank v Simmons* [1892] AC 201 at 221, per Lord Herschell.

674 Indeed, some of the suggestions made by Pugh to modify the test of actual notice explicitly seek to reduce the privacy of individual parties, for example by treating transactions involving "privacy coins" or "mixers" differently to other transactions: H Pugh, "Crypto fraud and the bona fide purchaser for value defence" (2023) 1 *Journal of International Banking and Financial Law* 5, 7.

hacks.[675] We also recognise that certain market participants are able to track or trace UTXO sets through transactions. For example, the bitcoin taken in the 2016 Bitfinex (a crypto exchange) hack are widely traced.[676] Because of this, certain market participants (heavily) discount the value of "tainted sets" that are associated with criminal activity.[677]

6.106 Moreover, crypto-tokens are potentially more amenable to sophisticated evidential presumptions which might enable an original legal title holder to identify their crypto-token post-transfer. That is particularly the case with non-fungible tokens based on standards such as ERC 721 and ERC 1155, but it might also be the case (to a lesser extent) with UTXO-based tokens.[678] The particular token standard in question and the particular crypto-token (or third category thing) in question is also likely to affect the question of whether a recipient had actual notice of the defect in title. For example, a recipient of a well-known NFT that was closely associated with a particular person might have "actual knowledge" of a potential defect if their suspicions are raised that the transferor is not the person normally associated with the NFT. This could also be the case for "soul-bound" tokens (a hypothetical example could be a "passport token") which are closely linked to a particular person. A recipient who acquires a "passport token" of a person other than them might have difficulty in showing they were acting in good faith and without notice of a defect in title.[679]

Digital securities and NFTs

6.107 Our conclusion that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law also applies to transactions involving NFTs. This is consistent with other international developments, including the position under UCC Article 12 and the position under UNIDROIT Principle 8.[680] That means that a good faith purchaser for value without notice would take a fresh indefeasible legal title to an NFT (which is different to the legal position in respect of an acquisition of physical goods).

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675 See OpenSea, "Why is my NFT marked for suspicious activity?" (2023), available at: https://opensea.io/. It is likely that the flagging system is wider than a system that flags only "legal title".

676 In an Initial Exchange Offering of LEO Tokens disclosure document, iFinex (Bitfinex) wrote that the exchange continues to implement various strategies for recovery of funds stolen in 2016. Available at: https://www.bitfinex.com/wp-2019-05.pdf.

677 It has also been suggested by some market participants that "newly minted" bitcoin might attract a premium compared to older bitcoin, given its lack of a (potentially tainted) transaction history. However, we understand that this might no longer be true (if it ever was) in the market today. See P Sibenik, "Tainted Bitcoin Isn't What You Think It Is" (2021), available at: https://cipherblade.com/blog/tainted-bitcoin-isnt-what-you-think-it-is/.

678 See also our discussion of Ordinals in n 545 above.

679 D Stoean and M Kimber, "Bind to law: Soulbound tokens and property law" (2022) 11 *Journal of International Banking and Financial Law* 744. Matthew Kimber is the lead lawyer on this project. Diana Stoean was a research assistant on this project.

680 UCC Committee, *Amendments to the Uniform Commercial Code* (2023) art 12-102(2); UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) principle 8, pp 43–45.

6.108 We think that this reflects the factual reality of choosing to use crypto-token systems for the purposes of transferring notional quantity units (including NFTs). However, there is a further, important caveat.

6.109 We conclude that a common law special defence of good faith purchaser for value without notice in respect of crypto-tokens should only apply to the crypto-token itself.[681] The consequences of derivative transfers of title to any linked or "stapled"[682] things will depend on, among other things, the nature of the link, the applicable law, and the intention of the parties.

6.110 In some cases, market participants are likely to want to create "digital bearer instruments" and so will structure the "link" between an obligation and a digital object, such that the obligation embodied in the digital object will be transferred by simple transfer of the digital object itself. This was explicitly discussed by the UKJT in relation to digital bearer securities, such as a digital bearer bond.[683]

6.111 Parties could also structure the association between an obligation and a digital object, such that the obligation embodied in the digital object would not be transferred by transfer of the digital object itself. In this case, as the UKJT noted, the digital object would function as a mere record of obligations, but would not embody the obligation.[684]

6.112 Different structures could also be used in relation to certain rights or privileges attaching to, for example, NFTs. An NFT project could permit only the legal title holder of a particular NFT to certain access rights or privileges, or the project could honour certain licences only in respect of a legal title holder. This might place a burden on the grantor of such rights, privileges or licences to investigate the legal title of a particular holder but would nonetheless be a valid structure for a project to adopt.[685]

Rationale for a common law special defence of good faith purchaser for value without notice applicable to crypto-tokens

6.113 One of the principal reasons for the existence of the common law special defences of good faith purchaser for value without notice applicable to money and to negotiable instruments is that they promote security and sanctity of transactions over security of personal property rights.[686]

6.114 The law of personal property effectively has to choose whether to protect the need to facilitate the free circulation of money and the transferability of negotiable instruments,

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681 See also our consultation paper from para 13.84.

682 For further discussion of linking or stapling, see Chapter 8 (Collateral arrangements), para 8.12.

683 See UKJT, Legal Statement on Digital Securities paras 12–20, 22–27.

684 See UKJT, Legal Statement on Digital Securities para 33.

685 See, for example, the initial (now updated) Otherside terms and conditions relating to "Koda" NFTs which permitted the licensor to terminate a licence to intellectual property in certain circumstances (such as non-payment of royalties), available at: https://twitter.com/punk6529/status/1520697348929822720?s=20.

686 D Fox, *Property Rights in Money* (2008) para 2.11. See also M Franklin, "Security of Acquisition and Transaction" (1931) 6 *Tulane Law Review* 589; G Gilmore, "The Commercial Doctrine of Good Faith Purchase" (1954) 63 *Yale Law Review* 1057; and L Ellis, "The Transfer of Moveables by a Non-Owner" (1980) 55 *Tulane Law Review* 145.

or the personal property rights of the (former) legal title holder. The effect of the law of personal property choosing to prioritise the sanctity of transactions is that a greater onus is placed on holders of objects of personal property rights to ensure that their things are not taken from them or transferred away without proper authority.

6.115 This mirrors the onus that is placed on personal autonomy by market participants within crypto-token and digital asset ecosystems.[687]

6.116 As we said at paragraph 6.13 above, when considered as a composite whole, crypto-token systems focus on manifesting functionality — the ability to transition the state of the system — and do not merely record the factual state of the system.[688] The technological focus on creating a *state transition system*, as opposed to a mere record of state should be recognised by the law. The law will then be justified in prioritising the sanctity of transactions over the personal property rights of the (former) legal title holder.[689]

6.117 Professor Fox suggests other justifications for this approach in the context of money, some of which we think also apply by analogy to crypto-tokens and crypto-token systems.

6.118 First, that transaction costs will generally be reduced if a good faith purchaser for value without notice does not need to make extensive inquiries into the transferor's title.[690] The expense of inquiring into a transferor's title would otherwise become an "information cost" of a transaction, which would likely be reflected in the price that market participants were willing to pay for the thing in question.[691] In the context of pseudonymous crypto-token systems, even extensive inquiries into the validity of title of a recorded holder might not reveal the true nature of that person's title. In that respect, market participants might be driven to discount the value they were willing to pay for a particular crypto-token.

6.119 Second, Professor Fox says:[692]

> The proprietary regime applying to money does not so much build trust between the parties as it makes the possible absence of trust less relevant. In the ordinary course of events, the recipient of money who gives good consideration can be assured of taking an indefeasible title to it…The currency principle thus supports

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687 For a detailed consideration of autonomy within the crypto-token space, see R Grassman, V Bracamonte, M Davis and M Sato, "Attitudes to Cryptocurrencies: A Comparative Study Between Sweden and Japan" (2021) 15(1) *The Review of Socionetwork Strategies* 169.

688 See n 515.

689 For consultees who broadly considered that the security and sanctity of transactions involving third category things should be protected, see: AFME and AGC p 18; COMBAR and the Chancery Bar Association pp 360–361 (paras 22.1–22.3); Deloitte Legal (UK) p 450; FMLC pp 543–544; and Stephan Smoktunowicz p 937.

690 Electronic Money Association pp 487–488.

691 Assuming an efficient market. See D Fox, *Property Rights in Money* (2008) para 2.14.

692 D Fox, *Property Rights in Money* (2008) para 2.18.

what has been called the "anonymity" of money, and its role in facilitating impersonal relations between market agents.

6.120 We think the point applies by analogy particularly well to crypto-token systems. Crypto-token systems are explicitly designed to facilitate impersonal relations between market agents that do not trust each other directly, but are nonetheless willing to transact within the rules of the crypto-token system. Given the fundamental importance of this proposition to crypto-token systems, the justification for the currency rule seems equally applicable to crypto-tokens and crypto-token systems.

6.121 Of course, a personal property law regime that favours transaction integrity over integrity of prior title leads to the inevitable result that the title of the (former) legal title holder is rendered more vulnerable.[693] Nevertheless, there is an argument that "the reallocation of property in the (former) legal title holder's [thing] to the recipient merely represents a wealth transfer which does not reduce society's net wealth."[694]

6.122 Today, society attributes value to crypto-tokens and crypto-token systems.[695] There is therefore an argument that the preservation of the functionality of those crypto-token systems (via the preservation and prioritisation of transaction sanctity) would provide a net benefit to society. This argument remains valid even if the security of the personal property rights of individuals that willingly participate in those crypto-token systems is reduced.

6.123 Finally, our reasoning is largely in line with the reasoning of other international law reform initiatives in this area. In particular, in support of an innocent acquisition rule the UNIDROIT Working Group says:[696]

> Digital assets are often traded on a distributed ledger system or other electronic networks that permit near instantaneous transactions. The fluidity of the market allows for transactions that recognise the full value of these assets and transactions. This fluidity, and the fact that many transferors are pseudonymous and often based in different jurisdictions, makes investigations as to whether there are any conflicting proprietary rights in the asset being acquired highly impractical. A person who has a proprietary right in a digital asset is therefore in a better position than a transferee to protect itself from wrongful activity by taking steps to safeguard its proprietary rights. The availability of an innocent acquisition rule would facilitate the types of transactions referred to above, and would contribute to legal certainty and efficient markets. In the absence of an innocent acquisition rule, the risk of third-party

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693 An approach generally more favoured in civil law systems. See, for example, C Harding and M Rowell, "Protection of Property versus Protection of Commercial Transactions in French and English Law" (1977) 26 *International and Commercial Law Quarterly* 354.

694 D Fox, *Property Rights in Money* (2008) para 2.28; see also D Fox, "Constructive notice and knowing receipt: an economic analysis" (1998) 57(2) *Cambridge Law Journal* 391.

695 Valued at approximately $2 trillion according to IMF in October 2021: International Monetary Fund, "Global Financial Stability Report" (October 2021), available at: https://www.imf.org/en/Publications/GFSR/Issues/2021/10/12/global-financial-stability-report-october-2021. It is however well-known that such value fluctuates over time and that the above figure has reduced to approximately $1 trillion at the time of publication of this report. In addition, different people have different views of the value the market should attribute to different crypto-tokens and crypto-token systems.

696 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023) p 44 para 8.4.

proprietary claims to a digital asset would be likely to be factored into, and reduce, the amount that a prudent buyer would be willing to pay for the digital asset or the value a secured creditor would assign to the digital asset as an encumbered asset. Moreover, the legal certainty provided by an innocent acquisition rule also benefits custodians of digital assets and their clients … The availability of an innocent acquisition rule will reduce friction in transactions and reduce costs for all involved. The availability of innocent acquirer status in other areas, such as negotiable instruments and securities has proved effective and safe for the operation of those markets. Digital assets are playing an important role in the current economy and are expected to play an even greater role over time.

Conclusion 3.

6.124 We conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things.

Chapter 7: Intermediated holding arrangements

INTRODUCTION

7.1 In this chapter we consider how intermediated holding arrangements in respect of crypto-tokens can be structured under the law of England and Wales. We focus on crypto-tokens by way of example, given the importance of intermediated holding arrangements to crypto-token markets, although analogous arrangements are likely to be possible for other third category things.

7.2 Crypto-token market participants rely extensively on holding and trading crypto-tokens indirectly through accounts at holding intermediaries (such as intermediary exchanges). This might be for a variety of purposes, including improved security over their holdings; access to specific trading markets; lower cost and/or more efficient transaction execution and settlement systems; yield- or revenue-generating opportunities; and access to different token functionalities.

7.3 Under current market practice, a holding intermediary will sometimes use a single network address to hold — on a collective basis — the crypto-token entitlements of a number of users at the same time.[697] Where the entitlements comprise of, or relate to, crypto-tokens which are fungible,[698] they are typically retained or recorded as pooled, consolidated balances. In these circumstances, there are not normally any specific, segregated allocations in those accounts or network addresses that can be linked to the claims of individual users.[699] In other words (and in high-level terms), much of the holding intermediary market holds user "entitlements" to crypto-tokens (or pools thereof), rather than specific crypto-tokens of users themselves. Although this generally reflects the position in traditional financial services markets, it has important practical implications for the baseline duties owed by a holding intermediary to its clients and for clients' entitlements where a holding intermediary enters an insolvency process.

7.4 In addition, some crypto-tokens derive their market value or functionality from other associated crypto-tokens that are subject to (and may be "locked" or "encumbered" within) certain facilities and/or arrangements. In many cases, the legal title holders of such "locked" or "encumbered" crypto-tokens (and/or the associated tokens) do not have direct control over the "locking" or "encumbering" facilities or arrangements, which are often administered, provided and/or controlled by other persons.

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697 This is one of the standard model for holding intermediary exchanges in operation today, particularly in the retail sector. However, some holding intermediaries do offer, as a premium service and/or for institutional users, segregation of entitlements at individual, client-specific, network addresses.

698 Fungibility is not an absolute concept. Fungibility instead depends on what different parties are willing to accept as mutually interchangeable. For a more detailed discussion, see paras 15.9–15.17 of our consultation paper.

699 See M Yates and G Montague, *The Law of Global Custody* (4th ed 2013) para 3.24.

7.5 In this chapter, we consider the key factual features for categorising arrangements between holding intermediaries and their users, and the legal rights and obligations to which they could give rise.

7.6 We conclude that the law of England and Wales already constitutes a highly flexible tool for structuring effective crypto-token intermediated holding arrangements. As such, we do not make any recommendations for law reform.

7.7 However, one of the clearest points of feedback from consultees was the need for greater clarity both around terminology applicable to intermediated holding arrangements and the precise legal consequences that follow. As such, we conclude on what we consider to be the best interpretation and use of the relevant terminology, and on the best way for the common law to develop further in this area.

DEFINING AND DISTINGUISHING INTERMEDIATED HOLDING ARRANGEMENTS

7.8 Crypto-token market participants use the term "custody" in a variety of ways and to describe both a variety of intermediated holding arrangements and non-holding services. Some of those arrangements or services are not necessarily consistent with the traditional conception of custody arrangements in, for example, regulated financial services markets. Indeed, many consultees said that the terminology around crypto-token specific holding patterns is unclear, particularly the term "custody".[700]

7.9 We agree. We acknowledge that adopting the term custody broadly and without any consideration of associated legal relationships does not help users (particularly retail consumers) understand better the varying degrees of risk to which their assets can be exposed when using such arrangements or services. We discuss consultee responses below and go on to describe our preferred terminology to help address this point.

Clearer terminology

7.10 In our consultation paper, we referred to "direct custody" arrangements.[701] In that context, we emphasised that we were using the term "custody" to denote a *factual* arrangement, and that such a factual arrangement does not necessarily give rise to a uniform set of legal (or regulatory) consequences. That is, we focused on the "intermediated holding" element of the arrangement in a practical sense, and not its legal consequences.

7.11 We did this because it was consistent with the way that many market participants had used and understood the term custody specifically in the context of crypto-token markets. We acknowledged, however, that the term custody had not yet acquired a singular settled meaning within the industry.[702] We then contrasted such "direct

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700 See, for example, COMBAR and the Chancery Bar Association pp 367–371 (paras 29.1–29.15).

701 That is, a "custodial arrangement" in which a "custodian" holds crypto-tokens on behalf of or for the account of other persons and has the capacity to exercise or to coordinate or direct the exercise of factual control in terms of both its positive and negative aspects: consultation paper paras 16.12, 16.15.

702 A recent example of the lack of consensus regarding the meaning of custody was provided by the Interim Report of the Examiner appointed by the US Bankruptcy Court of the Southern District of New York in *Re Celsius Network LLP*. Celsius, an intermediary, offered yield generation and collateralised lending services in connection with crypto-tokens deposited on its platform by users. Celsius filed for bankruptcy on 13 July

custody" arrangements (that is, those that involved *the holding of* crypto-tokens by or at the direction of the holding intermediary), and those that did not (that is, non-holding services) — and sought consultees' views on that distinction.

7.12 Most consultees who addressed this point supported our approach to defining and distinguishing direct custody arrangements,[703] and agreed that this factual approach to defining custody arrangements reflected the understanding and usage of market participants.[704]

7.13 However, some consultees disagreed with our approach. They argued that it would be more appropriate to align our terminology with how the term custody is used for regulated financial services. They said that, in the context of regulated financial services, an entity is generally understood to provide custody services only in cases where that entity holds assets for its client, but the client retains the ultimate (legal or beneficial) title to the assets.[705]

7.14 COMBAR and the Chancery Bar Association said that adopting a broad factual definition of custody for retail-facing services or arrangements could exacerbate the risk that retail users would take greater comfort in the integrity and resilience of these services than they should. Although they acknowledged that we could not change how holding intermediaries in the industry describe their services, they urged us not to perpetuate use of the term custody outside the context of a trust relationship.[706]

7.15 We agree with these concerns and see benefit in using terminology similar to that used within regulated financial services so that such terminology might better align with emerging regulatory frameworks, particularly as crypto-token intermediated holding arrangements increasingly become subject to regulation in the UK. Those frameworks appear likely to draw on concepts and terminology currently used for regulating custody services for mainstream regulated financial market instruments. As stated in its recently published consultation paper on the future financial services regulatory regime for cryptoassets,[707] HM Treasury considers that:

2022. In her commentary on the development of a custody product by Celsius earlier in 2022, the Examiner reported that "there was no 'common understanding' of the concept of custody between team members with a 'finance background' and those without": Interim Report of Shoba Pillay, Examiner, *In re Celsius Network LLC, et al.* (Chapter 11 Case No. 22-10964) p 40.

703 We received 30 responses to consultation question 29. Twenty-one consultees agreed with our proposed criterion. Eight provided a mixed or qualified response and one disagreed.

704 See for example, the responses of: Professor Sheehan p 480; Deloitte Legal (UK) p 453; and Professor Milne p 45.

705 The Digital Pound Foundation referred specifically to CASS 6 of the FCA Handbook and Article 40 of *The Financial Services and Markets Act 2000 (Regulated Activities) Order 2001* (the "RAO"). Similar comments were also made by Clifford Chance LLP, the Clifford Chance LLP Industry Group and IDAC and CryptoUK.

706 COMBAR and the Chancery Bar Association p 369 (para 29.7). COMBAR and the Chancery Bar Association referred only to trust relationships. In this chapter we consider arrangements where the user retains the ultimate (legal or beneficial) title to the assets held by the intermediary.

707 HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) (the "2023 HM Treasury Cryptoasset Regulatory Consultation Paper"), para 8.2.

Custody of cryptoassets is conceptually similar to traditional finance as the custodian holds itself out as being responsible for safekeeping a cryptoasset on behalf of another.

7.16 Unlike the more expansive application of "direct custody" deployed in our consultation paper, the framework we describe below, in addition to being aligned with distinctions used in financial markets, more clearly differentiates intermediated holding arrangements. It does so largely on the basis by which assets are held and whether users retain proprietary or merely unsecured contractual claims to the return of their assets.[708]

Our revised terminology

7.17 For the reasons explained above, we have revised our terminology for the purposes of this report. We now distinguish between two different types of arrangement:

(1) "**Intermediated holding**" by a "**holding intermediary**": arrangements for the holding of crypto-tokens or crypto-token entitlements by an intermediary *on behalf of or for the account of others*. These are further divided between the following two sub-types of intermediated holding arrangement (each of which we explain in more detail below):

(a) "**Custodial intermediated holding**" by a "**custodial holding intermediary**"; and

(b) "**Non-custodial intermediated holding**" by a "**non-custodial holding intermediary**".

(2) "**Non-holding services**": other technology and operational services related directly or indirectly to the safeguarding or administration of crypto-tokens or crypto-token entitlements that do *not* involve a service provider holding those crypto-tokens or crypto-token entitlements on behalf of or for the account of others.

7.18 It follows that our use of "holding" has also expanded. We explain that shift as well as each of our substantive categories below.

Holding

7.19 We now use "holding" more extensively and more explicitly as a framing device to accommodate a range of different operational models, services, and arrangements.

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[708] See, for comparison in the context of regulated financial services markets the FCA Handbook Client Asset Sourcebook (CASS), and CASS 6 (Custody rules), 6.2.1R, and CASS 3 (Collateral), 3.1.5G. In its recent consultation paper, the HM Treasury suggested that the existing custody provisions in the Client Assets Sourcebook (CASS) might be used as a basis to design bespoke custody requirements for cryptoassets. That consultation paper also sets out proposed design features for cryptoasset a custody regime: 2023 HM Treasury Cryptoasset Regulatory Consultation Paper, p 51–52 and in particular Table 8A and 8.A. See also *Pearson, Lomas v RAB Market Cycles (Master) Fund Ltd* [2009] EWHC 2545 (Ch), in which Briggs J (as he then was) used contractual references to "custody" and "custodian" in part to conclude that the relevant parties intended for assets held by an intermediary prime broker to continue to belong beneficially to its client: at [53].

We define "holding" as the capacity to exercise, or to coordinate or direct, the exercise of "full factual control".

7.20 Full factual control has two dimensions:

(1) positive control, which involves the factual ability to use, dispose of or transfer an asset; and

(2) negative control, which involves the factual ability to exclude others from using the asset.

7.21 A fundamental design feature of crypto-tokens is that it is possible for a person to hold a crypto-token themselves. That is, crypto-token systems allow for the imposition or creation of varying degrees of technical encumbrances over a crypto-token.[709] This makes it possible for a person to exercise full factual control over a crypto-token.[710] We now refer to this as "self-holding" (although we acknowledge that the market often refers to this as "self-custody").[711] The capacity or functionality for self-holding is a core design feature of crypto-tokens and is a fundamentally important part of many crypto-token ecosystems.

7.22 "Holding" can also be intermediated. Intermediated holding encompasses arrangements where a holding intermediary has the capacity to exercise full factual control entirely by itself, or where factual control is exercised in a practical sense. This control is exercised through, or in collaboration with, one or more third parties, including through the appointment of a sub-intermediary.

7.23 We do not introduce any specific limitation or qualification to "holding" based on referencing any particular mechanism (such as a private key) through which such control may be effected. In the context of an industry supported by evolving technologies and on-going innovation, we regard it as more appropriate for holding to be expressed in terms of its core defining feature, namely the exercise or direction of full factual control in a general sense.

7.24 We consider "holding" to be a meaningful and readily understandable label to apply to this concept for the purposes of the law of England and Wales (despite the fact that the term holding often has connotations with tangible objects). We have therefore decided not to follow the decision of the UNIDROIT Working Group to replace the term "holding" with "maintaining".[712]

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709 We discuss this in more detail in Chapter 5 (Control).

710 This includes software and/or hardware devices used by holders of crypto-tokens to undertake self-holding, or self-custody more securely. For example, this might include the provider of a hardware wallet (for example, Ledger), an offline storage mechanism for private keys; or a software wallet service (for example, Metamask).

711 In our consultation paper, we used the term "self-custody". See, for example, paras 10.68, 13.127, 16.16 and 16.44.

712 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023), principle 10(2) and associated commentary at para 4. See also principle 12, and in relation to the appointment of sub-custodians at principle 15.

Intermediated holding and holding intermediaries

7.25 By "intermediated holding" we mean arrangements for the holding of crypto-tokens or crypto-token entitlements on behalf of or for the account of others.

7.26 We divide intermediated holding arrangements into the following two sub-categories by reference to the particular types of legal relationships to which they give rise.

(1) **Custodial intermediated holding** by a **custodial holding intermediary**: arrangements under which users retain superior legal title or equitable title to the crypto-tokens or crypto-token entitlements held on their behalf or for their account. In the event of the custodial holding intermediary entering an insolvency process, these entitlements would ordinarily not form part of the holding intermediary's estate and would not be available to meet the claims of its general creditors.[713] In practice, we anticipate that such arrangements under the current law of England and Wales will likely and most commonly be structured as trusts. However, our description is intended to be broad enough to accommodate other legal frameworks that support the retention of proprietary claims to held assets. These could potentially include facilities in which the custodial holding intermediary acquires a control-based legal proprietary interest in held assets. The latter would likely require common law development to support their recognition, potentially by analogy with the law of bailment.[714]

(2) **Non-custodial intermediated holding** by a **non-custodial holding intermediary**: arrangements under which the holding intermediary acquires (or retains) superior legal title to the crypto-tokens or crypto-token entitlements that they hold (or acquire) on behalf of or for the account of users. Under this model, users have primarily[715] personal contractual claims to the return of assets equivalent to those held. In the event of a non-custodial holding intermediary entering insolvency proceedings these claims would consequently rank as unsecured claims only and would give rise to no priority right of recourse to any specific crypto-tokens or token entitlements.[716]

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713 In a custodial intermediated holding arrangement involving segregated assets held in their totality on trust for (or otherwise subject to the superior title of) a third-party beneficiary or superior title holder, a custodial holding intermediary's general creditors will have no claim to those assets at all. However, where more complex structures are deployed, such as funds of commingled holdings held on behalf of a number of third parties and the intermediary itself, a portion of the value of such holdings representing the holding intermediary's co-ownership entitlement can fall into the bankruptcy estate and be subject to claims of general creditors.

714 We consider the extension of bailment and/or development of an analogous concept based on control from para 7.97 below.

715 Primarily, but not necessarily exclusively. Depending on how a non-custodial intermediated holding arrangement is structured, the non-custodial holding intermediary might for example, also owe users fiduciary duties. In certain circumstances, a breach of these duties could entitle users to proprietary remedies. To a limited extent, these remedies could enable them to achieve a greater level of recovery in a non-custodial holding intermediary insolvency process than would be possible from unsecured contractual claims alone: see from para 7.123 below.

716 The definitions of the two sub-categories have also been revised to accommodate alternative or supplementary legal structures that could be used to structure intermediated holding arrangements beyond the two options of (1) contract-based outright title transfer/title retention and (2) trust, as described in our consultation paper. See from para 7.95 below.

Non-holding services

7.27 We contrast intermediated holding arrangements with other technology-based services that relate directly or indirectly to the administration or safekeeping of crypto-tokens but do *not* involve the service provider holding such tokens. We refer to such services as "non-holding services".

7.28 Contracts would likely form the basis of many such service provider-user relationships. The contractual rights and obligations would be determined by the express and implied terms agreed. In certain circumstances, tort-based duties of care and other non-contractual duties might also arise.[717]

LEGAL FRAMEWORKS FOR INTERMEDIATED HOLDING ARRANGEMENTS

7.29 There are two principal frameworks under the law of England and Wales that are likely to underpin intermediated holding arrangements (as defined above):

(1) a contract-based full title transfer/title acquisition arrangement;[718] or

(2) a trust.

7.30 We explain these arrangements further below. In our view, contract-based full title transfer/title acquisition arrangements and trusts already provide effective and versatile legal foundations for a wide variety of practical applications that use intermediated holding structures. We conclude that the law of England and Wales is clear in this respect, even where the assets involved in the arrangements include crypto-tokens or crypto-token entitlements held in omnibus accounts.[719] We do not recommend any private law reform because we do not consider any is required.

7.31 Depending on the use-case, intermediated holding arrangements for crypto-tokens or crypto-token entitlements might also rely on alternative or supplementary legal frameworks outside of basic contract and trust-based arrangements giving rise to a different distribution of rights and remedies between users and holding intermediaries. This potentially includes novel legal frameworks that could be developed by the common law for custodial intermediated holding arrangements that are not structured as trusts. It might also include intermediated holding arrangements incorporating other private law obligations such as fiduciary duties based on agency principles or otherwise arising outside of trust relationships.

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717 For more detail see para 16.51 of our consultation paper.

718 We note that such arrangements can also be described as "outright transfer or full retention of title" arrangements, and we used this terminology in our consultation paper (see paras 16.42–16.49). In this context, "full retention of title" refers to circumstances in which a non-custodial holding intermediary retains for the account of a user full title to crypto-tokens or crypto-token entitlements that has been acquired other than by way of a transfer from such user (for example by way of a transfer from a third party, or as a protocol-generated reward or distribution for participating in mining or staking activities). We do not use the term "retention of title" elsewhere in this paper to avoid any confusion with arrangements whereby a user seeks to retain legal (or beneficial) title in their assets.

719 See Glossary.

Contract-based full title transfer/title acquisition arrangements

7.32 Under contract-based full title transfer/title acquisition arrangements, the holding intermediary acquires or retains full title to any crypto-tokens, or crypto-token entitlements held or acquired for the account of the user. As noted above, we characterise this type of arrangement as "non-custodial intermediated holding".

7.33 A contract-based full title transfer/title acquisition arrangement will be recognised and given effect to as such where that would be consistent with the intention of the parties, subject to the relevant transfer formalities (if any) having been complied with. The intention of the parties will be determined by construing the terms of the contract that governs the operation and provision of the arrangement. The rights and obligations of the parties to contract-based full title transfer/title acquisition arrangement will be determined fundamentally by the terms (express or implied) of the agreement(s) on which the arrangement is based.[720]

7.34 We noted in our consultation paper that this model could be commercially and operationally appealing to service providers. It could be beneficial to users in terms of lower fees and potentially better access to yield- or revenue-generating opportunities. However, the (potentially significant) trade-off for users is that in an insolvency of the non-custodial holding intermediary that holds assets for their account, users would be unsecured creditors.[721]

Trusts

7.35 Trusts provide an alternative legal framework for structuring intermediated holding arrangements for crypto-tokens and crypto-token entitlements — provided that the "three certainties" for creating a trust are satisfied.[722] As noted above, we characterise this type of arrangement as "custodial intermediated holding".

7.36 Under a trust arrangement, the custodial holding intermediary acquires or retains bare legal title to held assets as trustee only. In contrast to an outright transfer of title arrangement, under a trust users have an equitable beneficial interest in the crypto-tokens, or the crypto-token entitlements, held on trust by the custodial holding intermediary. These entitlements would ordinarily not form part of the holding intermediary's estate and would not be available to meet the claims of its general creditors, providing more effective protection for users against insolvency risk of the custodial holding intermediary.

7.37 We consider that the use of trusts under the law of England and Wales will be important for many intermediated holding relationships — most likely involving

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720 Depending on the terms agreed and the circumstances of the relationships arising with users, non-custodial holding intermediaries may also be subject to additional private law obligations such as tort or fiduciary duties. Non-custodial holding intermediaries may also be subject to regulatory and/or other statutory obligations depending on the particular activities they undertake and the particular products involved.

721 Consultation paper paras 16.44–16.49.

722 The "three certainties" required to establish an effective trust under the general law are certainty of intention, subject matter and object and were first set out in *Knight v Knight* (1840) 49 ER 58. We discuss the "three certainties" in more detail below from para 7.43.

situations in which intermediaries providing safekeeping and/or trading services hold crypto-tokens or crypto-token entitlements on behalf of users.

7.38 However, we also consider that trusts might be useful or applicable to a wider range of services or arrangements, potentially including "lock and mint" facilities.[723] A trust over a "lock and mint" facility would rely on or require an arrangement[724] taking one of two general forms, with the "minted" crypto-tokens either:

(1) being merely used as part of a register or record of equitable interests to the underlying locked crypto-token(s); or

(2) constituting distinct objects, to which equitable interests in the underlying locked crypto-token(s) are constitutively linked or "stapled".

7.39 The trustee could use the relevant network on which the minted crypto-token is instantiated as a mechanism for managing the distribution of benefits to and the retention, use and transfer of such equitable interests. This could potentially be an effective structure for the creation of fractional entitlements to NFTs or for centralised bridging and wrapping protocols.

Clarification of conceptual approaches to trust

7.40 We conclude that it is clear that crypto-token intermediated holding arrangements can be structured as trusts, including where the underlying entitlements are: (1) held on a consolidated unallocated basis for the benefit of multiple users; or (2) potentially even commingled with unallocated entitlements held for the benefit of the holding intermediary itself under current law.

7.41 Case law across the common law world also increasingly confirms that crypto-token intermediated holding arrangements can be structured as trusts.[725] However, while the availability of a trust analysis is clear, courts have endorsed different conceptual

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723 Although not normally characterised as custodial intermediated holdings, certain (centrally controlled) "lock and mint" facilities might potentially be subject to a trust analysis. This could include crypto-token bridges, wrapping protocols, collateralised lending arrangements, fractional ownership, and collateralised tracker-token issuance platforms: see discussion in our consultation paper at paras 16.29–16.40. Ongoing proceedings involving Oasis, a platform or decentralised finance, provide a useful example. These relate to a major exploit that occurred in February 2022, in which a hacker exploited a vulnerability in the Wormhole Protocol (a token bridge), enabling it to extract "locked" crypto assets: see Chapter 5 (Control), para 5.90 and n 497. In a judgment of 6 March 2023, the High Court did not consider the legal characterisation of token bridges under the law of England and Wales. However, it did hear evidence on the availability of potential causes of action under New York law. In relation to that question, arguments were made which at least appear to rely on an understanding of Wormhole Protocol as (partially) akin to a holding intermediary: *Tai Mo Shan Limited v Oazo Apps Limited* (6 March 2023, unreported, EWHC) Pelling J.

724 We consider such arrangements and mechanisms for "linking" or "stapling" in Chapter 8 (Collateral arrangements) from para 8.12.

725 *Ruscoe v Cryptopia Limited (in liquidation)* [2020] NZHC 728, [2020] 22 ITELR 925 (New Zealand); *Quoine Pte Ltd v B2C2 Ltd* [2020] SGCA(I) 02 (Singapore); *Re GateCoin Ltd (In Liquidation)* [2023] HKCFI 914 (Hong Kong).

approaches in reaching that conclusion.[726] There is a potential for legal uncertainty where conflicting analyses are applied.

7.42 Therefore, we set out our preferred analysis for establishing a valid trust over commingled, unallocated holdings of crypto-tokens or crypto-token entitlements below. We do not consider that law reform (particularly any statutory reform) is necessary to affirm our conclusions. They are grounded in an analysis of the current law of England and Wales, which a majority of consultees found convincing and uncontroversial,[727] and agreed did not warrant statutory intervention.[728]

The three certainties

7.43 To establish a valid trust, the central question is whether the following "three certainties" are satisfied.[729]

(1) **Certainty of intention**: A clear substantive intention, based on an objective assessment, by the relevant party or parties for the holding intermediary to hold its title to specified crypto-token entitlements on trust for one or more beneficiaries.

(2) **Certainty of objects**: Sufficient identification of the beneficiaries that are the objects of the trust.

(3) **Certainty of subject matter**: Sufficient identification of the crypto-token entitlements constituting the things that will be the subject matter of the trust.

7.44 We conclude that each requirement might be satisfied as follows.

Certainty of intention

7.45 Whether there is requisite certainty of intention to create a trust must be ascertained from the user-intermediary agreement or relationship. We consider it likely that the courts will take a purpose-based and commercially responsive approach to identifying and giving effect to an intention to establish trusts by crypto-token holding intermediaries.[730]

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726 Primarily in relation to the satisfaction of subject-matter certainty in connection with intangible assets held in omnibus accounts. We consider the two approaches endorsed by courts in this context below, and in our consultation paper from para 16.66. Recently, the High Court of Hong Kong, holding that cryptocurrencies are capable of forming the subject matter of a trust, made references to both approaches without concluding in favour of either one: *Re GateCoin Ltd (In Liquidation)* [2023] HKCFI 914 at [61]–[62], by Chan J.

727 We received 30 responses to consultation question 30. Twenty-six consultees agreed with our conclusions without reservation. Four consultees offered qualified support. No consultees disagreed.

728 However, we note that some consultees did consider that statutory clarification "may be helpful, but not essential": King's College London p 679; and/or would "undoubtedly assist" where case law expresses a range of views: Clifford Chance LLP p 305.

729 H Liu, L Gullifer and H Chong, "Client-intermediary relations in the crypto-asset world" (2020) *University of Cambridge Faculty of Law Research Paper No 18/2021* p 4, reproduced in P Davies and C Tan, *Intermediaries in Commercial Law* (2022).

730 For a detailed discussion including of indicative case law see our consultation paper paras 16.57–16.63.

7.46 A crucial consideration will be whether it is intended that the holding intermediary should have free use of the asset, which has been described as a "powerful contra-indication" to the recognition of a trustee/beneficiary relationship.[731] We discuss this question below.

Certainty of objects

7.47 We consider that certainty of objects is relatively easily satisfied.[732] Moreover, we do not anticipate that object certainty raises any practical issues for structuring book-entries or crypto-token issuances as equitable interests in crypto-tokens or crypto-token entitlements under a trust. Beneficiaries and their individual interests should be adequately identifiable:

(1) with respect to book entry claims, from the accounting records maintained by relevant holding intermediaries in connection with their internal ledgers; or

(2) for claims linked to or recorded by tokens, from the distributed ledgers, structured records or registers maintained by the smart contracts or crypto-token networks through or in which such tokens are instantiated.

Certainty of subject matter

7.48 In our view, certainty of subject-matter can be satisfied irrespective of whether assets are segregated or held in commingled, unallocated holdings such as in omnibus accounts. We do not consider that statutory intervention or other law reform is necessary to clarify this point. Consultees overwhelmingly agreed.[733]

7.49 On first sight, where crypto-tokens are held in commingled, unallocated holdings, it is not clear that the requirements for a valid trust are met. Subject-matter certainty requires that the property that is the subject matter of the trust be clearly identifiable.[734] Yet where fungible assets are held in omnibus accounts for one or more users it may not be possible to identify the specific assets being held on behalf of each user.[735]

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731 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [258], by Briggs J (as he then was).

732 See our consultation paper paras 16.62, 16.64. This remains the case even if the identity of beneficiaries is subject to constant change over time, or if account ledgers or registers are maintained on a pseudonymous basis or otherwise do not comprehensively identify all the persons holding beneficial entitlements: *Ruscoe v Cryptopia Limited (in liquidation)* [2020] NZHC 728, [2020] 22 ITELR 925 at [148]–[150], [157]; H Liu, L Gullifer and H Chong, "Client-intermediary relations in the crypto-asset world" (2020) *University of Cambridge Faculty of Law Research Paper No 18/2021* p 4, reproduced in P Davies and C Tan, *Intermediaries in Commercial Law* (2022).

733 The characterisation of the interests of beneficiaries under such trusts was addressed as the second sub-point of consultation question 30. Twenty-six consultees agreed with our conclusion and four provided qualified support.

734 *Westdeutsche Landesbank Girozentrale v Islington London Borough Council* [1996] AC 669 at 705, by Lord Browne-Wilkinson.

735 This is due to the relevance of the "allocation principle", or "the law's insistence that proprietary rights cannot be acquired in fungibles forming an unidentified part of a bulk until they have been separated by some suitable act of appropriation": R Goode, "Ownership and Obligation in Commercial Transactions" (1987) 103

7.50 However, the common law has developed two methods for addressing subject-matter certainty in this context. These methods are based on two differing interpretations of the leading decision of the Court of Appeal in *Hunter v Moss*:[736] (1) the "intangible asset exception" approach; and (2) the equitable co-ownership approach.

7.51 Under the first approach, *Hunter v* Moss is interpreted as establishing that property rights can arise in an unidentified part of a specified quantity or bulk of assets that are intangible where such assets are necessarily indistinguishable from each other.[737]

7.52 The second approach is to treat *Hunter v Moss* as characterising the interests of beneficiaries under such trusts as rights of co-ownership in an equitable tenancy in common over the entire pool.[738] On this view, users' co-ownership rights (whether represented by internal account ledgers or linked tokens acting as either mere register entries or tokenised claims[739]) constitute proportional entitlements to the entire, undivided quantity of that crypto-token entitlements retained at, and identifiable by reference to, specified network addresses or higher-tier intermediary accounts held by the custodial holding intermediary.

7.53 In our consultation paper, we provisionally concluded that the best way to characterise the interests of beneficiaries of crypto-tokens or crypto-token entitlements held by a custodial holding intermediary on a consolidated unallocated basis for the benefit of multiple users is as rights of co-ownership in an equitable tenancy in common. Consultees agreed.[740] The analysis has received support from academic

Law Quarterly Review 433, 436. See also V Dixon, "The Legal Nature of Intermediated Securities: An Insurmountable Obstacle to Legal Certainty?" in L Gullifer, J Payne, *Intermediation and Beyond* (2019) p 64. This principle applies both to legal and equitable property claims, to absolute transfers and the grant of security interests: L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.19; M Yates, G Montague, *The Law of Global Custody* (4th ed 2013) para 3.27.

736 [1994] 1 WLR 452.

737 On this approach, the argument is that the complete interchangeability of these types of assets renders the allocation principle unnecessary and inapplicable to achieve subject matter certainty. We discuss the "intangible asset exception" in our consultation paper from para 16.72. Similar reasoning was applied by the New Zealand High Court in considering whether valid trusts could be granted over unallocated holdings of crypto-tokens: *Ruscoe v Cryptopia Limited (in liquidation)* [2020] NZHC 728, [2020] 22 ITELR 925 at [22], [137](b), [146].

738 We discuss the equitable co-ownership approach in detail in our consultation paper from para 16.69. Much of the academic commentary and judicial reasoning is in the context of holdings of intangible assets such as shares and other securities. We discussed the legal issues arising in relation to intermediated securities in particular in a previous scoping paper: Law Commission of England and Wales, Intermediated securities: who owns your shares? A Scoping Paper (2020).

739 For further explanation of and commentary on such arrangements see Chapter 8 (Collateral arrangements) para 8.12.

740 See n 727 above.

commentators[741] and has been endorsed by the courts in England and Wales.[742] We adopt it as our preferred view.

Conclusion 4.

7.54 We conclude that under the law of England and Wales, crypto-token intermediated holding arrangements can be characterised and structured as trusts, including where the underlying entitlements are (1) held on a consolidated unallocated basis for the benefit of multiple users, and (2) potentially even commingled with unallocated entitlements held for the benefit of the holding intermediary itself.

7.55 We conclude that the best way to understand the interests of beneficiaries under such trusts are as rights of co-ownership in an equitable tenancy in common.

Rights to swap

7.56 In establishing a valid trust, a central issue concerns a trustee's rights of use. In general, if an arrangement gives a holding intermediary a right of use amounting to free use of an asset, that is fatal to a trust analysis.[743] However, the courts of England and Wales have held that where such a right requires (in exchange for its exercise) an alternative entitlement to be held for the account of the underlying user, the right should be more properly understood as a "right to swap".[744] A right to swap can exist as part of a valid trust, particularly where there are other "powerful factors pointing towards a trustee beneficiary relationship".[745]

7.57 COMBAR and the Chancery Bar Association queried whether a "right to swap" could be satisfied simply by the intermediary holding for the beneficiary "a right against the borrower of the token to have an equivalent crypto-token entitlement transferred back at a later date". They did not regard this as likely to provide sufficient evidence of an intention to create a trust "since a crypto-token is being swapped merely for a seemingly personal right against a third party [in this example, *against the borrower*] to have the third party return an equivalent crypto-token."[746]

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741 M Yates and G Montague, *The Law of Global Custody* (4th ed 2013) para 3.47; R Goode, "Are Intangible Assets Fungible?" 3 *Lloyd's Maritime and Commercial Law Quarterly* 379; G Richardson, "Lehman Brothers: Traditional Trust Principles and 21st Century International Bank Failures" (2011) 17 *Trusts and Trustees* 226. G Cooper, "Virtual property as trust assets and investments" (2021) *Journal of International Banking and Financial Law* 751, 752.

742 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [231]–[232], by Briggs J (as he then was), citing with approval the analysis of Campbell J in *White v Shortall* [2006] NSWSC 1379 at [212].

743 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [258], by Briggs J (as he then was); see also our consultation paper at para 16.82.

744 *Pearson, Lomas v RAB Market Cycles (Master) Fund Ltd* [2009] EWHC 2545 (Ch) at [38], [60]–[64], by Briggs J (as he then was). *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [293], by Briggs J (as he then was).

745 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [293], by Briggs J (as he then was).

746 COMBAR and the Chancery Bar Association paras 30.8–30.9.

7.58 We agree with the point that a right to swap is in itself unlikely to provide sufficient evidence of an intention to create a trust. Indeed, bare rights of use are properly considered a "powerful contra-indication" to the recognition of a trustee/beneficiary relationship.[747] However, we remain of the view that a right to swap (as opposed to a right of use, free from any exchange requirement) can *exist as part of* (and therefore be consistent with the *recognition* of, and with an *intention to create*) *a* valid trust. That is particularly the case where there are other "powerful factors pointing towards a trustee beneficiary relationship".[748]

7.59 This remains the case as a matter of principle even if the swapped asset amounts to a personal right against the holding intermediary to return equivalent assets. A trust analysis remains possible where the holding intermediary is entitled to (1) exercise the right to swap without giving specific advance notice of its intention to do so, and (2) retain any and all profits, fees or benefits deriving from its use of the relevant assets.[749]

A presumption of trust

7.60 In our consultation paper, we considered arguments in favour of introducing interpretive principles applicable to establishing a valid trust in relation to crypto-token intermediated holding arrangements. Specifically, we considered whether such arrangements should be subject to a presumption that the relevant parties intended for that arrangement to take effect as a trust. This would mean intermediated holding arrangements might be presumed by law to be custodial intermediated holding arrangements, absent any clear and express indications or disclaimers to the contrary.

7.61 We concluded that a presumption of trust does not currently apply to crypto-token intermediated holding arrangements. We provisionally concluded that it should not be introduced as a new interpretive principle to displace the law's general interpretive approach of applying an objective assessment to identify any intention to create a trust.[750]

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747 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [258], by Briggs J (as he then was).

748 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [293], by Briggs J (as he then was).

749 *Pearson, Lomas v RAB Market Cycles (Master) Fund Ltd* [2009] EWHC 2545 (Ch) at [38], [52], [60]–[64], by Briggs J (as he then was). The terms of the trust could still provide for additional protections. For example, to the extent that the holding intermediary exercises a right of use over trust assets for the purposes of lending them to third parties, the contractual rights that the holding intermediary has against those third parties for the return of equivalent assets could be held on trust for the user as could any rights to collateral posted by those third parties. This is specifically referenced as a possibility in *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [240]. See also L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.65. However, as *RAB Market Cycles* demonstrates, the absence of such protections does not necessarily preclude a finding of trust. But in practice, holding intermediaries may be unwilling to offer such protections. They may compromise the efficacy of close-out netting-based credit-risk safeguards in third party lending contracts, thereby severely limiting the extent to which holding intermediaries can realise and capture economic benefits from rehypothecating client assets.

750 Consultation paper para 16.107.

7.62 Consultees broadly agreed[751] and as such, we do not recommend a presumption of trust as a new interpretative principle. Instead, we conclude that the continued application of general interpretive principles is sufficient for the following reasons.

7.63 First, a presumption of trust would be an exception to the courts' general reluctance to "impose" a trust relationship on unwitting parties in a business context where purely personal, non-proprietary rights suffice to achieve their commercial objectives.[752] Such an exception would constitute an arbitrary distinction between similarly-structured legal arrangements involving crypto-tokens on the one hand and other asset types on the other. Consultees agreed that such a distinction would be difficult to justify. Consultees also said that such an exception could cause further confusion, particularly in the context of intermediated holding arrangements involving mixed assets.[753]

7.64 Second, a presumption of trust is inappropriate in light of the variety of models and services which exist within markets for intermediated holding arrangements involving crypto-tokens, particularly if certain DeFi arrangements were caught by the presumption.[754] To impose an interpretive principle of uncertain scope and application in the context of such market diversity would risk hampering innovation and generating confusion and boundary disputes especially where the parameters of the presumption are interpreted broadly by courts.[755]

7.65 Third, we consider that the private law should provide market participants with the freedom to choose the legal structure best suited to their particular operating models. We conclude that the current law of England and Wales is already sufficiently flexible that a court will find a trust in appropriate circumstances.

7.66 For completeness, we note that the UNIDROIT Working Group has published principles which we consider could amount to the introduction of presumption of trust

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751 We received 32 responses to consultation question 31. Twenty-four consultees agreed, three provided qualified or mixed views and five disagreed.

752 *Pearson, Lomas v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [225]. In the crypto-token context, see *Wang v Darby* [2021] EWHC 3054 (Comm) at [52]–[53]. M Yates, G Montague, *The Law of Global Custody* (4th ed 2013) para 3.48.

753 See, for example, Gunnercooke LLP p 565.

754 COMBAR and the Chancery Bar Association p 374 (para 31.1); FMLC p 549 (para 5.3); Electronic Money Association p 488.

755 The responses from consultees re-enforced our original observation that the operating models potentially affected by this proposal reached beyond conventional intermediated holding arrangements and might include more complex and developing arrangements such as certain (centrally controlled) "lock and mint" arrangements: see para 16.103 of our consultation paper. The proceedings in respect of a hack of the Wormhole Protocol provide a useful potential example, see n 497 above. Depending on how broadly it was applied, a presumption of trust could create uncertainty for platforms that may not typically be regarded as custodial intermediary holdings but may nevertheless be at risk of being characterised as such by application of the presumption.

in relation to crypto-token intermediated holding arrangements, were such principles translated directly into the current law of England and Wales.[756]

7.67 We acknowledge that the reasoning behind such principles is to improve user protection and/or incentivise the drafting of more precise terms of use and service agreements. This would in turn increase transparency especially around risks to users on holding intermediary insolvency. Some consultees made similar arguments.[757] However, we remain of the view that such issues are better dealt with within a regulatory framework and not by a standalone principle of private law. To that end, we note that since the publication of our consultation paper relevant regulatory initiatives are underway.[758] Moreover, we agree with those consultees who questioned the extent to which a presumption of trust would necessarily protect user rights in practical terms.[759]

Dealings in trust-based crypto-token claims: section 53(1)(c) of the Law of Property Act 1925

7.68 Although trusts can provide a versatile and robust legal framework for custodial intermediated holding arrangements, market participants require a degree of clarity and certainty as to how they would operate in practice before electing to use them more broadly in commercial arrangements. In our consultation paper we looked in particular at section 53(1)(c) of the Law of Property Act 1925 ("LPA 1925"), which requires that the disposition of an equitable interest to be in writing and signed. We considered whether the deployment of trust-based custodial intermediated holding arrangements could be hindered by a (perceived or actual) lack of clarity relating to the possible application of section 53(1)(c).

7.69 As we explain in this section, we consider that there are very good arguments for concluding that section 53(1)(c) LPA 1925 does not raise any practical problems for dealings in book entry and equitable entitlements linked to, or recorded by, crypto-tokens. In particular we regard the recently published analysis of this provision by the UKJT as highly persuasive and authoritative,[760] and capable of providing crypto-token market participants with a substantial degree of clarity and comfort in the operation of trusts under the law of England and Wales. We conclude that the existing common law is sufficiently certain in this area and that clarificatory statutory law reform in respect of section 53(1)(c) of the LPA 1925 is not necessary at this time. We leave open the possibility that it might become necessary or warranted in future as the market and associated regulatory frameworks continue to evolve.

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[756] UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023), principle 10(4) and associated commentary at p 35 paras 5–7. See also our analysis of an earlier draft of these principles in our consultation paper at para 16.101.

[757] Joint response of AFME and AGC p 22 (para 20.45); Ashurst LLP p 80 (para 4.42); Professor Low p 696.

[758] See, for example, 2023 HM Treasury Cryptoasset Regulatory Consultation Paper.

[759] Some consultees noted that holding intermediaries wishing to avoid trust liabilities are likely to draft terms of use so as to rebut and/or exclude the application of a presumption of trust in any case: Clifford Chance LLP p 305 and FMLC p 549 (para 5.3).

[760] UKJT, Legal Statement on Digital Securities paras 119–137.

Section 53(1)(c) and its potential application to crypto-tokens

7.70 Section 53(1)(c) requires that:

(1) any transfer of or dealing in an existing equitable interest that constitutes a "disposition";

must be:

(2) made in writing and signed by (or by the agent of) the person making it.[761]

7.71 Where applicable, failure to comply with the "in writing, signed" requirement renders the transfer or dealing void and legally ineffective.

7.72 We note that a possible challenge for crypto-token holding intermediaries is in determining, to a sufficient degree of certainty, whether any of the transfers and dealings that they commonly undertake or facilitate are captured by section 53(1)(c) LPA 1925.[762] This might not necessarily be straightforward, due to a lack of clarity as to both the meaning of "disposition"[763] and also the scope and implications of the rule's underlying policy objective of preventing fraud.[764]

7.73 In any event, we consider there to be very strong arguments to conclude that the specific forms of electronic communication used in connection with intermediated and "on chain" network transfers can satisfy both the writing and signature elements stipulated under section 53(1)(c) LPA 1925.[765] We regard the core fundamental purpose of section 53(1)(c) LPA 1925 as being a safeguard against the fraudulent

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761 The specific wording of the provision is: "a disposition of an equitable interest or trust subsisting at the time of the disposition, must be in writing signed by the person disposing of the same, or by his agent thereunto lawfully authorised in writing or by will".

762 As stated above, equitable beneficial interests in crypto-tokens or crypto-token entitlements can be represented by book entries in the internal account ledgers of intermediaries or by tokens themselves (at para 7.52. A detailed assessment of the application of s 53(1)(c) LPA 1925 to a range of dealings in book entry crypto-token entitlements and equitable entitlements linked to or recorded by custodially held crypto-tokens is set out at paras 17.24–17.25 of our consultation paper. Crypto-tokens can also be linked to equitable interests in (or incorporate equitable secured claims to) specified assets or funds comprised of real-world physical assets, such as physical gold bars, or things in action such as debt claims.

763 For analysis of alternative characterisations of transfers in equitable entitlements to intermediated securities that arguable would not constitute dispositions for the purposes of s 53(1)(c) LPA 1925 see M Bridge, L Gullifer, K Low, G McMeel, *The Law of Personal Property* (3rd ed 2021) para 27.050; J Benjamin, *Interests in Securities* (2000) para 3.39–3.40.

764 It has been argued that s 53(1)(c) LPA 1925 only applies to qualifying dispositions that are at risk of being exploited for fraudulent purposes *against* trustees but, not *by* trustees: see *SL Claimants v Tesco plc* [2019] EWHC 2858 (Ch) at [116], by Hildyard J, considering the approach of Lord Upjohn in *Vandervell v Inland Revenue Commissioners* [1967] 2 AC 291 at 311, and B McFarlane and C Mitchell, *Hayton and Mitchell on the Law of Trusts & Equitable Remedies* (14th ed 2015) paras 3.077-3.079. For consideration of alternative interpretations of the fraud prevention purpose underpinning s 53(1)(c) LPA 1925 see H Liu, "Transfers of equitable interests in the digital asset world" (2022) 5 *Journal of International Banking and Financial Law* 325.

765 This is because in general, the common law takes a pragmatic approach to the electronic execution of transactions. For detailed analysis of this point, see our prior work on electronic execution, smart legal contracts and intermediated securities: Electronic Execution (2019) Law Com No 386; Law Commission of England and Wales, Smart Legal Contracts – Advice to Government (2022); and Law Commission of England and Wales, Intermediated securities: who owns your shares? A Scoping Paper (2020).

assertion of beneficial entitlements. On this interpretation, records of internal or external ledgers, associated transaction instructions and digital signatures generated through public–private key cryptography should in our view be more than sufficient to satisfy the "in writing" and "signed" requirements.[766]

Options for reform

7.74 In our consultation paper, we considered the following range of options and associated justifications in response to potential issues with section 53(1)(c) LPA 1925.[767]

(1) **Option 1**: Undertake no reform of section 53(1)(c) LPA 1925 on the grounds that the interpretation and application of the provision as currently drafted are sufficiently clear, and any suggestion that legislation is desirable could in in itself undermine existing legal certainty in this area.

(2) **Option 2**: Provide clarity as to formalities rules through statutory intervention,[768] either by way of:

(a) **Option 2(a)**: direct amendments to section 53(1)(c) LPA 1925; or

(b) **Option 2(b)**: introducing new statutory provisions that confirm the formality requirements for certain specified dealings in equitable entitlements undertaken through specified holding and transaction arrangements, modelled potentially on equivalent rules developed for intermediated securities in the Geneva Convention on Substantive Rules for Intermediated Securities.[769]

(3) **Option 3**: Achieve the required clarifications through clear and authoritative legal guidance, developed incrementally by the courts and/or in the form of non-binding guidance from formally recognised industry panels.

Conclusions on reform

7.75 In our consultation paper, we expressed a preference for Option 2(a) which we said could provide clarity on the application of section 53(1)(c), to the extent necessary to eliminate any present perceived ambiguity.[770] However, since the paper's publication we consider that any potential residual uncertainty has been effectively eliminated by

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766 We acknowledge that there is a possibility of the courts adopting a broader characterisation of the fraud prevention purpose underpinning s 53(1)(c) LPA 1925, which could potentially result in the formalities rule requiring a different interpretation. However, we do not regard this risk as being of practical significance at present and certainly not sufficient in and of itself to justify any statutory intervention to clarify or amend the current law.

767 Consultation paper paras 17.54–17.59.

768 Any such clarification would be expressed as matters of general principle, not by exclusive reference to any particular category of assets, and could therefore encompass entitlements to crypto-tokens as well as investment securities.

769 For example, Articles 11(1) and 11(2). See para 17.55(2) of our consultation paper, and ns 1560 and 1561.

770 Consultation paper para 17.57. We received 31 responses to consultation question 32. Twenty-five agreed with our provisional conclusion, one provided qualified support and five disagreed. We note that these responses were submitted before the publication of the UKJT's recent work on digital securities, which we refer to below.

the highly compelling and robust analysis of the provision's scope and formalities requirements undertaken by the UKJT in connection with their recent work on digital securities.[771]

7.76 We regard the UKJT's analysis as constituting authoritative non-binding guidance of the type contemplated by Option 3. As a result, and based on our understanding of current market conditions, we no longer consider section 53(1)(c) LPA 1925 to present any meaningful practical obstacles to the use of trusts by crypto-token industry participants.[772] Nevertheless, we acknowledge that it might be necessary to revisit this conclusion depending on how crypto-token markets continue to evolve. For example, it is possible that a future regulatory framework could result in certain limited categories of crypto-token market infrastructure service providers being required to adopt exacting standards on issues of legal uncertainty that are far more rigorous than would ordinarily be expected of industry participants in general.[773] Were such circumstances to arise, statutory intervention might be justified, with the appropriate form and scope of any such intervention to be determined at the relevant point in time.

Formalities for statutory assignments under section 136 LPA 1925

7.77 Three consultees referenced or suggested statutory reform to clarify the application of section 136 LPA 1925 in addition to section 53(1)(c). This section provides a statutory mechanism for enforcing certain specified assignments of things in action that comply with the formalities requirements stipulated therein. The general effect of the provision is to allow the assignee to bring any action against the obligor directly and solely in its own name.[774]

7.78 The formalities requirements for section 136 LPA 1925 comprise of two overt acts:

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771 UKJT, Legal Statement on Digital Securities paras 119–137 generally, and specifically, at paras 130 and 132 in which the authors state: "we see no reason why the requirements in s 53(1)(c) for writing and signature cannot be fulfilled by electronic documents and digital signatures in any event… we consider that an electronic document, with a digital signature which is intended to authenticate it, is perfectly capable of satisfying the statutory requirement, whatever its original intended purpose."

772 We note that a number of consultees were supportive of statutory reform, predominantly on the basis of Option 2(a) and with a minority of such consultees being in favour of Option 2(b). However, we consider that a substantial majority of the reasons expressed in support of statutory intervention relating to the existence and impact of interpretive uncertainty arising in connection with s 53(1)(c) LPA 1925 have been fundamentally and adequately addressed by the work of the UKJT.

773 This is an issue that has potentially had an impact on mainstream financial markets. See Clifford Chance LLP, "The treatment of crypto-tokens at English law: back to the future" (2019), in which the authors suggest that ambiguity in relation to formalities law has in part influenced the choice of some major settlement institutions in the Eurobonds market to be based outside the UK: at p 22. Similarly, in previously arguing for clarificatory reform of s 53(1)(c) LPA 1925 in connection with the activities of securities intermediaries, CLLS-FLC have emphasised that "[financial markets infrastructures] operating immobilisation systems must operate under a legal framework that achieves a "high degree of legal certainty (see [the Principles for Financial Market Infrastructures published by the Bank for International Settlements], Principle 1, Key Consideration 1)" – Response to the Joint Working Party of the City of London Law Society Company Law, Financial Law and Regulatory Law Committees to the Law Commission's Consultation on Intermediated Securities (2019) p 27.

774 M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 22.051, 22.055. H Beale (ed), *Chitty on Contracts* (34th ed 2021) para 22.008.

(1) The assignment must be in writing and signed[775] by the assignor.

(2) Express notice of the assignment must be given to the obligor, trustee or other person against whom the assignor has a claim.

7.79 We acknowledge that section 136 LPA 1925 could potentially be relevant to certain (or to elements of certain) dealings and transfers in crypto-tokens and crypto-token entitlements. However, and even in comparison with the issues we considered in relation to section 53(1)(c) LPA 1925, we regard any uncertainty in the application of the provision's formalities requirements as likely to be of extremely limited relevance in practice to holding intermediaries in the crypto-token and cryptoasset markets:

(1) The transfer between users of contractual claims owed by intermediaries related to the holding of crypto-tokens or crypto-token entitlements can readily be characterised or indeed, intentionally structured as taking effect by way of novation.[776]

(2) We believe that the general pragmatic approach of the common law to recognising a broad range of electronic communication and authentication processes as being in writing and constituting valid signatures would apply to section 136 LPA 1925.[777]

7.80 Consequently, we do not regard the current state of the law as imposing any substantive hindrance on the establishment or adoption of intermediated holding platforms or arrangements by crypto-token and cryptoasset market participants under the law of England and Wales. Accordingly, we do not propose any statutory reform to this section.

Shortfalls and crypto-token custodial holding intermediary insolvency

7.81 The final issue we consider in relation to trusts relates to shortfalls on the onset of insolvency proceedings of a custodial holding intermediary that holds crypto-tokens or crypto-token entitlements on trust on an unallocated commingled basis for the benefit of multiple users.

7.82 Shortfalls occur where a holding intermediary does not hold or have access to sufficient crypto-tokens or crypto-token entitlements to meet the aggregate claims of its users. This can occur in a variety of ways.[778] The question which arises is how to apportion shortfall losses among affected participants.

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[775] The statutory wording referring to the requirement that the written assignment be made "under the hand of the assignor" has been interpreted as meaning that it must be signed by the assignor.

[776] See UKJT, Legal Statement on Digital Securities. At para 152 the UKJT note that "A transfer of Digital Securities would not be required to meet the requirements of s 136(1) provided it did not involve a legal assignment (which we consider to be readily avoidable)." We fully agree with this conclusion.

[777] Electronic execution of documents (2019) Law Com No 386, paras 2.15–2.17, 3.1; Statement of the Law: Execution with an electronic signature, (4)–(7). Our position here is consistent with the analysis of Y Liew in the fourth edition of *Guest on The Law of Assignment* (4th ed 2021) paras 2.18, 2.34.

[778] This includes unintentionally on the part of the holding intermediary (for example, due to a fraud or hack or because of administrative or operational error). Shortfalls can also arise because of improper activity by a

7.83 If a shortfall occurs and the holding intermediary enters insolvency proceedings, then the allocation of losses will depend on the legal nature of the intermediated holding arrangement and the rights granted to users under it.[779] If the arrangement is a non-custodial holding arrangement, then users will have no proprietary rights of recourse to any specific crypto-tokens retained by the insolvent estate but will instead rank as general unsecured creditors.[780]

7.84 For trust-based custodial intermediated holding arrangements, where crypto-tokens or crypto-token entitlements are held on an individually-allocated basis for each user, then a loss affecting any particular holding will be borne entirely by the user that is the beneficial owner of that holding. However, where crypto-tokens or crypto-token entitlements are subject to a trust but held on an unallocated commingled basis for the benefit of multiple users, there is some uncertainty as to the correct approach to apportioning any shortfall losses among such parties under the law of England and Wales.

7.85 In our consultation paper, we said that for unallocated, commingled pools that are subject to substantial volumes and high frequency of transactional activity, the courts are likely to allocate losses among all affected participants on a proportionate (or *pro rata*) basis.[781] We said that this could be regarded as the "most practical and least arbitrary approach",[782] particularly where the application of traditional tracing rules to determine the appropriate distribution of losses would be unduly complex.[783] It could also be justified as being aligned with the commercial expectations of users, as a reflection of their "common venture of holding securities in a pooled account and the common risk taken by the account holders as to the [custodian]'s integrity and solvency".[784]

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holding intermediary. They can also happen as a result of activity consistent with the proper operation of an intermediated holding arrangement, such as following the exercise of a right of use over and subsequent lending of crypto-tokens, either to a third party or through a DeFi platform. See our consultation paper para 17.60.

779 The Financial Services Compensation Scheme will not provide compensation in this context because claims against crypto-token holding intermediaries would not fall within its remit: see FCA Handbook Compensation Sourcebook ("COMP"), in particular COMP 5.2.

780 K van Zwieten, *Goode on Principles of Corporate Insolvency Law* (5th ed 2018) paras 8.02, 8.55.

781 Consultation paper para 17.66. M Yates, G Montague*, The Law of Global Custody* (4th ed 2013) para 3.55. The *pro rata* approach was adopted by the New Zealand High Court to apportion shortfall losses remaining following the insolvency of a custodial crypto-token exchange in *Ruscoe v Cryptopia Limited (in liquidation)* [2020] NZHC 728 at [204].

782 M Solinas, "Bitcoins in Wonderland: Lessons from the Cheshire Cat" (2019) 3 *Lloyd's Maritime and Commercial Law Quarterly* 433, 450. In the context of intermediated securities holdings trading activities in conventional financial markets, see FMLC, *Property Interests in Investment Securities* (2004) p 11.

783 *Barlow Clowes International Ltd (in liq) v Vaughan* [1992] 4 All ER 22 at 42, by Woolf LJ. For an overview of the different approaches to tracing that could apply as an alternative to a *pro rata* allocation principle, see B McFarlane, R Stevens "Interests in Securities – Practical Problems and Conceptual Solutions" in L Gullifer, J Payne, *Intermediated Securities – Legal Problems and Practical Issues* (2010) pp 41–43.

784 M Solinas, "Bitcoins in Wonderland: Lessons from the Cheshire Cat" (2019) 3 *Lloyd's Maritime and Commercial Law Quarterly* 433, 450. *Pearson v Lehman Brothers Finance SA* [2010] EWHC 2914 (Ch) at [244]. Where consistent with the commercial expectations of the parties, a *pro rata* allocation of shortfall risks could be supported on the basis of an implied term of the trust or services agreement governing the

7.86 We also discussed potential alternative approaches to the allocation of shortfall losses in the context of unallocated, commingled pooled accounts.[785] In addition, we briefly considered how a *pro rata* rule might be implemented in a more targeted way through structured statutory law reform. We listed the following potential examples of narrower versions of the rule.

(1) *Pro rata* shortfall allocation might be expressly limited to commingled unallocated holdings subject to relatively high transactional activity.

(2) *Pro rata* shortfall allocation might be expressly limited to commingled unallocated holdings that are properly characterised in co-ownership terms (and not extended to entitlements to specific crypto-tokens that form part of an undivided bulk[786]).

(3) *Pro rata* shortfall allocation might apply only *after* shortfall losses are first borne by application of an intermediary's own "house" assets, so that *pro rata* allocation applies to apportion any residual deficit.[787]

7.87 We provisionally concluded in favour of a general rather than targeted rule,[788] but asked consultees for their views.

7.88 Consultees broadly agreed that a *pro rata* allocation of shortfall losses might be practical, fair, and pragmatic,[789] and would potentially avoid "both the question of what tracing rules apply to crypto-tokens in any given circumstance, as well as the practical issue of applying the applicable tracing rules".[790] Since the publication of our consultation paper, the UNIDROIT Working Group published Principles which address shortfall allocation and which provide that shortfalls should be met "first by any digital assets of the same description" maintained the [custodial holding intermediary] for itself. Any remaining shortfall is borne on a *pro rata* basis".[791]

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custodial intermediated holding arrangement: L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.26.

785 This includes the rule in *Clayton's Case* (1816) 1 Mer 572 or a "first in, first out" approach; and the "rolling charge" or "North American" approach: consultation paper para 17.67.

786 For the reasons previously stated in our consultation paper, we think that this characterisation should be of limited or no application: consultation paper n 1589, and paras 16.69–16.74.

787 The allocation of losses of the intermediary might be considered in different ways. For example, that allocation might either be generally applicable, irrespective of the reason for the shortfall, or take place only where shortfall losses are themselves due to a relevant breach by the intermediary (and where that breach is not covered by a valid trustee exemption clause): consultation paper para 17.79 and n 1590.

788 While acknowledging that a targeted regime might facilitate more just outcomes across a range of shortfall scenarios, we also considered that it risked generating further uncertainty. In turn, this could generate litigation costs and delays to the return of trust assets so as to undermine the aim of the statutory rule in the first place.

789 We received 30 responses to consultation question 33. Twenty-one consultees agreed, five provided qualified or mixed views, and four disagreed.

790 COMBAR and the Chancery Bar Association p 376 (para 33.1).

791 UNIDROIT Working Group, *Principles on Digital Assets and Private Law* (2023), principles 13(4)–(6) (and the associated commentary at p 45 paras 6–7).

7.89 However, some consultees rightly said that any such law reform must be considered against wider regulatory and policy frameworks and alongside current work ongoing in those areas. For example, AFME and AGC in a joint response, said that any statutory intervention on the point should not aim merely to make private law interpretive rules more responsive to shortfalls if and when they arise after an insolvency. Rather, they said that the private law must be made to work together with regulatory and insolvency regimes to foster particular policy outcomes — namely, favourable market conditions for the general protection of ultimate investors.[792]

7.90 Deloitte Legal also cautioned against legislative reform, especially while regulatory consideration of crypto-asset related activity is ongoing.[793]

7.91 On balance, we remain in favour of a general *pro rata* shortfall allocation rule of relatively broad application in respect of commingled unallocated holdings crypto-tokens or crypto-token entitlements. We consider that the approach is both conceptually coherent and a sensible pragmatic intervention that addresses potential uncertainty as to the correct approach to shortfall allocation in this context. However, and in light of the feedback received from consultees, we do not at this stage set out any detailed recommendations for an express statutory rule to this effect, nor for its application within the context of specific insolvency regimes. Rather, we agree with those consultees who said that shortfalls arising on custodial holding intermediary insolvency must be considered within wider regulatory and policy frameworks rather than by the application of a standalone rule of private law.

7.92 In this respect, we note that since the publication of our consultation paper, HM Treasury published a consultation and call for evidence on a potential future financial services regulatory regime for cryptoassets. That paper includes specific consideration of outcomes that a future regulatory regime might seek to achieve. It includes direct consideration of user rights on insolvency,[794] and the resolution and insolvency components which a future cryptoasset safeguarding or administration of crypto-tokens or crypto-token entitlements regime might contain.[795]

7.93 Our hesitancy to propose specific recommendations for express statutory law reform is heightened by the fact that intermediary insolvency risk is evidently elevated across crypto-token markets, at least as they currently exist. This strengthens the need to approach intermediary insolvency in careful and comprehensive terms.

7.94 Thus, while we continue to favour a broadly applicable *pro rata* approach to shortfall allocation at least in general terms, we stop short of outlining any detailed proposal.

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792 AFME and AGC pp 24–25.

793 Deloitte Legal (UK) cited potential amendments to the Financial Services and Markets Bill to include crypto-assets: at p 454. See also responses of The Centre for Commercial Law Studies at the University of Aberdeen p 259–260; Professor Low p 697; FMLC p 551 (para 5.5).

794 These outcomes include that custodians "should ensure adequate arrangements to safeguard investors' rights to their cryptoassets when it is responsible for them such that, if and when the custodian becomes insolvent, those assets are returned to investors promptly and as whole as possible": 2023 HM Treasury Cryptoasset Regulatory consultation paper at para 8.7(1).

795 Table 8.A sets out Proposed Design Features for Crypto-asset Custody Regime and includes "Resolution and Insolvency" considerations at page 53. Questions 23 and 24 (Box 8.A) then seeks consultees' views on the proposed features of a potential regime: 2023 HM Treasury Cryptoasset Regulatory consultation paper.

The specifics of any statutory provisions[796] must be considered in coordination with the development of broader legal and regulatory regime(s) for crypto-token markets and related activities, including intermediated holdings of crypto-tokens or crypto-token entitlements. In particular, the risks to users in insolvency scenarios might be very different where crypto-tokens are held by intermediaries when compared with cash, or traditional financial securities, which might require different (and potentially novel) approaches to the way in which the law currently approaches insolvencies of investment banks or of payment and securities settlement systems. This could include a more market, service-provider and technology-specific approach to the allocation of shortfall losses where a shortfall occurs and the (trust-based) custodial holding intermediary enters insolvency proceedings.[797] A more discrete and forensic approach might, for example, be warranted in scenarios where movements of crypto-tokens and/or crypto-token entitlements are recorded in great detail by a combination of the books and records of the custodial holding intermediary and the distributed ledger or structured records of the crypto-token systems themselves.

Alternative and supplementary legal structures for intermediated holding arrangements

7.95 We conclude that contract and trust under the law of England and Wales provide effective and flexible structuring optionality for intermediated holding arrangements involving crypto-tokens and crypto-token entitlements which are likely to continue to be utilised by most market participants. However, depending on the use-case, it is possible that those structuring intermediated holding arrangements might also seek to rely on supplementary or alternative legal frameworks outside of basic contract and trust-based arrangements.

7.96 In this section, we discuss how the common law might develop to support novel legal frameworks for custodial intermediated holding arrangements as an alternative to trust. We also consider how intermediated holding arrangements might incorporate additional private law obligations such as fiduciary duties based on agency principles or otherwise arising outside of trust relationships, to change the balances of rights and responsibilities in those arrangements.

The extension of bailment or creation of an analogous control-based concept

7.97 Under current law, a bailment occurs where one person (the bailee) takes possession of a possessable thing belonging to another (the bailor), often for a specific purpose. The bailor retains superior legal title to the thing in question. At the end of the bailment, the bailee must either return the thing to the bailor or deal with it as the

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796 For example, the relevant specifics could potentially accommodate limitations in scope to the application of or alternatives to any *pro rata* rule: see para 7.86 above.

797 See, for example, Lister and Panahy who suggest that "As regulation progresses, the Digital Settlement Asset Special Administration Regime will need to become increasingly bespoke (beyond what is currently proposed) to cater for the differences in activities between various firms. N Lister and L Panahy, "There is nothing so stable as change": is the Treasury's proposed new special administration regime for stablecoin and other systemic DSA firms a change in the right direction? (2022) 37 *Journal of International Banking and Financial Law* 610. See also CLLS: Response to HM Treasury's consultation "Managing the failure of systemic digital settlement asset (including stablecoin) firms", available at: UKP1-2017065734-v1-CLLS-Response-to-stablecoin-SAR-consultation.pdf.

bailor directs.[798] Bailments can be undertaken gratuitously or for reward. Where a bailment relationship arises, the bailor is under a duty of care to take such care of the thing as is reasonable in the circumstances.[799]

7.98 At present, it is not possible to create bailments of intangible assets (including crypto-tokens) because under current law the permissible subject matter of bailments is limited to things in possession.[800] However, in principle, this position might be modified through appropriate law reform, provided that a coherent and sensible case could be made.

7.99 Another potential challenge to the extension of bailment arises if a transfer of a crypto-token is characterised as extinguishing a pre-transfer object and creating a "new", post-transfer object.[801] If the extinction/creation analysis is correct, the crypto-token transferred to a "bailee's" "control" would be a different object to the pre-transfer object. This appears to run counter to a conceptual understanding of bailment that rests on the relevant object retaining its identity throughout the transfer process ensuring that a bailor's title is not extinguished. But even if the extinction/creation analysis is correct, there is an argument that this objection might be overcome where bailment is characterised as involving the imposition of a particular *set of duties* on a bailee.[802]

7.100 Many consultees agreed with our provisional proposal that bailment should not be extended to relationships involving crypto-tokens either through statute or via the development of the common law.[803] Some cautioned that to do so would be "conceptually ungainly" once it is accepted that possession ought not to apply.[804]

7.101 We accept these arguments. For the reasons set out below, we now consider that the common law might usefully develop to support an analogous concept to bailment in

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798 In a bailment at will, the bailor can take back possession at any time — the bailor retains an immediate right to possession, but the bailee has possession as a matter of fact. In a term bailment, the bailor's right is limited to that of the reversion. It is only once the term bailment comes to an end that the bailor can take back possession of the object.

799 *Volcafe Ltd v Compania Sud Americana de Vapores SA* [2018] UKSC 61; [2019] AC 358 at [8]–[9], by Lord Sumption. M Bridge, L Gullifer, K Low, G McMeel, *The Law of Personal Property* (3rd ed 2021) paras 12.004–12.005, 12.030.

800 UKJT, Legal Statement paras 87–88. M Solinas, "Bitcoins in Wonderland: Lessons from the Cheshire Cat" [2019] 3 *Lloyd's Maritime and Commercial Law Quarterly* 433, 448. Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 12.008.

801 We discuss the "extinction/creation analysis" and an alternative characterisation, the "persistent thing analysis", in more detail in Chapter 6 (Transfers).

802 H Liu, L Gullifer and H Chong, "Client-intermediary relations in the crypto-asset world" (2020) *University of Cambridge Faculty of Law Research Paper No 18/2021* pp 5–6, reproduced in P Davies and C Tan, *Intermediaries in Commercial Law* (2022).

803 We received 29 responses to consultation question 34. Twenty-two consultees agreed with our provisional conclusion against the extension of bailment and/or development of an analogous concept. One consultee provided a qualified view and six consultees disagreed.

804 Dr Crawford p 807; Professor Tettenborn p 57. Some consultees went further, arguing against the conceptual coherence of bailment at all: Dr Gibbs-Kneller pp 426–427. This consultee also provided the Law Commission with an advance copy of "'A Rule Adumbrated': Bailment on Terms and the Rule of Law", *Law Quarterly Review* (forthcoming).

which holding intermediaries acquire a control-based legal proprietary interest in assets held.

Common law development of a control-based legal proprietary interest

7.102 We conclude that the development of a control-based legal proprietary interest within the common law is conceptually coherent and would offer market participants a useful additional framework for structuring custodial intermediated holding arrangements as an alternative to trusts. This is consistent with our ultimate conclusion in Chapter 5 (Control) that that control of a third category thing can, in certain circumstances, give rise to a proprietary interest which can be separated from (and be inferior to or short of) a superior legal title. It is also aligned with our final conclusion with respect to the development of control-based security interests over crypto-tokens, discussed below in Chapter 8 (Collateral arrangements).

7.103 Where the law recognises this, a custodial intermediated holding relationship could be characterised as a retention by a user of legal proprietary rights in assets held by a custodial holding intermediary. The user's legal proprietary interest would be superior to the control-based legal proprietary interest held by the custodial holding intermediary. These superior legal rights would, in the event of the custodial intermediary's insolvency, result in the relevant crypto-token entitlements being excluded from the custodial holding intermediary's estate and unavailable to satisfy the claims of its general creditors.

7.104 In our consultation paper, we provisionally concluded that there was no clear need for law reform to develop any additional framework specifically for the purpose of structuring intermediated holding arrangements. In our provisional view, contract and trust provided adequate legal foundation for structuring a variety of asset holding frameworks, particularly in the commercial context.[805] Most consultees agreed.[806]

7.105 However, a minority of consultees[807] provided convincing arguments in favour of recognising an alternative structure based on holding intermediaries acquiring a control-based legal proprietary interest in assets held, including by analogy with bailment.

7.106 First, the recognition of a control-based legal proprietary interest which can be inferior to (or short of) a superior legal title is useful once it is accepted that superior legal title to a digital object might be separated from its factual control. In these circumstances,

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805 However, we recognised that as markets evolve, there might be good reasons for developing a legal mechanism that allows for the imposition of legal duties on a party without the need for a trust relationship to arise and in the absence of contract. For that reason, we invited consultees to provide specific examples of market structures or platforms that would benefit from frameworks in the alternative to trust and/or contract: consultation paper paras 17.98–17.103.

806 As set out above, 22 consultees agreed with our provisional conclusion against the extension of bailment and/or development of an analogous concept. These consultees broadly agreed that there was no need for an additional framework on the basis that trust arrangements provided sufficient functionality and were already widespread throughout the markets.

807 In particular, Norton Rose Fulbright LLP, Linklaters LLP and COMBAR and the Chancery Bar Association.

there is a place for an analogue of "possessory" concepts which better explain the variety of circumstances where control and "ownership" are separated.[808]

7.107 Second, recognition of a control-based legal proprietary interest would promote flexibility within the common law by providing "a greater palette of rights and remedies which parties might use to structure their commercial relationships".[809] In addition to flexibility, Linklaters LLP also pointed to additional and specific benefits. For example, the recognition of a control-based legal proprietary interest would provide the basis on which a control-based security interest (akin to a pledge) might be developed.[810] As we explain in Chapter 8 (Collateral arrangements), we now conclude that this would be a useful development within the law.[811] We then proceed to set out a range of suggested scenarios for the incorporation of control-based security interests into a more comprehensive and nuanced future collateral regime for (certain) crypto-tokens and (certain) cryptoassets, which we recommend should be developed as a matter of priority.[812] Linklaters LLP also explained that the availability of a control-based custodial intermediated holding arrangement (as an alternative to trust) might be helpful for conflict of laws purposes given that some jurisdictions do not recognise common law trusts but will be more familiar with "possessory"-style security interests. Gunnercooke LLP made a similar point.[813]

7.108 Third, a control-based legal proprietary interest might serve an important gap-filling function particularly for situations outside of commercial contexts. In their response, Norton Rose Fulbright LLP said that in circumstances where superior legal title to a digital object is separated from its factual control, it may be desirable to impose legal duties on the person in control of the asset. However, where there is a gratuitous or informal arrangement or an involuntary transfer of control, for example, contractual obligations are unlikely to arise. Similarly, it might be inappropriate, unhelpful or conceptually unsound for fiduciary duties to be imposed.[814] In equivalent

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808 COMBAR and the Chancery Bar Association p 377 (para 34.2). See also Norton Rose Fulbright LLP pp 847–848 and Linklaters LLP pp 748–749 (para 1.5.1 (ii)). For a broader discussion on this point, see Chapter 5 (Control).

809 COMBAR and the Chancery Bar p 377 (para 34.2).

810 For example, where market participants are creating smart contract based "collateral" arrangements, without any formalities, including as to registration: Linklaters LLP pp 748–749 (para 1.5.1).

811 Chapter 8 (Collateral arrangements) from para 8.36

812 Chapter 8 (Collateral arrangements) from para 8.104.

813 Gunnercooke LLP p 565.

814 Some consultees considered if and when it would or would not be appropriate for fiduciary duties to arise. Informal "Safekeeping" scenarios provide a useful example (where one party (A) gives a private key to another (B) for safekeeping on an informal basis). Norton Rose Fulbright LLP said that in those scenarios contract law would not be applicable, and fiduciary duties not appropriate merely for taking control over a third category thing. Bailment or an analogous conceptual framework could provide a legal solution where B later refuses to return control. Professor Duncan Sheehan submitted that in most cases of safekeeping, an agency relationship might arise in which B would be authorised to deal with the assets in some ways and accountable for breach of the agency agreement and accompanying fiduciary duties if things go wrong.

We agree that both agency and fiduciary duties might have application including in respect of involuntary and/or gratuitous arrangements and discuss both below from para 7.95. However, we do not consider that fiduciary duties will exist or be appropriate in all scenarios. Fiduciary duties "impose heavy constraints on a

circumstances, bailments can arise over tangible property to explain the legal rights and duties of the resulting relationship. The same rationale exists for an equivalent structure in relation to crypto-tokens. The obligations potentially then imposed on a controller (especially if made subject to a duty of care) could serve a social and protective function.[815]

7.109 We recognise that most market participants are likely to continue to rely on contract and trust-based structures to support intermediated holding arrangements involving crypto-tokens. However, the recognition and development of a control-based legal proprietary interest would enhance the flexibility of the common law should certain parties prefer alternate structuring arrangements. Indeed, it may better reflect certain existing arrangements — particularly in informal and non-commercial contexts — and the assumptions which underlie them.[816]

7.110 We do not recommend any statutory law reform in this context. Rather, we consider that a control-based legal proprietary interest might be recognised and developed by the common law. Courts are well placed to develop the law in this way. While initially unfamiliar to the common law, we do not think that this development risks unworkable uncertainty.[817] Parties remain free to structure their arrangements by the application of contract and trust and we expect most will continue to do so.

7.111 We expect that a holding arrangement in which holding intermediaries acquire a control-based legal proprietary interest in held assets may have a number of parallels with the existing law of bailment. However, just as we consider "control" a distinct concept from "possession", we also conclude that a holding arrangement in which a holding intermediary acquires a control-based legal proprietary interest would be conceptually distinct from bailment. That division will allow courts to develop the parameters of the control-based legal proprietary arrangement without distorting the existing principles of bailment.

7.112 In our view, the touchstone of this control-based legal proprietary interest concept would be proper characterisation of the underlying arrangement ascertained by close attention to party intention and the particular circumstances.[818] This would also allow

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fiduciary's personal autonomy, and should be imposed only when nothing else will do the job": Sarah Worthington, "Four Questions on Fiduciaries" (2016) 2 *The Canadian Journal of Comparative and Contemporary Law* 2, 732.

815 By reference to bailment, Norton Rose Fulbright LLP noted additional advantages including that bailment allows for the bailee an insurable interest in the thing that is the subject of the bailment; it enables a proprietary action by the bailee (even, in some circumstances, against the bailor); it allows for sub-bailment; it deals with attornment: Norton Rose Fulbright LLP pp 847–848.

816 On this point, Norton Rose Fulbright LLP said that many DeFi participants on public blockchains do not see themselves as agreeing to a web of contracts and so relationships such as staking might be amenable to this analysis: pp 847–848.

817 However, we recognise the concern of some consultees regarding legal certainty: Clifford Chance LLP p 308. We also recognise that aspects of the law of bailment, which might be applied by analogy, have been subject to comparatively limited consideration by the courts as compared to trusts and contract: see para 7.114 below and our consultation paper at para 17.98.

818 On this point, we note commentary that questions whether the "alleged distinct features of bailment are better explained in terms of general principles of contract, tort, unjust enrichment and property", such that "so-called bailment cases" might best be explained by reference to foundational conceptual categories

courts to be more responsive to the idiosyncrasies of digital objects and the possible configurations of relationships involving them.

7.113 We do not consider that the recognition of a limited control-based legal proprietary interest would necessarily be precluded where crypto-tokens are co-mingled or mixed so that specific entitlements can no longer be identified. Bailments can arise over mixed quantities of tangible assets in equivalent circumstances provided that this accords with party intention.[819] We see no reason why courts might not develop similar or equivalent reasoning for application to crypto-tokens. However, again, this would not be because of simple analogy to bailment but because that outcome best reflects party intention. Thus, where parties intended that users should be tenants in common of the total unallocated crypto-tokens deposited, a control-based holding structure might be recognised by the courts as arising.

7.114 However, analysis of bailments over co-mingled or mixed assets is less well developed in case law and commentary as compared to equivalent consideration of trusts over commingled unallocated holdings. There would be even less established analysis underlying a new holding arrangement in which holding intermediaries acquire a control-based legal proprietary interest in held assets. The comparative certainty of trust law in this respect provides an additional reason why market participants may generally prefer it over a new holding arrangement in which holding intermediaries acquire a control-based legal proprietary interest in held assets.[820]

Conclusion 5.

7.115 We conclude that recognition of a control-based legal proprietary interest could provide the basis for an alternative legal structure for custodial intermediated holding arrangements in addition to trusts. This could take the form of holding intermediaries being recognised as acquiring a control-based proprietary interest in held crypto-token entitlements that is subject to a superior legal title retained by users.

within the private law. Such commentary demonstrates the flexibility open to courts if they were to develop a control-based legal proprietary interest as an alternative holding structure: GP McMeel "The Redundancy of Bailment" (2003) *Lloyd's Maritime and Commercial Law Quarterly* 169.

819 In the context of tangible assets, where clients/legal title holders and an intermediary agree that client/legal title holders should be tenants in common of the total assets deposited, there may be a bailment: *Mercer v Craven Storage* [1994] CLC 328, HL; *Glencore International v Metro Trading International* [2001] 1 Lloyd's Rep 284 at [154]–[155]. However, if the client's assets are mingled without others, and the intermediary merely promises to redeliver an equivalent quantity to the client in isolation and without any agreement as to co-ownership, there would be no possibility of a bailment. The arrangement would instead be considered a relinquishment of legal title once transferred to the intermediary: A Burrows, *English Private Law* (3rd ed 2013) para 16.18; H Liu, L Gullifer and H Chong, "Client-intermediary relations in the crypto-asset world" (2020) *University of Cambridge Faculty of Law Research Paper No 18/2021* p 7, reproduced in P Davies and C Tan, *Intermediaries in Commercial Law* (2022).

820 See our consultation paper at para 17.98 and n 1605 in particular.

An alternative conceptual framework

7.116 Some consultees suggested an alternative conceptual framework: that a holding intermediary could obtain full factual control over a digital object but would not (or is not intended to) obtain a control-based legal proprietary interest in the digital object. Some consultees said that this might happen in agency arrangements where an agent has full factual control but exercises that control on behalf of its principal.[821]

7.117 Consultees differed in their views as to whether this possibility and the possibility that a person with full factual control could obtain a control-based legal proprietary interest above were mutually exclusive, and the level to which the scenarios overlap. For example, CLLS-FLC said that if the law were to recognise circumstances in which control gave rise to a control-based legal proprietary interest (as we conclude it can above), this would undermine parties' ability to put in place, for example, pure agency arrangements. CLLS-FLC considered that recognition of a control-based legal proprietary interest is not possible at law.[822] Others, such as Linklaters LLP, disagreed.[823]

7.118 CLLS-FLC said that there might be circumstances in which parties opt to rely solely on agency principles to structure the terms of a relationship. For example, an investor might wish to create a trilateral mandate relationship in respect of digital objects held in a non-custodial intermediated holding arrangement. To that end, the user (as principal) might grant mandate control over a non-custodial intermediated holding account holding digital objects to a third party (as agent) without wishing to cede any proprietary interest to the agent. The CLLS-FLC response also implied that the superior legal title holder of a digital object might wish to enter into a bilateral agency relationship where it appoints a person as its agent and for that purpose gives full control over the digital object to the agent but without wishing to cede any proprietary or other interest to the agent. We discuss both trilateral agency relationships and bilateral agency relationships below.

Agency

7.119 At common law, an agent holds a power to affect (by way of creating, changing, or terminating) the legal relations of another, the principal. Agency relationships can operate alongside and supplement other legal frameworks. Consider, for example, an intermediated agency arrangement for holding and dealing in money or other assets. In such an arrangement, the intermediary agent can also undertake functions on behalf of its principal in other capacities outside of the agency relationship including, for example, as trustee or, in relation to goods, as bailee.[824]

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821 See for example, CLLS-FLC. The UNIDROIT Working Group also discuss control by an agent and agency relationships in in brief terms: *Principles on Digital Assets and Private Law* (2023) p 28, para 5; p 41 para 22.

822 CLLS-FLC pp 506–507.

823 Linklaters LLP pp 748–749 (para 1.5.1).

824 An intermediary "may be a bailee of goods, an agent to sell them and a trustee of the proceeds of sale": P Watts, *Bowstead and Reynolds on Agency* (22nd ed 2020) paras 1.032–1.033.

Trilateral non-tokenised agency relationships

7.120 We agree that agency principles could be useful in structuring trilateral agency arrangements where an agent is given "mandate" powers over a principal's account at a holding intermediary.[825] We do not consider there to be anything in our analysis of the existence or utility of a control-based legal proprietary interest that would prevent such arrangements being implemented in relation to intermediated accounts over crypto-token entitlements that are not themselves tokenised.[826] The objects of personal property rights held in such intermediated holding accounts and over which an agent may be granted control (without simultaneously acquiring title to such objects by virtue of that control) are things in action. They are contractual or equitable entitlements to crypto-tokens, not crypto-tokens themselves. Consequently, we consider these mandate arrangements as identical conceptually to those that are routinely granted in the conventional financial services sector over bank and securities accounts.[827]

Bilateral and trilateral tokenised agency relationships

7.121 However, we conclude that the analysis would be different in (1) a bilateral principal-agent relationship where the agent holds crypto-tokens on behalf of the principal, or (2) a trilateral arrangement where the agent is given mandate control over the principal's account entitlements in tokenised form. For these arrangements the agent would acquire a control-based legal proprietary interest in such crypto-tokens by virtue of the full factual control it exercises by holding them.[828] The parties would remain free to stipulate under the relevant contract or trust deed that the principal retains full and sole legal title and the agent acquires no legal or beneficial title to the crypto-tokens that the agent holds on behalf of the principal. However, this would only be effective as between the principal and agent themselves. It would have no effect on proprietary claims involving third parties asserted by or against the agent, which would still be based on and determined by reference to the agent's control-based legal proprietary interest.

7.122 Nevertheless, we do not regard our conclusion on the existence of control-based legal proprietary interests as imposing any undue limitations on the utility of agency facilities for structuring crypto-token intermediated holding arrangements in any real practical

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825 M Brindle, R Cox, *Law of Bank Payments* (5th ed 2017) paras 6.23–6.236. We also think that this structure could also be used to grant an agent control over (without conferring title on the agent to) an omnibus account holding the entitlements of multiple principals on an unallocated commingled basis. This structure could be appropriate where for example, principals appoint the agent under identical investment mandate terms.

826 We consider tokenised arrangements in Chapter 8 (Collateral arrangements) at para 8.12.

827 A possible example of a trilateral agency mandate relationship consistent with this analysis being recognised in relation to intermediated non-tokenised entitlements to crypto-tokens may be the recent decision of *HDR Global Trading Ltd v Shulev* [2022] EWHC 1685 (Comm). However, we note that the judgment does not expressly analyse nor state any conclusions as to the legal characterisation of the crypto-token entitlements held in the intermediated internal ledger trading account that was the subject of the dispute. Accordingly, it does not necessarily provide a clear crypto-token market specific affirmation of our analysis. In any event, we think that our conclusions are valid based on the arguments set out in this section and the clear analogy that can in our view be drawn with trilateral mandate arrangements in relation to choses in action over bank accounts and securities entitlements.

828 See Chapter 5 (Control).

sense. Where an agent has agreed to or accepted private undertakings recognising the principal's full retention of title over crypto-tokens that the agent holds on behalf of the principal, these undertakings can if appropriately structured and depending on the circumstances impose meaningful, substantive constraints on the agent's conduct in relation to proprietary third-party claims. Any attempt by the agent to bring or respond to such claims on the basis of its relative title to held crypto-tokens might amount to a breach of contract, trust and/or fiduciary duty, for which it would face the possibility of legal action by the principal.

Fiduciary duties

7.123 Depending on the use-case, intermediated holding arrangements could also rely on supplementary legal frameworks such as those involving fiduciary duties, which may arise on the basis of agency principles and/or other relationships outside of trusts.

7.124 Agency, in this strict legal sense, is a relationship that gives rise to fiduciary duties.[829] In *Bristol and West Building Society v Mothew*, Lord Justice Millett (as he then was), defined a fiduciary in the following terms:[830]

> A fiduciary is someone who has undertaken to act for or on behalf of another in a particular matter in circumstances which give rise to a relationship of trust and confidence. The distinguishing obligation of a fiduciary is the obligation of loyalty. The principal is entitled to the single-minded loyalty of his fiduciary. This core liability has several facets. A fiduciary must act in good faith; he must not make a profit out of his trust; he must not place himself in a position where his duty and his interest may conflict; he may not act for his own benefit or the benefit of a third person without the informed consent of his principal.

7.125 In *Al Nehayan v Kent*[831] Lord Justice Leggatt (as he then was) referred to agents as one of the "settled categories of fiduciary", alongside trustees, partners, company directors and solicitors. His Lordship noted that it was possible — albeit exceptional — for fiduciary duties to be recognised outside of these established categories. He said that "fiduciary duties typically arise where one person undertakes and is entrusted with authority to manage the property or affairs of another and to make discretionary decisions on behalf of that person."[832]

7.126 A non-custodial holding intermediary ordinarily owes users contractual duties in relation to the services provided. However, additional fiduciary duties may also arise

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829 *De Busshe v Alt* (1878) 8 Ch D 286; *Kirkham v Peel* (1880) 43 LT 171; *Lamb v Evans* [1893] 1 Ch 218; *New Zealand Netherlands Society Oranje Inc v Kuys* [1973] 1 WLR 1126; *English v Dedham Vale Properties Ltd* [1978] 1 WLR 93; *Korkontzilas v Soulos* (1997) 146 DLR (4th) 214. See also P Watts, *Bowstead and Reynolds on Agency* (22nd ed 2020) para 1.001.

830 [1998] Ch 1 at 18A-C, referred to by Birss LJ in *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [42] as "The classic definition of a fiduciary". His Lordship went on to explain that the role of a fiduciary has certain key characteristics which involve "acting for or on behalf of another person in a particular matter and also that there is a relationship of trust and confidence between the putative fiduciary and the other person": at [70].

831 [2018] EWHC 333 (Comm) at [157].

832 [2018] EWHC 333 (Comm) at [157], [159]. See also *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [74].

on the basis of an agency relationship. Even in the absence of agency, fiduciary duties may be implied as a result of the activities undertaken by the holding intermediary. Examples of the types of activities that could give rise to fiduciary duties include the provision of services relating to investment advice, investment management, brokering trades on a discretionary (as opposed to "execution only") basis and arranging loans of crypto-tokens with third parties.[833]

7.127 The existence of fiduciary duties in addition to the contractual obligations that ordinarily define a non-custodial intermediated holding relationship can be beneficial to users. The breach of such fiduciary duties may give rise to proprietary remedies.[834] In the event of a holding intermediary entering insolvency proceedings, these remedies could enable users to achieve enhanced recoveries relative to what would be possible on the basis of unsecured contractual claims alone.

7.128 For example, where a holding intermediary obtains secret profits, illegitimate commissions, or bribes in breach of fiduciary duty, users may be able to take advantage of a constructive trust imposed on the intermediary to prevent them from profiting from their position.[835] The subject matter of that constructive trust would not form part of the holding intermediary's estate. However, to the extent a constructive trust is found in this context at all, it would likely only apply to the gains obtained in breach of fiduciary duty or their traceable substitutes (including further gains). It would not operate to alter the characterisation of a user's primary entitlement to the redelivery of held assets, which would remain in the form of unsecured contractual claims.[836]

7.129 As we noted in our consultation paper, is common practice for holding intermediaries operating in conventional securities markets to include in their services contracts

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833 Fiduciary Duties of Investment Intermediaries (2014) Law Com No 350 paras 10.8, 10.14, 10.17, 10.22, 10.29–10.30, 10.33. See also *Första AP-Fonden v Bank of New York Mellon* [2013] EWHC 3127 (Comm) at [173]; *JP Morgan Chase Bank v Springwell Navigation Corp* [2008] EWHC 1186 (Comm) at [573].

834 See further analysis in Chapter 9 (Remedies) from para 9.35. It is important to emphasise however that "not every breach of duty committed by a fiduciary is a breach of fiduciary duty": *Bristol and West Building Society v Mothew* [1998] Ch 1 by Millett LJ (as he then was). A non-custodial holding intermediary subject to fiduciary duties may also owe for example a common law contractual duty of care in connection with the delivery of various services, breach of which would give rise to personal contractual remedies. It is only where the holding intermediary's actions amount to a breach of its fiduciary duty of loyalty that an affected user may be able to access equitable proprietary remedies.

835 *Keech v Sandford* [1726] EWHC J76; *Boardman v Phipps* [1967] 2 AC 46; *A-G for Hong Kong v Reid* [1994] AC 324 at 338; *FHR European Ventures LLP v Cedar Properties LLC* [2014] UKSC 45, [2015] AC 250 at [34]–[37]. A Burrows, *Remedies for Torts, Breach of Contract, and Equitable Wrongs* (2019) pp 528–529. See further analysis in Chapter 9 (Remedies).

836 A potential exception to this could be where the breach of fiduciary duty occurs at and not subsequent to the initial deposit of crypto-tokens by a user. Consider for example, a non-custodial holding intermediary that receives crypto-tokens as agent to allocate them to a specified investment strategy for the account of its principal. Instead, the intermediary agent improperly designates and/or applies them upon receipt for use in other unauthorised deals, in breach of fiduciary mandate duty, generating a personal gain. In such circumstances it is possible that the tokens (and any traceable substitutes) might be treated as being held on constructive trust, converting the principal's unsecured contractual rights to their return into an equitable proprietary entitlement. Such an outcome could potentially be justified on the basis of analogising with the decision in *Longfield Parish Council v Robson* [1913] 29 TLR 357 (Ch D). In that case, an agent who had been engaged to buy property for his principal was held to hold the property on constructive trust after they had in fact purchased it for themselves.

provisions designed to modify implied fiduciary duties.[837] These are intended to disclose, and thereby obtain informed consent to, conflicts of interest and to the generation and retention of profits, and to obtain permission for the relaxation of confidentiality obligations to permit the sharing of client information with affiliates and other third parties. Particularly in a commercial context, the courts have recognised the validity of, and given effect to, a broad range of arrangements, seen as consistent with the law of England and Wales.[838] We anticipate that a similar approach to controlling and defining the scope of fiduciary duties could also be effectively deployed in the context of non-custodial intermediated holding relationships.

"Lock and mint" facility developers as holding intermediaries

7.130 We turn finally to "lock and mint" facilities. These facilities are used in a wide range of applications, including crypto-token "bridges", wrapping protocols and fractional ownership token issuance platforms. As we explain above, although not normally characterised as custodial intermediated holdings, certain (centrally controlled) "lock and mint" facilities might potentially be subject to a trust analysis.[839]

7.131 In our consultation paper we also considered the role of developers of "lock and mint" facilities. We concluded that such developers would only be at risk of being characterised, and of owing obligations, as what we now refer to as holding intermediaries if they were capable of exercising discretionary negative and positive control of crypto-tokens in a real and immediate sense. We suggested that this risk would be minimal for developers that comprise an unidentified, shifting class of persons without any formal organisational structure, and whose ability to exert positive and negative control is remote and essentially hypothetical.

7.132 In making this point, we drew an analogy with the decision of the High Court in *Tulip Trading*.[840] In that case, the court had to consider claims that the developers of the Bitcoin network and certain related forked networks owed fiduciary and tortious duties to all legal title holders of tokens instantiated within those networks. It was alleged that the effect of those duties was to render the developers legally obligated to develop and issue software updates to facilitate the recovery of any bitcoin to which legal title holders had lost access. The High Court held that the claims had no realistic prospect of success. Mrs Justice Falk (as she then was) concluded that the software developers of the relevant networks consisted of a "fluctuating and unidentified body".[841] In those circumstances the developers could not realistically be regarded as having been entrusted with the property of others (in the form of crypto-tokens

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837 Consultation paper paras 16.91 and 16.96.

838 Fiduciary Duties of Investment Intermediaries (2014) Law Com No 350 paras 10.8, 10.42–10.44, 10.49 and 10.52. See also our consultation paper at paras 16.88–16.90 as well as Blair J: "The basic rights and liabilities of the parties and the fiduciary relationship, if it is to exist at all, must accommodate itself to its terms…. This applies with particular force when the parties are substantial financial institutions dealing on an arms-length basis": *Första AP-Fonden v Bank of New York Mellon SA/NV* [2013] EWHC 3127 (Comm) at [177]–[178] (citing *Hospital Products Ltd v United States Surgical Corp* [1984] 156 CLR 41 at 97).

839 See n 723 above.

840 *Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch).

841 Above at [73].

instantiated on the relevant networks) for the purpose of establishing fiduciary obligations and tortious liability.

7.133 Since the publication of our consultation paper the decision of the High Court in *Tulip Trading* has been overturned by the Court of Appeal.[842] The appeal was allowed in part because the Court of Appeal found that the High Court's dismissal of the claim relied inappropriately on a characterisation by the developers of the relevant crypto-token networks as a decentralised and shifting collective — a characterisation that the claimant did not agree with and that was highly contested.[843] The Court of Appeal concluded (on the basis of the claimant's case) that it was at least realistically arguable for the developers in question to owe fiduciary duties to legal title holders of crypto-tokens.[844] The court also regarded it as reasonably arguable that such duties might extend to a positive obligation to introduce software code to enable legal title holders to recover inaccessible or stolen tokens.[845]

7.134 Our conclusions regarding the types of "lock and mint" facilities that can be structured as, or that may be at risk of being re-characterised as, intermediated holding arrangements are unaffected by the successful appeal in *Tulip Trading*. The status of a developer as a holding intermediary will ultimately be dependent on their having the practical capacity to hold crypto-tokens. This requires an ability to exercise or to coordinate or direct the exercise of full factual control over those tokens in a real and immediate sense. This is a far more comprehensive and direct form of control than was under consideration in *Tulip Trading* as arguably being capable of giving rise to fiduciary obligations.[846] We continue to regard it as extremely unlikely that members of a decentralised, unidentified and shifting community of developers without any formal organisational structure would have the active capacity to exercise, coordinate or direct control of this type.

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842 *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16.

843 Above at [77], by Birss LJ.

844 Above at [40], [51], [74], [86], by Birss LJ. The argument would characterise the developers as undertaking a role involving discretionary decision-making and the exercise of authority and control over the state of and updates to the software code on which the Bitcoin network and related specified networks operated. This role would have been undertaken for and on behalf of other people, in relation to crypto-tokens (as objects of personal property rights) to which those other people held legal title, amounting to an "entrustment of property" and thereby, in aggregate, giving rise to a fiduciary relationship.

845 The appeal related to an interim application and not substantive proceedings. As such, these points were not determined finally. The Court of Appeal did not conclude that there would necessarily be a fiduciary duty in law in the circumstances alleged by the claimant (and Birss LJ acknowledged that for the claimant's case to succeed there would need to be "a significant development of the common law on fiduciary duties"). Rather, the Court considered that "the case advanced raises a serious issue to be tried": *Tulip Trading v Van Der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [78], [86], [91], by Birss LJ.

846 We do not discuss whether it is ever appropriate (and if so, in what circumstances) for software engineers/developers of open-source code for software protocols to owe duties of care and/or fiduciary duties to users of those software protocols in detail in this report. However, we raised the issue in our call for evidence on decentralised autonomous organisations ("DAOs") (see paras 5.33–5.45) and expect to discuss the issue in detail in our scoping paper on DAOs. More information and the latest updates are available at: https://www.lawcom.gov.uk/project/decentralised-autonomous-organisations-daos/.

Chapter 8: Collateral arrangements

INTRODUCTION

8.1 Collateral arrangements are mechanisms to manage counterparty credit risk. A collateral taker acquires a proprietary interest in specified assets or a pool of assets to secure a payment obligation or cover the performance of an undertaking.[847] This might be achieved by the collateral taker acquiring either an absolute interest or a security interest in the relevant collateralised assets.

8.2 In this chapter, we discuss legal issues relating to crypto-token collateral arrangements. We consider crypto-tokens specifically and not third category things in general because crypto-tokens are currently the third category thing in respect of which collateral arrangements are most often made.[848]

8.3 Crypto-token collateral arrangements offer various benefits. They enable users to extract value from what otherwise could be underutilised assets. They might also have the potential to support increased market efficiency and stability by improving liquidity and more effective management of counterparty credit risk.[849] However, market participants require a high level of confidence in the legal reliability and predictability of such arrangements.

8.4 We begin the chapter by discussing how title transfer and non-possessory security-based arrangements can be used to structure crypto-token collateral arrangements without the need for law reform. Second, we explain that possessory security-based arrangements do not apply to crypto-tokens.

8.5 We then discuss how the recognition of a control-based proprietary interest to facilitate both the holding of and the grant of security over crypto-tokens might be a beneficial development within the common law. We conclude that the common law could develop to recognise a control-based security interest in respect of crypto-tokens (possibly by analogy with pledge). However, the development of such a security interest would likely not be a complete solution given that such a security interest would be reliant on static, comprehensive notions of control.

8.6 We then consider the applicability of the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs") to crypto-tokens and other collateral that might use and/or be linked to public, permissionless crypto-token systems or private, permissioned blockchain systems (including Central Bank Digital Currencies ("CBDCs"), stablecoins, equity and debt securities and credit claims). We broadly

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847 L Gullifer, "What should we do about financial collateral?" (2012) 65 *Current Legal Problems* 377, 378: "The point of collateral is to protect A against credit risk relating to B…. It does this by acquiring a proprietary interest in assets, so that it has a right to pay itself out of the value of those assets, despite the insolvency of B.

848 However, we consider our analysis is potentially applicable more widely insofar as third category things utilise the same or similar underlying technology as crypto-tokens.

849 For further discussion on this point, see from para 8.111.

subdivide our analysis into an analysis of crypto-tokens, cryptoassets and mere record/register tokens.[850]

8.7 We conclude that many crypto-tokens are likely to fall outside of the scope of the FCARs regime. However, for collateral arrangements in respect of cryptoassets (including CBDCs, stablecoins, equity and debt securities and credit claims) or mere record/register tokens we think the answer is possibly different. For at least some of those things, there is a better argument that they fall within the scope of the FCARs regime. We recommend law reform to clarify this position, although we do not ultimately conclude on what the complete scope of the FCARs regime should be, given that question involves policy considerations beyond the scope of our current work.[851]

8.8 As part of this discussion, we consider the tokenisation of securities. We recommend that the laws governing the tokenisation of equity and other corporate securities by UK companies are reviewed. The aim of this review would be to confirm, and where appropriate extend, the range of technological facilities (including potentially to public, permissionless ledgers) and operational arrangements through which the valid creation, transfer, and use of such tokenised equity and other securities would be legally possible. This would require further legislative change.

8.9 We conclude that although the law of England and Wales already provides options for granting security in respect of crypto-tokens, those options are not adequate. As such, we recommend that as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.[852] We support this recommendation by considering some potential issues in relation to such a bespoke legal regime, including:

(1) how such a regime might interact with financial markets more broadly as well as the real-world economy;

(2) the possible objectives for such a regime;

(3) whether such a regime should differentiate between offchain and onchain collateral arrangements;

(4) the possible development of a perfection requirement for security interests incorporating practical control as a core constituent element but defined in

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850 For more on this terminology, see from para 8.12 below.

851 The scope of the FCARs regime is largely a question of legal interpretation. However, considering whether new asset classes such as crypto-tokens, CBDCs and stablecoins fall within scope arguably also involves the question as to whether the relevant policy rationales behind the FCARs regime also applies to such assets and so whether such assets *should* fall within scope. This is particularly the case when considering whether clarifications to the scope of the FCARs should be made. For a more detailed discussion of some of these issues, see from para 8.54 below.

852 The scope of the regime — that is, which crypto-tokens and cryptoassets fell within scope — would again be a policy-related issue in part and would also be likely to depend on whether (and if so, how) clarifications were made to the scope of the FCARs to include certain crypto-tokens or cryptoassets.

terms of a more flexible, higher order framing principle that we refer to as "provision";

(5) the accommodation of a potential control-based security interest recognised at common law;

(6) whether it would be appropriate for such a regime to develop and define a bespoke statutory security interest for crypto-tokens and cryptoassets that is more aligned to their functionality and use;

(7) recognising that any such regime would need to deal with conflict of laws issues and include rules to determine which national laws apply to various aspects of collateral arrangements that incorporate cross-border elements; and

(8) the merits of integration with and/or corresponding or parallel amendments to the FCARs, and coordination with related policy initiatives such as the future financial services regulatory regime for crypto-token and cryptoasset markets.

8.10 This chapter therefore departs from much of the rest of this report in two ways. First, we conclude that there are existing problems with the law of England and Wales that cannot be solved or improved by further common law development. That is largely because we conclude that an effective collateral regime for (certain) crypto-token and (certain) cryptoasset collateral requires statutory intervention if it is to provide the level of certainty required by the market. Second, we recommend law reform, but acknowledge that identifying the optimal approach cannot solely be determined by reference to applicable private law principles or the mere technical feasibility of statutory commercial law reform (although both will be of central importance). We recognise and acknowledge that any such law reform has complex policy implications that require a wide-ranging cross-functional investigation and rigorous cost benefit analysis. It will also require coordination with, and the appropriate allocation of policy objectives between, other policy initiatives affecting the operation and development of crypto-token and cryptoasset markets and the conduct of market participants, such as changes in the regulatory environment.

8.11 Although this recommendation and the work required to implement it are significant, we conclude that there is a very high degree of support and demand for such law reform among consultees, markets participants and industry bodies.[853]

Our terminology

8.12 In this chapter, we use the following terminology:

(1) We use "**crypto-token**" to refer to a composite thing which exists as a notional quantity unit manifested by the combination of the active operation of software by a network of participants and network-instantiated data. By this we mean crypto-tokens denominated in their own notional unit of account; sometimes market participants refer to these as "unbacked" crypto-tokens.

[853] See, in particular, consultee responses to consultation question 39 in n 974 and n 1001 below.

(2) We use "**cryptoasset**" as a related legal concept. A cryptoasset in this sense refers to a crypto-token which has been "linked" or "stapled" to a legal right or interest in another thing.[854] Linking or stapling refers to a legal mechanism whereby the holder of a legal right or interest in a thing is identified by reference to a crypto-token.[855] So, we use the term cryptoasset to describe things including CBDCs, stablecoins,[856] tokenised equity and debt securities and tokenised credit claims.

(3) We use "**mere record/register tokens**" to refer to crypto-tokens that are used merely as part of a register or record of entitlements to an underlying asset. This could include tokens that record or form part of a register to record equity and debt securities and credit claims. The underlying securities/credit claims would not be "tokenised" and they would not be "linked" or "stapled" to the crypto-token that records them and therefore would not fall within the concept we describe as a cryptoasset.[857]

8.13 Clearly, the terms are not exact (nor are they intended to be) but are helpful as broad descriptive terms for the limited purposes of our analysis of the FCARs.

8.14 We also refer to "**CeFi**" and "**DeFi**" arrangements. This reflects the two broad categories into which financing facilities backed by crypto-tokens are generally divided.

(1) CeFi (centralised finance) includes arrangements made between identifiable persons that directly manage the establishment of credit facilities, the creation and servicing of loans and/or the intermediated holding of collateral using conventional operational processes. These arrangements bear many similarities to those used currently by intermediaries in mainstream financial markets and by traditional credit institutions such as banks when extending loans secured by investment securities, bank account cash balances and real-

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854 The UKJT define "stapling" as referring "to a legal mechanism whereby the holder of a legal right or interest in an asset is identified by reference to a cryptoasset, or to another digital object of property or a ledger record that is not itself an object of property (in the case of registered or similar structures)": UKJT, Legal Statement on Digital Securities para 31. We adopt the same approach.

855 For more details on how such a legal mechanism might be structured see our consultation paper Chapter 14 and the UKJT, Legal Statement on Digital Securities para 84.

Broadly, to be effective, the legal mechanism linking an entitlement to a crypto-token must satisfy the following conditions. First, it must render the right to or in the underlying entitlement transferable through an "on chain" disposition of the linked crypto-token that is (or is capable of being) effected by an update to the ledger on which the token is instantiated. Second, it must prevent the "decoupling" of the right to or in the instrument such that it cannot be transferred independently of an on-chain transfer of the linked token: H Liu and L Gullifer, "Financial collateral arrangements in the digital asset world" (2022) *Journal of International Banking and Financial Law* 527, 528. The UKJT has concluded that "English law provides several mechanisms that could be used for stapling legal interests to cryptoassets or to ledger entries that are not themselves assets," some of which permit not only the conferring of rights but also the imposition of obligations on holders of securities: UKJT, Legal Statement on Digital Securities paras 84–118.

856 At least those stablecoins which are structured as a token which has been "linked" or "stapled" to a legal right or interest in another thing, such as a right to redeem a certain (monetary) amount. Algorithmic stablecoins or those not linked to any legal right or interest might be better described as crypto-tokens.

857 See the UKJT, Legal Statement on Digital Securities para 33.

world assets. In crypto-token and cryptoasset[858] markets, this form of lending is often referred to as "CeFi" or "Centralised Finance", highlighting the dependence of such facilities on traditional intermediaries as direct providers of credit and/or intermediated holding arrangements for the underlying collateral.[859]

(2) DeFi (decentralised finance) is an alternative model, which has emerged as market participants increasingly use the technological capabilities of crypto-token systems to create collateral facilities, businesses and platforms that differ from those typically used in conventional financial contexts. DeFi arrangements rely on the functionalities of crypto-token systems themselves to automate certain processes that mimic or replicate the substantive economic effect of collateralised loans. "DeFi" is a general term for automated or deterministic and purportedly decentralised[860] and/or disintermediated applications which provide financial services (or similar functional results as traditional financial services) on a (generally decentralised and often blockchain-based) settlement layer, including payments, lending, trading, investments, insurance, and asset management.[861]

8.15 DeFi has been a major contributing factor in driving broader adoption of new applications across crypto-token and cryptoasset markets.

CRYPTO-TOKEN COLLATERAL ARRANGEMENT STRUCTURING OPTIONS UNDER THE CURRENT LAW

8.16 In this section, we consider the existing options for structuring crypto-token collateral arrangements (title transfer or security arrangements) under the common law.

8.17 In the next section, we discuss financial collateral arrangements. For practical and policy reasons, the grant of collateral is governed by complex rules including a range of statutory formalities. Financial collateral is subject to a "nearly separate"[862] regime set out in the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs").[863] Whether and to what extent that regime applies to crypto-token collateral arrangements has significant implications for the operation and utility of those arrangements.

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858 We intentionally use the term cryptoasset here to include both crypto-tokens and those crypto-tokens linked or stapled to things external to crypto-token systems.

859 Examples of CeFi Lending Platforms include Nexo (https://nexo.io/.) and BlockFi (https://blockfi.com/).

860 We note that decentralised finance platforms may be subject to a degree of re-characterisation risk. Ongoing litigation involving Oasis, a platform for decentralised finance, provides a useful example. See our brief discussion of those proceedings in Chapter 5 (Control) and Chapter 7 (Intermediated holding arrangements) in particular n 497 and n 732.

861 See Wharton Blockchain and Digital Asset Project, "DeFi Beyond the Hype: The Emerging World of Decentralized Finance" (2021) p 2, available at: https://wifpr.wharton.upenn.edu/wp-content/uploads/2021/05/DeFiBeyond-the-Hype.pdf.

862 L Gullifer "What should we do about financial collateral?" (2012) 65 *Current Legal Problems* 377, 377.

863 SI 2003 No 3226.

Title transfer and security collateral arrangements

8.18 Under current law, there are broadly two ways in which a collateral taker can acquire a proprietary interest in the relevant collateral assets. A collateral taker either acquires an absolute interest in those assets ("title transfer collateral arrangements") or is granted a security interest in them ("security-based collateral arrangements").

Title transfer collateral arrangements

8.19 Under a title transfer collateral arrangement, a collateral provider transfers in full its interest in the collateral assets to the collateral taker. In turn, the collateral taker undertakes to transfer the full interest (or, more often, equivalent assets) back to the collateral provider once the relevant obligations secured are satisfied in full.

8.20 We conclude that, as things to which personal property rights can relate at law, crypto-tokens can in principle be the subject of title transfer collateral arrangements without the need for law reform. The majority of consultees agreed.[864]

8.21 However, even though they are available as a matter of current law, we anticipate that most market participants will not seek to rely on title transfer collateral arrangements as a preferred structuring option. While advantageous from the perspective of a collateral *taker*,[865] title transfer collateral arrangements expose a collateral *provider* to greater exposure of unsecured surplus risk. This arises because a collateral provider has recourse to only a personal obligation on the part of the collateral taker to the return of collateral. Where the crypto-tokens transferred exceed a collateral provider's credit exposure (post close-out),[866] a collateral taker's obligation to repay surplus proceeds is merely personal. If a collateral taker enters insolvency proceedings, a collateral provider would have only an unsecured claim for the amount constituting surplus proceeds, rather than a proprietary claim to the assets.[867]

8.22 The threat of unsecured surplus exposure might be more significant in the context of crypto-token collateral arrangements due to the comparatively high price volatility and fluctuating liquidity currently evident in crypto-token markets. For that reason, we expect that market participants concerned to minimise exposure to unsecured surplus

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864 We received 34 responses to consultation question 35. Twenty-six consultees agreed with our conclusion, four provided qualified views, and four consultees disagreed. However, a number of consultees went on to identify particular issues which they said undermined the practical operation of title transfer collateral arrangements and necessitated targeted law reform. We address these considerations within our discussion of a legal framework that better facilitates crypto-token collateral arrangements: from para 8.104 below.

865 We set out possible advantageous of a title transfer collateral arrangement to a collateral taker in our consultation paper at para 18.14.

866 Close out refers to the process by which a contract is terminated, all transactions or obligations governed by that contract are accelerated so as to be immediately due and payable or due for performance, and all non-monetary obligations are converted into their monetary equivalents. These sums are then aggregated and netted against each other in settlement of the related claims. To the extent that that the obligations owed by each party to the other do not match there will be a single payment claim representing the value of the net surplus remaining. Note that issues of netting and/or set off (whether contractual, by mandatory operation of law or otherwise) will be important for the future development of crypto-token markets but are outside the scope of this consultation paper.

867 See L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.45.

risk are more likely to rely on security-based collateral arrangements as a preferred structuring option.

Security-based collateral arrangements

8.23 At a general level, the common law of England and Wales recognises two broad categories of consensual security:[868]

(1) Non-possessory security arrangements: mortgage and equitable charge.

(2) Possessory security arrangements: pledge and contractual lien.

Non-possessory security arrangements (mortgage and equitable charge)

8.24 A mortgage is a transfer of ownership of an asset by way of security upon the express or implied condition that ownership will be transferred back to the collateral provider when the obligation secured has been settled.[869] Unlike with an outright title transfer, the collateral *provider* under a mortgage retains the equity of redemption. This means that they have an (equitable) proprietary right to the return of the asset on the satisfaction of the relevant obligation, as opposed to a mere contractual right to the value of that asset.

8.25 In contrast, a charge does not involve the transfer of ownership. Rather, it constitutes a specifically enforceable right, created either by trust or by contract, to have recourse to a designated asset or class of assets to discharge a specified debt.[870] The right of recourse is satisfied by the exercise of a power of sale and out of the resulting proceeds realised.

8.26 We conclude that both of these non-possessory security-based arrangements can be granted in respect of crypto-tokens without the need for law reform. The majority of consultees agreed.[871]

8.27 Non-possessory security-based arrangements offer certain advantages. Both mortgage and charge are versatile security interests which can be granted over entitlements to an unallocated part of an identified bulk of intangible fungible assets. Since there is no need to transfer possession to the collateral taker, they are not restricted to assets which are amenable to possession. They can be validly granted

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868 *Re Cosslett (Contractors) Ltd* [1998] 1 Ch 495 at 508, by Millett LJ (as he then was).

869 *Santley v Wilde* [1899] 2 Ch 474; *Maugham v Sharpe* (1864) 17 CB NS 443.

870 The existence of a specifically enforceable agreement is critical to the creation of a charge because the existence of the equitable proprietary right relies on a chargee having a specifically enforceable right to have the charged property appropriated to the payment of the debt or discharge of some other obligation. As Briggs J put it: "It is that right of specific enforcement which transforms what might have otherwise been a purely personal right into a species of proprietary interest in the charged property…": *Re Lehman Bros International (Europe) Ltd (In Administration)* [2012] EWHC 2997 (Ch) at [43], citing *Palmer v Carey* [1926] AC 703 at p 706, by Lord Wrenbury. See also M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 16-068.

871 We received 35 responses to consultation question 36. Twenty-three consultees agreed with our conclusion, nine provided qualified or mixed views, three disagreed.

over assets that are subject to holding arrangements that may vary over time and that may involve the participation of multiple parties and even automated processes.

8.28 Mortgage and charge are also useful to crypto-token collateral providers concerned to manage and minimise exposure to collateral takers' credit risk. Unlike an outright title transfer, the collateral provider retains a proprietary right to the return of the assets on satisfaction of the relevant obligation (or in any surplus value remaining subsequent to any enforcement of the security interest by the mortgagee or chargee).[872] This might be particularly important where the value of crypto-tokens offered as collateral and the value of the obligations they secure are volatile and uncertain (perhaps due to market risk and/or liquidity issues).

8.29 However, various practical and commercial considerations limit the appeal and operation of non-possessory security-based arrangements for crypto-token collateral arrangements. Consultees raised these concerns consistently throughout this project.[873]

8.30 A common concern relates to the application of statutory formality requirements, for example perfection requirements applicable to non-possessory security interests, such as registration. Consultees considered the application of statutory formalities uncertain and/or likely to inhibit the creation, validity, perfection,[874] or enforceability of crypto-token collateral arrangements. We return to these issues below in our consideration of a bespoke collateral framework applicable to crypto-tokens.

8.31 In addition, the practical methods for taking control over crypto-tokens (if and to the extent required as part of a non-possessory security arrangement) are different to the practical methods for taking control over things in possession and things in action.[875]

Possessory security arrangements

8.32 Under a possessory security arrangement, the party taking security has or will take possession of the assets provided as security. Because crypto-tokens are not things in possession, they cannot be the subject of a valid possessory security arrangement.

8.33 In our consultation paper we considered the extent to which third category things might be made the subject of possessory security arrangements — specifically a

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872 L Gullifer "What should we do about financial collateral?" (2012) 65 *Current Legal Problems* 377, 385.

873 This includes from our call to evidence (for example, the responses of Linklaters LLP and FMLC) and throughout our consultation process. This process, including some of these concerns, is summarised in our consultation paper at paras 18.22–18.23. For specific concerns raised in responses to our consultation paper, see Ashurst LLP p 82 (para 4.47), FMLC p 552 (para 6.2), IDAC and CryptoUK p 600, CLLS-FLC p 531 Stirling & Rose LLP p 960.

874 Perfection refers to steps required by statute in various contexts to give publicity to security interests in assets owned by another person to ensure their effectiveness against competing third party claims. Failure to comply with these steps results in the interests being void in the event of the collateral provider entering insolvency proceedings. We discuss perfection requirements from para 8.90 and from para 8.144 below.

875 For a more detailed discussion of issues relating to control, see Chapter 5 (Control).

pledge,[876] or an analogous interest based on control. This would require development of the existing law.[877]

8.34 A pledge is a security interest created by the pledgor's delivery of actual or constructive possession of an asset to the pledgee as security for the performance of an obligation owed by the pledgor.[878] A pledge is a type of bailment.[879] The pledgee is entitled to retain possession of the pledged assets until the secured obligation has been performed. The pledgee also has the right to sell the pledged assets on the pledgor's default, and to retain the proceeds to the extent necessary to satisfy the unperformed obligation.[880]

8.35 We provisionally concluded that the application of pledge to crypto-tokens would have limited practical benefits and could give rise to problems.[881] In our view, law reform efforts would be better directed at developing crypto-token collateral arrangements that built on and enhanced the inherent flexibility of non-possessory security interests.[882] A majority of consultees agreed.[883]

A control-based security interest?

8.36 As we explain throughout the remainder of this chapter, we continue to view "control" as a rigid and overly restrictive concept on which to base a security interest granted in respect of crypto-tokens. Collateral holding arrangements for crypto-tokens often involve multiple parties and automated or deterministic processes through which control might be dispersed and change in quality and character over time. A security

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876 Pledges are one of two forms of possessory security recognised under the law of England and Wales. The other form of possessory security is the lien: a right to retain possession of a thing until a claim or debt has been satisfied. However, liens are of limited utility as credit risk management tools or devices for obtaining credit on a secured basis since they do not provide any right to realise or appropriate the value inherent in the detained assets in the event of a debtor default. Consequently, we did not substantively analyse liens as part of our review of the forms of security permissible under the current law.

877 Things regarded as purely intangible cannot be possessed currently as a matter of law, and consequently cannot be the subject of a valid pledge. However, see para 3.20 above in relation to Electronic Trade Documents. Although documentary intangibles (such as bills of lading, bearer bonds or other negotiable instruments) can be pledged, "there seems to be greater uncertainty surrounding what might have been assumed to be the essential right of the pledgor to reclaim the pledged instrument on discharge of the secured obligation": M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 16-023. The authors note that in perhaps as a consequence, characterisation issues are more prevalent: para 16-076.

878 M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) paras 12.015, 16.024–16.026.

879 *Coggs v Bernard* (1703) 2 Ld Raym 909, 92 E.R. 107. M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 16.011, n 71; H Beale, M Bridge, L Gullifer, E Lomnicka, *The Law of Security and Title-Based Financing* (3rd ed 2018) para 5-01.

880 L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 1.44. A pledgee is not entitled to enforce their interest by way of foreclosure: *Carter v Wake* (1877) 4 Ch D 605.

881 We set these out at para 18.42 of our consultation paper. These problems are particularly acute for sophisticated financial market participants but might be less problematic for non-commercial users.

882 See our consultation paper at paras 18.42–18.44.

883 We received 31 responses to consultation question 37. Twenty-two consultees agreed with our provisional conclusion outright, while four consultees offered mixed or qualified support. Five consultees disagreed.

interest based on control is unlikely to be sufficiently dynamic to encompass these various arrangements.

8.37 Nonetheless, we conclude that the recognition of a control-based security interest in respect of crypto-tokens would be a possible and coherent development within the common law. This conclusion is consistent with our earlier conclusion in the previous chapter that the common law might develop to recognise alternative holding arrangements — including by analogy with bailment. Pledges are a specific form of bailment. If courts were to recognise a limited control-based proprietary interest in respect of crypto-tokens as we outline in Chapter 7 (Intermediated holding arrangements), this might form the basis for developing the control-based security interest that we describe here. This could be done by analogy with the law of possessory security, if and to the extent deemed necessary or appropriate.[884]

8.38 We continue to think that a control-based security interest might be useful only in a limited range of relatively straightforward applications.[885] However, we recognise the views of those consultees who considered it nonetheless had practical function. First, control-based security could enhance the flexibility of the common law, and its capacity to provide effective legal frameworks for a broader range of collateral structures. This includes applications outside of statutory collateral regimes, for example as a way of providing security between individuals which can be accomplished simply and entirely offchain.[886]

8.39 Second, pledges play an important function in traditional trading and finance. We think there is a place for the common law to recognise an analogous control-based security interest.[887] For example, having options beyond non-possessory security interests (such non-possessory security interests being founded in notions of equitable proprietary interests) might be useful where collateral arrangements have an international or cross-border element. Outside of wholesale financial markets (in which non-possessory security is used broadly and extensively), there might be benefits to recognising control-based security interests, particularly in terms of any conflict of laws analysis involving jurisdictions that do not easily recognise common law equitable proprietary interests.[888]

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884 Courts would therefore be able to deviate from the principles underpinning pledge where appropriate. For example, there is considerable uncertainty as to whether and on what conceptual basis a pledge can be granted over an unallocated part of an identified bulk of fungible assets: M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) paras 16.024–16.026. This undermines their utility as a potential secured financing structure for crypto-token intermediaries, which routinely utilise omnibus accounts: see Chapter 7 (Intermediated holding arrangements) at para 7.3.

885 IDAC and CryptoUK commented that "possessory" security interests are not a widely recognised format for crypto-token collateral arrangements. They anticipated that given the degree of negative control required, "pledges" via "possession" of crypto-tokens would not be flexible enough to give effect to the intention of the parties and accommodate the full spectrum of encumbrances over collateral: pp 600–602. We agree. See also CLLS-FLC p 530, and Dr Crawford p 808, who submitted that the recognition of control-based security interests was unnecessary as mortgages and charges are capable of meeting the requirements of market participants.

886 Norton Rose Fulbright LLP p 848.

887 Dr Zhang p 652.

888 FMLC p 553.

8.40 Third, control-based security interests in respect of crypto-tokens might improve liquidity and efficiency in crypto-token and cryptoasset markets.[889] Moreover, developing the law in this way would in many respects merely confirm the basis on which some parts of the market already operate. Consultees said that crypto-token security arrangements are already being entered into on the basis of a factual state of control without any registration being performed. A very clear rationale would be required if the law was to displace such market practice.[890]

8.41 However, consultees were more divided in respect of registration requirements. Given the lack of registration requirements applicable to pledges, some consultees said that allowing a control-based security interest to be granted over crypto-tokens could lead to reduced transparency and publicity for security interests.[891] Others saw the lack of registration requirements as a key reason in favour of recognising a control-based security interest.[892]

8.42 We accept that, were the law to recognise control-based security interests in crypto-tokens (as third category things), this would represent a divergence in their treatment from that of book-entry securities entitlements (things in action) where such a security interest is not available. We consider this entirely appropriate. It would not be an arbitrary distinction, but a manifestation of the fundamental differences between crypto-tokens (third category things) and book-entry securities entitlements (things in action) from a personal property law perspective. The same issue arises when considering structuring options for security interests over mixed collateral pools comprising both things in possession and things in action.

8.43 We therefore do not consider any resulting disparity in the range of permissible security interest forms between crypto-tokens and book-entry securities entitlements to be a reason against the recognition of control-based security interests for crypto-tokens within the common law. We also anticipate that any such development would be founded on a consideration of the key characteristics of crypto-tokens as distinct things to which personal property rights can relate. We would expect that it would likely justify the grant and recognition of control-based security interests over crypto-tokens and cryptoassets.[893]

8.44 One possible solution, in a formal sense at least, to avoiding the challenge of managing multiple security interest forms over mixed collateral pools would be to rely instead on non-possessory security interests. However, using a single form of security

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889 ISDA p 637 (para 2.4).

890 Law Society p 721; Linklaters LLP pp 759-760 (para 1.12); ISDA p 638 (para 2.4).

891 The Centre for Commercial Law at the University of Aberdeen p 261.

892 For example, Norton Rose Fulbright LLP submitted that the "false wealth" problem raised by a lack of registration is not necessarily greater for third category things than tangible assets: p 848. The Law Society considered that, in the context of capital markets, any policy reasons in favour of maintaining a registration requirement for UK corporate security providers are limited, given that most collateral arrangements fall under the FCARs and, as such, are not subject to registration: Law Society p 721. See also Dr Zhang p 652.

893 For sophisticated financial and crypto-token market participants to realise the practical benefits of any such development in the law, the incorporation and accommodation of control-based security interests, by way of an amendment to the FCARs and/or by an express statutory provision in any future crypto-token collateral regime, would likely be required. We discuss this at para 8.138 below.

interest does not necessarily mean that the constituent assets in such mixed collateral pools will be capable of being subject to the same collateral management techniques. Furthermore, it would not necessarily be possible to exercise a uniform enforcement procedure over all of these assets at the same time and with the same priority outcome if the collateral provider were to enter insolvency proceedings. Such issues cannot be determined solely by reference to the form of security granted. They must also take account of whether the operation and enforcement of security over different forms of collateral is to be determined by principles and rules of general application or by specific legal frameworks targeted at particular types of transactions, counterparties or market sectors. An example of the latter would be the regime applicable to financial collateral, which we consider alongside an analysis of the core features of any future crypto-token collateral regime later in this chapter.

8.45 We do not recommend any statutory law reform to give effect to the recognition of control-based security interests in crypto-tokens, because we conclude that this would be a possible and coherent development for the common law. However, we do acknowledge that in certain circumstances statutory reform might be necessary. This might be the case in the context of introducing a bespoke statutory legal framework for a crypto-token and cryptoasset collateral regime at a time when common law recognition of a control-based security interest in crypto-tokens had yet to occur. Either process would significantly benefit from the non-binding guidance provided by the technical expert group (see Chapter 5 (Control)).

APPLICATION OF THE FCARS REGIME TO CRYPTO-TOKENS, CRYPTOASSETS, AND MERE RECORD/REGISTER TOKENS

8.46 Next, we consider the extent to which the activities of crypto-token and cryptoasset market participants could fall within the scope of and benefit from the FCARs regime. This includes collateral arrangements over crypto-tokens, cryptoassets or mere record/register tokens.

The FCARs

8.47 The FCARs constitute the UK's domestic implementation of the EU Financial Collateral Directive ("FCD").[894] The purpose of the FCD is to:[895]

> facilitate the provision of financial collateral under bilateral transactions, and thereby promote not only the stability of the financial markets but also their efficiency, by requiring Member States to disapply rules of law and statutory provisions that would otherwise invalidate financial collateral arrangements…

8.48 The FCARs implement the FCD by exempting "financial collateral arrangements" from certain formality requirements and insolvency provisions,[896] including:

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894 European Directive on Financial Collateral Arrangements, Directive 2002/47/EC of the European Parliament and Council of 6 June 2002, OJ L 168/43.

895 L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.34; see also Directive recitals 3, 5, 10 and 17.

896 FCARs, SI 2003 No 3226, reg 4.

(1) formality requirements applicable to guarantees,[897] dispositions of equitable interests,[898] and assignments of legal rights;[899]

(2) registration requirements for company charges under section 859A of the Companies Act 2006; and

(3) provisions in the Insolvency Act 1986 empowering an administrator to deal with the charged assets and giving preferential status to certain creditors over the charged assets.

8.49 The broad purpose of these various exemptions is to reduce the "administrative burden" on the parties[900] and to enable "rapid" enforcement of security interests in the event of insolvency.[901]

8.50 The FCARs create a regime for qualifying collateral arrangements based on both security interest[902] and title transfer structures. To fall within their scope, a collateral arrangement must satisfy various criteria. Particularly important for our purposes, the relevant collateral arrangement must be:

(1) entered into between non-natural persons[903] (but qualifying parties are not limited to wholesale mainstream financial markets participants);[904]

(2) evidenced in writing;[905]

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897 Statute of Frauds 1677, s 4.

898 Section 53(1)(c) Law of Property Act 1925 ("LPA 1925"). For further analysis of this provision in relation to transfers of and dealings in equitable entitlements to crypto-tokens see Chapter 7 (Intermediated holding arrangements), from para 7.68–7.76.

899 Section 135 LPA 1925. For further analysis of this provision in relation to transfers of and dealings in equitable entitlements to crypto-tokens see Chapter 7 (Intermediated holding arrangements), paras 7.77–7.80.

900 FCD, recital 10.

901 FCD, recital 17.

902 "Title transfer financial collateral arrangement" and "security financial collateral arrangement" are defined in reg 3(1) of the FCARs. A security financial collateral arrangement is defined as "any legal or equitable interest or any right in security, other than a title transfer financial collateral arrangement, created or otherwise arising by way of security". This includes all four forms of consensual security interests that are available under the general law: pledge, lien, mortgage, and charge. For the purposes of the FCARs, charges that can form the basis of a qualifying security financial collateral arrangement are limited to: (i) fixed charges, and (ii) charges created as floating charges "where the financial collateral charged is delivered, transferred, held, registered or otherwise designated so as to be in the possession or under the control of the collateral-taker or a person acting on its behalf…".

903 Defined in reg 3(1) FCARs as "any corporate body, unincorporated firm, partnership or body with legal personality except an individual, including any such entity constituted under the law of a country or territory outside the United Kingdom or any such entity constituted under international law".

904 This definition means that the FCARs' personal scope of application is wider than that required by the FCD (see art 1(2) of the FCD).

905 This requirement is included in the definitions of both "title transfer financial collateral arrangement" and "security financial collateral arrangement" in reg (3)(1) FCARs.

(3) granted to secure or otherwise cover "relevant financial obligations".[906] The FCARs definition covers not just monetary payment obligations, but also delivery obligations even if they are in respect of assets that do not themselves qualify as forms of financial collateral;[907]

(4) granted in respect of "financial collateral", which is defined as meaning "cash, financial instruments or credit claims";[908] and

(5) an arrangement that otherwise satisfies the definition of one of the two categories of "financial collateral arrangement".[909]

8.51 The FCARs are therefore broad enough:

(1) to permit crypto-token market participants to enter into, and

(2) for obligations to deliver crypto-tokens (regardless of whether those crypto-tokens satisfy the definition of "financial collateral") to be secured by,

a qualifying financial collateral arrangement.

8.52 However, whether crypto-tokens, cryptoassets or mere record/register tokens can themselves be utilised as collateral under a qualifying financial collateral arrangement depends on whether they can constitute "cash", "financial instruments", or "credit claims" for the purposes of the FCARs and thereby satisfy the definition of "financial collateral".

8.53 The answer to that question and the potential application of the FCARs regime to collateral arrangements involving those things is highly significant. If applicable, certain formality requirements (such as registration) would be disapplied, enforcement of the security interest becomes easier, and particular legislative insolvency consequences are disapplied.[910] This has important implications not only for the effective utilisation of collateral arrangements but also in respect of third parties, and potentially even the financial system as a whole.[911]

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906 In reg 3(1) FCARs, "relevant financial obligations" are defined broadly to mean "the obligations that are secured or otherwise covered by a financial collateral arrangement….". See further: L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.36.

907 "Relevant financial obligations" could therefore include, for example, a physically settled forward contract for the delivery of a quantity of a form of crypto-tokens (regardless of whether those crypto-tokens satisfied the definition of "financial collateral" or not).

908 The application of the definitions of the individual categories of financial collateral to different forms of crypto-tokens are considered in paras from para 8.57.

909 Reg 3(1) FCARs. The two categories are "security financial collateral arrangement" and "title transfer financial collateral arrangement".

910 H Liu and L Gullifer (2022) "Financial collateral arrangements in the digital assets world" (2022) 8 *Journal of International Banking and Financial Law* 527, 528.

911 L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.40; H Liu and L Gullifer (2022) "Financial collateral arrangements in the digital assets world" (2022) 8 *Journal of International Banking and Financial Law* 527, 528.

Issues relating to the FCARs

8.54 We discuss two broad issues relating to the FCARs.

(1) Whether crypto-tokens, cryptoassets, or mere record/register tokens constitute "financial collateral". That is, do such things fall within the definition of "cash", "credit claims" or "financial instruments" under the FCARs regime?[912]

(2) Where within scope, are security-based financial collateral arrangements in respect of crypto-tokens, cryptoassets or mere record/register tokens available and/or useful?

8.55 Broadly, we conclude that crypto-tokens (that is, crypto-tokens denominated in their own notional unit of account) generally do not fall within the scope of the FCARs regime. However, for other collateral that might use cryptoassets or mere record/register tokens (including CBDCs, stablecoins, equity and debt securities and credit claims) we think the answer is possibly different. For those things, there is a better argument that some of them fall within the scope of the FCARs regime although the extent to which they do will ultimately depend on a consideration of differing policy rationales informing the correct interpretive approach to the various sub-categories of financial collateral.[913] We recommend law reform to clarify this position below at paragraphs 8.86 and 8.87.

8.56 However, we also conclude that, even if crypto-tokens, cryptoassets, or mere record/register tokens fall within scope, the FCARs do not comprehensively provide a satisfactory regime. That is largely because of the requirement that security-based financial collateral be in the "possession or control" of the collateral taker, and the problems that raises when applied to crypto-token and cryptoasset collateral arrangements. We discuss this from paragraph 8.89 below.

"Financial collateral" arrangements

8.57 The FCARs defines "financial collateral" as: "cash", "financial instruments" and "credit claims". It is possible to argue that certain crypto-tokens, cryptoassets (including CBDCs, stablecoins, equity and debt securities and credit claims) or mere record/register tokens might already fall within the definition of "financial collateral". However, the correct position in respect of each sub-category is subject to varying degrees of uncertainty.

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912 FCARs, reg 3. We note that this might not merely be a definitional question, but also raises policy questions as to what types of asset were *intended* to fall within the scope of the FCARs regime, and why the FCARs regime is justified in respect of those assets.

913 In respect of cash, see for example: "The possible inclusion of digital assets within the definition raises similar questions of whether it is appropriate for security interests granted over them to fall within the FCARs. While it could be appropriate for the registration requirements to be disapplied where a collateral taker has control of the digital asset, it is more debatable whether the insolvency protection, the right of use and right of appropriation should apply": L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.06.

Cash

8.58 Cash within the FCARs means:[914]

> money in any currency, credited to an account, or a similar claim for repayment of money and includes money market deposits and sums due or payable to, or received between the parties in connection with the operation of a financial collateral arrangement or a close-out netting provision.

8.59 The precise boundaries of this definition are not easy to identify.[915] For a crypto-token or cryptoasset to qualify as a form of cash for the purposes of the FCARs it would first need to constitute "money in any currency". It would then need to be "credited to an account" or constitute "a similar claim for repayment of money".

8.60 Money is not defined in either the FCD or the FCARs. There is a considerable divergence of opinion among commentators and practitioners about how money should be defined, whether as a matter of private law more broadly, or in relation to "cash" specifically under the FCARs. There is also no consensus as to whether and in what circumstances particular forms of crypto-token or cryptoasset could satisfy any such definition, either now or in the future.[916]

8.61 Notwithstanding this interpretative uncertainty, we make the following observations. We do not seek to offer any definitive conclusion as to the scope and application of the current law, and different possible interpretations of its application to various crypto-tokens or cryptoassets. Nor do we make any comment on the monetary status or otherwise of crypto-tokens or cryptoassets.[917]

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914 FCARs, reg 3.

915 L C Ho "The Financial Collateral Directive's practice in England" (2011) 26 *Journal of International Banking Law and Regulation* 151, 155. "Cash" does not include cash in the form of bank notes (or coins): Recital 18, FCD; nor does it include book debts (although in certain circumstances they could qualify as financial collateral by reason of being a credit claim): G Yeowart, R Parsons, E Murray and H Patrick, *Yeowart and Parsons on The Law of Financial Collateral* (2016) para 3.09. See further analysis in our consultation paper at paras 18.55–18.56.

916 J Perkins and J Enwezor, "The legal aspect of virtual currencies" (2016) *Journal of International Banking and Financial Law* 569, 570 to 572; R Cohen, P Smith, V Arulchandran, A Sehra, "Automation and blockchain in securities issuances" (2018) *Journal of International Banking and Financial Law* 144, 149–150; M Solinas, "Bitcoins in Wonderland: Lessons from the Cheshire Cat" [2019] 3 *Lloyd's Maritime and Commercial Law Quarterly* 433, 444–445; D Fox, "Cryptocurrencies in the Common Law of Property" in S Green, D, Fox, *Cryptocurrencies in Public and Private Law* (2019) paras 6.61–6.62; L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) paras 6.05–6.06. See further discussion at paras 15.57–18.61 of our consultation paper.

917 See also our discussion on the application to crypto-tokens of the special defence of good faith purchaser without notice that applies to money in Chapter 6 (Transfers). We also discuss actions for an agreed sum and, separately, "monetary" awards in more detail in Chapter 9 (Remedies). See also our consultation paper at paras 13.39–13.40, 18.54–18.62 and 19.19–19.25.

(1) "Money in any currency" seems to indicate money that is denominated in fiat currency (that is, currency issued by and backed by a State).[918] A CBDC, issued by a central bank, might fall within that definition.[919]

(2) If "money in any currency" is limited to fiat currency in this way it could potentially exclude some or all "stablecoins" — that is, crypto-tokens or cryptoassets that are denominated in and track the value of state-issued currencies (such as USDC). The exclusion would most likely apply to algorithmic stablecoins, which have no right of redemption or payment against any issuer at all, and may even extend to stablecoins that are linked to redemption or payment rights against a private, unregulated issuer.[920]

(3) However, a stablecoin could be considered a "similar claim for repayment of money" if the redemption right against the issuer (where such a right existed) was denominated in fiat currency. This would depend on a range of factors including how the particular stablecoin is designed.[921]

(4) To the extent that they qualify at all, crypto-token entitlements held via holding intermediaries such as crypto-token exchanges are comparatively more likely to be characterised as cash than directly controlled "on chain" crypto-tokens because of the condition that "cash" must be "credited to an account".

(5) To the extent that they qualify at all, it could be argued that intermediary Account-based entitlements to crypto-tokens are potentially more likely to satisfy the cash definition if the crypto-token themselves have been recognised as legal tender by sovereign nation states[922] (but perhaps only if they also fulfil the functional test of actually being used widely by the public as money in the relevant states).

8.62 We also think that the potential characterisation of various crypto-tokens or cryptoassets as "cash" for the purposes of the FCARs may well change over time. Crypto-token and cryptoasset markets are highly dynamic and have undergone

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[918] L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.05, although see the possible, broader alternative definition of "currency" meaning "currency that is generally used as a medium of exchange within a country" referred to therein.

[919] However, for a CBDC to satisfy the definition of "cash" under the FCARs as drafted it would also need to be "credited to an account" or constitute a "similar claim for the repayment of money" (see sub-paras (3) and (4) below. These additional requirements explain why cash in the form of bank notes (or coins) does not qualify as "cash" under the FCARs, despite clearly being "money" in the conventional sense: n 915 above.

[920] The argument might be that the latter category of stablecoins are different to money in conventional bank accounts, which would constitute rights against a private issuer that is subject to state regulation and which may in whole or in part, have the benefit of a guarantee or other form of deposit protection provided by the state. However, this distinction seems relatively arbitrary and it is certainly not clearly intended on the face of the FCARs.

[921] These points have been set out more substantively elsewhere: L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.06; H Liu and L Gullifer "Financial Collateral arrangements in the digital asset world" (2022) 8 *Journal of International Banking and Financial Law* 527, 528.

[922] Such as El Salvador: S Perez, C Ostroff, "El Salvador Becomes First Country to Adopt Bitcoin as National Currency" (September 2021), available at: https://www.wsj.com/articles/bitcoincomes-to-el-salvador-first-country-to-adopt-crypto-as-national-currency-11631005200.

substantive change in a relatively brief period. This includes the growth in stablecoin markets,[923] the growing interest in CBDCs from central banks around the world,[924] and the emergence of a global NFT market,[925] in which participants arguably appear to use crypto-tokens as money in a functional sense. It is not clear how these and other developments might affect the characterisation of various crypto-tokens or cryptoassets as "cash" now and in the future.[926]

Financial instruments

8.63 The definition of "financial instruments" encompasses a number of different types of conventional securities and investment contracts.[927]

8.64 In our view, crypto-tokens are unlikely to fall within the definition of "financial instruments". However, where conventional investment products are effectively linked or "stapled" to a crypto-token (so that they are, in our terminology, a cryptoasset),[928] they would seem to qualify as a "financial instrument" and fall within the FCARs. This remains the case whether they are held directly or via an intermediary.[929] In addition, as we discus below, we conclude that the characterisation of an asset that by itself satisfies the definition of a financial instrument will be unaffected by that asset being merely recorded or registered by a crypto-token within a blockchain- or DLT-based system (where the underlying asset is not "linked" or "stapled" by any legal mechanism to the crypto-token that records them).

8.65 Examples of securities that are "linked" or "stapled" to crypto-tokens but that would seem to qualify as "financial instruments" include the following.

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923 TheBlockCrypto, "Stablecoin Supply Charts", available at: https://www.theblockcrypto.com/data/decentralizedfinance/stablecoins.

924 Most central banks around the world are now exploring the development of CBDCs including through concrete pilot projects: Anneke Kosse and Ilaria Mattei, "Gaining momentum – Results of 2021 BIS survey on central bank digital currencies" (2022) *Bank of International Settlements (BIS), paper 125*, available at: https://www.bis.org/publ/bppdf/bispap125.htm. This includes in the UK following the establishment of a joint Bank of England and HM Treasury CBDC Taskforce in April 2021, and publication of a consultation paper into a "digital pound": Bank of England and HM Treasury, "The digital pound: a new form of money for households and businesses?", Consultation Paper (2023).

925 IntoTheBlock, "NFT Analytics & Insight", available at: https://www.intotheblock.com/. Albeit a market which remains very small at the time of writing.

926 We note that a number of the academic commentaries referenced above and in our consultation paper were published prior to these major industry developments: see our consultation paper para 18.62(4).

927 FCARs, reg 3(1). The definition includes company shares, bonds and other debt instruments that are tradeable on the capital markets, units in collective investment schemes (as defined under s 235 Financial Services and Markets Act 2000) and money market instruments.

928 See para 8.12 above.

929 The effect of the inclusion of the phrase "claims relating to or rights in or in respect of any of the financial instruments referred to in the preceding part of the definition" is to expressly extend the definition to qualifying financial instruments that are held via intermediaries so that the rights and entitlements of beneficiaries under indirect and intermediated holdings can benefit from the FCARs.

(1) Tokenised bond or debt instruments, but only if they are "tradeable on the capital market".[930]

(2) Tokenised equity, even if issued by a private company (whether registered in the UK[931] or in a foreign country) and/or with transferability limitations to give practical effect to transfer restrictions set out under the issuer's articles of association or the terms of the shareholders' agreement.

(3) Conventional registered bond structures which use crypto-tokens as an alternative form of electronic register to record *and effect* bond transfers (that is, structures where legal rights are linked to the token and the token is not simply used as a mere register/record token).

8.66 As with the definition of "cash", the boundaries of what constitutes "financial instruments" are not entirely clear. It may therefore be the case that crypto-tokens or cryptoassets that are issued with the intention of representing a tokenised proprietary interest in a basket of underyling crypto-tokens or cryptoassets could constitute "financial instruments" in a number of ways. They could be characterised as shares, debt instruments, interests in collective investment schemes, or even "any other securities which are normally dealt in and give rise to a cash settlement".[932] However, the position is not clear.

Credit claims

8.67 Crypto-tokens are unlikely to come within the scope of "credit claims". Therefore, we do not discuss credit claims in any detail here.[933] However, we think that it is possible that tokenised credit claims could increasingly come within scope, particularly if tokenisation becomes more prevalent among regulated financial institutions for representing and transferring financial claims.

Clarifying the scope of "financial collateral"

8.68 We conclude that the definition of "financial collateral" is of limited and uncertain application. At most, it is likely to encompass only a limited subset of cryptoassets.

8.69 Market participants must be able to determine the legal and regulatory regime applicable to any particular asset. We therefore conclude that the scope and application of the current law under the FCARs and its possible application to crypto-tokens, cryptoassets and mere record/register tokens should be clarified by statutory amendment. In particular, we recommend that a number of statutory amendments are made to the FCARs to clarify how key definitional terms work or are intended to work in the context of new assets.

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930 G Yeowart, R Parsons, E Murray and H Patrick, *Yeowart and Parsons on The Law of Financial Collateral* (2016) paras 3.46–3.50.

931 For further commentary on the tokenisation of proprietary interests in equity and other registered corporate securities issued by UK companies see from para 8.78 below.

932 FCARs, reg 3.

933 In brief, "credit claims" constitute monetary claims arising out of an agreement for the repayment of credit granted in the form of a loan by a bank or other credit institution. We considered credit claims in our consultation paper at paras 18.67–18.68.

Cash

8.70 In respect of "cash", this requires clarification of the key definitional terms we set out in brief terms above. We recommend statutory amendments (and associated guidance) to clarify the extent to which and under what holding arrangements crypto-tokens, cryptoassets (including CBDCs and fiat currency-linked stablecoins) and/or mere record/register tokens can satisfy the definition of cash, including potentially by providing additional guidance as to the interpretation of "money in any currency", "account" and "similar claim to the repayment of money".

Mere register/record tokens

8.71 Where crypto-tokens function merely as part of a register or record of interests, we think this is not controversial. We agree with the UKJT that structures that use DLT and blockchain technologies simply as an alternative form of electronic register might be accommodated within the existing law without difficulty.[934]

8.72 We conclude that the characterisation of an asset that by itself satisfies the definition of a financial instrument or a credit claim will be unaffected by that asset being merely recorded or registered by a crypto-token within a blockchain- or DLT-based system (where the underlying asset is not "linked" or "stapled" by any legal mechanism to the crypto-token that records them). In the same way that financial collateral arrangements in respect of securities recorded by a database record do not require the database record itself also to be collateralised, a mere register/record token would not be required to be collateralised in addition to the underlying securities.

Cryptoassets

8.73 In our view, the characterisation of assets that are linked to or stapled to crypto-tokens under the FCARs should focus on the substantive nature of the underlying asset rather than its specific technological form. That is, provided that the underlying asset satisfies the definition of "financial collateral", its characterisation as such should not be affected by the fact of a linking or stapling arrangement. Nor should it be affected by the fact that an asset is recorded by a mere register/record token.

8.74 As we explained in Chapter 6 (Transfers), the holder of a cryptoasset has rights in two distinct things: the crypto-token instantiated on a particular network or contract ledger and the underlying asset (or entitlement thereto) to which it is linked or stapled. The fact that there are two distinct objects enables our analogy to negotiable instruments, and the observation that such structures function like "digital bearer instruments".[935]

8.75 We think bearer instruments are a useful analogy to apply again here. A bearer bond is a form of documentary intangible,[936] in which the rights to performance of certain

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934 UKJT, Legal Statement on Digital Securities para 33.

935 See Chapter 3 (Third thing) para 3.52 and Chapter 6 (Transfers) para 6.80. This is not however true of a mere register/record token, the holder of which would not necessarily be the holder of the asset that such a mere register/record token records.

936 A documentary intangible as "a document that entitles the holder to claim performance of the obligation recorded in the document and to transfer the right to claim performance of that obligation by transferring the document. The document is said to "embody" the obligation." See Electronic Trade Documents (2022) Law Com No 405.

obligations of the issuer are embodied in and represented by the physical document in which those rights are recorded. Here too, there are two distinct things: the right to performance of the obligations of the issuer contained in the contract and the physical piece of paper (which embodies that right).[937]

8.76 It is uncontentious that paper-based bearer bonds are included within the FCARs regime. Their characterisation as "financial collateral" occurs by reference to the substantive nature of the underlying asset rather than its (physical) form. We think that tokenised financial collateral (including both financial instruments and credit claims) or financial collateral that is subject to a linking or stapling arrangement might be subject to similar analysis.[938]

8.77 We think that the purposive approach we set out above represents the current law. Nonetheless we think that clarificatory statutory amendments would be helpful to deal with any residual uncertainty.

Tokenising equity securities and other registered corporate securities

8.78 The tokenisation of equity and other registered corporate securities is less straightforward. The extent to which UK companies might use tokenised equity and other registered corporate securities is constrained by the need to comply with the requirements of the Companies Act 2006, namely statutory requirements relating to the maintenance of members' (and other) registers.[939]

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937 We recognise that the utility of this analogy relies on a tokenised structures being subject to an effective linking mechanism. This is because a key property of paper-based bearer bonds is that they are negotiable instruments, which prevents any risk of decoupling: UKJT, Legal Statement on Digital Securities paras 39, 53. There is an argument that mercantile custom has already developed to treat crypto-tokens as negotiable (see Chapter 6 (Transfers) from para 6.77 and UKJT, Legal Statement on Digital Securities paras 40, 54, 147). However, even in the absence of tokenised cryptoassets being recognised as negotiable, it is possible to structure the linking or stapling arrangements using legal mechanisms derived from private contractual and/or trust law principles to emulate the practical effects of negotiability. This enables tokenised arrangements to operate in a similar way: UKJT, Legal Statement on Digital Securities para 55. This makes bearer bonds a useful analogy. We note the UKJT takes a similar approach: UKJT, Legal Statement on Digital Securities para 31.

938 H Liu and L Gullifer, "Financial collateral arrangements in the digital asset world" (2022) *Journal of International Banking and Financial Law* 527, 528.

939 The Companies Act 2006 imposes statutory requirements for issuing companies to maintain (and control) a register of members (s 113). A company is not required to keep a register of its debenture holders. However, if it chooses to issue debentures in registered (as opposed to bearer form), it must comply with the corresponding requirements for debenture holders' registers set out in the Companies Act 2006 as well. Registers may be kept in electronic form provided that the information in it is adequately recorded for further reference and capable of being reproduced in hard copy form (s 1135). Registers must be kept available for inspection (in the sense of being capable of being viewed, but not necessarily stored at) the company's registered office or a single alternative inspection location (ss 114 and 743 (for members' and debenture holders' registers respectively), and s 1136; and reg 3 Companies (Company Records) Regulations 2008).

The level of control that the company exercises over its registers must be sufficient to satisfy the statutory maintenance obligations stipulated, which include, for example: a duty to register certain transfers of shares or debentures (s 771); the right to refuse to register certain transfers of shares or debentures (s 771); permission to remove certain stale entries on the register of members (s 121); a duty to rectify the register of members when ordered by the Court to do so (s 125); and a duty to guard against and facilitate the discovery of falsification (s 1138). In addition, the effect of s 770 is that proper instruments of transfer are required for the transfer of legal title to shares or registered debentures. Unlike debentures, shares must be

8.79 These require that an issuer maintains centralised discretionary control over updates and retains the capacity to reverse or rectify previous updates to the ledger in order for it to constitute a statutorily compliant register. In addition, the system would need to be configured to generate electronic transfer forms capable of being submitted to HMRC for stamping.[940]

8.80 The UKJT recently considered the issuance of tokenised equity and other registered corporate securities in detail.[941] We agree with the view of the UKJT that these various statutory requirements can only be effectively met with a ledger operated by a permissioned blockchain network, smart contract or DLT-based system and likely not a ledger within a public, permissionless crypto-token system.[942]

8.81 An alternative approach might be to tokenise intermediated equitable entitlements in the underlying equity securities instead. This would require legal title to the equity securities to be held by (and immobilised with) a nominee holding intermediary on trust for the benefit of tokenholders. The constitutive link between the relevant crypto-tokens and the underlying equitable entitlements would be structured and defined by the terms of the declaration of trust. Token transfers would potentially need to comply with the statutory formalities stipulated by section 53(1)(c) Law of Property Act 1925. However, as we explain in Chapter 7 (Intermediated holding arrangements), we do not consider that this presents meaningful practical obstacles.[943]

8.82 We note that other jurisdictions have recently introduced or proposed changes to their corporate laws to facilitate the use of a broader range of blockchain and DLT-based technologies in the issuance and transfer of securities.

8.83 In Delaware, the General Corporation Law was amended in 2017 to permit locally incorporated private companies to issue and track shares on a blockchain or distributed ledger. The effect of the amendments is to recognise tokenised shares as a form of uncertificated security in law. This enables Delaware companies and their stockholders to access the benefits of electronic trading while permitting the latter to maintain direct ownership of their shares.[944]

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issued in registered form by UK companies since they are now prohibited from issuing bearer warrants for shares (s 779).

940 A "proper instrument of transfer" is one that is appropriate or suitable for stamping by HMRC (*Nisbet v Shepherd* [1994] 1 BCC 91 at 94–95, by Leggatt LJ). Under current procedures this will be any document (1) which can be submitted to HMRC electronically; (2) which HMRC will recognise as transferring an interest in property; and (3) which is executed and dated. Where the relevant transfer is exempt from stamp duty, we agree with the conclusion of the UKJT that the courts would interpret "proper instrument of transfer" as requiring an instrument that is "capable of recording the key details of the transfer as needed in order to give effect to the transfer": UKJT, Legal Statement on Digital Securities para 168.

941 For a detailed analysis relating to the tokenisation of equity securities see UKJT, Legal Statement on Digital Securities paras 19–20, 76–83, 143, 155–192.

942 UKJT, Legal Statement on Digital Securities paras 19, 179.

943 Chapter 7 (Intermediated holding arrangements), paras 7.68–7.80.

944 A number of legislative provisions have been revised to facilitate the use of record keeping systems utilising blockchain databases. The definition of "stock ledger" has been updated to include ledgers "administered by or on behalf of the corporation," (s 219 General Corporation Law). The maintenance of corporate records on

8.84 More recently, in April 2023, the German Federal Ministry of Finance (BMF) and the German Federal Ministry of Justice (BMJ) published their draft bill for an "Act on the financing of future-proof investments" ("Zukunftsfinanzierungsgesetz" (ZuFinG)). The draft bill includes proposals to update the German Electronic Securities Act to permit the issuance of registered shares in tokenised form. This expands Germany's current framework which already recognises the tokenisation of bonds and certain investment funds.[945]

8.85 In light of the reforms being undertaken internationally, we think it would be beneficial for the laws governing the tokenisation of equity and other corporate securities by UK companies to be reviewed. In particular, we recommend that reforms expressly recognising and supporting the use of crypto-token networks (including public, permissionless ledgers maintained thereon) for the issuance and transfer of tokenised securities should be considered. This review could usefully be undertaken alongside the development of a crypto-token and cryptoasset collateral regime and the FCARs reforms proposed in this report to ensure that UK financial markets remain internationally competitive and capable of harnessing the full potential of these innovative technologies.[946]

"one or more electronic networks or databases (including one or more distributed electronic networks or databases)" has also been expressly permitted (s 224 General Corporation Law). This is subject to the relevant ledger being capable of (i) producing a list of the company's stockholders; (ii) recording certain mandatory information; (iii) recording transfer of stock, and (iv) conversion into 'clearly legible paper form', upon the request of a person entitled to inspect the records.

945 See English translation available at: https://www.bundesfinanzministerium.de/Content/EN/Downloads/Financial-Markets/key-points-financing-for-the-future-act.pdf?__blob=publicationFile&v=2. The proposed legislation will apply to German companies with less than 500 employees and annual revenues of less than EUR100 million.

946 The laws governing and constraining the tokenisation of equity securities by UK companies is also subject to ongoing analysis by the Law Commission in connection with our project exploring legal aspects of and issues relating to DAOs. For further details available at: https://www.lawcom.gov.uk/project/decentralised-autonomous-organisations-daos/).

Recommendation 3.

8.86 We recommend statutory amendment to the FCARs as follows.

(1) To clarify the extent to which and under what holding arrangements crypto-tokens, cryptoassets (including CBDCs and fiat currency-linked stablecoins) and/or mere record/register tokens can satisfy the definition of cash, including potentially by providing additional guidance as to the interpretation of "money in any currency", "account" and "similar claim to the repayment of money".

(2) To confirm that the characterisation of an asset that by itself satisfies the definition of a financial instrument or a credit claim will be unaffected by that asset being merely recorded or registered by a crypto-token within a blockchain- or DLT-based system (where the underlying asset is not "linked" or "stapled" by any legal mechanism to the crypto-token that records them).

(3) To confirm that, where an asset that satisfies the definition of a financial instrument or a credit claim is tokenised and effectively linked or stapled to a crypto-token that constitutes a distinct object of personal property rights from the perspective of and vested in the person that controls it, the linked or stapled token itself will similarly satisfy the relevant definition.

8.87 We recommend that laws applicable to UK companies should be reviewed to assess the merits of reforms that would confirm the validity of and/or expand the use of crypto-token networks for the issuance and transfer of equity and other registered corporate securities. In particular, we recommend that any such review should consider the extent to which applicable laws could and should support the use of public permissionless ledgers for the issuance and transfer of legal interests in equity and other registered corporate securities.

The problems with "possession or control"

8.88 The recommendations we set out above are intended to clarify the scope of the FCARs in its current form. However, even if the scope is clarified, we conclude that the FCARs do not comprehensively provide a satisfactory regime for collateral arrangements in respect of crypto-tokens and cryptoassets.

8.89 This is largely because of the problems with the requirement that security-based financial collateral be in the "possession or control" of the collateral taker. In our view, application of the FCARs' "possession or control" requirement to crypto-token and cryptoasset collateral does not yield certain or satisfactory results. As we expect security-based arrangements to be the preferred structuring option of most market participants, this conclusion is significant.[947]

[947] See para 8.22 above.

"Possession or control"

8.90 We discuss above the potential security-based interests that could apply to crypto-tokens.[948] For a security interest-based crypto-token collateral arrangement to come within the scope of the FCARs as a "security financial collateral arrangement", the collateral in question must not only fall within the definition of "financial collateral" but must also be:[949]

> delivered, transferred, held, registered or otherwise designated so as to be in the *possession or under the control* of the collateral-taker or a person acting on its behalf…

8.91 In 2011, the FCARs were amended, to incorporate a partial definition for "possession".[950] The effect of the amendment was to clarify that for the purposes of the FCARs, intangible assets in the form of cash or intermediated securities entitlements booked to an account in the name of the collateral taker were capable of being "possessed".[951] We therefore consider the application of both "possession" and "control" below.

8.92 The "possession or control" test constitutes the FCARs' sole perfection requirement for qualifying security interest-based collateral arrangements. It has been widely criticised by market participants even in its application to conventional wholesale financial markets.[952]

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948 See from para 8.23 above.

949 See FCARs, reg 3(1) (emphasis added). The requirement that collateral is in the "possession or control" of the collateral-taker is included within the definition of a "security financial collateral arrangement": see n 902. above.

950 FCARs, reg 3(2). The provision states that "For the purposes of [the FCARs] "possession" of financial collateral in the form of cash or financial instruments includes the case where financial collateral has been credited to an account in the name of the collateral-taker or a person acting on his behalf (whether or not the collateral-taker, or person acting on his behalf, has credited the financial collateral to an account in the name of the collateral-provider on his, or that person's, books) provided that any rights the collateral-provider may have in relation to that financial collateral are limited to the right to substitute financial collateral of the same or greater value or to withdraw excess financial collateral".

951 This change was enacted as a response to widespread concern among market participants prompted by the decision of the High Court in *Gray v G-T-P Group Ltd; Re F2G Realisations Ltd (In Liquidation)* [2010] EWHC 1772. In that case, in the context of considering the meaning of "possession or control" under the FCARs, the judge stated that "possession has no meaning in English law as regards intangible property": at [54].

952 H Beale, M Bridge, L Gullifer, E Lomnicka (eds), *The Law of Security and Title-Based Financial* (3rd ed 2018) paras 3.42–3.80; G Yeowart and R Parsons, *Yeowart and Parsons on the Law of Financial Collateral* (2016), ch 8; L Gullifer, "Piecemeal reform: is it the answer?" in F Dahan (ed), *Research Handbook on Secured Lending in Commercial Transactions* (2014); S Goldsworthy, "Taking possession and control to excess: issues with financial collateral arrangements under English law" (2013) *Journal of International Banking and Financial Law* 71; L C Ho "The Financial Collateral Directive's practice in England" (2011) 26 *Journal of International Banking Law and Regulation* 151.

8.93 What constitutes "possession or control" for the purposes of the FCARs is not entirely settled. That question can be analysed against the following four different conceptions of what might constitute "control" in respect of financial collateral arrangements:[953]

(1) Positive control: the ability (in a generic sense) to take or dispose of an asset from the collateral pool.

(2) Negative control: the ability (in a generic sense) to prevent an asset being taken or disposed of from the collateral pool.

(3) Legal control: the *legal* ability (in the sense of a legally enforceable right or power) to (i) take or dispose, and/or (ii) prevent the taking or disposing, of an asset from the collateral pool.

(4) Administrative (or factual) control: the *practical* ability to (i) take or dispose, and/or (ii) prevent the taking or disposing, of an asset from the collateral pool.[954]

8.94 Based on the leading decision of the High Court in *Re Lehman Brothers International (Europe) (in administration)*[955] (together with the preceding cases of *Gray*[956] and *Swedbank*,[957] and the 2011 revisions to the FCARs), it appears that the current position at law in regard to "possession or control" under the FCARs is as follows:

(1) Control for the purposes of the FCARs is not (or not solely) a question of fact but fundamentally and necessarily incorporates a legal construct: specifically, a legally enforceable right to exercise negative control. It is therefore distinct from the concept of "control" that we propose in Chapter 5 in respect of third category things.

(2) It follows that mere administrative or factual (positive and/or negative control) is insufficient to establish either "possession" or "control".

(3) Possession for the purposes of the FCARs is different to the common law concept of possession that we discuss, for example, in Chapter 5. It is a composite factual and legal construct that must incorporate a legally enforceable right to exercise negative control.[958] Whether the level of legal

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953 These four different conceptions of control are set out in E Zaccaria, "An inquiry into the meaning of possession and control over financial assets and the effects on third parties" (2017) *Journal of Corporate Law Studies* 1, 4–5 and L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) from para 6.52.

954 As discussed below, this is not the same "factual control" as we envisage for the purposes of third category things (see Chapter 5 (Control) from para 5.8

955 [2012] EWHC 2997 at [131]–[132], [134], [136], by Briggs J.

956 *Gray v G-T-P Group Ltd; Re F2G Realisations Ltd (In Liquidation)* [2010] EWHC 1772.

957 *Private Equity Insurance Group SIA v Swedbank AS* [2017] 1 WLR 1602.

958 In addition (and unlike possession under the common law) possession for the purposes of the FCARs does not include an explicit intention element, although it is possible that this is implied by the incorporation of (intention-based) legal contractual rights of control into the concept.

control required for possession is the same as or less exacting than the level required for standalone (non-possessory control) is uncertain.[959]

(4) The test for control is definitely satisfied by legal negative control in combination with any of factual negative, factual positive, or factual negative and factual positive control.

(5) The test for control is probably capable of being satisfied by legal negative control alone, without any form of practical control.[960]

(6) The legally enforceable right to exercise negative control necessary to establish possession or (non-possessory) control for the purposes of the FCARs does not have to be absolute. It can be subject to certain qualifications including where the collateral provider has retained or been granted the legal right to the return of excess collateral or the legal right to substitute collateral of the same or greater value.[961] The fact that certain rights reserved or granted to the collateral provider do not compromise the collateral taker maintaining control to a degree sufficient to satisfy the FCARs' test has prompted some commentators to suggest that control is not intended to be exercised over specific assets but to Account-based pools of assets the composition of which may fluctuate and change substantially over time.[962]

Applying "possession or control" to crypto-token collateral arrangements

8.95 In practical terms, applying the FCARs' "possession or control" requirement to security-based crypto-token collateral arrangements is complicated by the variety of control-based arrangements used by market participants. Many collateral arrangements for crypto-tokens routinely incorporate automated technological and/or operational processes which share control between parties, or make it conditional on specified conditions.[963] These often operate deterministically based on the functioning of smart contracts.

8.96 Within such arrangements, control might be shared or made conditional (often through automated or deterministic processes) in the following ways.

(1) For the duration of the loan, crypto-token collateral might not be practically controllable by either the collateral taker or the collateral provider but subject to

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959 See also G Yeowart, R Parsons, E Murray, H Patrick, *Yeowart and Parsons on The Law of Financial Collateral* (2016) paras 8.76–8.77.

960 See *Re Lehman Brothers International (Europe) (in administration)* [2012] EWHC 2997 at [136], by Briggs J. See further L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.53 and E Zaccaria, "An inquiry into the meaning of possession and control over financial assets and the effects on third parties" (2017) *Journal of Corporate Law Studies* 1, 16–18.

961 FCARs reg 3(1).

962 *Re Lehman Brothers International (Europe) (in administration)* [2012] EWHC 2997 at [133], by Briggs J. See also E Zaccaria, "An inquiry into the meaning of possession and control over financial assets and the effects on third parties" (2017) *Journal of Corporate Law Studies* 1, 23, and L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.54.

963 For example, conditions might include for example the occurrence of loan repayments, the expiry of loan repayment periods or the maintenance of collateral value thresholds.

a deterministic holding arrangement, such as an "escrow smart contract". The holding arrangement might be coded deterministically to permit positive practical control by the collateral provider upon settlement of the loan within the permitted repayment period or by the collateral taker upon a repayment default.[964]

(2) In relation to excess withdrawal and collateral substitution facilities, responsibilities for quantification and access might be allocated to or shared with the collateral provider or a third party instead of being determined solely at the discretion of and actively managed by the collateral taker.[965] Alternatively, they could operate deterministically through mechanisms such as smart contracts[966] and flash loans[967] that the collateral taker cannot override.

(3) Practical positive and/or negative control might be allocated to or shared with third parties. For example, a third party might exercise full factual control over crypto-tokens and assume the responsibilities of a custodial holding intermediary on behalf of the collateral provider while undertaking to acknowledge and operate the collateral arrangement consistent with the rights of the collateral taker (or vice versa).

(4) Alternatively, a third party could be engaged as a technology service provider or as a co-signer under a multi-signature or multiparty computation wallet arrangement that facilitates shared practical control of the crypto-token collateral.

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964 See for example, the Yawww Platform (https://www.yawww.io/), which provides a matching facility for peer-to-peer SOL-denominated loans and escrow smart contracts for associated NFTs issued on the Solana network to be used as collateral; and also NFTfi, a similar platform on the Ethereum blockchain (for an overview of the escrow smart contracts deployed in connection with NFTfi, see *Janesh Rajkumar v Unknown Person* [2022] SGHC 264 at [12]). In that case, the claimant was granted an interlocutory proprietary injunction by the Singapore High Court to restrain the defendant from dealing with a Bored Ape Yacht Club NFT that the borrower had previously transferred to an escrow smart contract as collateral for a peer-to-peer loan matched on NFTfi. As a result of the injunction the NFT cannot be traded on the Opeansea NFT marketplace (https://opensea.io/assets/ethereum/0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d/2162). For further commentary on NFTfi's escrow smart contract, see T Chan, K Low "DeFi Common Sense: Crypto-backed Lending in *Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE")*" (2023) *Modern Law Review* 1, 3–4.

965 Furthermore, excess and exposure may be defined to intentionally leave the collateral taker under-collateralised, for example by setting the minimum collateral amount at a specified percentage below the total value of outstanding secured liabilities, or by omitting contingent liabilities from the exposure calculation.

966 Smart contracts can rely on external data providers (or "oracles"), for valuation inputs (see for example, Aave's use of an aggregated price feed from Chainlink, a decentralised oracle network).

967 Flash loans are special transactions that allow the borrowing of an asset, as long as the borrowed quantity (and a fee) is returned before the end of the transaction. The borrowing of the asset, the use of the borrowed asset for a particular purpose, and the return of the asset (and fee) are arranged and completed within a single "block" on a blockchain (for this reason they are sometimes called "One Block Borrows"). Because of this, these transactions do not require a user to supply collateral prior to engaging in the transaction — the borrowing, use of the asset and return of the asset will only occur and change the state of the blockchain if all three occur. Substitution of crypto-tokens held in on-chain collateral arrangements could therefore potentially be undertaken through flash loans in a similar way to how they are currently utilised in the Aave v2 and v3 platforms. Available at: https://docs.aave.com/developers/guides/flash-loans for more detail on flash loans.

(5) Collateral providers might retain the practical capacity to dispose of, extract value from, or directly access the functionality of crypto-tokens, subject to collateral arrangements that go beyond the excess withdrawal and substitution rights that are expressly recognised in the FCARs. Forms of access could include the capacity to withdraw distributions received in connection with crypto-tokens such as staking rewards or airdrops or the exercise of voting or other governance-related functionalities.

8.97 There is considerable uncertainty as to whether an agreement incorporating any of the shared or conditional control arrangements described above could satisfy the FCARs' core test of (legal negative) "control". Nor is it apparent that it would (or would necessarily) incorporate the practical control necessary to demonstrate "possession" for the purposes of the FCARs.[968] Given the variety of control configurations utilised within crypto-token collateral arrangements, we do not consider that legal negative control is an appropriate conceptual basis on which to build a perfection rule.

Conclusions on the FCARs

8.98 In its current form, we conclude that the FCARs regime does not constitute a reliable legal framework for structuring crypto-token or cryptoasset collateral arrangements.

8.99 The amendments we recommend at paragraphs 8.86 and 8.87 above address some of the definitional and scope concerns associated with the current FCARs regime. However, even if the scope is clarified,[969] this is only a partial solution which we do not think is sufficient. This is for two reasons:

8.100 First, we expect that clarification of the scope of "financial collateral" could result in certain crypto-tokens and certain cryptoassets being excluded from the FCARs.

8.101 Second, as we discuss above, even for those crypto-tokens or cryptoassets that do fall within the scope of the FCARs regime, the application of the FCARs' "possession or control" requirement in the context of crypto-token and cryptoasset collateral does not yield certain or satisfactory results.

8.102 Moreover, in our consultation paper, we said that the FCARs regime was:

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968 The analysis in this section includes issues of interpretive uncertainty as to the features of collateral excess and substitution facilities and the extent to which additional collateral access rights retained by the collateral provider are permissible under the FCARs. These issues (and their implications for collateral arrangements over account based crypto-token entitlements in particular) are similar to those that have been raised by academics and market practitioners in connection with the structuring and operation of intermediated securities collateral facilities in mainstream financial markets: see L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.54; FMLC, "Issue 1: Collateral Directive: Analysis of uncertainty regarding the meaning of "possession or ... control" and "excess financial collateral" (2012) paras 2.15–2.18, 3.4; *Re Lehman Brothers International (Europe) (in administration)* [2012] EWHC 2997 at [132]; G Yeowart, R Parsons, E Murray, H Patrick, *Yeowart and Parsons on The Law of Financial Collateral* (2016) para 8.18.

969 To the extent that was deemed desirable and/or necessary to promote policy goals in that context.

(1) designed without any specific expectation that it would apply to, and without any consideration of the particular features and requirements of, crypto-token and cryptoasset markets, and related collateral holding structures;[970] and

(2) widely regarded as problematic even in its application to the conventional wholesale financial markets that was the primary driver for its original implementation.[971]

8.103 We therefore provisionally concluded that an extension of the FCARs formally and more comprehensively to encompass crypto-token and cryptoasset collateral arrangements would not be appropriate. A majority of consultees agreed.[972] These responses indicated both clear dissatisfaction with the FCARs,[973] and strong support for law reform.[974]

DEVELOPING A BESPOKE LEGAL FRAMEWORK FOR CRYPTO-TOKEN COLLATERAL ARRANGEMENTS

8.104 We therefore recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

8.105 We propose that work might proceed in the following ways:

(1) First, by considering how such a regime might interact with financial markets more broadly as well as current economic realities.

(2) Second, by considering the possible objectives for a crypto-token and cryptoasset collateral framework.

(3) Third, by considering whether such a regime should differentiate between offchain and onchain collateral arrangements. That is, offchain intermediated collateral arrangements where crypto-token entitlements are represented by book entries in an internal ledger. And onchain crypto-token collateral

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970 Consultation paper para 18.45.

971 Consultation paper para 18.46.

972 Consultation question 38 stated our provisional conclusion that the FCARs should not be extended as set out above. We received 29 responses. Fourteen consultees agreed, 11 disagreed and four gave mixed responses.

973 This was evident in the responses of consultees who agreed *and* disagreed with our provisional conclusion. For example, a number of consultees who disagreed with our provisional conclusion that the FCARs should not be extended acknowledged deficiencies in the FCARs (including the "possession or control" requirement). Nevertheless, they argued that such deficiencies could be addressed at the same time as extending the financial collateral framework to cover crypto-tokens: IDAC and CryptoUK pp 602–604; AFME and AGC pp 27; IDAC and CryptoUK pp 602-604; Linklaters LLP pp 759-760 (para 1.12), ISLA pp 623–626 (para 2.9).

974 Consultation question 39 stated our provisional conclusion that it would be beneficial to implement law reform to establish a legal framework that better facilitates the entering into, operation, rapid, priority enforcement and/or resolution of crypto-token collateral arrangements. We received 34 responses to consultation question 39. Twenty-seven agreed, two disagreed, and five offered mixed views and/or raised additional issues. See further discussion at n 1001 below.

arrangements that rely on technical features of (or of platforms or protocols built on) the network in which the relevant crypto-token collateral is instantiated.

(4) Fourth, through the development of a perfection requirement defined by statute applicable to non-possessory security arrangements in respect of crypto-tokens and cryptoassets. This could be formulated to accommodate, more readily and potentially with greater certainty and versatility, various collateral holding and servicing facilities.

(5) Fifth, by accounting for and accommodating a potential control-based security interest recognised in common law.

(6) Sixth, by considering whether it would be appropriate to develop and define a bespoke statutory security interest for crypto-tokens and cryptoassets that was more aligned to their functionality and use. Again, this could be formulated to accommodate, more readily and potentially with greater certainty and versatility various collateral holding and servicing facilities.

(7) Seventh, by developing a bespoke regime that specifically deals with conflict of laws issues including rules to determine which national laws apply to various aspects of collateral arrangements that incorporate cross-border elements.

(8) Eighth, by considering related policy questions as to how such a bespoke statutory legal framework might interact with the existing FCARs framework (and, potentially any further amendments to the existing FCARs framework). In particular, this might require consideration of:

(a) Whether the FCARs should be reformed to include a "provision" based perfection requirement applicable to non-possessory security arrangements (as suggested by CLLS-FLC).

(b) Whether any "provision-based" security interest defined by statute should also be included within the range of security interests for the purposes of the FCARs.

(c) Whether (certain) crypto-tokens and (certain) cryptoassets should remain subject to a distinct and bespoke statutory collateral regime, or included within the scope of the amended FCARs (that is, within a unified, or re-unified, regime).

8.106 Much of the work required to implement these recommendations is beyond the scope of this report. We therefore limit our observations to highlighting only some of the principal issues which future law reform would need to consider.

Positioning of a bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements

8.107 Formulating the relevant substantive rules for a bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements is a significant undertaking beyond the scope of our current work. It would require a detailed cost-benefit analysis, not only in relation to crypto-token and cryptoasset markets and their participants, but to financial markets more broadly as well as to the contemporary economy.

Consequently, we limit our observations to highlighting some of the key issues that we anticipate would need to be considered as part of any future law reform initiative rather than set out in detail any substantive recommendations.

8.108 In developing and framing our considerations we note the Government's stated aim of making the UK a global hub for crypto-token and cryptoasset technology and investment.[975] We recognise the important role that a clear, responsive and facilitative private law collateral regime would play in realising this policy objective. We also recognise that any new regime would need to be aligned with, and supportive of, changes in the regulatory environment.[976]

8.109 A legal regime that supports innovation can also influence its direction of development. For example, integrating crypto-token and cryptoasset markets with mainstream financial markets through the creation of a unified, undifferentiated collateral regime could encourage crypto-token and cryptoasset markets to adopt the structural characteristics of mainstream financial markets. This could result in an increasing reliance on certain key intermediaries to facilitate and provide core services, further enhancing their (potentially systemic) importance within crypto-token and cryptoasset markets. It could also have unintended negative consequences for DeFi platforms by constraining the potential and utility of their applications, which are designed to deal with risk in different ways to traditional financial markets counterparties and infrastructure providers.

8.110 An alternative approach is to implement differentiated collateral regimes for crypto-token and cryptoasset markets distinct from the equivalent framework for mainstream financial markets.[977] This could arguably be more effective at encouraging an alignment of business practices where appropriate (for example, between mainstream financial markets intermediaries and crypto-token service providers that utilise a CeFi model). It could also better preserve opportunities for innovation in the DeFi sector by supporting applications that directly utilise the native technological functionality of crypto-token systems.

Possible objectives for a crypto-token collateral framework

8.111 Formulating any bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements would require consideration of, and the striking of an appropriate balance between, a number of different objectives including (but not limited to):

(1) The rights of solvent collateral takers to have the credit risk safeguards they have agreed and implemented in the form of crypto-token and cryptoasset

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975 Keynote Speech by John Glen MP, Economic Secretary to the Treasury, at the Innovate Finance Global Summit (4 April 2022).

976 Subsequent to the publication of our consultation paper, HM Treasury published a broad-ranging set of proposals for a new regulatory regime: HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023).

977 This might also require there to be updates to the FCARs to exclude crypto-token collateral arrangements in express terms: see from para 8.138 below.

collateral arrangements to be given effect to in accordance with their terms and exercisable without undue delay.

(2) The rights of solvent collateral providers to obtain access to collateral that is not required to cover or settle obligations secured by the relevant arrangement in accordance with the terms agreed with their respective collateral taker counterparties without undue delay.[978]

(3) Supporting the efficient and stable operation of crypto-token and cryptoasset markets by recognising mechanisms that enhance liquidity and by preventing and/or constraining the development of sources of systemic risk.

(4) Supporting broader participation and continued innovation in crypto-token and cryptoasset markets.

(5) Controlling the fraud risk exposure of parties to collateral arrangements and third parties by establishing appropriate evidentiary and publicity requirements for their validity and perfection respectively.

(6) Where a collateral arrangement counterparty becomes subject to insolvency proceedings, maximising the value of the insolvent entity's estate so that either (i) viable options for rehabilitation can be realised, or (ii) an equitable distribution of that value among the entity's creditors upon a winding up can be achieved.

Differentiation between offchain and onchain collateral arrangements?

8.112 A crypto-token and cryptoasset collateral regime might be structured as follows.

(1) The regime could apply to qualifying collateral arrangements that would include title transfer, non-possessory, control-based (and potentially provision-based) security interest-based collateral arrangements as set out below.

(2) Qualifying forms of collateral and possibly qualifying obligations[979] could be limited to those relating to crypto-tokens and cryptoassets not otherwise capable of satisfying the definition of financial collateral under the FCARs to minimise the risk of collateral regime arbitrage.[980]

(3) The crypto-token and cryptoasset collateral regime could itself be bifurcated into two rules-based frameworks that would be capable of development in parallel:

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978 See L Gullifer, *Goode and Gullifer on Legal Problems of Credit and Security* (7th ed 2022) para 6.54.

979 To fall within the scope of the FCARs, a collateral arrangement must be granted to secure or otherwise cover "relevant financial obligations". These are broadly defined: see para 8.50(3) above and para 18.51(3) of our consultation paper. Under a bespoke statutory framework, "qualifying obligations" might be framed so as to target more precisely the range of activities that the regime is intended to support and is justified in doing so from a policy perspective. This would reduce the risk of collateral regime overlap and the emergence of regime arbitrage opportunities.

980 As we discuss above, complimentary reform of the FCARs would likely be required as well to ensure that the scope of the FCARs was clear.

(a) The first framework could apply to intermediated collateral arrangements where the crypto-token and cryptoasset entitlements were represented by book entries in an internal ledger (the "Book-Entry Framework").

(b) A separate parallel framework could then be developed for onchain crypto-token and cryptoasset collateral arrangements that rely on technical features of (or of platforms or protocols built on) the network in which the relevant crypto-token is instantiated (the "Onchain Framework").

(4) Evidentiary requirements for both Book-Entry and Onchain Frameworks would need to strike a balance between (1) controlling fraud risk for parties to crypto-token and cryptoasset collateral arrangements; and (2) being responsive to emerging trends and technologies in crypto-token networks and supportive of market efficiency. Some of the following provisions and features might help facilitate this balance:

(a) Requiring qualifying collateral arrangements to be evidenced in writing or in a durable medium[981] without the need for any statutory formalities.[982]

(b) For on chain collateral arrangements, a confirmed transaction on the relevant crypto-token network effecting a transfer to an escrow arrangement controlling smart contract could be recognised as satisfying evidentiary requirements.

8.113 The statutory framework could support the establishment of, and recognise guidance from, expert industry panels tasked with monitoring the emergence of future market and technological developments as well as evolving standards for best practices in crypto-token and cryptoasset lending markets. These panels could issue authoritative statements on the extent to which various forms of communication and/or transaction records could and should be capable of fulfilling the fraud prevention objective underpinning evidentiary requirements.[983]

Formulating a perfection-criteria for qualifying non-possessory security interests

8.114 As we explain above,[984] we do not view "possession or control" as a satisfactory conceptual or practical basis on which to build a perfection requirement. Attempting to accommodate a myriad of configurations within a perfection principle defined in terms

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981 "Durable medium could be interpreted broadly to include, for example, recorded telephone conversations. This would be similar in principle to how the equivalent phrase has been interpreted in the context of the FCD. (See comment on FCD, art 1(5) in Section III.2 (Analysis of the Common Position– Scope (Article 1)), Common Position (EC) No 32/2002 adopted 5 March 2002, OJ C 119 E/22 of 22 May 2002).

982 Formalities rules such as s 53(1)(c) LPA 1925 would therefore be disapplied. For more detail on this issue, see Chapter 7 (Intermediated holding arrangements) paras 7.68–7.80.

983 See also our proposal for encouraging and supporting the establishment of a technical expert group to develop guidance and suggested legal frameworks for crypto-tokens and associated markets in Chapter 5 (Control).

984 See from para 8.95.

of "control" is unnecessarily artificial and not readily understandable by market participants.

8.115 Formulating an appropriate alternative requires attention to the purpose underlying perfection requirements. Where formal registration requirements are disapplied, perfection criteria provide an alternative method for ensuring the adequate publicity of collateral arrangements to third party creditors.[985]

8.116 We conclude that "provision" might fulfil this function effectively. Some form of factual control over crypto-tokens would be an important constituent element of any such perfection requirement,[986] but would not define it. Rather, the concept would capture the practical manifestation of features of the arrangement that are observable by potential third party creditors. This would indicate the possible existence of proprietary claims in crypto-tokens and cryptoasset subject to collateral arrangements other than their assumed or apparent owner. At the same time, it need not operate in a way which overly restricts innovation or undermines market efficiency.

8.117 In considering control not as a defining principle in itself but as a constituent element of a higher-level framing concept for perfection requirements, we note that the perfection requirement under the FCD (but not the FCARs) can be understood as adopting a similar approach:

(1) The FCD framework "applies to financial collateral once it has been provided and if that provision can be evidenced in writing."

(2) "Provision" of financial collateral for the purposes of the FCD is explained as meaning "financial collateral being delivered, transferred, held, registered or otherwise designated so as to be in the possession or under the control of the collateral taker or of a person acting on the collateral taker's behalf."

(3) The FCD goes on to clarify that "Any right of substitution, right to withdraw excess financial collateral in favour of the collateral provider or, in the case of credit claims, right to collect the proceeds thereof until further notice, shall not prejudice the financial collateral *having been provided* to the collateral taker as mentioned in this Directive."[987]

8.118 The perfection requirement for the FCD therefore appears to have been defined in terms of "provision" of which control is (alongside possession) only a constituent element. This reading is reinforced by the fact that rights of withdrawal and

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985 Publicity minimises the risk of third-party transacting decisions and claims being undermined by an "invisibility of security interests", and of the value realisable by third parties being compromised by the existence of undisclosed priority security interests. L Gullifer "What should we do about financial collateral?" (2012) 65 *Current Legal Problems* 377, 388–391.

986 This would diverge from the approach adopted under the FCARs, which focuses instead on legal control as the core organising principle. We agree with Professor Gullifer that, when thinking about intangibles, "what we actually are interested in is a badge of ownership (or of a lesser but proprietary interest)… if what we are interested in is the outward signs of an arrangement, one might have thought that operational [ie factual] control was more important than legal control.": L Gullifer "What should we do about financial collateral?" (2012) 65 *Current Legal Problems* 377, 391–392.

987 FCD, art 2(2) (emphasis added).

substitution are expressed as not compromising the "provision" requirement, and not by reference to the impact of these rights on "possession or control".

8.119 This can be compared with the drafting of the equivalent clarification in the FCARs, which states that:[988]

> Any right of the collateral-provider to substitute financial collateral of the same or greater value or withdraw excess financial collateral or to collect the proceeds of credit claims until further notice shall not prevent the financial collateral *being in the possession or under the control of* the collateral-taker.

8.120 The FCARs therefore omits the notion of "provision", elevating "possession or control" to being the primary principle *defining* perfection requirements and requiring all qualifications and clarifications to be stated by direct reference to that principle.

8.121 In developing a perfection requirement for crypto-token and cryptoasset collateral we therefore consider that a useful starting point would be a framing approach similar to the FCD, developing a concept of "provision" as the core principle with control being merely a constituent element thereof. However, it is important to note that although the framing of the perfection principle would be similar to the FCD, its substantive content (including the substantive content of the control concept that it incorporates) would be fundamentally different.

8.122 We think that this concept of "provision" could be more flexible and better able to deal with the complex way in which collateral arrangements work in respect of crypto-tokens and cryptoassets.

8.123 In making this observation, we draw heavily on and are grateful for the detailed and persuasive paper by the CLLS-FLC, "Financial collateral: A proposal for its 'provision'" which contains proposed changes to the FCARs that they:[989]

> consider necessary or desirable to enable relevant collateral arrangements governed by English law to be commercially useful, workable, safe and effective as part of the UK's modern, dynamic and internationally-focused financial markets.

8.124 The paper includes proposals for the FCARs to be reformed to incorporate a "provision" concept for the taking and perfecting of qualifying security interests over financial collateral. The proposal aims to address longstanding and widespread criticism of the uncertainties, practical challenges and limitations arising from the interpretation of the current "possession or control" test under the FCARs.

8.125 We found this work useful. The proposal has been helpful in our efforts to develop an equivalent framework for use in the context of crypto-token and cryptoasset collateral arrangements that is conceptually coherent, capable of dynamic development and provides market participants with clear, practical guidance. While the CLLS-FLC paper

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988 FCARs, reg 3(1). *Re Lehman Brothers International (Europe)* [2012] EWHC 2997 at [101] (emphasis added).

989 CLLS-FLC, "Financial Collateral: A Proposal For its "Provision" (4 November 2022), para 7, available in our consolidated consultee responses. The paper is also publicly available at: https://www.citysolicitors.org.uk/clls/consultations-responses-2/.

does not speak directly to collateral arrangements in respect of crypto-tokens or cryptoassets, we think that much of the reasoning in that paper can be extrapolated to the development of bespoke statutory legal framework which better and more clearly facilitates the entry into, operation and enforcement of crypto-token and cryptoasset collateral arrangements.

8.126 In our view, a provision-based perfection requirement might also play an important role in encouraging industry best practices including prudent risk management as well as in supporting the emergence of stable and efficient crypto-token and cryptoasset markets. For example:

(1) The way in which the perfection requirement and its constituent elements is designed and drafted will limit the scope of potential collateral arrangements that fall within the regime. Market participants wishing to benefit from the application of the regime would need to put in place arrangements that fell within scope (for example, arrangements that were consistent with prudent risk management), thus incentivising the adoption of certain practices.

(2) Guidance on the specific forms of different qualifying patterns (and associated best practices) could be set out in the relevant statutory instrument or developed over time by designated expert panels and/or the courts. For example, the concept of provision might be sufficiently nuanced to enable onchain automated or deterministic collateral holding facilities such as escrow smart contracts to be recognised as satisfying the provision requirement, but only if they had been subject to market standard security audits. This would be more difficult where a perfection requirement focused on possession or control.

(3) Similarly, the recognition of onchain automated or deterministic collateral management processes (such as excess withdrawal and substitution facilities based on smart contracts and flash loans[990]) as consistent with a provision requirement could be subject to limitations. This might include requiring parties to the collateral arrangement to give their full, informed consent to the use of such processes and/or requiring them to incorporate reliable and secure pricing feeds for valuing collateral. Facilities that instead rely on “hard coded”, fixed values could be excluded from recognition due to their susceptibility to being exploited if market prices deviate from those values.[991] This would allow the statutory delineation of the provision requirement to both support the emergence of stable and efficient crypto-token and cryptoasset markets and to encourage industry best practices including prudent risk management.

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990 For an example of how flash loans could potentially be used as part of a collateral substitution process available at: https://docs.aave.com/faq/swap-and-repay-with-collateral-v2.

991 For an example of how hard coded valuations can compromise collateral and risk management operations for a DeFi lending platform see O Avan-Nomayo “DeFi lender left with $35 million bad debt after quoting depegged stablecoins at $1” (16 May 2022) *theblockcrypto.com*.

The accommodation of a potential control-based security interest recognised in common law

8.127 As outlined above, we foresee that a bespoke regime would apply to qualifying collateral arrangements including title transfer and non-possessory security interest-based collateral arrangements.

8.128 We discuss at paragraph 8.36 above how we consider that a control-based security interest might emerge through development of the common law. However, this gives rise to the possibility that the bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements might be implemented before the common law has developed sufficiently such that a control-based security interest could be referred to or included in any statutory form.

8.129 In such circumstances, we consider that law reform might be approached in one of three ways.

(1) The statutory framework does not include any reference to nor any provision that attempts to capture the potential future common law development of control-based security interests. Any subsequent recognition of such security interests by the courts would need to be addressed by way of a legislative amendment to the collateral regime.

(2) The statutory framework includes a "future proofing" provision that attempts to capture the potential future common law development of control-based security interests.

(3) The statutory framework incorporates and specifies the substantive requirements for the valid grant of a new form of security interest that is based on control, without reference to potential common law developments.

8.130 Implementing a statutory framework that risks becoming outdated and potentially incomplete would not serve the needs of crypto-token and cryptoasset market participants. Our preference is therefore for a legislative approach that avoids the need for subsequent statutory updates.

8.131 The second option outlined above might be capable of achieving this objective. However, we think it would be extremely challenging to draft "future proofing" provisions which capture reliably and comprehensively future common law developments the precise terms of which cannot be anticipated in advance. Accordingly, if such a provision is required, it might be more appropriate to proceed on the basis of the third option outlined above. However, this in itself would lead to further difficult questions as to how to frame such a statutory framework, some of which we outline briefly below.

Developing a statutory security interest for crypto-tokens

8.132 As outlined above, we consider that the recognition of a control-based security interest would be a beneficial and coherent development within the common law and is consistent with our general approach in this report. However, we also consider that "control" is too restrictive a conceptual foundation to accommodate a wide range of crypto-token collateral holding arrangements and management techniques. Market

participants (particularly sophisticated financial market participants) might end up regarding control-based security interests as straightforward to put in place but of limited practical utility. As such, the adoption of such control-based security arrangements might end up confined to niche market sectors and relatively unsophisticated use-cases.[992]

8.133 In addition, it is possible that a bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements might seek to define a control-based security interest. Alternatively, it could encompass a common law control-based security interest, but relax the requirements for the creation of such interest through the concept of "provision". This is broadly analogous with how the "possession or control" criteria under the FCARs relaxes the form and nature of possession otherwise applicable under the common law for the valid grant of possessory security interests. If either of those options were considered appropriate, there might also (or instead) be value in considering the parallel introduction of a novel type of security, capable of broad application as a meaningful alternative to mortgages and charges.

8.134 We think the concept of "provision" might also be good foundation on which to develop a security interest of this nature. By "provision", we refer to the notion of collateral having been "provided to" the collateral taker. To date, this concept has been discussed primarily as an alternative perfection requirement to replace the FCARs' current requirement to the FCARs' requirement for "possession or control".[993] However, we think that there are good reasons why "provision" could also form the basis of a (statutorily created) security interest in its own right. This more flexible concept would be of far broader application. It could be formulated to accommodate a diverse range of collateral holding arrangements and management techniques for crypto-tokens including:

(1) commingled omnibus accounts, whether maintained by the collateral taker, an independent third-party custodian or operated through automated smart contract-based crypto-token escrow arrangements;

(2) collateral excess withdrawal and substitution arrangements; and

(3) rights of rehypothecation.

8.135 Guidance on the specific forms of qualifying patterns might be set out in the relevant statutory instrument and/or developed over time by designated expert panels and/or the courts.

Conflict of laws

8.136 Conflict of laws (or private international law) aspects of crypto-token and cryptoasset holdings and transactions were outside the scope of this project and so are not considered as part of this report. However, given the global nature of crypto-token and cryptoasset markets any future legal regime applicable to crypto-token collateral arrangements will need to consider the consider the inclusion of rules to determine

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992 We think the similar considerations to that which we set out above at paras 8.88–8.97 in respect of the "possession or control" perfection requirement under the FCARs applies here.

993 See from paras 8.88–8.97 above.

which national laws apply to various aspects of facilities that incorporate cross-border elements.[994]

8.137 We have also agreed with Government that we will undertake a separate project looking at English and Welsh private international law the rules as they apply to emerging technology, including, for example, proprietary questions concerning digital assets.[995]

How a bespoke statutory legal framework for a crypto-token and cryptoasset collateral regime might interact with the existing FCARs framework

8.138 Over time we expect there could be a degree of convergence between the operational processes and legal relationships used to structure crypto-token and cryptoasset collateral arrangements under a bespoke statutory legal framework and equivalent or similar arrangements used by intermediaries in conventional financial markets in respect of financial collateral. We anticipate that this degree of overlap will be particularly acute in at least two areas. First, where crypto-tokens or cryptoassets fall within the scope of the FCARs regime. Second, for the various factual constructs that might be recognised in relation to Book Entry Framework-type crypto-token and cryptoasset collateral arrangements as satisfying or being consistent with the necessary perfection requirements under a bespoke statutory legal framework.

8.139 Many consultees rightly said that this would likely lead to related policy questions as to how such a bespoke statutory legal framework for crypto-token and cryptoasset collateral arrangements might interact with the existing FCARs framework (and, potentially any further amendments to the existing FCARs framework). In particular, consultees said that this would require consideration of:

(1) Whether the FCARs should be reformed to include a "provision" based perfection requirement applicable to non-possessory security arrangements (as suggested by CLLS-FLC).[996]

(2) The legal definitional and policy-related question as to whether crypto-tokens and cryptoassets themselves should remain subject to a distinct and bespoke

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994 This point was raised by a number of consultees, including CLLS-FLC at p 510. which made the following comment: "Given the international nature of blockchain or DLT-based systems, it is necessary as a matter of some urgency to either determine that there is no need to look to any other legal system than English law for an issue before an English court relating to digital assets (in the third category) held in the system – unless a different law is specifically chosen by the participants of the system to govern the relevant issue – or tackle the difficult questions of trying to define what system of law should be applied by an English court to determine proprietary or other issues affecting the relevant assets held in the system. In this latter case, the law should specifically provide for parties to be able to exclude (by contract or otherwise) any rule of English private international law which would otherwise require regard to be had to another legal system in deciding the validity or effectiveness of any action relevant to the system. This seems essential given the uncertainty whether such a rule would apply (it clearly would if concepts of possession are used) and the difficulties that the architecture of blockchain and DLT-based systems raise in determining what other system of law might then be applicable."

995 More information and the latest updates are available at: https://www.lawcom.gov.uk/project/conflict-of-lawsand-emerging-technology/ and https://www.lawcom.gov.uk/project/digital-assets-which-law-which-court/.

996 See our discussion at paras 814–8.126 above.

statutory collateral regime, or should be included within the scope of the amended FCARs (that is, within a unified, or re-unified, regime).

Whether the FCARs should be reformed to include a "provision" based perfection requirement applicable to non-possessory security arrangements

8.140 CLLS-FLC propose that the FCARs should be reformed to incorporate a "provision" concept for the taking and perfecting of qualifying security interests over financial collateral.[997] The proposal aims to address longstanding and widespread criticism of the uncertainties, practical challenges and limitations arising from the interpretation of the current "possession or control" test. The proposal was framed by reference only to the FCARs and not to specific issues relating to crypto-tokens or to cryptoassets. Therefore, were such amendments made to the FCARs, they could have a twofold benefit. First, they would achieve the intended benefits described by CLLS-FLC in their paper.[998] Second, the concept of "provision" would be more applicable to crypto-tokens and cryptoassets. In particular, it could provide for a legal framework that better facilitated the entering into, operation, rapid, priority enforcement and/or resolution of collateral arrangements involving those crypto-tokens or cryptoassets to which it was clear that the FCARs applied.[999] Indeed, we model our suggested concept of a perfection-criteria for qualifying non-possessory security interests under a crypto-token and cryptoasset collateral regime on "provision".

Whether crypto-tokens and cryptoassets themselves should remain subject to a distinct and bespoke statutory collateral regime, or included within the scope of the amended FCARs

8.141 If (1) the FCARs were amended such that certain crypto-tokens and/or cryptoassets fell within its scope;[1000] and (2) the FCARs were amended to include a "provision" based perfection requirement applicable to non-possessory security arrangements, then this might provide an effective regime for the taking of collateral over certain crypto-tokens and certain cryptoassets.

8.142 However, there would still remain a question as to whether those crypto-tokens and crypto-assets that clearly fell outside of the scope of the FCARs *should* be brought within scope.

8.143 In our consultation paper, we asked consultees whether it would be more appropriate for any law reform in relation to a collateral regime for crypto-tokens and cryptoassets to create: (i) a unified, comprehensive and undifferentiated regime for financial collateral arrangements involving both traditional types of financial collateral and

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997 CLLS-FLC, "Financial Collateral: A Proposal For its "Provision" (4 November 2022), Appendix 1, available in our consolidated consultee responses. The paper is also publicly available at: https://www.citysolicitors.org.uk/clls/consultations-responses-2/.

998 Above, para 1.20.

999 See para 8.50, and our discussion of qualifying financial collateral arrangements from para 8.57 above.

1000 See our discussion on this point at paras 8.68–8.87 above.

crypto-tokens; or (ii) a bespoke regime for crypto-token and cryptoasset collateral arrangements.[1001] Consultees had varied views on this policy question:

8.144 Those in support of a consolidated regime made the following comments.

(1) It would better support the law of England and Wales as a regime of choice for financial markets transactions and minimise the risk of regime arbitrage, boundary issues and market distortion from regime misalignment.[1002]

(2) A consolidated regime would facilitate the use of broad consolidated collateral pools of crypto-tokens, cryptoassets and conventional financial collateral by participants of the securities lending and financing markets.[1003]

(3) The policy objectives[1004] underpinning the disapplication of various insolvency code provisions under the FCARs for the benefit of collateral takers are similarly applicable to crypto-token and cryptoasset markets. A unified approach across both categories of assets is justifiable, potentially reducing the risk of regime arbitrage and distorted collateral allocation decisions, and facilitating the adoption by market participants of collateral arrangements involving combined collateral pools comprising conventional financial collateral, crypto-tokens and cryptoassets.[1005]

8.145 However, other consultees argued against a consolidated regime, challenging the assertion of consistent underlying policy objectives across both categories of assets and their associated trading and lending markets. They made the following points.

(1) A bespoke regime could be better tailored to the idiosyncrasies of crypto-tokens and cryptoassets and for accommodating DeFi applications.[1006]

(2) A bespoke regime should be introduced because the features, market environments and (likely) policy considerations differed as between traditional financial collateral, crypto-tokens and cryptoassets.[1007]

(3) Crypto-token and cryptoasset trading and DeFi-based financing markets are at such an early stage of development and have the potential to generate

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[1001] Consultation question 39 stated our provisional conclusion that it would be beneficial to implement law reform to establish a legal framework that better facilitates the entering into, operation, rapid, priority enforcement and/or resolution of crypto-token collateral arrangements. It then set out in broad terms the two legislative options set out below. We received 34 responses to consultation question 39. Twenty-seven agreed, two disagreed, and five offered mixed views and/or raised additional issues. However, as we explain below, consultees were divided between the two legislative options presented.

[1002] D2 Legal Technology pp 422–423; International Securities Lending Association ("ISLA") p 625 (para 2.9); Deloitte Legal (UK) p 455.

[1003] D2 Legal Technology pp 422–423; ISLA p 625 (para 2.9); Deloitte Legal (UK) p 455.

[1004] Referred to by consultees as including increased market efficiency and stability, reduced systemic risk and increased liquidity.

[1005] AFME and AGC p 27; Linklaters LLP pp 759-760 (para 1.12), Ashurst LLP pp 86 and Clifford Chance LLP pp 310-311.

[1006] IDAC and Crypto UK pp 605–606.

[1007] COMBAR and the Chancery Bar Association pp 379–378 (para 39).

substantial social and economic risks such that limiting their interaction with other financial markets should be the priority.[1008]

8.146 We note that in this second alternative, where a distinct regime is maintained, amendments to the FCARs would likely be necessary to exclude (certain) crypto-token and (certain) cryptoasset collateral arrangements expressly from its scope. Any boundary between crypto-token and cryptoasset collateral regime(s) and the regime for conventional financial collateral could be maintained to further or recognise various policy objectives.

8.147 First, it could be used to control and limit the transmission of systemic risks between crypto-token/cryptoasset and mainstream markets.[1009]

8.148 Second, it could be reflective of a conclusion that the justifications for the disapplication of various insolvency code provisions under the FCARs[1010] that confer substantial advantages on collateral-takers do not apply (whether at all or to the same extent) to the equivalent receivers of crypto-token and cryptoasset collateral and the associated markets in which they operate. The justifications under the FCARs are that the relevant insolvency code disapplications help support the stable and efficient operation of financial markets by reducing systemic risk caused by "domino" contagion effects.[1011] While this conclusion may be defensible[1012] in relation to conventional

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[1008] Professor Milne pp 46-47.

[1009] See R Auer, M Farag and ors "BIS Working Papers 1013 – Banking in the shadow if Bitcoin? The institutional adoption of cryptocurrencies" (2022) *Bank for International Settlements Working Papers.*

[1010] These include rules that could prevent the rapid enforcement of collateral realisation rights, undermine the validity of certain pre-insolvency collateral transfers, suspend the exercise of termination rights and that reserve a portion of collateral value for distribution to other preferential creditors or for the settlement of other debts.

[1011] FCD, recital (17). "Domino" contagion risk refers to the potential for the insolvency of a prominent institution to trigger a series of defaults in back-to-back transactions causing financial distress to cascade through chains of counterparties across the market. The purported risk reduction benefits of disapplying the relevant insolvency code provisions are said to outweigh third party and societal costs resulting from the consequential reduction in assets available for distribution to other creditors and the diminished capacity and prospects for rehabilitation of an insolvent entity: R Mokal, "Liquidity, systemic risk, and the Bankruptcy treatment of financial contracts" (2016) 10(1) *Brooklyn Journal of Corporate, Financial and Commercial Law* 15. At 45, the author strongly criticises this view of contagion in financial markets as being "a product of the unsatisfactory microprudential approach to systemic risk, [which] is theoretically implausible and empirically false", arguing that it is "asset value contagion" – "a collective action problem in which an asset price shock…causes balance sheet constraints on asset-holders to tighten, causing assets to be liquidated, lowering asset prices further, and so on" that precipitates systemic crises in financial markets.

[1012] The underlying policy argument is not universally accepted however, and has been subject to a degree of criticism. See R Mokal, "Liquidity, systemic risk, and the Bankruptcy treatment of financial contracts" (2016) 10(1) *Brooklyn Journal of Corporate, Financial and Commercial Law* 15. In relation to bankruptcy law immunities (or "safe harbours") granted to financial contracts, the author argues that from a macro-economic perspective, "Immunities encourage systemic opacity, frothy markets, declining lending standards, the funding of negative value projects, exponentiation of leverage, and procyclical reductions in capital buffers and collateral. This is hugely corrosive to systemic stability. The disapplication of standard bankruptcy moratoria and avoidance or claw-back mechanisms, enables an asset seizure and disposal frenzy by immune creditors. This is harmful not merely to the bankruptcy estate and its stakeholders but also amplifies systemic stress through asset value contagion": p 63. Mokal also notes that at a micro-economic level, "The primary cost of ill-chosen priority rules is the misallocation of value from the bankruptcy estate, that is, the misallocation of bankruptcy loss. The primary cost of wrong immunities is not merely the misallocation but the *destruction* of value from the estate": p 15.

wholesale financial markets and the activities of financing intermediaries that support their operation, it is not self-evident that the same cost benefit assessment would apply to crypto-token and cryptoasset markets and financing intermediaries.[1013] Indeed for many crypto-token and cryptoasset markets, both in general and in relation to (and at times, as a result of) DeFi platforms in particular, it could be argued that supporting the creation and rapid enforcement of collateral arrangements in crypto-token and cryptoasset markets may amplify rather than diminish systemic risk.[1014]

8.149 Whichever option is judged appropriate in policy terms, we think that it is also important to recognise that the choice itself will influence market development. Integrating crypto-token and cryptoasset markets with mainstream financial markets through the creation of a unified, undifferentiated collateral regime could encourage crypto-token and cryptoasset markets to adopt the structural characteristics of those markets. This could result in an increasing reliance on certain key intermediaries to facilitate and provide core services, further enhancing their (potentially systemic) importance within crypto-token and cryptoasset markets. It could also have unintended negative consequences for DeFi platforms by constraining the potential and utility of their applications, which are designed to deal with risk in different ways to traditional financial markets counterparties and infrastructure providers.

8.150 By contrast, maintaining a differentiated collateral regime for crypto-token and cryptoasset markets might be more effective at encouraging an alignment of business practices where appropriate. This might include for example further alignment between mainstream financial markets intermediaries and crypto-token service providers that utilise a CeFi model — that is, aligning businesses practices across service and arrangement-type as opposed to across asset-classes. It could also better preserve opportunities for innovation in the DeFi sector by supporting applications that directly utilise the native technological functionality of crypto-token systems.

8.151 The extent to which a bespoke statutory legal framework for a crypto-token and cryptoasset collateral regime should interact with the existing FCARs framework is a question that will likely need to be answered before (or as part of) the creation of such a bespoke framework. It is also possible that given the nascence of crypto-token and cryptoasset markets, that question might need to be considered (and reconsidered) over time as the crypto-token and cryptoasset markets mature and become increasingly regulated.

8.152 We do not attempt to provide a view or answer to that question in this report. Instead, we simply highlight that legal issues relating to scope, and the creation of a bespoke

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[1013] H Liu and L Gullifer, Financial collateral arrangements in the digital asset world (2022) 8 *Journal of International Banking and Financial Law* 527.

[1014] H J Allen, "DeFi: Shadow Banking 2.0?" (2023) 64 *William & Mary Law Review* 919, 920, 928–929, 942, at which the author argues that as a result of the complexity and rigidity inherent in the automated applications implemented by various platforms coupled with the sector's capacity for generating leverage and its reliance on stablecoins, "DeFi mirrors and magnifies the fragilities of shadow banking innovations that resulted in the crisis of 2008" and that because "negative spillover effects from DeFi will wreak the most havoc on the real economy if regulated banks become integrated into the DeFi ecosystem, steps should be taken to insulate regulated banks from DeFi" (references are to page numbers in open access draft dated February 18, 2022). For further criticisms of the potential destabilising and pro-cyclicality amplifying effects of leverage in DeFi applications and the susceptibility of stablecoins to "fire sales" or "run risk", see S Aramonte, W Huang, A Schrimpf "DeFi risks and the decentralisation illusion" (2021) *BIS Quarterly Review*, 29–32.

statutory legal framework for a crypto-token and cryptoasset collateral regime are also intertwined with complex policy-related issues.

Our recommendation

8.153 We conclude that the introduction of bespoke collateral regime applicable to crypto-tokens and cryptoassets is consistent with the Government's stated policy objective of making the UK a global hub for crypto-token and cryptoasset technology and investment.[1015] It would provide market participants with clarity and flexibility on their legal structuring options for entering into effective crypto-token and cryptoasset collateral arrangements. It might also be designed so as to encourage increased, prudent participation in crypto-token and cryptoasset lending markets and support the emergence of innovative applications for generating yield from crypto-token and cryptoasset holdings and/or facilitating their deployment as effective credit risk safeguards.

8.154 However, formulating the substantive provisions of any such regime, and defining the extent of its interaction with the collateral regime for financial markets transactions, is a complex undertaking. Identifying the optimal approach cannot solely be determined by reference to applicable private law principles or the mere technical feasibility of statutory commercial law reform (although both will be of central importance).

8.155 Therefore, we anticipate that this law reform will require a wide-ranging cross-functional investigation and rigorous cost benefit analysis.[1016] It will also require coordination with and the appropriate allocation of policy objectives between other policy initiatives impacting the operation and development of crypto-token and cryptoasset markets and the conduct of market participants, such as changes in the regulatory environment.[1017]

[1015] Keynote Speech by John Glen MP, Economic Secretary to the Treasury, at the Innovate Finance Global Summit (4 April 2022).

[1016] R Auer, M Farag and ors. "BIS Working Papers 1013 – Banking in the shadow of Bitcoin? The institutional adoption of cryptocurrencies" (2022) *Bank for International Settlements Working Papers*. The authors note that "...the potential for many interlinkages between novel cryptocurrency intermediaries and the mainstream financial system requires a comprehensive approach to assessing and mitigating risks… A recurring lesson from the history of financial crisis is that risks in the "shadow" corners of the financial system can quickly find their way to established and regulated institutions. … the fundamental policy choice is to either focus on a framework that allows such interlinkages but adamantly enforces a more level playing field with regard to the regulation and supervision of financial services. Alternatively, policy could treat cryptocurrencies as a self-contained system that can develop in parallel with the mainstream financial system but does not interlink with it.": p 4.

[1017] This would include the outcome of the HM Treasury's current consultation and call for evidence regarding a future financial services regulatory regime specifically for cryptoassets: see HM Treasury, "Future financial services regulatory regime for cryptoassets: Consultation and call for evidence" (2023) (the "2023 HM Treasury Cryptoasset Regulatory Consultation Paper"). As to the allocation of policy objectives between different legal and regulatory initiatives see P Paech, "The value of financial market insolvency safe harbours" (2016) *Oxford Journal of Legal Studies* 1, 26 and 39 where the author argues that although the existence and scope of "safe harbours" that disapply various insolvency code provisions to the advantage of specified financial markets participants and transactions can have a "significant influence on the behaviour of market participants towards risk-taking while they are going concerns [they are] too bold a tool to control that behaviour. This role is better left to regulation. Regulation is able to address more selectively the vast majority of adverse systemic effects in which safe harbours may have a (smaller or larger) share, notably by

8.156 We also think that any law reform initiative must involve considered engagement with a broad range of stakeholders to determine the underlying policy objectives and the relative importance ascribed to them.

8.157 We acknowledge the existence of potential functional similarities in the use and structuring of financing facilities collateralised by conventional financial collateral and crypto-tokens respectively. However, we do not think that it can be assumed that the impact of their operation on underlying trading markets will necessarily be consistent without further careful analysis. For example, it could be argued that liquidity enhancement is a more convincing policy justification than systemic risk minimisation for disapplying insolvency code provisions that could otherwise inhibit the rapid, priority enforcement of financial collateral arrangements.[1018] Whether the availability of such collateral enforcement mechanisms would necessarily have the same positive impact on the stability and efficiency of crypto-token and cryptoasset markets and thereby provide sufficient justification for granting insolvency code privileges to collateral receivers under crypto-token and cryptoasset collateral arrangements would need to be established.[1019]

8.158 We therefore recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

8.159 We support this recommendation with the following conclusions. The project should:

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establishing requirements for liquidity buffers, mandatory haircuts, initial margin requirements, central clearing and in respect of risk-taking behaviour, without choking the liquidity made possible by the safe harbours."

[1018] See P Paech, "The value of financial market insolvency safe harbours" (2016) *Oxford Journal of Legal Studies* 1. The author points out that "[a]s a consequence of the introduction of resolution regimes the safe harbour rules will remain without effect in the most systemically relevant failures, notably those of systemically relevant banks, investment firms and infrastructures. Instead, regulators will use a completely different set of legal mechanisms to avoid contagion, including a stay on termination of contracts. Where insolvency proceedings may still occur, notably upon failure of a systemically irrelevant financial institution, the systemic risk rationale of safe harbours does not bite…"; and concludes that "To the extent that safe harbours are based on a systemic risk rationale, this is at odds with reality – the main argument, at least today, is liquidity": pp 36, 39.

[1019] For an example of how a DeFi loan liquidation can lead to a network-wide systemic loss of liquidity, sharp drops in asset prices as well as transaction congestion and high fees, see L Kelly, "How $50 Million in Loans Nearly Crashed Fantom" (7 May 2022) *Decrypt.co*. The report outlines how a $50m collateralised DeFi loan generated significant price instability and a system-wide degradation in functionality for the Fantom network (a layer one crypto-token protocol, listed on coinmarketcap.com with a market capitalisation at the time of the exploit of in excess of $2.4 billion). Beyond market risk vulnerabilities, DeFi platforms are complex systems that are susceptible to technical vulnerabilities as well. Funds lost by DeFi platforms due to exploits and hacks in the first four months of 2023, have reportedly been in excess of $320 million, although this is admittedly substantially down on the $1.3 billion lost in the same period the previous year (CertiK "HACK3D: The Web3 Security Quarterly Report – Q1 2023" (2023), available at: https://www.certik.com/resources). See also H J Allen, "DeFi: Shadow Banking 2.0?" (2022) *William & Mary Law Review* (2023) 64 *William & Mary Law Review* 919 and S Aramonte, W Huang, A Schrimpf "DeFi risks and the decentralisation illusion" (2021) *BIS Quarterly Review*, 29–32. The liquidity benefits of granting insolvency safe harbours would have to outweigh or otherwise justify accepting the potential negative consequences of a more inequitable creditor distribution and/or reduced rehabilitation prospects in the event of a collateral provider insolvency: R Mokal, "Liquidity, systemic risk, and the Bankruptcy treatment of financial contracts" (2016) 10(1) *Brooklyn Journal of Corporate, Financial and Commercial Law* 15.

(1) Involve the collaboration of multi-disciplinary lawyers and policy specialists with expertise in market integrity, risk and conduct issues specific to crypto-token and cryptoasset markets in particular but would also require input from experts in conventional finance.

(2) Involve extensive stakeholder engagement and consider the merits of integration with and/or corresponding or parallel amendments to the FCARs.

(3) Coordinate with related policy initiatives such as the future financial services regulatory regime for cryptoasset markets. Law reform proposals must be aligned with, and supportive of, changes in the regulatory environment.[1020]

(4) Determine the manner in and extent to which any such regime should support the rapid priority enforcement of crypto-token and cryptoasset collateral arrangements through the implementation of insolvency code privileges (or "safe harbours") for the benefit of such facilities and/or crypto-token and cryptoasset market participants.

8.160 Although this recommendation and the work required to implement it are significant, we conclude that there is a very high degree of support and demand for such law reform among consultees, markets participants and industry bodies.

Recommendation 4.

8.161 We recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

[1020] Subsequent to the publication of our consultation paper, HM Treasury have published a broad-ranging set of proposals for a new regulatory regime together with timeframes for their implementation: see the 2023 HM Treasury Cryptoasset Regulatory Consultation Paper.

Chapter 9: Causes of action and associated remedies

INTRODUCTION

9.1 This chapter considers some of the causes of action and associated remedies that parties might pursue in the context of third category things.[1021] Broadly, our conclusions follow those in our consultation paper. We discuss:

(1) breach of contract and associated remedies;

(2) vitiating factors, and the remedies that might be awarded if a contract involving a third category thing is void or set aside because of a vitiating factor;

(3) the evidential processes of following and tracing;

(4) breach of trust, equitable wrongs and constructive trust;

(5) proprietary restitutionary claims at law;

(6) unjust enrichment;

(7) conversion and principles of tortious liability; and

(8) injunctions and enforcement.

9.2 We conclude that much of the current law concerning causes of action and associated remedies can be applied to third category things without law reform. In the majority of cases the law does not distinguish between causes of action and associated remedies that apply to things in possession or to things in action.[1022] We conclude that, in general, this is also likely to be true of causes of action and associated remedies that apply to third category things. Therefore, in those cases there is no need for bespoke rules or for law reform. Instead, what is required is that the courts continue to recognise the nuances or idiosyncrasies of third category things (including their distinct functionality and technical characteristics) and apply existing legal principles to

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[1021] The chapter draws from a body of case law specifically concerned with third category things. We note however that the categorisation of some things as third category things — specifically EUAs in *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 — has been criticised by some academic commentators. Those commentators that consider *Armstrong* to be incorrectly decided often characterise an EUA as a thing in action — or at least an object of personal property rights that should attract the same legal treatment as a thing in action. For debate as to the correct characterisation of an EUA, see commentary such as K Low and J Lin, "Carbon Credits as EU Like It: Property, Immunity, TragiCO2medy?" (2015) 27(3) *Journal of Environmental Law* 377; M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 15.127; and N McBride, "mcbridesguides: *Armstrong v Winnington Networks Ltd"* (2013), available at: http://mcbridesguides.com/wp-content/uploads/2013/08/armstrong-v-winnington-networks-ltd.pdf.

[1022] However, in some cases it does. The primary example of this is the tort of conversion, but there are other distinctions and nuances that we highlight in this chapter and in Chapter 19 of our consultation paper.

such things as appropriate. This is consistent with our conclusions throughout this report that further common law development is preferable where possible.

9.3 However, we identify a potential lacuna in the law which would prevent a superior legal title holder (or, in certain circumstances, a person with a control-based legal proprietary interest) from pursuing a cause of action in certain, limited factual scenarios. We conclude that it would be possible for the courts to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things such as digital objects. This conclusion acknowledges that the lacuna we identify within the law is small and arises in situations where a claim based on unjust enrichment or proprietary restitution cannot be made out.

9.4 We also asked in our consultation paper whether there are any other causes of action or associated remedies that consultees thought might be relevant to third category things (but which would require specific law reform). We do not make recommendations in this context, because most of the potential reforms suggested by consultees are dealt with by the areas of law that we do consider.[1023]

BREACH OF CONTRACT

Application of remedies for breach of contract

9.5 Generally, a party who fails to perform a contract in accordance with its terms may be liable for breach of contract.[1024] Remedies for breach of contract can include: (1) an award of damages; (2) an award for an agreed sum; (3) termination of the contract; or (4) an order of specific performance.

9.6 In our consultation paper, we provisionally concluded that the existing legal framework for breach of contract can be applied to agreements involving third category things.[1025] Consultees broadly agreed.[1026] We conclude that no law reform is required in this respect. Broadly, if parties conclude a contract for the exchange of a third category thing, and one party fails to perform their obligation, the innocent party will, in principle, be able to bring a claim for damages or specific performance (depending on

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[1023] Simon Deane-Johns' suggestion at pp 923–924 is dealt with by the law of misrepresentation and/or breach of contract – see the sections starting at paras 9.5 and 9.20. LawFiDAO's suggestion at p 734 is dealt with by the law relating to injunctions – see below para 9.84. Stephan Smoktunowicz's suggestion at p 942 is best left for consideration as part of any potential future crypto-token collateral regime; see Chapter 8 (Collateral arrangements). The COMBAR and the Chancery Bar Association at pp 388–389 (paras 45.1–45.5) highlight concerns in relation to data privacy, which is excluded from our terms of reference, and regulation, which we do not consider (and which is dealt with by other bodies including HM Treasury and the Financial Conduct Authority).

[1024] A Burrows, *A Restatement of the English Law of Contract* (2nd ed 2020) p 112.

[1025] We did not discuss in detail all remedies for breach of contract (for example, termination) but rather the ones we thought (and continue to think) are most relevant to third category things, or which might give rise to novel legal questions. See our discussion in our consultation paper from para 19.4.

[1026] Consultation question 42 grouped together six legal frameworks, asking for views on the applicability of the frameworks absent statutory reform. One such framework was the law of breach of contract. There were 31 responses to consultation question 42. 24 of these responded generally, not differentiating between the six frameworks. Of these 24 responses, 21 agreed, two provided qualified agreement, and one provided a mixed response. Four consultees responded specifically on breach of contract. Of these, two agreed outright and two provided qualified agreement.

the facts).[1027] Similarly, parties could agree that, if a certain obligation is breached, the defaulting party must transfer a certain quantity of the third category thing in question (for example crypto-tokens) to the innocent party.[1028]

9.7 We do however consider one specific aspect of our provisional proposals in more detail below.

Action to enforce an obligation to "pay" non-monetary quantity units such as crypto-tokens

9.8 The award of an agreed sum protects the claimant's expectations by enforcing the defendant's promise to pay a sum of money that is due under the contract.[1029] It directly enforces the debt owed under the contract,[1030] and so is generally regarded as an action in debt rather than for damages. We provisionally concluded that an obligation to "pay" non-monetary units such as crypto-tokens would not be characterised as a monetary debt, meaning an action to enforce such an obligation would be characterised as a claim for unliquidated damages for failure to deliver. We did not propose any law reform to change this position.[1031]

9.9 Most consultees agreed.[1032] We think, and consultees agreed, that crypto-tokens denominated in their own notional unit of account are currently unlikely to be (or to be treated as) money in the same way as fiat currency.[1033] One reason for this is that crypto-tokens in this context (sometimes referred to as "crypto-currencies") are "self-anchored mathematic creatures" whose value depends on different structural and social concepts compared to existing fiat currencies.[1034] In addition, holding a crypto-token (such as bitcoin) in itself generates no right to exchange that token for legal tender.[1035]

1027 The claim will operate in the same way as if the contract were for the exchange of shares or some other object of personal property rights.

1028 Ashurst LLP p 88 (para 4.73). If a dispute arose, a court would be required to consider whether such a clause is a penalty clause (and therefore unenforceable) and/or whether to grant relief from forfeiture in the ordinary way. See *Cavendish Square Holdings BV v Talal El Makdessi* [2015] UKSC 67; [2016] AC 1172 and *Shiloh Spinners Ltd v Harding* [1973] AC 691, as well as footnotes 1752–1753 of our consultation paper.

1029 A Burrows, *Remedies for torts, breach of contract, and equitable wrongs* (4th ed 2019) p 381.

1030 A Burrows, *A Restatement of the English Law of Contract* (2nd ed 2020) p 149.

1031 See our detailed discussion and reasoning from para 19.19 of our consultation paper.

1032 Of the 24 consultees who responded to this question, 18 agreed outright, five disagreed, and one gave a mixed view.

1033 See our consultation paper at para 19.19; Hugh James LLP p 578; Professor Milne p 47; AFME and AGC pp 27–28; CLLS-FLC p 532. Broader discussions around whether crypto-tokens are money are outside the scope of this analysis.

1034 B Geva and D Geva, "Non-State Community Virtual Currencies" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 11.56.

1035 At least in England and Wales and other jurisdictions that have not adopted certain crypto-tokens as legal tender. "Legal tender" is usually taken to refer to the banknotes or coins which constitute the national currency issued under the legislation of the State: S Green, "'It's Virtually Money" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) paras 2.31–2.33.

9.10 In light of the above, we think that an action to enforce an obligation to "pay" non-monetary units such as crypto-tokens would, under the existing law, be characterised or construed as a claim for unliquidated damages for failure to deliver a commodity, rather than as a monetary debt. Support for this approach can be found in the courts' historical treatment of foreign currency. Under the law of England and Wales foreign currency was, historically, not considered to be money. Therefore, an action to enforce a foreign currency obligation was historically perceived by the court as an action for damages for breach of contract for failure to deliver a commodity or object of value.[1036]

9.11 Even though this result might be disadvantageous to claimants in some situations,[1037] we provisionally conclude that it is an accurate reflection of the current law, and do not propose any law reform or changes to existing principles. In particular, we do not suggest developing the law to permit an action for an agreed sum to be brought in relation to crypto-tokens that are not considered to be money or analogous thereto. Instead, we think that such crypto-tokens should only be able to form the subject matter of such an award if and when they are considered money or analogous thereto. In other words, if and when (certain) crypto-tokens are treated in a general sense as money (or analogous thereto) there will be a legitimate basis for those crypto-tokens to be considered the subject matter of an award of an agreed sum, and therefore actionable in debt.

9.12 The difficulty for the law will be in identifying when (and why) this threshold is crossed. One concern expressed by consultees was that an obligation to "pay" in central bank digital currencies, if and when these are introduced, should be characterised as a monetary debt.[1038] Separately, whether stablecoins might possess characteristics that could render them sufficiently analogous to money such as to form the subject matter of an action in debt was explicitly considered and rejected in the recent Singapore case of *Algorand Foundation Ltd v Three Arrows Capital Pte Ltd*.[1039]

Professor Sarah Green is the Commissioner for Commercial and Common Law at the Law Commission of England and Wales, and lead Commissioner for this project.

[1036] See B Geva and D Geva, "Non-State Community Virtual Currencies" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 11.10, and *Re United Railways of the Havanas and Regla Warehouse Ltd* [1961] AC 1007. This position was, however, rejected in *Miliangos v George Frank (Textiles) Ltd* [1976] AC 443 in the context of foreign currency obligations. We contrast this historic position with the current modern position in relation to foreign debt claims, and how they might be applied to an obligation to "pay" crypto-tokens, at para 9.14 below.

[1037] As Professor Green observes: "the principal consequence for a disappointed seller, having agreed to accept bitcoin, would seem to be remedial, since she thereby loses the ability to sue for the price. This denies the seller the ability to enforce the primary obligation, and its corresponding advantages: debt claims are not discretionary, nor are they subject to the common law constraints of remoteness, mitigation, or penalties, and it is both procedurally and substantively easier for debt claimants to obtain summary judgment". S Green, "It's Virtually Money" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 2.43.

[1038] See the response of the Electronic Money Association p 489. See also our discussions on CBDCs and stablecoins in Chapter 8 (Collateral arrangements) in the context of the Financial Collateral Arrangements (No 2) Regulations 2003 ("FCARs").

[1039] The Singapore High Court held that the claimant was a "creditor" within s 124(1)(c) of the Insolvency, Restructuring and Dissolution Act 2018 but that an obligation to re-transfer loaned stablecoins (USDC) could

9.13 Without (certain) crypto-tokens being treated as money, developing the law to permit an action for the agreed sum in relation to certain crypto-tokens is, in our view, undesirable. Such an approach would be contrary to the well-established principle of remedies that an action to enforce a debt applies in relation to a definite sum of money. In addition, infringements of rights in relation to other objects of personal property rights are generally addressed either through a claim in damages or through an award of specific performance in equity. Relatedly, enforcing an award of an agreed sum where the subject matter is arguably non-monetary would, in our view, be tantamount to ordering specific performance of a non-monetary obligation as of right.[1040] This would be contrary to the existing legal position where awards of specific performance are subject to limitations as part of the court's equitable jurisdiction.[1041]

9.14 We recognise that this reasoning could have potentially significant consequences, particularly in situations involving insolvency.[1042] For example, a person might conclude a transaction of sale with a counterparty on terms that payment will be made in crypto-tokens. If the counterparty becomes insolvent before the execution of the contract, a question will arise as to the proper characterisation of the crypto-tokens for the purposes of the creditors' claim.[1043] If as we conclude, the claim would be characterised as a claim for unliquidated damages based on breach of contract to deliver a commodity, then the assessment of the value of the loss might not necessarily be made as at the onset of insolvency proceedings. However, a party might argue instead that the claim should be characterised as an action for the price (denominated in the relevant crypto-token). If it were, then that action for the price (denominated in the relevant crypto-token) might be analogous with a foreign debt claim.[1044] It therefore would need to be converted into the currency in which the insolvency estate was to be administered before any distribution could be calculated and made.[1045]

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not constitute a monetary debt for the purposes of a statutory demand under s 125(2)(a) of that Act: *Algorand Foundation Ltd v Three Arrows Capital Pte Ltd* (HC/CWU 246/2022).

1040 Dr Crawford p 808.

1041 A Burrows, *Remedies for torts, breach of contract, and equitable wrongs* (4th ed 2019) p 402.

1042 Conversely, treating arrangements denominated in crypto-tokens as monetary debts and developing the law to permit an action for the agreed sum in relation to certain crypto-tokens might undermine the existing design and operation of certain DeFi arrangements. That is because many such arrangements rely on the functionalities of crypto-token systems themselves to automate (or render deterministic) certain processes that mimic or replicate the substantive economic effect of traditional finance arrangements, such as collateralised loans but those arrangements are, in general, intentionally not structured as "monetary debt" arrangements.

1043 This example was given by Mr Justice Zacaroli in a lecture delivered to the Insolvency Lawyers Association on 17 October 2019, reproduced in *South Square Digest* (November 2019) available at: https://southsquare.com/wpcontent/uploads/2019/11/Digest-Nov-2019.pdf.

1044 That is, the current modern position in relation to foreign debt claims, as opposed to the historic treatment of foreign debt claims which we discuss in para 9.10 above.

1045 See rule 14.21 Insolvency Rules 2016: "(1) A proof for a debt incurred or payable in a foreign currency must state the amount of the debt in that currency. (2) The office-holder must convert all such debts into sterling at a single rate for each currency determined by the office-holder by reference to the exchange rates prevailing on the relevant date."

9.15 As Mr Justice Zacaroli observed:[1046]

> Given the volatility of [some] crypto-tokens and the fact that the valuation of the claim may well depend on a different date in either case, the difference between treating it as a foreign currency claim, or as a damages claim for failing to deliver a commodity could be enormous.

9.16 Consultees broadly agreed with our provisional conclusion and as such we do not recommend any law reform or changes to existing principles. However, we acknowledge that these issues will remain important to many industry participants, particularly following a number of high-profile insolvencies during 2022.[1047]

VITIATING FACTORS

9.17 Vitiating factors include mistake, misrepresentation, duress, and undue influence. Depending on the factor in question, these may render a contract void or voidable.[1048] If a contract is void, it is treated as though it never existed. If a contract is voidable, it remains valid unless and until it is rescinded by the innocent party.[1049] We conclude that no law reform is needed in relation to third category things in this context.[1050]

Mistake

9.18 A contract can be rendered void if one or both parties laboured under a mistake when entering the contract. A "mistake" is an erroneous belief or assumption about a matter of fact or law.[1051] A mistake made by both parties is known as a "common mistake" and a mistake made by one party is known as a "unilateral mistake".[1052] In our consultation paper, we provisionally concluded that where a contract involving a third

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1046 Mr Justice Zacaroli in a lecture delivered to the Insolvency Lawyers Association on 17 October 2019, reproduced in *South Square Digest* (November 2019) available at: https://southsquare.com/wpcontent/uploads/2019/11/Digest-Nov-2019.pdf.

1047 Including the US Chapter 11 bankruptcy reorganisation proceedings in respect of Celsius Network LLC (https://cases.stretto.com/Celsius/court-docket/), Voyager Digital Holdings Inc (https://cases.stretto.com/Voyager/court-docket/), FTX Trading Ltd (https://restructuring.ra.kroll.com/FTX/Home-DocketInfo), and the appointment of joint provisional liquidators over the hedge fund Three Arrows Capital Ltd.

1048 A Burrows, *A Restatement of the English Law of Contract* (2nd ed 2020) pp 178–179.

1049 The effect of rescission is that the contract is set aside from the start. The term "rescission" is also sometimes used to describe the termination of the contract with prospective effect. However, today, the term is more commonly used to describe the retrospective setting aside or wiping away of the contract: see *Goff & Jones: The Law of Unjust Enrichment* (10th ed 2022) para 40-02.

1050 We received limited feedback on this area of our consultation paper. Five consultees responded. Of these, three provided qualified agreement, one provided a mixed view, and one disagreed with our provisional conclusion that no law reform was required. See n 1026 above for the structure of responses to consultation question 42.

1051 *Chitty on Contracts* (34th ed 2021) para 5-001; *Pitt v Holt* [2013] UKSC 26, [2013] 2 WLR 1200 at [108]–[109], by Lord Walker.

1052 *Chitty on Contracts* (34th ed 2021) para 5-001. Note, however, that not all mistakes will render a contract void, but only fundamental mistakes: see *Chitty on Contracts* (34th ed 2021) para 5-008.

category thing is void for mistake, the ordinary rules following recovery of objects transferred under a void contract would apply.[1053]

9.19 King's College London suggested that, in relation to third category things, specifically digital objects, the law should rectify its "historical accident" and recognise a fundamental mistake as rendering a contract voidable, not void.[1054] However, we consider that any change in this area (if necessary) would be best left to the common law of mistake in general, and should not be implemented by law reform specific to third category things or digital objects.

Misrepresentation

9.20 A contract will be voidable if a party was induced to enter the contract by a misrepresentation made by the other party.[1055] A misrepresentation can be fraudulent,[1056] negligent,[1057] or innocent.[1058] Where any such misrepresentation is established the contract will be voidable,[1059] potentially entitling the claimant to damages.[1060] Again, we conclude that misrepresentation will operate in the same way for contracts involving third category things as it does for contracts involving other objects of personal property rights. King's College London highlighted potential difficulties surrounding the measure of damages for a misrepresentation under section 2(1) of the Misrepresentation Act 1967.[1061] However, such difficulties, while

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1053 See para 19.30 and paras 19.39–19.42 of our consultation paper.

1054 King's College London pp 680–681. A similar point is made by Dr Maddox and Dr Richardson pp 833–834.

1055 A "misrepresentation" can be defined as a false representation, by words or conduct, about a matter of fact or law: *Chitty on Contracts* (34th ed 2021) para 9-006.

1056 Where the party making the representation knows that it is false or is reckless as to whether it is true or false: *Derry v Peek* (1889) 14 App Cas 337.

1057 Where the party making the representation did not have reasonable grounds for believing it to be true: *Hedley Byrne & Co Ltd v Heller & Partners Ltd* [1964] AC 465; *Esso Petroleum Co Ltd v Mardon* [1976] QB 801.

1058 Where the party making the representation was neither fraudulent nor negligent.

1059 In cases of non-fraudulent misrepresentation, the court also has a discretion to refuse rescission and order damages in lieu if it considers "that it would be equitable to do so", having regard to the nature of the misrepresentation, the loss caused to the claimant if the contract were upheld, and the loss that rescission would cause to the defendant: Misrepresentation Act 1967, s 2(2).

1060 Where the claimant has suffered loss as a result of entering into the contract, they might be entitled to damages in the law of tort. For example, in the case of fraudulent misrepresentation the claimant may be able to claim damages under the tort of deceit. In the case of negligent misrepresentation the claimant might be able to obtain damages through the tort of negligence. Damages are also potentially available under the Misrepresentation Act 1967, s 2(1).

1061 King's College London at pp 681–682 said that damages awarded under s 2(1) of the Misrepresentation Act 1967 are awarded on the same basis as if they were awarded for a fraudulent misrepresentation – *Royscot Trust v Rogerson* [1991] 2 QB 297. This is despite the fact that, under s 2(1), a claimant need only establish that they entered into the contract after a misrepresentation was made by another party to the contract. This means, although there might be no fraud, that the defendant is liable as if there were a fraud, meaning they are potentially liable for all damages flowing from the loss (not merely those within the reasonable contemplation of the parties) – *Doyle v Olby (Ironmongers) Ltd* [1969] 2 QB 158. King's College London said that "the ease and frequency with which digital assets can be traded or utilized means that the losses which might arise as a result of an actionable misrepresentation under s 2(1) could be far beyond what either party might contemplate or reasonably foresee."

undeniable, are not specific to third category things or to crypto-token markets,[1062] and as such we consider that any reform should not be implemented by law reform specific to third category things.

Duress and undue influence

9.21 A contract is voidable for duress where a party was induced to enter into the contract by an illegitimate threat made by the other party.[1063] Where it is proven that, but for the illegitimate threat, the claimant would not have entered into the contract, the claimant can rescind the contract.[1064] Undue influence arises in situations where, because of the relationship between the parties, the claimant is unable to exercise free and independent judgment when entering into the contract.[1065] A contract may be set aside for undue influence where such influence was a factor in the claimant's decision to contract.[1066] We received no feedback in response to our provisional conclusion that the existing legal framework on duress or undue influence can be applied to contracts involving third category things and we do not recommend any law reform.

Remedies where the contract is void

9.22 A void contract entails that there is no legal relationship between the parties, meaning a void contract produces no legal effects whatsoever.[1067] Most objects of personal property rights transferred pursuant to a void contract are generally recoverable, as title does not thereby pass from the transferor to the transferee.[1068] However, legal title to money can in some cases pass to the transferee despite a void contract.[1069] Where the claimant no longer retains title to the money, there are no proprietary consequences for the void contract.[1070] We think these legal principles can apply to

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1062 We note that crypto-tokens are not the only assets traded with ease and at high frequency. Markets for debt or equity securities and financial instruments might operate in similar conditions. We are not convinced that reform is needed in the specific context of third category things or crypto-tokens, given the seemingly sufficient operation of the law of misrepresentation in mainstream financial contexts. Courts appear to take a commercial, pragmatic approach when considering cases arising out of these environments: *Peekay Intermark Ltd v Australia and New Zealand Banking Group Ltd* [2006] EWCA Civ 386. See A Hudson, *Securities Law* (2nd ed 2013) at paras 24-113–24-114.

1063 *Pakistan International Airline Corporation v Times Travel (UK) Ltd* [2021] UKSC 40, [2021] 3 WLR 727 at [62], by Lord Burrows.

1064 Above.

1065 *Royal Bank of Scotland v Etridge (No 2)* [2001] UKHL 44, [2002] 2 AC 773.

1066 *UCB Corporate Services Ltd v Williams* [2002] EWCA Civ 555 at [86], by Jonathan Parker LJ.

1067 *Chitty on Contracts* (34th ed 2021) para 1-074.

1068 *Cundy v Lindsay* (1878) 3 App Cas 459 at 466, by Lord Cairns LC; *Benjamin's Sale of Goods* (11th ed 2021) para 16-092.

1069 *Westdeutsche Landesbank Girozentrale v Islington London Borough Council* [1996] AC 669 at 689 to 690 by Lord Goff who says that "there is no general rule that the property in money paid under a void contract does not pass to the payee". Professor Fox considers these issues (in relation to money) in detail: D Fox, *Property Rights in Money* (2008) ch 4.

1070 Instead, the innocent party may have a personal restitutionary claim under the law of unjust enrichment for the value of the benefit transferred pursuant to the void contract: *Guinness Mahon & Co Ltd v Kensington and Chelsea Royal London Borough Council* [1999] QB 215 (CA); A Burrows, *A Restatement of the English Law of Contract* (2nd ed 2020) p 179.

third category things in the same way as they do to other objects of personal property rights without law reform.

Remedies where the contract is rescinded

9.23 In our consultation paper we provisionally concluded that the legal principles of rescission can apply to contracts involving third category things in the same way as they do to other objects of personal property rights without the need for reform. However, we also noted that practical issues might arise in achieving rescission in the way in which it conventionally works, principally due to the immutability of crypto-token systems.[1071] Given these issues, we considered that a court might seek to achieve rescission by way of "practical justice",[1072] by either ordering the parties to enter into an "equal and opposite" second transaction,[1073] or by valuing the benefits transferred and ordering restitution thereof.[1074] No feedback received during the consultation process changed our view as to this provisional conclusion.[1075] We conclude that the law of England and Wales already provides the relevant remedial tools following rescission of a contract involving third category things including crypto-tokens, and we therefore do not recommend law reform.

FOLLOWING AND TRACING

9.24 Following and tracing are evidential rules concerned with establishing what has happened to a thing in which a claimant has a legal or equitable interest.[1076] The purpose of following and tracing is to enable a claimant to locate and identify their object of personal property rights (or its proceeds or substitute) through a series or chain of transactions, with the overarching aim of establishing a proprietary claim against that object (or its proceeds or substitute).[1077] Such a claim could be for a proprietary remedy in respect of the object of personal property rights itself (or its proceeds or substitute), or a personal (monetary) remedy against the defendant who received the object of personal property rights for the value thereof.[1078] The essence

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1071 Crypto-token system immutability can render it practically impossible to unwind transactions effected in the system: see para 19.40 of our consultation paper.

1072 See para 19.40 of our consultation paper.

1073 We think that this could potentially be analysed as being conceptually similar to an order for delivery up pursuant to a constructive trust.

1074 This could be achieved through a claim in unjust enrichment. See further N Yeo and A Taylor, "Avoiding blockchain contracts" (2019) 9 *Journal of International Banking and Financial Law* 586.

1075 Norton Rose Fulbright LLP at p 850 said that there is no need to caveat the process of ordering an "equal and opposite" second transaction as not being "rescission in a strict legal sense" (as we wrote at para 19.41 of our consultation paper).

1076 Technically speaking therefore, they are not themselves remedies; rather, they facilitate or permit a claimant to assert their right to other remedies: *Foskett v McKeown* [2001] 1 AC 102 at 113, by Lord Steyn; G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 612.

1077 *Foskett v McKeown* [2001] 1 AC 102 at 127, by Lord Millett.

1078 See G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 557 for a discussion on terminology in this context. As the author notes, all restitutionary claims which are founded on the claimant's proprietary rights are properly classified as proprietary claims, since they are dependent solely upon the identification and protection of proprietary rights. But the remedies are not necessarily proprietary remedies, since, depending on the particular circumstances of the case, the appropriate remedy may be either proprietary or

of following is that the claimant is able to show that the actual object in which they have a proprietary interest has been received by the defendant[1079] — that is, pursuing things from one location to another. If the identity of the claimant's object has been lost or the object has been destroyed, the claimant will no longer be able to follow it. Tracing, conversely, involves an exercise by the claimant to show that the value of the asset in which they originally had a proprietary interest can be identified in (or "traced" to) assets (including substitutes or proceeds) received by the defendant.[1080] That is, characterising transactions by which we identify substitute assets or things.[1081]

Following or tracing?

9.25 In our consultation paper we provisionally concluded that transfers of crypto-tokens are best characterised as involving a destruction of the pre-transfer token, followed by a creation of a new post-transfer token.[1082] Broadly, this was the "extinction/creation" analysis discussed in Chapter 6 (Transfers). We therefore provisionally concluded that because pre- and post-transfer crypto-tokens are arguably not the "same"[1083] thing when they are transferred onchain, a tracing analysis, in general, will be the more appropriate evidential process than a following analysis.[1084]

9.26 As we discuss in detail in Chapter 6 (Transfers), consultees gave varied feedback to this provisional conclusion, and offered an alternative: the "persistent thing" analysis. In this report we conclude that there is no "correct" analysis; both the "extinction/creation" analysis and the "persistent thing" analysis could be said to be accurate in their own ways. However, we note in Chapter 6 (Transfers) that consultees offered a number of suggestions as to why the most practically accurate is the persistent thing analysis.

9.27 This potentially impacts the application of the evidential processes of following or tracing. That is because it is less clear that a "new" object of personal property rights is created on a transfer of a crypto-token, meaning that it is at least possible to make an alternative argument that (at least some) crypto-tokens can be followed through transactions.

Following or tracing into mixtures

9.28 In our consultation paper, we also described how the rules on tracing at common law differ from (and are relatively more restrictive than) those at equity. At common law, a

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personal. See also *Trustee of the Property of FC Jones and Sons (a firm) v Jones* [1997] Ch 159 at 168 by Millett LJ for a brief mention of the distinction between proprietary claims and proprietary remedies.

1079 *Foskett v McKeown* [2001] 1 AC 102 at 127, by Lord Millett.

1080 The orthodox view is that the claimant is showing that the value of the property in which they originally had a proprietary interest can be identified in (or "traced" to) property that has been received by the defendant: *Foskett v McKeown* [2001] 1 AC 102 at 127–128, by Lord Millett. See also G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 608. However, see T Cutts, "Tracing, Value and Transactions" (2016) 79 *Modern Law Review* 381, which presents challenges to the view that tracing should be understood as the process of following value through one or more substitutions.

1081 T Cutts, "Dummy asset tracing" (2019) 135 *Law Quarterly Review* 140, 143.

1082 See Chapter 12 of our consultation paper.

1083 *Foskett v McKeown* [2001] 1 AC 102 at 127, by Lord Millett.

1084 See paras 19.47–19.51 of our consultation paper.

claimant might be able to follow their asset into a mixture when it remains possible to separate the components of the end product.[1085] But the traditional approach has been that tracing to a substitute is only possible where the substitute asset is readily identifiable and has not been mixed with other assets so that it loses its identity.[1086] Where money has been mixed with other money, tracing at common law has traditionally failed.[1087] Tracing in equity will not be defeated by mixing.[1088]

9.29 In our consultation paper, we noted that the distinction between the rules of following and tracing at common law and in equity has been the subject of judicial and academic criticism. For instance, in *Foskett v McKeown*,[1089] both Lord Steyn and Lord Millett favoured the view that "following and tracing should be treated as a single analytical process, with the distinction between common law and equity relevant only to the claim in support of which that process is invoked."[1090]

Specific evidential questions for crypto-tokens

9.30 Because the technology that manifests different third category things (including crypto-tokens)[1091] is different, different analytical and evidential processes might be required to establish what has happened to those things in which a claimant has a legal or equitable interest. This is likely further to blur the distinctions between following and tracing. In some cases, it might be more appropriate to follow a "persistent" crypto-token from one "location" (for example, a public address) to another. This is most obviously the case for certain NFTs, which are specifically identified by reference to public addresses.[1092] However, other crypto-tokens or

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1085 See generally *Spence v Union Marine Insurance Co Ltd* (1868) LR 3 CP 427 and *Indian Oil Corp Ltd v Greenstone Shipping SA (Panama)* [1988] QB 345.

1086 *Trustee of the Property of FC Jones v Jones* [1997] Ch 159 at 169, by Millett LJ. It has been said that tracing at common law is only possible where there is a "clean substitution": A Burrows, *The Law of Restitution* (3rd ed 2011) p 123. Examples of clean substitutions are the exchange of a car for a boat, or a cow for a goat. See also G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 615, where the point is made that: "Where there has been an irretrievable mixing it is simply not possible to say in what property the claimant has a proprietary interest. Consequently, where such mixing has occurred, the claimant's legal title to the property will be extinguished".

1087 *Trustee of the Property of FC Jones v Jones* [1997] Ch 159 at 168, by Millett LJ. However, some case law suggests that when money is withdrawn from a bank account, thus converting the thing in action (the bank account debt) into drawn money, a claimant might be able to trace at common law from the bank account into the drawn money (even where that drawn money was mixed with other money): *Lipkin Gorman v Karpnale Ltd* [1991] 2 AC 548. *Agip (Africa) Ltd v Jackson* [1990] Ch 265 at 286, by Millett J, upheld [1991] Ch 547 at 566, by Fox LJ; *Snell's Equity* (34th ed 2019) para 30-053. Professor Smith has previously argued against mixing defeating tracing at common law: L Smith, *The Law of Tracing* (1997) pp 71, 162–174.

1088 *Re Hallett's Estate* (1880) 13 Ch D 696; G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 628.

1089 *Foskett v McKeown* [2001] 1 AC 102 at 113, by Lord Steyn, and 128–129, by Lord Millett.

1090 T Grant and D Mumford, *Civil Fraud: Law, Practice & Procedure* (1st ed 2018) para 23-008. See further: P Birks, "The Necessity of a Unitary Law of Tracing", in R Cranston, *Making Commercial Law, Essays in Honour of Roy Goode* (1997) pp 239–258; L Smith, *The Law of Tracing* (1997); J English and M Hafeez-Baig, *The Law of Tracing* (2021).

1091 See our consultation paper paras 12.10–12.60.

1092 Specifically, NFTs on Ethereum commonly implement the ERC-721 standard interface which includes a 'tokenId' variable that creates a unique pair between the tokenId and the smart contract address. Available

arrangements involving crypto-tokens might lead to a different analysis being more appropriate. For example, it might be that the better analysis involves identifying substitute things, such that tracing is the more suitable evidential process to adopt. It is therefore highly likely that courts will need to engage in complex evidentiary exercises to characterise the result of (sometimes multiple) transactions or transactional processes involving crypto-tokens.

9.31 We think that, in the context of third category things (and specifically, crypto-tokens), establishing the applicable evidentiary process (following and/or tracing) is likely to be complicated for the following reasons.

(1) Self-held crypto-tokens can be transferred through intermediated holding arrangements and back to self-held arrangements.[1093]

(2) Many transfers of crypto-tokens will involve crypto-tokens becoming "mixed" on transfer — that is, it is no longer possible to separate the pre-transfer components of the product from the post-transfer mixture. This will be the case where crypto-tokens are transferred to a public address which is already associated with a quantity of the same tokens, because the state of the relevant crypto-token generally only tracks amounts associated with a public address and not specific tokens.[1094]

(3) One type of crypto-token might be exchanged for a different type of crypto-token as part of the chain of transactional processes. These exchanges might occur through a variety of different mechanisms, including automated market maker protocols where crypto-tokens are exchanged for other tokens deposited into a liquidity pool smart contract.[1095]

(4) Crypto-tokens might be burned, encumbered or mixed as part of complex DeFi arrangements that rely on the functionalities of crypto-token systems themselves to automate certain processes that mimic or replicate the substantive economic effect of traditional finance arrangements, such as collateralised loans.[1096]

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at: https://eips.ethereum.org/EIPS/eip-721. The BAYC token smart contract can be viewed at: https://etherscan.io/token/0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d.

[1093] The proprietary interest (if any) retained by the user will differ depending on the type of intermediated holding arrangement involved. See further Chapter 7 (Intermediated holding arrangements).

[1094] This is particularly the case with Account-based tokens and crypto-tokens based on "fungible" token standards, although it is arguably less likely with UTXO-based tokens and is not the case with NFTs. See D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.76, where the point is made that: "the unique transactional history recorded in some crypto-coins, such as bitcoins, may mean that it can never be mixed in an absolute sense".

[1095] In high-level terms, an automated market maker is a smart-contract based mechanism which mathematically defines the price of certain pairs of crypto-tokens and provides liquidity for those pairs of tokens (in "pools"). If a person wants to swap one crypto-token for another, they can make a trade directly with the automated market maker smart contract, using the relevant liquidity pool(s).

[1096] For example, MakerDAO's protocol is a complex system, supporting the stablecoin 'DAI' pegged to the US dollar. DAI tokens may be burnt, ie permanently removed from circulation, when their associated "collateral" falls too low or when the DAI is repaid to release the "collateral". See, eg, Maker Foundation, "Maker Protocol 101" pp 8 and 27, available at: https://docs.makerdao.com/getting-started/maker-protocol-101.

9.32 Because of these difficulties, we conclude that the law should not draw any automatic conclusions from changes to the constitution of third category things on transfer.[1097] Instead, the applicability of following or tracing (or both) on a given fact pattern should be determined on a case-by-case basis with specific reference to the technology in question. Taking an overly general, technologically ambivalent approach could lead to improper analogies being drawn with other types of transfer of other objects of personal property rights, which in turn could generate even more conceptual ambiguities within the law relating to following and tracing.[1098]

9.33 Another important reason for applying the evidentiary processes of following and tracing on a case-by-case and technology-responsive basis is that there is limited consensus as to the underlying rationale of this area of law. For example, although it has been held that tracing is based in the law of property,[1099] some academics have argued that the true basis is instead the law of unjust enrichment.[1100] Further, others have put forward a hybrid approach, suggesting that there are two sets of tracing rules, one operating against knowing recipients (grounded in accounting-based rules), and the other operating against innocent recipients (grounded in unjust enrichment).[1101] It has also been suggested that the law of tracing, insofar as it relates to tracing through bank accounts, is flawed, and that a better approach would focus more closely on the defendant's proximity to the factual injustice.[1102]

9.34 We do not express a view on what we consider to be the proper basis of the law of tracing, because that involves wider questions beyond the scope of this report. We simply highlight that many disputes focusing on third category things, particularly crypto-tokens, are likely to involve the application of principles relating to both following and tracing. The high frequency of disputes and litigation in this context, exacerbated by the large number of crypto-related frauds and scams, are likely to serve as a catalyst for development of the law relating to following and tracing. Again, we consider that the work of the technical expert group will be useful for the courts if

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1097 Professor Cutts p 972. See also Ashurst LLP p 88 (para 4.76): "By reason of the Law Commission's approach to the transfer of crypto-tokens, the Law Commission also appears to view the options between following and tracing as binary in relation to the much wider category of data objects. We consider such a restrictive approach to be unnecessary. Both following and tracing are evidential processes. Both may be applicable. The applicability of one over the other is to be determined by the facts of a given case to determine the most appropriate analytical process."

1098 See T Cutts, "Dummy asset tracing" (2019) 135 *Law Quarterly Review* 140.

1099 *Foskett v McKeown* [2001] 1 AC 102 at 127, by Lord Millett: "The transmission of a claimant's property rights from one asset to its traceable proceeds is part of our law of property, not of the law of unjust enrichment. … Property rights are determined by fixed rules and settled principles. They are not discretionary. They do not depend upon ideas of what is "fair, just and reasonable"."; P Millett, 'Proprietary Restitution' in S Degeling and J Edelman, *Equity in Commercial Law* (2005) p 325.

1100 A Burrows, *The Law of Restitution* (3rd ed 2011) ch 6.

1101 M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 32-027.

1102 Professor Cutts argues that a defendant should be liable "either because [they] actuated or participated in a breach of some duty owed to the claimant, or because the claimant's agent lacked the authority to effect the bank transfer to [them]": T Cutts, "Dummy Asset Tracing" (2018) pp 29–30, available at: https://eprints.lse.ac.uk/87541/1/Cutts_Dummy%20Asset%20Tracing_Author.pdf; T Cutts, "Dummy asset tracing" (2019) 135 *Law Quarterly Review* 140.

they are accurately and consistently to apply and develop complex evidentiary processes and legal principles in this area.

BREACH OF TRUST, EQUITABLE WRONGS, AND CONSTRUCTIVE TRUSTS

Breach of pre-existing duties

9.35 A trustee can be held liable for breach of trust if they "wrongfully exceed the equitable authority conferred upon [them] by the trust instrument or by the general law".[1103] Separately, a breach of fiduciary duty typically arises where the fiduciary abuses their position of trust for their own advantage and/or places themselves in a position in which their duty conflicts with their personal interests.[1104] Claims for both breach of trust and breach of fiduciary duty may give rise to proprietary or personal remedies.[1105]

9.36 As regards proprietary remedies, trust beneficiaries generally retain a beneficial interest in misapplied trust property and its traceable proceeds.[1106] This interest binds any person who acquires the property (or its traceable proceeds), except a good faith purchaser for value without notice of the beneficiary's equitable interest.[1107] Additionally, a claimant may be able to take advantage of a constructive trust imposed on trustees and other fiduciaries to prevent them from profiting from their position.[1108]

9.37 Personal remedies might also be available. If a trustee commits a breach of trust which causes a loss,[1109] the trustee might be required to pay "equitable compensation" to restore the fund to the position that it would have been in had the breach not occurred.[1110] An aggrieved beneficiary might also pursue a third party for dishonest assistance.[1111] Alternatively, a third party that receives property disposed of

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1103 *Snell's Equity* (34th ed 2019) para 30-001.

1104 Without having first obtained informed consent from their principal. See *Bristol & West Building Society v Mothew* [1998] Ch 1 at 18, by Millett LJ. For more detail, see para 19.55 of our consultation paper; see also Chapter 7 (Intermediated holding arrangements) from para 7.123.

1105 M Bridge, L Gullifer, K Low and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 36.023.

1106 See paras 19.44–19.45 of our consultation paper.

1107 *Foskett v McKeown* [2001] 1 AC 102 at 127–128, by Lord Millett. This includes both trustees in breach of trust and innocent third-party recipients who have, for example, been gifted assets by a defaulting trustee.

1108 For example, a fiduciary who receives a bribe or secret commission in breach of fiduciary duty will hold that profit on constructive trust for their principal: *FHR European Ventures LLP v Cedar Capital Partners LLC* [2014] UKSC 45, [2015] AC 250. See further Chapter 7 (Intermediated holding arrangements) paras 7.123–7.129.

1109 A trustee may for example fail to exercise proper care when selecting investments. See Trustee Act 2000, s 3; *Pauling's Settlement Trusts (No 2)* [1963] Ch 576 at 586, by Wilberforce J; *Byrnes v Kendle* [2011] HCA 26 (High Court of Australia) at [119], by Heydon and Crennan JJ. On the relationship between trusteeship and crypto-tokens, see generally L Brown, "Cryptocurrencies and trustees: what are the risks?" (2023) 29(3) *Trusts & Trustees* 186.

1110 *AIB Group (UK) Plc v Mark Redler & Co Solicitors* [2014] UKSC 58, [2015] AC 1503. See *Snell's Equity* (34th ed 2019) para 30-011.

1111 This is an accessorial form of liability, applicable to a defendant who dishonestly assists or induces a trustee or fiduciary to commit a breach of trust or other fiduciary duty: *Snell's Equity* (34th ed 2019) paras 30-077–30-082.

in breach of fiduciary duty[1112] or breach of trust[1113] might be (personally)[1114] liable for knowing receipt.[1115]

9.38 In our consultation paper we provisionally concluded that the principles governing the award of equitable remedies are sufficiently flexible to be applied in situations where third category things such as crypto-tokens are held on trust,[1116] as well as where third category things are dealt with by fiduciaries.[1117] Consultees agreed,[1118] and no response suggested that we deviate from our provisional conclusion.[1119] We therefore do not recommend law reform, on the basis that the existing law in this area is capable of accommodating third category things.

Constructive trust arising in cases of theft and fraud

9.39 In cases of theft or fraud, a constructive trust may arise as soon as the object of personal property rights is received by the thief or fraudster.[1120] This enables the victim to take advantage of equitable remedies, for example, to trace their interest in a thing through a mixture.[1121] The meaning of "fraud" in this context applies only to those situations in which a defendant commits a "fraudulent appropriation [of a thing] without any legally effective consent from the victim".[1122] It would not encompass a situation in which the defendant induces the victim to transfer a thing in which they have a property right by making a fraudulent misrepresentation. In such a case, although the victim's consent is defective, its presence at the point of transfer means that legal transfer would be unencumbered by any trust interest, although subject to

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1112 *Arthur v A-G of the Turks and Caicos Islands* [2012] UKPC 30.

1113 *Novoship (UK) Ltd v Mikhaylyuk* [2014] EWCA Civ 908, [2015] QB 499.

1114 *Paragon Finance plc v DB Thakerar and Co* [1999] 1 All ER 400 at 408, by Millett LJ.

1115 The claimant must show that the trust property was disposed of in breach of fiduciary duty or breach of trust, and that this property (or its traceable proceeds) was received by the defendant for their own benefit (in the knowledge that the trust property had been transferred in breach of fiduciary duty or breach of trust): *El Ajou v Dollar Land Holdings Plc* [1994] 1 All ER 685; *Bank of Credit and Commerce International (Overseas) Ltd v Akindele* [2001] Ch 437, 438 (CA). See further *Lewin on Trusts* (20th ed 2020) para 42-023.

1116 See paras 19.66–19.69 of our consultation paper. We discussed the contexts where digital assets may be held on trust in paras 16.52–16.74 of our consultation paper.

1117 See paras 19.66–19.69 of our consultation paper. See also Chapter 7 (Intermediated holding arrangements) paras 7.123–7.129.

1118 See n 1026 above for the structure of responses to consultation question 42. Five consultees responded specifically on equitable wrongs. Three agreed, one provided qualified agreement, and one gave a mixed response.

1119 Law Society (at pp 723–724) generally agreed with our provisional conclusion but noted that questions might arise in practice as to the existence or otherwise of fiduciary relationships in crypto-token contexts, citing the ongoing *Tulip Trading* litigation ([2023] EWCA Civ 83, [2023] 4 WLR 16; [2022] EWHC 667 (Ch)). In its response, CILEX wrote that its survey data "indicates that … Equitable Wrongs have a mixed view from our members regarding the requirement for Statutory Law Reform" (at p 278 (para 6.4)). This was not elaborated on.

1120 *Westdeutsche Landesbank Girozentrale v Islington London Borough Council* [1996] AC 669 at 716, by Lord Browne-Wilkinson.

1121 D Fox, *Property Rights in Money* (2008) para 4.106.

1122 Above para 4.99.

the victim's equity to rescind.[1123] A constructive trust would only arise (if at all) at the point when the victim exercises their right to rescind.[1124]

9.40 Even though it appears that in cases of theft (or fraud as described above) a constructive trust may arise when the transferred thing is received by the thief or fraudster, a conceptual difficulty arises concerning the nature of any right held on constructive trust by the defendant. This is because in such cases superior legal title does not pass to the thief or fraudster.[1125] One possible answer, advanced by Professor Fox, is that it is the thief's purely possessory title which constitutes the subject of the constructive trust.[1126]

9.41 A constructive trust analysis was adopted by Stephen Morris QC (sitting as Deputy High Court Judge) in *Armstrong DLW GmbH v Winnington Networks Ltd* in relation to intangible European Union Allowances ("EUAs").[1127] The court acknowledged that the fraudster held the EUAs on constructive trust after having acquired "possession" or "control" over the EUAs which gave them "some form of de facto legal title".[1128] Even though this decision supports the proposition that a constructive trust can arise in cases of fraud involving intangible things, it is not clear whether the judgment supports the analysis suggested by Professor Fox. This is because the proprietary restitutionary claim at law (which requires the claimant to have retained superior legal title) and the personal claim for knowing receipt arising in equity (which presupposes a loss of superior legal title) were advanced as alternative causes of action or legal bases for the claim.[1129]

[1123] In general, a mere equity is a claimant's inchoate (imperfectly formed) right to rescind or to claim an equitable interest which is binding on specific property. That inchoate right will transform into an equitable proprietary claim (an equitable interest) if and when the person chooses to enforce it. In other words, the person must perform some other act to cause their mere equity to crystallise as an equitable interest. See *Snell's Equity* (34th ed 2019) para 2-006.

[1124] *Snell's Equity* (34th ed 2019) para 26-013; *Shalson v Russo* [2003] EWHC 1637 (Ch), [2005] Ch 281 at [108] and [111], by Rimer J; B Häcker, "Proprietary restitution after impaired consent transfers: a generalised power model" (2009) 68(2) *Cambridge Law Journal* 324.

[1125] *Shalson v Russo* [2003] EWHC 1637 (Ch), [2005] Ch 281 at [109]–[118], by Rimer J. See further: S Thomas, "Thieves as Trustees: The Enduring Legacy of *Black v S Freedman & Co Ltd*" (2009) 3 *Journal of Equity* 52.

[1126] D Fox, *Property Rights in Money* (2008) paras 4.103–4.106; J Tarrant, "Thieves as Trustees: In Defence of the Theft Principle" (2009) 3 *Journal of Equity* 170. This analysis is endorsed in *Snell's Equity* (34th ed 2019) para 26-012 and G Virgo, *The Principles of Equity & Trusts* (5th ed 2023) pp 292–293.

[1127] *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156. EUAs are a form of carbon emissions allowance – see [1] and paras 4.67–4.75 above.

[1128] Above at [276].

[1129] Above at [287]. What is not clear is whether, although the causes of action seem to have been argued in the alternative, the causes of action needed to have been treated by the claimant or the court as mutually exclusive, given the argument made by Professor Fox (see n 1126 above). See L Chambers and C Buckingham, "Intangible Property and Proprietary Restitution in the High Court" (2013) 3 *Lloyd's Maritime and Commercial Law Quarterly* 296.

Application to third category things

9.42 These principles have been applied in the context of third category things.[1130] However, we note that, in several cases, it is unclear whether the claimant is the victim of a theft (where the superior legal title remains with the victim) or the victim was defrauded in circumstances where the superior legal title passes to the fraudster (and the transaction was subsequently rescinded).[1131] This leads to some difficult issues with interpreting whether (and if so, how and why) the common law has developed in this area. Although this issue is not unique to third category things, we consider that given the nascent market and the relatively common instances of theft or fraud in such markets, more cases are likely to arise concerning third category things (particularly crypto-tokens and NFTs). We conclude that it is inevitable that some interpretative difficulties will arise in relation to the application of complex legal principles to emerging asset classes and new technology, especially where those issues arise in connection with arguments for the granting of interim relief.[1132] This is particularly likely to be the case where alternative causes of action are argued to achieve functionally similar results. We conclude that the common law is perfectly able to evolve in a logical and clear way where the facts at hand are described clearly and in full, and where legal principles are logically and consistently applied to distinct causes of action.[1133]

9.43 For example, it is important that distinctions are drawn between third category things or crypto-tokens that are self-held or held in "self-custody" and those that are held in an intermediated holding arrangement, or a non-holding arrangement. These kinds of factual distinctions might be particularly important in the context of constructive trusts when clarifying:

(1) whether (and when) a beneficial interest under a constructive trust arises;[1134]

(2) when a beneficial interest under a constructive trust can be extinguished by a good faith purchaser for value without notice;[1135] and

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1130 *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch) at [23]–[30], by Trower J; *Osbourne v Persons Unknown* [2023] EWHC 340 (KB) at [24], by James Healy-Pratt; *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm) at [25]–[27], by Judge Pelling QC; *Wang v Darby* [2021] EWHC 3054 (Comm), [2022] Bus LR 121 at [60]–[92], by Stephen Houseman QC; *LMN v Bitflyer Holdings Inc* [2022] EWHC 2954 (Comm) at [19], by Butcher J; *Jones v Persons Unknown* [2022] EWHC 2543 (Comm) [21]–[31], by Nigel Cooper QC; *D'Aloia v Persons Unknown* [2022] EWHC 1723 (Ch) at [12]–[27], by Trower J.

1131 *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm) paras [8] and [25]–[27] (see paras 19.132–19.134 of our consultation paper; *Jones v Persons Unknown* [2022] EWHC 2543 (Comm), criticised by T Chan and K Low, "Post-Scam Crypto Recovery: Final Clarity or Deceptive Simplicity?" (2023), available at: https://ssrn.com/abstract=4394820.

1132 Many of the cases involving crypto-tokens and NFTs involved interim applications in which a party was seeking an order or directions before the substantive hearing of a claim. They were therefore concerned with specific preliminary issues (such as whether the court has, or should accept jurisdiction), and subject to rules which limit the extent to which these issues are argued before the court.

1133 For a discussion of this point, see *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch).

1134 See above n 1130.

1135 See *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch) at [23]–[30], by Trower J. See also from para 6.56 in Chapter 6 (Transfers) where we discuss common law special defences of good faith purchase for value without notice and the equitable principle of good faith purchase for value without notice.

(3) whether a control-based legal proprietary interest to a crypto-token can be the subject matter of the constructive trust held for the benefit of a victim of theft who (also) retains the (superior) legal title.[1136]

9.44 Each of these clarifications would provide greater legal certainty to those persons affected by fraud or theft of crypto-tokens (including subsequent holders of those crypto-tokens). We think that clarity in this context will be significantly assisted by the work of the technical expert group, given that many issues will involve complex arrangements, holding patterns and/or legal relationships with crypto-tokens.[1137]

BURNING TOKENS

9.45 In the following three sections we consider proprietary restitutionary claims at law, unjust enrichment, and the tort of conversion. Along with considering the general application of these causes of action to third category things, we also explore their effectiveness in responding to one specific technological scenario that can affect crypto-tokens: "burning".[1138]

9.46 Broadly, burning involves irreversibly sending a crypto-token to a "burn address". A burn address is a public address the private key to which is unknown. Sending crypto-tokens to a burn address is normally done to remove tokens from circulation, thus reducing the total number and so "burning" or "destroying" them.[1139] Burning can be done for many valid reasons within crypto-token ecosystems — indeed, since the August 2021 implementation of Ethereum Improvement Proposal (EIP) 155, burning tokens is an integral part of the Ethereum system.[1140] However, it is also possible that a person sends another person's crypto-tokens to a burn address without consent, thus irreversibly removing the tokens from circulation. We consider that the private law of England and Wales does not currently provide an adequate cause of action for a claimant whose token has been burned without consent. None of proprietary restitution, unjust enrichment, or the tort of conversion can currently provide redress in such a situation. We therefore consider that crypto-tokens systems might present novel factual circumstances which could give rise to potential lacuna in the law that

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[1136] See *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [272]–[276], by Stephen Morris QC and *Jones v Persons Unknown* [2022] EWHC 2543 (Comm) at [21], by Nigel Cooper QC. As we discuss from para 9.39 above, and from para 19.125 of our consultation paper, we do not think these cases provide conclusive authority for the proposition that some form of control-based legal proprietary interest to a crypto-token can be the subject matter of a constructive trust held for the benefit of a victim of theft who (also) retains the superior legal title. Nevertheless, we think that this argument is conceptually more appealing when applied to crypto-tokens than things in action, given the position put forward in this report that a control-based legal proprietary interest can be separated from (and be inferior to or short of) a superior legal title to a crypto-token (whereas that is not possible for a thing in action).

[1137] Chapter 5 (Control) from para 5.23.

[1138] Burning is discussed in the context of remedies by Hin Liu, who in response to our consultation paper provided an early draft of "Interference torts in the digital asset world", which is now on SSRN, available at: https://ssrn.com/abstract=4433956.

[1139] M Graham, "Burning Crypto Tokens: What Does it Mean & How Does it Work?" (2022), https://boardroom.tv/burning-crypto-tokens-definition/#:~:text=Benefits%20of%20burning%20crypto&text=For%20coins%20like%20Bitcoin%2C%20there,proof%2Dof%2Dstake%20network.

[1140] See https://notes.ethereum.org/@vbuterin/eip-1559-faq; and https://consensys.net/blog/quorum/what-is-eip-1559-how-will-it-change-ethereum/.

would deny a claimant an effective cause of action. Burning of tokens without consent is just one current example.

PROPRIETARY RESTITUTIONARY CLAIMS AT LAW

9.47 In *Armstrong DLW GmbH v Winnington Networks Ltd*, the claimant brought various claims to recover the value of EUAs, which had been transferred from the claimant to the defendant's account by a third party.[1141] Stephen Morris QC held there to be a basis of claim known as proprietary restitution.[1142] This claim, the judge held, is grounded in the claimant's subsisting legal property rights in an asset held by the defendant, and is distinct from a claim for restitution of an unjust enrichment.[1143]

9.48 It was held that a claim for proprietary restitution will not arise where the asset in question is land, a chattel, or a documentary intangible. This is because there are existing torts that respond to interferences with those types of asset.[1144] Stephen Morris QC said further that a proprietary restitutionary claim can only avail a claimant retaining legal title in a "[thing] in action or other intangible property".[1145] We therefore provisionally concluded in our consultation paper that it was arguable that, following the decision in *Armstrong*, a proprietary restitutionary claim would, in principle, be available where the claimant retains legal title to a particular third category thing.[1146]

9.49 We said that the availability of a claim for proprietary restitution might be useful for two reasons. First, such a claim would (helpfully) not be subject to the limitation applicable to the tort of conversion (that is, that the property in question must be a tangible thing capable of possession).[1147] Second, the claim would also not be subject to the

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1141 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156.

1142 Above at [84]–[85], by Stephen Morris QC. It is worth noting that the existence of a proprietary restitutionary claim at law, as distinct from a claim in unjust enrichment, has been criticised by a number of commentators, especially as regards claims to property which is substituted for the original property received. See P Birks, *Unjust Enrichment* (2nd ed 2005) pp 34 to 36; A Burrows, "Proprietary Restitution: Unmasking Unjust Enrichment" (2001) 117 *Law Quarterly Review* 412.

1143 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [84]–[85], by Stephen Morris QC.

1144 Above at [86].

1145 Above at [94].

1146 See paras 19.73–19.76 of our consultation paper. Even so, it is important to note that, as a general rule, the common law has no proprietary remedies *(OBG Ltd v Allan* [2007] UKHL 21, [2008] AC 1 at [308], by Baroness Hale). Consequently, if the claimant has retained legal title to the object of personal property rights which was received by the defendant, the claimant can only claim the value of the property rather than the property itself (*Trustee of the Property of FC Jones and Sons (a firm) v Jones* [1997] Ch 159 at 168, by Millett LJ). The only true exception to this relates to land, where the claimant is able to recover land from the defendant. There is also the remedy of delivery up of goods under s 3(3) of the Torts (Interference with Goods) Act 1977, which is a proprietary remedy which is available where the defendant has committed a tort involving interference with the claimant's property rights, such as conversion. But this remedy is discretionary and is only available where compensatory damages are an inadequate remedy.

1147 See below para 9.63. D Fox, "Cryptocurrencies in the Common Law of Property" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 6.102

limitations of claims in unjust enrichment, which would not succeed on *Armstrong*-type three-party fact pattern.[1148]

9.50 A claimant can only make out a proprietary restitutionary claim at law where they retain the legal title to the object of personal property rights in question (or its traceable substitute). Whether the claimant retains legal title depends on the applicable rules of derivative transfer of title.[1149] Further, before being able to assert such a claim the claimant would need either to follow or trace the third category thing (or its traceable substitute) into the hands of the defendant. Stephen Morris QC framed the proprietary restitutionary claim as available regardless of whether tracing or following was applicable.[1150]

9.51 In our consultation paper we acknowledged existing criticisms of *Armstrong*, but did not suggest law reform to the position specifically in the context of third category things. Consultees broadly agreed with our position.[1151] We conclude that any change in this area (if necessary) would be best left to the common law in general, and should not be implemented by law reform specific to third category things.

Burning tokens

9.52 However, we acknowledge that a proprietary restitutionary claim would likely not be available in the case of unauthorised burning of tokens without further common law development. Stephen Morris QC made clear in *Armstrong* that a successful proprietary restitutionary claim requires there to be "subsisting legal property rights in an asset held by the defendant."[1152] When a crypto-token is burned it is sent to an inaccessible wallet, out of both the claimant's and defendant's control, it is irrevocably removed from circulation. A defendant who sent another person's crypto-token to a burn address without consent will therefore hold neither the original object of personal

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[1148] Such a claimant's claim for restitution of an unjust enrichment would be unlikely to succeed for several reasons, one being that the claimant will not be able to demonstrate that the defendant was enriched at their expense. Instead, the defendant's enrichment was at the expense of the third party, who transferred the property to them. See generally, *Investment Trust Companies v Revenue and Customs Commissioners* [2017] UKSC 29, [2018] AC 275, and *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [95]–[98], by Stephen Morris QC.

[1149] We discuss how the law on derivative transfer of title is applicable to crypto-tokens and third category things in Chapter 6 (Transfers) and in Chapter 13 of our consultation paper.

[1150] *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [85], by Stephen Morris QC: "The asset in respect of which the claimant is asserting a claim may be identified by following the claimant's original asset into the defendant's hands or by tracing it into a substitute asset in the defendant's hands".

[1151] See above n 1026 for the structure of responses to consultation question 42. Four consultees responded specifically on proprietary restitution. Two agreed, one provided a mixed response, and one disagreed. The one consultee in disagreement – CILEX – suggested without elaboration that further consideration might be needed in relation to the application of proprietary restitution to digital assets. For further consideration of proprietary restitution in relation to the burning of crypto-tokens, see below paras 9.52–9.54.

[1152] Above at [85].

property rights, nor any substitute object of personal property rights, meaning a proprietary restitutionary claim would, in principle, likely not be available.[1153]

9.53 We do not think that this position should be reformed. It is fundamental to proprietary restitution that the defendant holds the object of personal property rights (or its traceable substitute), because the action's core purpose is to vindicate legal property rights in a thing held by the defendant.[1154] To alter this requirement, such as to facilitate a proprietary restitution claim where the defendant no longer holds the object of personal property rights (or its traceable substitute), would conflict with the conceptual foundations of the cause of action. This is because such a cause of action would focus not on the defendant's retention of the thing (or its traceable substitute) in which the claimant has a property right, but on the defendant's wrongful interference.

9.54 We therefore conclude that proprietary restitutionary claims are helpful in the context of third category things, but might not be available in certain circumstances (such as where a defendant sent another person's crypto-token to a burn address without consent). Given the limited factual circumstances in which a proprietary restitutionary claim would not be available, and the extent of common law development that would be required to facilitate such a claim, we do not think that further development in this area is desirable. Expanding the scope of proprietary restitutionary claims to encompass burning would risk developing proprietary restitution beyond its conceptual foundation, which might lead to a proprietary restitutionary claim being available in other circumstances (not involving third category things) where one ought not be available.

UNJUST ENRICHMENT

9.55 Claims based on unjust enrichment do not depend on the existence of any contract. Rather, under the law of England and Wales, unjust enrichment is a distinct source of rights and obligations.[1155] A claim in unjust enrichment is "not a claim for compensation for loss, but for recovery of a benefit unjustly gained [by a defendant] at the expense of the claimant".[1156] For a successful claim, the claimant must show:[1157] (1) that the defendant was enriched; (2) that the enrichment was at the expense of the claimant; and (3) that the enrichment was unjust. Where liability is established,[1158] the

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1153 G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 558. Professor Virgo considers that, where a personal remedy to a proprietary restitutionary claim (at law) is sought, it might not be necessary for the defendant to retain the object of personal property rights. However, this proposition is based on the availability of an action for money had and received, which was expressly rejected as the basis of a proprietary restitutionary claim in *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [90], by Stephen Morris QC. See further N McBride, "mcbridesguides: *Armstrong v Winnington Networks Ltd"* (2013), available at: http://mcbridesguides.com/wp-content/uploads/2013/08/armstrong-v-winnington-networks-ltd.pdf.

1154 *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [85] and [88], by Stephen Morris QC. See also [67] and [68] which discusses the distinction between following EUAs and tracing substitute proceeds, although this distinction was not made again at [287].

1155 *Chitty on Contracts* (34th ed 2021) para 3.088.

1156 *Boake Allen Ltd v HMRC* [2006] EWCA Civ 25, [2006] STC 606 at [175], by Mummery LJ.

1157 *Banque Financière de la Cité v Parc (Battersea) Ltd* [1999] 1 AC 221 at 227, by Lord Steyn.

1158 A defendant to an unjust enrichment claim may be able to raise a defence, such as change of position: *Lipkin Gorman v Karpnale Ltd* [1991] 2 AC 548 at 580, by Lord Goff.

court will order restitution (the purpose of which is to reverse the defendant's enrichment) which normally takes the form of a monetary award representing the value of the enrichment.[1159]

9.56 Courts in England and Wales have already recognised the potential availability of a claim in unjust enrichment in the context of third category things, including crypto-tokens.[1160] In our consultation paper, we concluded that the existing principles of unjust enrichment can be applied to disputes involving third category things in the same way as they are to other objects of personal property rights.[1161] Those consultees that responded broadly agreed.[1162] The fact that third category things, such as crypto-tokens, are recognised as falling within a distinct category of things to which personal property rights can relate does not require a reform or development of the principles of the law of unjust enrichment. Nonetheless, the application of existing principles to third category things may give rise to novel considerations. For example, determining the nature and value of an enrichment where a crypto-token is involved (particularly a crypto-token that is linked to something external to the system) might be difficult.[1163] Challenges might also arise when establishing that the defendant's enrichment was at the claimant's expense, particularly given the complex ways in which crypto-tokens can be transferred.[1164]

Burning tokens

9.57 We conclude that a claim in unjust enrichment would not be available in the case of unauthorised burning of tokens without further common law development. Hin Liu suggests that where a claimant's crypto-token is burned, then:[1165]

> Unjust enrichment is … of limited assistance, because … burning does not involve an enrichment to the defendant. There may also be issues with establishing the 'at the expense of' requirement or the unjust factor.

1159 *Bank of Cyprus UK Limited v Menelaou* [2015] UKSC 66, [2016] AC 176 at [81], by Lord Neuberger.

1160 *Fetch.ai Ltd v Persons Unknown* [2021] EWHC 2254 (Comm). See also the Malaysian case of *Robert Ong Thien Cheng v LUNO Pte Ltd* [2021] 3 All Malaysia Rep 143 (albeit considering section 73 of the Malaysian Contracts Act 1950, not the common law of unjust enrichment). See further: A W-L See and M Yip, "Restitution of Mistakenly Transferred Bitcoins" (2022) 1 *Lloyd's Maritime and Commercial Law Quarterly* 46.

1161 For more detail, see paras 19.80–19.86 of our consultation paper.

1162 See above n 1026 for the structure of responses to consultation question 42. Four consultees responded to our consultation question on unjust enrichment. Three agreed and one disagreed.

1163 The analysis of an enrichment might also depend on whether the crypto-token in question is non-fungible or fungible, as this will be relevant for determining the market value of such things. Similarly, questions of timing could play an important role, particularly where the value of digital objects such as crypto-tokens and NFTs fluctuates significantly. For example, see *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm); *Osbourne v Persons Unknown* [2023] EWHC 39 (KB); *Osbourne v Persons Unknown* [2023] EWHC 340 (KB).

1164 Establishing enrichment at the claimant's expense may require reference to principles of following or tracing – see above from para 9.24.

1165 Hin Liu provided an early draft of "Interference torts in the digital asset world", which is now on SSRN, available at: https://ssrn.com/abstract=4433956. The content referenced by this footnote is available at p 3 of the SSRN draft.

9.58 We broadly agree. Although the burning of a claimant's crypto-token without consent is not necessarily inconsistent with the defendant being enriched simply by the taking control of it,[1166] there does not seem to be an unjust factor available to assist a claimant on such a fact pattern. Some academic scholarship has suggested that there exists an unjust factor broadly described as "ignorance"[1167] or "lack of consent", which renders an enrichment unjust when it stems from a transfer of value to a defendant without the "consent"[1168] of the claimant. Such an unjust factor has been recognised in some common law jurisdictions, such as Singapore.[1169] However, this has not been uncontroversial.[1170] Further, although the High Court in *Relfo Ltd v Varsani* held that "lack of proper consent" could constitute a ground for restitution,[1171] the extent of the impact of this recognition has been queried.[1172] It is therefore not entirely clear whether this unjust factor forms part of the law of England and Wales.[1173]

9.59 On a conservative analysis, it seems that the common law of unjust enrichment might not currently ground an actionable claim following a defendant's burning of a claimant's crypto-token without consent.[1174] We do not however recommend law reform to change the position. That is for two reasons. First, introducing a new unjust factor to deal with the relatively small lacuna considered in this chapter would mean a significant development the boundaries of unjust enrichment in response to a relatively small and asset-specific issue.

9.60 Second, we do not think that the principles underlying unjust enrichment map neatly to factual scenarios involving burning. The function of unjust enrichment is to disgorge a defendant of an enrichment unjustly obtained at the claimant's expense.[1175] There is an argument that a defendant might be enriched as a technical matter as part of the process of burning a claimant's crypto-token without consent. However, we consider that a better reason for subjecting the defendant to liability is due to their wrongful interference with the claimant's object of personal property rights. It is this wrongdoing

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1166 If the defendant obtained control of the claimant's crypto-token at any point during the burning process, they are likely to have been enriched, regardless of their subsequent loss of the token: *Agip (Africa) Ltd v Jackson* [1990] Ch 265 at 285, by Millett J.

1167 A Burrows, *The Law of Restitution* (3rd ed 2011) ch 16.

1168 *Goff & Jones: The Law of Unjust Enrichment* (10th ed 2022) ch 8.

1169 *Esben Finance Ltd v Wong Hou-Lianq Neil* [2022] SGCA(I) 1.

1170 R Leow and T Liau, "A Pyrrhic Victory for Unjust Enrichment in Singapore? *Esben Finance Ltd v Wong Hou-Lianq Neil*" (2023) 86(2) *Modern Law Review* 518.

1171 [2012] EWHC 2168 (Ch) at [86], by Sales J.

1172 The outcome in *Relfo Ltd v Varsani* was upheld by the Court of Appeal ([2014] EWCA Civ 360), although without discussion of the unjust factor/ground for restitution. *Goff & Jones: The Law of Unjust Enrichment* (10th ed 2022) at p 245 treats this case as judicial endorsement of the existence of a "lack of consent" ground for restitution. However, the judgment and its potential implications have also received criticism, see L Chambers and C Buckingham, "Intangible Property and Proprietary Restitution in the High Court" (2013) 3 *Lloyd's Maritime and Commercial Law Quarterly* 296 at 302.

1173 For criticism, see: W Swadling, "Ignorance and Unjust Enrichment: The Problem of Title" (2008) 28(4) *Oxford Journal of Legal Studies* 627; R Chambers and J Penner, "Ignorance" in S Degeling and J Edelman, *Unjust Enrichment in Commercial Law* (2008) ch 13.

1174 G Virgo, *The Principles of the Law of Restitution* (3rd ed 2015) p 152.

1175 *Boake Allen Ltd v HMRC* [2006] EWCA Civ 25, [2006] STC 606 at [175], by Mummery LJ.

that is the key factual element. Any enrichment is peripheral (and transient). This is likely to matter when determining the appropriate remedy for a claimant. Focusing on the harm to the claimant caused by the defendant's wrongdoing would allow the law to award a remedy based on the loss to the claimant. This could potentially take into account consequential losses flowing from the defendant's wrongdoing.[1176] Conversely, the law of unjust enrichment would focus on restitution based on the value of the defendant's enrichment. This could potentially be a smaller amount that arguably might be less reflective of the defendant's damage to the claimant's position.

THE TORT OF CONVERSION

9.61 In our consultation paper we provisionally concluded that there are arguments in favour of extending the tort of conversion or a conversion-type cause of action, grounded in control rather than possession, to third category things. We said that, in light of the decision in *OBG Ltd v Allan*,[1177] extending conversion to third category things would most likely need to be by way of statute, rather than by development of the common law. In this report we do not recommend statutory law reform to extend the application of the tort of conversion to third category things. However, we conclude it would be possible for the courts to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things such as digital objects.

The general law

9.62 When a person's tangible property is interfered with by another, they can sue in the tort of conversion.[1178] The tort's three elements are:[1179] (1) a claimant who has the superior possessory right; (2) a deprivation of the claimant's full benefit of that right; and (3) an assumption by the defendant of that right. Conversion is a strict liability tort. This means that the defendant's liability does not depend on how reasonable or well-intentioned their actions were,[1180] nor on whether the defendant knew that they were wrongly interfering with objects of the claimant's personal property rights.[1181] The standard remedy for conversion is an award of damages, with delivery up (that is, return of the property to the claimant) being available in certain circumstances.[1182]

1176 *Kuwait Airways v Iraq Airways Co* [2002] UKHL 19; [2002] 2 AC 883 at [67], by Lord Nicholls; *Clerk & Lindsell on Torts* (23rd ed 2020) paras 16-95–16-107.

1177 *OBG Ltd v Allan* [2007] UKHL 21, [2008] 1 AC 1.

1178 See paras 19.89–19.99 of our consultation paper.

1179 S Green and J Randall, *The Tort of Conversion* (2009) p 75.

Professor Sarah Green is the Commissioner for Commercial and Common Law at the Law Commission of England and Wales, and lead Commissioner for this project.

1180 See *Tongue v RSPCA* [2017] EWHC 2508 (Ch) where the defendant was liable in conversion for moving cattle from an absent farmer's land without permission, although this was done to enable the cattle to be better cared for. See also *Marfani & Co Ltd v Midland Bank Ltd* [1968] 1 WLR 956 at 970–971, by Diplock LJ

1181 *Marfani & Co Ltd v Midland Bank Ltd* [1968] 1 WLR 956 at 970–971, by Diplock LJ, who noted that this principle was "subject to some exceptions".

1182 Section 3(2) of the Torts (Interference with Goods) Act 1977 provides several remedies for conversion. For further detail and relevant authorities, see paras 19.92–19.94 of our consultation paper.

9.63 Conversion lies in respect of dealings with things in possession. Courts have held that intangible property cannot form the subject matter of the tort.[1183] In *OBG Ltd v Allan,*[1184] the House of Lords ruled that, since contractual rights are a type of intangible property, and intangible property cannot be possessed, an action in conversion could not lie in respect of them. The existing judicial authority therefore prevents intangible things in action from being the subject matter of the tort of conversion, and we think this likely encompasses third category things as well.[1185] We therefore provisionally concluded in our consultation paper that third category things cannot be the subject matter of the tort of conversion under the law as it stands. However, we suggested that there are good policy arguments for the extension of the tort to third category things,[1186] noting that in light of the decision in *OBG Ltd v Allan*, any such development would most likely need to be by way of statute.[1187] We provisionally proposed that, if conversion were extended to third category things, the application of strict liability in that context could be mitigated by the introduction of a common law special defence of good faith purchaser for value without notice applicable to third category things.

The need for specific and discrete principles of tortious liability

9.64 Of the 31 consultees who responded to our consultation question on the extension of the tort of conversion (or the introduction of a conversion-type cause of action),[1188] 21 agreed outright, one provided qualified agreement, seven disagreed, and two gave mixed views. Many consultees agreed that the tort of conversion (or a conversion-type cause of action) should be extended to third category things. However, there was strong disagreement with our provisional proposal from some consultees.[1189] We consider consultees' arguments in more detail below.

Burning tokens and the remedial lacuna

9.65 We conclude above that claims in proprietary restitution or unjust enrichment would likely not be available in the case of an unauthorised burning of tokens without further

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1183 *OBG Ltd v Allan* [2007] UKHL 21, [2008] 1 AC 1 (incorporeal property); *Stewart v Engel* [2000] BCC 741 (copyright); *Murphy v Electoral Commission* [2019] EWHC 2762 (QB), [2020] 1 WLR 480 (information); *Your Response Ltd v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] QB 41 (documents stored electronically on a computer drive).

1184 [2007] UKHL 21, [2008] 1 AC 1.

1185 See paras 19.95–19.99 of our consultation paper; Electronic Trade Documents (2022) Law Com No 405 at pp 81–82.

1186 See para 19.103 of our consultation paper.

1187 See para 19.105 of our consultation paper. We also considered that reform to the Torts (Interference with Goods) Act 1977 would be needed: see para 19.106 of our consultation paper.

1188 See para 19.123 of our consultation paper. We asked consultees whether they agreed with our provisional conclusion that, in relation to the tort of conversion, there are arguments in favour of extending conversion (or a conversion-type cause of action grounded in control rather than possession).

1189 Six general arguments were made by consultees. First, that control is distinct from possession. Second, that there is a large amount of conceptual baggage associated with the tort of conversion. Third, that there are significant differences between third category things and tangible things that warrant different treatment. Fourth, that strict liability in conversion is not appropriate for interactions with third category things. Fifth, that other forms of legal protection are available. Sixth, that a new, distinct cause of action would be preferable. We touch on all of these in our discussion below.

development. We conclude that there are good reasons why the common law might be reticent to develop in a way that fills this lacuna.

9.66 Because we conclude that third category things are currently incapable of being converted under the existing law of England and Wales,[1190] the tort of conversion does not fill this lacuna. We do not suggest statutory law reform to change this position. However, we think that common law development of specific and discrete principles of tortious liability that protect interests in third category things would be a more appropriate common law development than extending proprietary restitution or unjust enrichment.

9.67 In relation to other intangible assets, such as things in action and intellectual property rights, there already exist dedicated torts[1191] and statutory protections[1192] (respectively) available to assist claimants.[1193] No such specialist causes of action exist however for third category things. On most fact patterns, claims in unjust enrichment,[1194] or for proprietary restitution,[1195] are likely to be available to a claimant whose crypto-tokens have been misappropriated. There remain however certain factual scenarios — such as where a claimant's token is burned without their consent — in which unjust enrichment or proprietary restitution will not assist a claimant.[1196]

9.68 Indeed, there may well be further scenarios — beyond those we can currently envisage — that also present a remedial lacuna. This is particularly likely given the continuing advancement of complex technology including Layer 2 applications and rollups[1197] and DeFi arrangements. In addition, given the myriad complex ways in which digital objects can be held and given that control can be joint, split, sharded or otherwise encumbered in a variety of different ways, other new and complex fact patterns could arise where there is no clearly applicable cause of action. We think therefore that the example of a person burning a crypto-token without consent is a useful hypothetical because it highlights the difficulties that might flow from having no cause of action (in a third category things context) that responds to a defendant's *wrongdoing*.

9.69 Unjust enrichment focuses on an unjust factor and a defendant's enrichment at the expense of the claimant. Proprietary restitution focuses on the defendant's retention of a thing (or its traceable proceeds) to which another person's property rights relate. While conversion is available for wrongful interference with things in possession, no such equivalent exists for third category things. It is for this reason, among others, that

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1190 See from para 19.95 of our consultation paper; Electronic Trade Documents (2022) Law Com No 405 at pp 81–82.

1191 For example, the tort of inducing (or procuring) a breach of contract – see *Clerk & Lindsell on Torts* (23rd ed 2020) para 23-04.

1192 See, for example*, Copinger and Skone James on Copyright* (18th ed 2020) ch 7.

1193 Clifford Chance LLP, pp 316–317.

1194 See above para 9.55.

1195 See above para 9.47.

1196 For arguments that there might already be sufficient forms of protection available in relation to third category things, see: Professor Sheehan p 483; Law Society p 724; and CLLS-FLC pp 533–534.

1197 See Glossary.

we consider an expansion to tortious liability, as opposed to developments of the legal principles in relation to unjust enrichment or proprietary restitution.[1198] In burning scenarios it is the defendant's wrongful interference with an object of personal property rights,[1199] rather than an unjust factor, their enrichment or their retention of another's object of personal property rights (or its substitute proceeds), that should attract liability. We think that a focus on wrongdoing is the more appropriate analytical concept from which to begin to develop causes of action that can apply to complex online interactions with digital objects. But we acknowledge the difficulties with applying the tort of conversion directly to such complex online interactions, particularly given that tort developed by reference to interferences with tangible things.[1200] As such, our conclusion seeks to limit the risk of undesirable consequences flowing from the wholesale application of the tort of conversion to digital objects. However, we think that filling this remedial lacuna is essential to ensuring that the law offers comprehensive legal protection to personal property rights in the digital age.[1201]

Vulnerability of third category things

9.70 The potential need for the development of specific and discrete principles of tortious liability in this context is supported by the vulnerability of third category things to interference. We consider that *OBG Ltd v Allan* was correct in preventing the application of conversion to things in action. Things in action are not vulnerable to interference in the same way as possessable things. As Simon Douglas said, things in action do not "have the quality of 'thing-relatedness', … the absence of a 'thing' to which it relates means that there is nothing a defendant can actually convert."[1202] But digital objects, such as crypto-tokens, *do* have a quality of "thing-relatedness", rendering them vulnerable to interference, deprivation and misappropriation. They are, as we say elsewhere in this report, susceptible to involuntary alienation. This

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1198 For reasons not to extend proprietary restitution, see above from para 9.53. For reasons not to extend unjust enrichment, see above from para 9.59.

1199 S Douglas, "The Scope of Conversion: Property and Contract" (2011) 74(3) *Modern Law Review* 329, 338.

1200 CLLS-FLC at pp 533–534 write that extending conversion directly in the context of third category things "would create unacceptable legal risk (as a strict liability tort) for operators/administrators of private, permissioned blockchain or DLT-based systems for the holding and transfer of such digital assets". The consultee continues to note that such operators/administrators may be required to "take "defensive" measures that adversely affect the efficient and effective operation of their systems in support of the relevant financial market".

1201 We note that in some situations individuals are exposed to having their property rights interfered with by receivers or law enforcement agencies. Although there are many statutory powers permitting this, any *ultra vires* interference should entitle the individual to redress. Without specific and discrete principles of tortious liability however, such redress might not be possible in relation to third category things. We consider that a focus on wrongdoing might, for example, be able to be constructed such that it captured such *ultra vires* actions but did not capture (1) interactions with third category things by innocent recipients; or (2) proper exercises of control in the context of intermediated holding arrangements, non-holding arrangements and DeFi arrangements. On this, see above n 1200. On receivers, see *OBG Ltd v Allan* [2007] UKHL 21, [2008] 1 AC 1. On law enforcement agencies, see the proposals under the Economic Crime and Corporate Transparency Bill to grant such agencies the power to destroy crypto-tokens (for example, at sch 7, para 30), and the potential parallels with *Costello v Chief Constable of Derbyshire* [2001] EWCA Civ 381, [2001] 1 WLR 1437.

1202 S Douglas, "The Scope of Conversion: Property and Contract" (2011) 74(3) *Modern Law Review* 329, 341.

vulnerability is analogous to that of things in possession.[1203] Not only that, but new technical encumbrances and conditions within a crypto-token system can be used to regulate how a particular crypto-token can be controlled. Crypto-token systems (and other systems that might manifest third category things) often rely on a combination of social participation, game theory, network effects, and the powers and incentives/incentive mechanisms of participants. They less obviously rely on direct claims/rights, and corresponding duties and obligations between system participants.[1204] Building concepts based on interference with an object of personal property rights is likely to be more aligned with this technical and social structuring.

Issues with strict liability

9.71 But there is an important balance to be struck. In this report we conclude that the technological features of third category things — specifically their inherent transmissibility — justifies the law of England and Wales prioritising the sanctity of transactions over the personal property rights of a (former) legal title holder.[1205] The corollary of that is that a greater onus is placed on holders of third category things to ensure that their things are not taken from them or transferred away without their consent. Any development of the common law in respect of specific and discrete principles of tortious liability would therefore have to be responsive to preserving this choice.

9.72 Moreover, despite facing analogous vulnerabilities, possessable things and third category things behave in different ways.[1206] Key differences include the fact that tangible things (at least those things that are not very small) have physical forms that are easily perceived by human beings, whereas third category things such as crypto-tokens, as notional quantity units manifested by software and network-instantiated data, do not. The result is that humans generally have a stronger intuitive idea of how tangible things behave, and are more easily able to identify who is in possession of them, whereas the properties and behaviours of third category things are less widely and instinctively understood.[1207]

9.73 We conclude that these differences between things in possession and third category things could cause difficulties if conversion — as it currently applies to things in

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[1203] Dr Crawford at p 809 responded that cryptocurrencies have, "albeit in a digital form, re-created the security hazards associated with carrying and storing large quantities of metallic coin (which are covered by the tort of conversion)."

[1204] See above n 210. We discuss this point in more detail in Chapter 3 (Third thing) at para 3.72.

[1205] See Chapter 6 (Transfers) at para 6.84 and from para 6.113.

[1206] This point is made in significant detail by Hin Liu in response to our consultation paper, and the examples given in para 9.72 are taken from this response. Hin Liu provided an early draft of "Interference torts in the digital asset world", which is now on SSRN, available at: https://ssrn.com/abstract=4433956. The content referenced by this footnote is available at p 10 of the SSRN draft. See also Professor Tettenborn pp 58–59. Some consultees also highlighted potential difficulties in the context of conversion (or a conversion-type cause of action) arising from the differences between possession and control: Katie McCay p 672; Professor Sheehan p 483; and Professor Low p 699.

[1207] "It is usually far easier for someone to recognise and comply with exclusionary obligations in respect of objects that have some tangible form": T Cutts, "Dummy asset tracing" (2019) 135 *Law Quarterly Review* 140, 159.

possession – were to be applied wholesale to third category things.[1208] This is due in part to the strict liability nature of conversion. For example, the different properties, behaviours, and characteristics of third category things might make it harder for people innocently engaging with distributed systems to avoid accidentally interfering with a claimant's object of personal property rights.[1209] This might lead to unexpected, and unjustified, liability in tort, particularly within systems where participants will interact with digital objects — largely by taking control of them — without knowing any information about their counterparty or the history of transactions involving that digital object. In our consultation paper however, we said that a common law special defence of good faith purchaser for value without notice applicable to digital objects would protect innocent actors who are less likely to be aware that those digital objects with which they are transacting had been converted. Although most consultees agreed that this would be a helpful limitation,[1210] some still said that strict liability would remain a problem for crypto-token and other digital assets markets and could have a consequential chilling effect on those markets.[1211] Any development of principles of tortious liability would therefore have to be alive to the risk of such a chilling effect.

Developments in the United States

9.74 We note that, in the United States conversion can apply to intangible objects of personal property rights.[1212] US courts have found that various types of intangible objects of personal property rights can be converted, including:[1213] electronic records,[1214] live transmissions of audio-visual material,[1215] website performance/bandwidth,[1216] and domain names.[1217] As a result, victims who have had their crypto-tokens misappropriated following frauds or hacks have often based their claims on the tort of conversion.[1218]

1208 Another reason not to apply conversion wholesale to third category things is provided by Professor Tettenborn, who at pp 58–59 writes: "Conversion has a lot of baggage and a lot of complexity … extending it with alterations to cover [third category things] would pile complication upon complexity."

1209 See Hin Liu's "sport bet" example. Hin Liu provided an early draft of "Interference torts in the digital asset world", which is now on SSRN, available at: https://ssrn.com/abstract=4433956. The content referenced by this footnote is available at pp 14–15 of the SSRN draft.

1210 25 consultees responded to this suggestion, 17 agreed outright, one provided qualified agreement, four disagreed, and three gave mixed views.

1211 See above n 1200. See also Professor Tettenborn pp 58–59.

1212 *Thyroff v Nationwide Mutual Insurance Co*, 8 NY3d 283 (2007).

1213 See generally R C Merrell, "Trespass to Chattels in the Age of the Internet" (2002) 80(2) *Washington University Law Review* 675.

1214 *Thyroff v Nationwide Mutual Insurance Co*, 8 NY3d 283 (2007).

1215 *New York Racing Association v Nassau Regional Off-Track Betting Corp*, 29 Misc3d 539 (Nassau Co 2010).

1216 *CompuServe Inc v Cyber Promotions*, 962 F Supp 1015 (SD Ohio 1997); *EBay INC v Bidder's Edge Inc*, 100 F Supp 2d 1058 (ND Cal 2000).

1217 *Kremen v Cohen,* 337 F3d 1024 (9th Cir 2003).

1218 *Mango Labs LLC v Eisenberg* (2023, Case Number: 1:23-cv-00665); *Jessup v Bankman-Fried* (2022, Case Number: 4:22-cv-07666-DMR); *LCX AG v John Doe Nos 1-25* (2022, Case Number: 154644/2022); *Donovan v GMO-Z.Com Trust Company Inc* (2022, Case Number: 3:22-cv-02826); *Crypto Asset Fund LLC v MedCredits* (2019, Case Number: 3:19-cv-01869-BEN-MDD); *Wu v Bitfloor Inc* (2019, Case Number:

9.75 We do not think that the law of England and Wales should take the same approach as US law in extending the tort of conversion to apply to third category things. For example, in the US there remains a degree of uncertainty surrounding the scope[1219] and conceptual foundations[1220] of the extended tort. Given that the courts of England and Wales have firmly held that intangible objects of personal property rights cannot form the subject matter of conversion,[1221] we maintain the view that the optimal approach would be to develop specific and discrete principles of tortious liability applicable to third category things that are more sensitive to these issues and more limited in scope and effect.

Our conclusion

9.76 The majority of consultees agreed with our provisional conclusion that there are arguments in favour of extending the tort of conversion or a conversion-type cause of action to third category things. Despite this broad agreement, we conclude that a better approach would be for the law to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things such as digital objects,[1222] rather than applying conversion in its current form to those things.

9.77 First, we think that such a development is more consistent with the overall approach in this report. We have consistently argued that existing legal concepts applicable to either things in possession or things in action are not perfectly transposable to digital objects. We think that is equally true of the tort of conversion. If the law of England and Wales is to develop a comprehensive, competitive legal framework which is sensitive to the idiosyncrasies of digital objects, we conclude that it should also take the same approach to protecting wrongful interference with those digital objects.

9.78 Second, we conclude that it makes more sense to describe how specific and discrete principles of tortious liability work in the context of digital objects, rather than to

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1:19-cv-00238); *Schafer v Graf* (2018, Case Number: 1:18-cv-08236); *Wanlin Wang, Bibox Grou Holdings Ltd v Wei Liu* (2018, Case Number: 655050/2018); *Kleinman v Wright* (2018, Case Number 9:18-cv-80176-BB); *Leidel v Project Investors Inc* (2016, Case Number 9:16-cv-80060-KAM). For more information on these claims, as well as further examples, see: Morrison Cohen LLP, "Cryptocurrency Litigation and Regulation Tracker" (2023), available at: https://www.morrisoncohen.com/news-page?itemid=471.

1219 It seems that, at least under New York law, there sometimes remains the need for some physical manifestation of the property in question: *Hyperlync Technologies v Verizon Sourcing*, 2016 WL 642721 (NY Co Feb 17 2016); *Alrai Naked Opportunity v Naked Brand Group,* 2019 NY Slip OP 33241(U), 2019 WL 5595157 (NY Co Oct 30, 2019); T J Hall and J A Archer, "The Slow Expansion of Conversion Claims To Cover Intangible Property" (2020), available at: https://www.law.com/newyorklawjournal/2020/02/20/the-slow-expansion-of-conversion-claims-to-cover-intangible-property/.

1220 R C Merrell, "Trespass to Chattels in the Age of the Internet" (2002) 80(2) *Washington University Law Review* 675, 687.

1221 *OBG Ltd v Allan* [2007] UKHL 21, [2008] 1 AC 1 (incorporeal property); *Stewart v Engel* [2000] BCC 741 (copyright); *Murphy v Electoral Commission* [2019] EWHC 2762 (QB), [2020] 1 WLR 480 (information); *Your Response Ltd v Datateam Business Media Ltd* [2014] EWCA Civ 281, [2015] QB 41 (documents stored electronically on a computer drive).

1222 We think that wrongful interference would have to be crafted carefully. In particular, there should be a focus on protecting innocent acquirers or those who innocently interact with digital objects. Nonetheless, we do not think that such protection should extend to *ultra vires* actions by public authorities. See further *Costello v Chief Constable of Derbyshire* [2001] EWCA Civ 381, [2001] 1 WLR 1437 and *OBG Ltd v Allan* [2007] UKHL 21, [2008] 1 AC 1.

attempt to apply existing principles developed in relation to tangible things, with a new defence. In particular, a common law special defence of good faith purchaser for value without notice applicable to crypto-tokens might not provide the level of protection we initially envisaged. As the CLLS-FLC argued, it might not adequately protect crypto exchanges and operators of DLT-based systems that "innocently interfere with an immediate right of control, but who do not themselves acquire any title to the affected digital asset"[1223] (and are not therefore good faith purchasers). This militates against the application of a strict liability tort in this context.

9.79 Third, we have so far identified only a small remedial lacuna — one that relates to the burning of tokens without consent. We think that the most appropriate and principled way to begin to fill this lacuna is through the law of tort.[1224] However, this comes with two important caveats. First, we consider that limited common law development helps to limit the risk of unintended consequences flowing from the wholesale application of the tort of conversion to digital objects. Second, the digital objects markets are still nascent and evolving, and market practice in relation to digital objects (including how they are controlled) is still settling. New regulation is also likely to affect how those markets mature. Any new principles of tortious liability should be sensitive to this. Applying the tort of conversion wholesale risks discouraging market participants from using the law of England and Wales to structure their arrangements. However, developing new, digital object-sensitive principles of tortious liability on an initially limited and discrete basis might also help to protect market participants (particularly retail or end-users) in new areas where they may otherwise find themselves without a suitable cause of action.

Appropriateness of common law development

9.80 We therefore conclude that the most appropriate way for the law to evolve is to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things and the realities of their markets. We think that it is best to leave such a development to the courts, so that the law responds to real-world fact

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[1223] CLLS-FLC pp 533–534.

[1224] We think that tortious liability aligns more appropriately with the nature of crypto-token systems than liability for breach of fiduciary duty, or liability in unjust enrichment. One key reason for this is that the duties owing under the law of tort are owed "towards persons generally" (P H Winfield, *The Province of the Law of Tort* (1931) p 32), whereas liability for breach of fiduciary duty or in unjust enrichment arguably requires a further step to establish some legal relationship. For example, "a fiduciary, is someone who has undertaken to act for or on behalf of another in a particular matter in circumstances which give rise to a relationship of trust and confidence. The distinguishing obligation of a fiduciary is the obligation of loyalty.": *Bristol and West Building Society v Mothew* [1998] Ch 1 at 18A-C, by Millett LJ. For a claim in unjust enrichment to arise, the defendant must (generally speaking) receive a benefit directly from the claimant: *Investment Trust Companies v Revenue and Customs Commissioners* [2017] UKSC 29, [2018] AC 275 at [43] by Lord Reed. We consider that the position in the law of tort, involving the owing of duties to persons generally, is more aligned to the realities of crypto-token systems, which can feature a wide range of participants with whom a given participant might interact but with whom any such "further step", such as circumstances giving rise to a relationship of trust and confidence, or enrichment at the expense of another might not occur. For example, the Wormhole hacker never interacted directly with participant "owners" of tokens, but nonetheless was able to acquire $320 million of ether. See summons filed by Tai Mo Shan Ltd against unknown defendants in the US *Tai Mo Shan Limited v John Doe Nos 1-100* litigation (Case Number 651017/2023), available at: https://iapps.courts.state.ny.us/nyscef/ViewDocument?docIndex=0fXwxvv5v163bEmNzYobww==, and more broadly, *Tulip Trading v Van Der Laan* [2022] EWHC 667 (Ch) and [2023] EWCA Civ 83, [2023] 4 WLR 16.

patterns (as opposed to the hypothetical situations we describe in this report) and that the courts benefit from nuanced, practical arguments from counsel.

9.81 Further, we do not think that such a development would be an unprecedented change to the law. This is for two reasons. First, conversion is a common law tort,[1225] and it would therefore be appropriate to develop specific and discrete principles of tortious liability through the same means. Second, Stephen Morris QC (sitting as Deputy High Court Judge) in *Armstrong DLW GmbH v Winnington Networks Ltd* already filled much of the pre-existing remedial lacuna by holding that proprietary restitution is available to a claimant deprived of their intangible objects of personal property rights (or their substitute proceeds).[1226] We think that the common law development of specific and discrete principles of tortious liability applicable to third category things would be a similarly significant development, but *Armstrong* demonstrates that the courts are willing to make such changes where necessary and appropriate. And as Lord Justice Birss observed in *Tulip Trading*, specifically in the context of third category things (bitcoin):[1227]

> The common law often works incrementally and by analogy with existing cases, and rightly so; but if the facts change in a way which is more than incremental I do not believe the right response of the common law is simply to stop and say that incremental development cannot reach that far.

9.82 Last, the lacuna currently existing within the law is small and arises in situations where a claim based on unjust enrichment or proprietary restitution cannot be made out. We consider that the development of specific and discrete principles of tortious liability is necessary to ensure full legal protection is provided for this nascent class of things.

Conclusion 6.

9.83 We conclude that it would be constructive for the courts to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things.

[1225] The Torts (Interference with Goods) Act 1977 was a consolidating statute.

[1226] *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch), [2013] Ch 156 at [93]. See above at para 9.47.

[1227] *Tulip Trading v Van der Laan* [2023] EWCA Civ 83, [2023] 4 WLR 16 at [71], by Birss LJ. Indeed, in that case Birss LJ contemplated a much more significant and impactful development of the law in relation to the question as to whether the developers of certain crypto-token systems owe fiduciary duties or duties in tort to an "owner" of notional quantity units within those systems: "Pulling all this together, I recognise that for Tulip's case to succeed would involve a significant development of the common law on fiduciary duties [and tortious duties]" at [86]. Note the discussion of the argument relating to tortious duties at [41].

INJUNCTIONS

9.84 An injunction is a court order by which a party to an action is required to do, or refrain from doing, a particular thing.[1228] Injunctions may be granted as an interim (interlocutory), or a final remedy,[1229] and may be either prohibitory or mandatory.[1230]

9.85 A freezing order or injunction[1231] is a type of interim prohibitory injunction intended to prevent the dissipation of assets outside of the ordinary course of business in a way which would render any future judgment unenforceable.[1232] A freezing order operates directly on the person against whom the injunction is made, and does not produce proprietary rights in respect of the assets themselves.[1233] A proprietary injunction[1234] (also a type of interim prohibitory injunction) prevents a defendant from dealing with, or disposing of, assets in respect of which a proprietary claim has been made.[1235] A freezing injunction restricts a defendant from dealing with their own assets, whereas a proprietary injunction (at least in part) restrains a defendant from dealing with assets to which the claimant asserts title.[1236]

Application to third category things

9.86 Given the number of court decisions indicating that third category things are capable of being the subject of freezing orders and proprietary injunctions, in our consultation paper we provisionally concluded that no law reform was required specifically in the context of third category things.[1237] Consultees broadly agreed.[1238]

9.87 The principal point of disagreement related to the enforceability of injunctions,[1239] the key concern being that there is often no way of knowing the identity of the defendant against whom the injunction is sought. However, this challenge is met well in practice by the availability of injunctions against,[1240] as well as the ability to effect service

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1228 *Jowitt's Dictionary of English Law* (5th ed 2019); see para 19.135 of our consultation paper.

1229 A Burrows, *A Restatement of the English Law of Contract* (2nd ed 2020) p 161; see para 19.135 of our consultation paper.

1230 Above p 163.

1231 See paras 19.138–19.139 of our consultation paper.

1232 *Crowther v Crowther* [2020] EWCA 762, [2020] Fam Law 1167 at [48], by Males LJ, quoting *Vneshprombank LLC v Bedzhamov* [2019] EWCA Civ 1992.

1233 *Cretanor Maritime Co Ltd v Irish Marine Management Ltd (The Cretan Harmony)* [1978] 1 WLR 966, [1978] 3 All ER 164 at 974, by Buckley LJ.

1234 See paras 19.140–19.141 of our consultation paper.

1235 M Bridge, L Gullifer, K Low, and G McMeel, *The Law of Personal Property* (3rd ed 2021) para 34.045; *Polly Peck International v Nadir (No 2)* [1994] 3 ALL ER 764.

1236 *Twentieth Century Fox Film Corporation v Harris* [2013] EWHC 159 (Ch), [2014] Ch 41 at [7], by Newey J, quoting Millett LJ in *Ostrich Farming Corporation Ltd v Ketchell* (10 December 1997, unreported).

1237 Consultation paper paras 19.142–19.148. See broadly the cases listed in Chapter 3 (Third thing) at n 166.

1238 Of the 27 consultees who responded to our consultation question, 20 agreed outright, two provided qualified agreement, three disagreed, and two gave mixed views.

1239 LawFiDAO pp 733–734; Law Society p 724.

1240 See *AA v Persons Unknown* [2019] EWHC 3556 (Comm).

upon,[1241] unknown persons. Indeed, the courts of England and Wales have demonstrated significant flexibility when effecting service against unknown remote parties in crypto-token contexts.[1242] We do not recommend law reform in this context.

ENFORCEMENT

9.88 Where an unsuccessful defendant subject to a court order or judgment (a "judgment debtor") does not voluntarily comply with that court order or judgment, the successful claimant (a "judgment creditor") might take steps to enforce that court order or judgment. A judgment creditor may elect from many available methods of enforcement. Depending on the circumstances these might include the appointment of a receiver,[1243] third party debt orders,[1244] charging orders,[1245] and/or an attachment of earnings.[1246] In our consultation paper we provisionally concluded[1247] that these methods, when combined with the law's mechanisms for helping a judgment creditor obtain control over the judgment debtor's assets,[1248] provide sufficient support even where the assets are third category things such as digital objects. We provisionally concluded that no law reform was necessary.

9.89 Most consultees agreed with our provisional conclusion,[1249] although some highlighted areas of the law that might benefit from reform in relation to third category things. We consider these below.

Third party debt orders

9.90 One consultee highlighted potential deficiencies in relation to the application of third party debt orders in crypto-token contexts.[1250] Third party debt orders enable "a judgment creditor to obtain an order for the payment to [them] of money which a third party … owes to the judgment debtor."[1251] Under Part 72 of the Civil Procedure Rules,

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1241 Civil Procedure Rules, r 6.15(1); *Zuckerman on Civil Procedure* (4th ed) para 5.113.

1242 In *D'Aloia v Persons Unknown* [2022] EWHC 1723 (Ch), a case concerning interim injunctive relief, Mr Justice Trower permitted service via an NFT airdrop (at [38]), as this would "lead to a greater prospect of those who are behind the tda-finan website being put on notice of the making of th[e] order" (at [39]). See also *Piroozzadeh v Persons Unknown* [2023] EWHC 1024 (Ch), *Osbourne v Persons Unknown* [2023] EWHC 340 (KB), and *AA v Persons Unknown* [2019] EWHC 3556 (Comm) at [72]–[78].

See further: A Held, "Cryptoassets as property under English law Pt II: ownership, situs and the circular question of jurisdiction" (2023) 4 *Journal of International Banking and Financial Law* 236, as well as the Law Commission's ongoing project, "Digital assets: which law, which court?", available at: https://www.lawcom.gov.uk/project/digital-assets-which-law-which-court/.

1243 Part 69 of the Civil Procedure Rules.

1244 See below para 9.90.

1245 See below from para 9.92.

1246 Part 89 of the Civil Procedure Rules; The Attachment of Earnings Act 1971.

1247 See para 19.157 of our consultation paper.

1248 We noted at para 19.156 of our consultation paper that a judgment creditor may be able to rely on: disclosure, premises searches, nominated person orders, and custodian assistance.

1249 Of the 26 consultees who responded on this point, 16 agreed outright, three provided qualified agreement, four disagreed, and three gave mixed views

1250 Clifford Chance LLP, p 320.

1251 Civil Procedure Rules, r 72.1(1).

third-party debt orders apply to "money"[1252] and "debt".[1253] Since crypto-tokens do not constitute money (and are not likely to constitute debts for these purposes), an obligation to transfer crypto-tokens likely cannot fall within Part 72.[1254] At paragraph 9.10 above we conclude that an obligation to "pay" non-monetary units such as crypto-tokens would not be characterised as a monetary debt, but do not recommend law reform at this stage to change the position. We conclude that reasoning applies equally to the application of Part 72.[1255]

Encumbering and taking control of a judgment debtor's property

9.91 Certain enforcement regimes seek to deprive a judgment debtor of their objects of personal property rights, either because the successful claimant is entitled to that specific object of personal property rights, or because it is necessary to sell the thing to help pay a judgment debt. We briefly consider three such regimes relating to charging orders, nominated persons orders, and taking control of property. We think that the first two of these regimes already operate sufficiently in the context of third category things. To the extent that the regimes we consider do not function in this context, we do not recommend reform at this stage.

Charging orders

9.92 The Charging Orders Act 1979 provides a regime through which security interests in favour of judgment creditors may be imposed by a court.[1256] Four kinds of property are capable of being so charged: (1) land;[1257] (2) securities;[1258] (3) funds in court;[1259] and (4) a beneficial interest under a trust.[1260] The definition of securities under the Act broadly applies only to stock and units of any unit trust.[1261] Because these categories

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[1252] Civil Procedure Rules, r 72.1(1).

[1253] Civil Procedure Rules, r 72.2.

[1254] Clifford Chance LLP p 320. A third party debt order was obtained in the crypto case of *Ion Science Ltd v Persons Unknown* (28 January 2022, unreported), available at: https://files.lbr.cloud/public/2022-02/Judgment_0.pdf. However, as is clear from the judgment, the subject matter of the claim is in sterling, meaning the crypto-token context of the case is ancillary to the success of the third party debt order.

[1255] For this reason, we do not consider that *Choice Investments Ltd v Jeromnimon* [1981] QB 149, 155–156, in which Lord Denning MR held that a third party debt order can apply to foreign currencies, alters our analysis.

[1256] Charging Orders Act 1979, s 1.

[1257] Charging Orders Act 1979, s 2(2)(a).

[1258] Charging Orders Act 1979, s 2(2)(b).

[1259] Charging Orders Act 1979, s 2(2)(c).

[1260] Charging Orders Act 1979, s 2(1).

[1261] Charging Orders Act 1979, s 2(2)(b)(i)–(iv). The kinds of stock capable of being charged are specified in further detail in the Act. Although certain kinds of crypto-tokens, such as tokenised equity, might fall within the meaning of "stock of any body" under s 2(2)(b)(ii), most crypto-tokens will not.

of property are exhaustive,[1262] most third category things including digital objects like crypto-tokens will not be chargeable under the Act.[1263]

9.93 In some cases crypto-tokens might be held in trust-based custodial intermediated holding arrangements.[1264] In such cases, the judgment debtor's beneficial interest in the tokens will be chargeable by virtue of section 2(1)(a)(ii), which allows "any interest … under a trust" to be charged.[1265] The Charging Orders Act 1979 might therefore be applicable in those limited cases.[1266] Were any reform considered necessary in relation to the scope of the Charging Orders Act 1979, we also think it would need to be sensitive to the issues in relation to taking security over third category things — specifically crypto-tokens — that we discuss in Chapter 8.[1267] As such, we do not recommend law reform at this stage.

Nominated persons orders

9.94 Section 39 of the Senior Courts Act 1981 enables a court to "order that [a] conveyance, contract or other document … be executed … by such person as the court may nominate for that purpose."[1268] Such an order can be made where the original party ordered to execute the conveyance, contract, or other document either neglects or refuses to comply with the order,[1269] or cannot after reasonably inquiry be found.[1270]

9.95 One consultee suggested that section 39 could be extended, such as to enable a person nominated by the court to "issue any document or electronic instruction that

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[1262] Clear both from the express wording of the statute, and *Gittins v Serco Home Affairs* [2012] EWHC 651 (Ch) at [47], by Behrens J.

[1263] Although we note that there is no immediate conceptual difficulty with crypto-tokens being the subject of an equitable charge (see above from para 8.24), which is the mechanism used to charge property under the Act: Charging Orders Act 1979, s 3(4).

[1264] See further Chapter 7 (Intermediated holding arrangements).

[1265] Charging Orders Act 1979, s 2(1)(a)(ii).

[1266] See J Lee, "The endgame: issues in enforcement against cryptoassets" (2022) 8 *Journal of International Banking and Financial Law* 545 at 545. Only one consultee favoured reform in this context. Clifford Chance LLP considered that extending the scope of the regime would provide a "relatively uncomplicated starting point for judgment creditors" in a digital assets context, at pp 320–321.

[1267] See also A M Hinkes, "Throw Away the Key, or the Key Holder? Coercive Contempt for Lost or Forgotten Cryptocurrency Private Keys, or Obstinate Holders" (2019) 16(4) *Northwestern Journal of Technology and Intellectual Property* 225. It is possible to expand the list of property capable of being charged by utilising the Act's expansion provision: Charging Orders Act 1979, s 3(7). In our 1976 report on charging orders, we recommended the inclusion of "units of any unit trust" (now found under s 2(2)(b)(iv)) within the definition of securities on the basis that "no list is likely to remain appropriate for ever. The inclusion … serves as a reminder … of the way in which totally new kinds of "security" may develop": Charging Orders (1976) Law Com No 74 at para 86.

[1268] Senior Courts Act 1981, s 39(1). This also includes ordering that the nominated person shall indorse a negotiable instrument.

[1269] Senior Courts Act 1981, s 39(1)(a).

[1270] Senior Courts Act 1981, s 39(1)(b).

could have been issued by the defendant."[1271] There are two reasons why we do not think that statutory reform would be of practical assistance in this context. First, the provision would have little effect unless the court or nominated person could obtain the relevant means of authenticating a transfer operation (for example, the private key relating to the public address associated with the tokens in question). But this would likely be of little practical use where a judgment debtor had already refused to provide the private key or transfer crypto-tokens in breach of a court order. Second, we think that, despite the first point, a court with knowledge of the relevant private key could probably already effect an onchain transfer using section 39,[1272] particularly given the House of Lords' acknowledgment of the provision's breadth.[1273]

Taking control of a judgment debtor's property

9.96 Schedule 12 of the Tribunals, Courts and Enforcement Act 2007 provides a regime through which enforcement agents may take control of a judgment debtor's "goods" and sell them to recover a judgment debt.[1274] In this context, "goods" is defined very broadly as "property of any description, other than land".[1275] At surface level, this broad definition would seem to include things in possession, things in action, and third category things. However, on further analysis, the category of "goods" that Schedule 12 can accommodate is narrower than the definitional breadth suggests.

9.97 For example, things in action do not fall easily within the regime in practical terms. As Lord Leggatt recognised in *365 Business Finance Ltd v Bellagio Hospitality WB Ltd*,[1276] this is because the methods of taking control are all premised on an enforcement agent taking *physical* control.[1277] According to Lord Leggatt, therefore, the only "goods" amenable to Schedule 12 enforcement are tangible property, or things in action "embodied ... in some tangible form".[1278] We think that the same reasoning applies to third category things.[1279] However, we do not recommend reform.

1271 For example, theoretically allowing a nominated person to effect an onchain transfer of a third category thing where the defendant refuses to do so (for example, following an order for specific performance of that third category things). Professor Tettenborn, pp 59–60.

1272 The court could, for example, order the defendant to execute a document authorising the claimant to transfer the crypto-token using the private key. If the defendant refuses or neglects to do so, then the court could make an order under s 39 authorising a nominated person to execute that document.

1273 *Astro Exito Navegacion SA v Southland Enterprise Co (The Messiniaki Tolmi) (No 2)* [1983] 2 AC 787 at 802, by Lord Roskill.

1274 Tribunals, Courts and Enforcement Act 2007, s 62(1), sch 12 para 1(1). For an overview of key provisions, see *Hamilton v Secretary of State for Business, Energy and Industrial Strategy* [2021] EWHC 2647 at [18]–[39], by Lane J.

1275 Tribunals, Courts and Enforcement Act 2007, sch 12 para 3(1).

1276 [2020] EWCA Civ 588 at [96], by Lord Leggatt.

1277 To take control, an agent must do one of four things with the goods: (1) secure them on the premises; (2) if found on a highway, secure them there (or within a reasonable distance); (3) remove them and secure them elsewhere; (4) enter into a controlled goods agreement with the debtor. Tribunals, Courts and Enforcement Act 2007, sch 12 para 13(1)(a)–(c).

1278 *365 Business Finance Ltd v Bellagio Hospitality WB Ltd* [2020] EWCA Civ 588 at [96], by Lord Leggatt.

1279 Clifford Chance LLP pp 318–321, in particular p 320. Further, para 9 of sch 12 imposes a gateway criterion, providing that an enforcement agent may take control of goods only if they are "on premises". Third category things such as crypto-tokens do not have a singular physical location — given their existence is manifested by distributed networks —and so cannot be located on a specific premises.

An enforcement regime of this kind would need to be highly technology-responsive, and certain third category things, including crypto-tokens are unlikely to be suitable candidates for enforcement in this manner. The fundamental difficulty remains that where a judgment debtor had already refused to provide the private key or transfer crypto-tokens in breach of a court order an additional layer of statutory enforcement mechanism is likely to be superfluous.[1280]

AWARDS DENOMINATED IN CRYPTO-TOKENS

9.98 When a court orders a losing party to pay a sum of money, that sum is typically denominated in pounds sterling. However, since the decision in *Miliangos v George Frank (Textiles) Ltd*,[1281] courts have recognised that they have the power to award monetary remedies denominated in foreign currencies. We are not aware of any precedent which suggests that courts in England and Wales have the power to award monetary remedies denominated in third category things including crypto-tokens.[1282]

Consultees' views

9.99 In our consultation paper we described some policy-based arguments in favour of courts having a discretion to denominate awards in crypto-tokens,[1283] and provisionally concluded that there is an arguable case for reform to provide this discretion. Most consultees agreed with this provisional conclusion.[1284]

[1280] However see generally the Economic Crime and Corporate Transparency Bill, which seeks to expand the Proceeds of Crime Act 2002 by introducing additional powers to allow law enforcement agencies "more options for seizure [to] theoretically allow cryptoassets to be seized in the same way as cash and other listed assets": Home Office "Impact Assessment: Powers to seize illicit cryptoassets (Economic Crime and Corporate Transparency Bill 2022)" (2023) para 62, available at: https://www.gov.uk/government/publications/economic-crime-and-corporate-transparency-bill-2022-impact-assessments.

[1281] [1976] AC 443.

[1282] We discuss this in the context of an action for the agreed sum above from para 9.8. There, we make the argument that if and when crypto-tokens are treated in a general sense as money (or analogous thereto) there will be a legitimate basis for those crypto-tokens to be considered the subject matter of an award of an agreed sum, and therefore an action in debt (but not before). We do not think it would be appropriate for an action for the agreed sum (which is effectively an award that seeks to enforce the primary obligation under a contract) to be denominated in crypto-tokens until such time as those crypto-tokens are considered to be money (or analogous thereto) because, as discussed above, that would be tantamount to awarding specific performance as of right. The discussion in this section therefore does not apply to an action for the agreed sum, in relation to which different policy considerations arise. The focus is on other, secondary remedies awarded by the court, such as damages for breach of contract or tort, or equitable compensation, which are generally treated as actions for damages.

[1283] See paras 19.162–19.166 of our consultation paper.

[1284] Of the 31 consultees who answered this consultation question, 15 agreed outright, while six provided qualified agreement. Four consultees gave mixed responses, and six disagreed.

9.100 Consultees set out the policy arguments in favour of,[1285] and against,[1286] courts having the discretion to award a "monetary" remedy denominated in (certain types of) crypto-tokens (or third category things) in appropriate cases. We think that this point remains debatable on policy grounds, and therefore consider this matter to be best left to the courts if and when appropriate facts arise. The judgment in *Miliangos* makes clear that courts can award remedies in alternate currencies when the currency in question is considered "money", although the reasoning for doing so was arguably broader.[1287] We recognise that, at present, crypto-tokens are unlikely to be regarded as money under the law of England and Wales.[1288] As with *Miliangos,* we think that, if it so desired, a court could potentially exercise its discretion to award a "monetary" remedy denominated in (certain types of)[1289] crypto-tokens in certain circumstances, namely where doing so would provide a better reflection of the innocent party's loss.[1290] However, we acknowledge that, on its face, this would be a novel step.[1291]

[1285] IDAC and CryptoUK at pp 607–608 noted that stablecoins should be capable of being awarded by a court. Hugh James LLP at p 579 made a similar point in relation to central bank digital currencies. The FMLC at p 556 (para 7.3.1) considered that most "market participants, would expect the courts in England and Wales to be able to grant awards denominated in crypto-tokens in appropriate circumstances." Clifford Chance LLP at pp 321–322 noted that the impact of price volatility on effective award quantum is not an issue, and is merely a reflection of the fact that parties trading crypto-currencies do so in volatile markets.

We note that the High Court recently ordered a cryptocurrency exchange to "conver[t] the cryptocurrency held in the relevant account to fiat currency" (so that there was a sterling denominated claim for the purposes of enforcement): *Joseph Keen Shing Law v Persons Unknown* (26 January 2023, unreported) at [9], by Judge Pelling KC. We consider that such a conversion could be rendered unnecessary, were a court to decide to award damages in crypto-tokens.

[1286] Dr Michael Crawford at p 809 responded that law reform is unnecessary, as an appropriate remedy already exists in the form of specific performance. Dr Zhang at pp 653–654 makes a similar point. CILEX at pp 278–279 (para 6.7) responded that crypto-tokens can be volatile, and that this volatility can lessen predictability and can result in unexpected windfalls and losses. It is notable that Simon Thorley IJ in *Quoine Pte Ltd v B2C2 Ltd* [2019] SGHC(I) 3, [2019] 4 SLR 17 at [256] saw such volatility as a barrier to granting specific performance.

[1287] "As a general rule the plaintiff should be compensated for the expense or loss in the currency which most truly expresses his loss": *Services Europe Atlantique Sud (Seas) v Stockholms Rederiaktiebolag Svea, The Folias* [1979] QB 491 at 514, by Lord Denning MR, affirmed by the House of Lords: [1979] AC 685 at 701, by Lord Wilberforce.

[1288] A Dickinson, "Cryptocurrencies and the Conflict of Laws" in D Fox and S Green, *Cryptocurrencies in Public and Private Law* (2019) para 5.91; M Howard, J Knott, and J Kimbell, *Foreign Currency: Claims, Judgments and Damages* (1st ed 2016) para 15.17.

[1289] Multiple consultees indicated that the crypto-tokens capable of being so awarded should have money-like qualities, such as being fungible: Professor Tettenborn pp 60–61; Linklaters LLP p 760 (para 1.13).

[1290] And for the (policy) reasons we discuss in more detail in paras 19.162–19.166 of our consultation paper. In response to the second limb of consultation question 47, consultees listed various factors that should be relevant to the exercise of this discretion: Linklaters LLP p 760 (para 1.13); Professor Tettenborn p 60; Gunnercooke LLP p 567; Dr Crawford p 809; Moneybrain p 818; Stephan Smoktunowicz p 942; the Centre for Commercial Law at the University of Aberdeen p 264; Clifford Chance LLP pp 322–323; CLLS-FLC pp 534–535; COMBAR and the Chancery Bar Association pp 392–393 (paras 47.9–47.12); and IDAC and CryptoUK pp 607–608.

[1291] We note that the United States District Court in *Titus Williams v Kasim Mahmood* (2022, Case Number 6:21-cv-03074-RK) granted to the defendant "conversion damages in the amount of 33.7398 bitcoin". We consider that there are (at least) two potential difficulties with this. First, the court does not explain why it felt entitled to award damages denominated in bitcoin, beyond noting that "[t]he measure of damages for a claim

of conversion under Missouri law is generally the market value of the property at the time of conversion." This seems only to be relevant to the quantum of the damages awarded, and not to their denomination. Second, immediately after awarding conversion damages in the amount of 33.7398 bitcoin, the court proceeds to impose a constructive trust over "the 33.7398 bitcoin, and [orders] disgorgement thereof". This is a conceptually questionable approach to ordering alternate remedies, and potentially undermines the utility of the damages award, even to the extent that it might not be characterisable as an award for damages.

Chapter 10: Recommendations and conclusions

Recommendation 1.

10.1 We recommend statutory confirmation that a thing will not be deprived of legal status as an object of personal property rights merely by reason of the fact that it is neither a thing in action nor a thing in possession.

Paragraph 3.76

Recommendation 2.

10.2 We recommend that the Government creates or nominates a panel of industry-specific technical experts, legal practitioners, academics and judges to provide non-binding guidance on the complex and evolving factual and legal issues relating to control involving third category things such as digital objects (and other issues relating to digital asset systems and markets more broadly).

10.3 This panel would need to include those with expertise in the crypto-token markets, and not just those with expertise in traditional finance markets or intermediated securities markets.

Paragraphs 5.36

Recommendation 3.

10.4 We recommend statutory amendment to the FCARs as follows.

(1) To clarify the extent to which and under what holding arrangements crypto-tokens, cryptoassets (including CBDCs and fiat currency-linked stablecoins) and/or mere record/register tokens can satisfy the definition of cash, including potentially by providing additional guidance as to the interpretation of "money in any currency", "account" and "similar claim to the repayment of money".

(2) To confirm that the characterisation of an asset that by itself satisfies the definition of a financial instrument or a credit claim will be unaffected by that asset being merely recorded or registered by a crypto-token within a blockchain- or DLT-based system (where the underlying asset is not "linked" or "stapled" by any legal mechanism to the crypto-token that records them).

(3) To confirm that, where an asset that satisfies the definition of a financial instrument or a credit claim is tokenised and effectively linked or stapled to a crypto-token that constitutes a distinct object of personal property rights from the perspective of and vested in the person that controls it, the linked or stapled token itself will similarly satisfy the relevant definition.

10.5 We recommend that laws applicable to UK companies should be reviewed to assess the merits of reforms that would confirm the validity of and/or expand the use of crypto-token networks for the issuance and transfer of equity and other registered corporate securities. In particular, we recommend that any such review should consider the extent to which applicable laws could and should support the use of public permissionless ledgers for the issuance and transfer of legal interests in equity and other registered corporate securities.

Paragraph 8.86

Recommendation 4.

10.6 We recommend that, as a matter of priority, the Government sets up a multi-disciplinary project to formulate and put in place a bespoke statutory legal framework that better and more clearly facilitates the entering into, operation and enforcement of (certain) crypto-token and (certain) cryptoasset collateral arrangements.

Paragraph 8.161

Conclusion 1.

10.7 We conclude that factual control (plus intention) can found a legal proprietary interest in a digital object. We conclude that in certain circumstances such a control-based legal proprietary interest can be separated from (and be inferior to or short of) a superior legal title.

Paragraph 5.104

Conclusion 2.

10.8 We conclude that it is possible (with the requisite intention) to effect a legal transfer of a crypto-token offchain by a change of control or onchain by a transfer operation that effects a state change.

Paragraph 6.47

Conclusion 3.

10.9 We conclude that a special defence of good faith purchaser for value without notice applicable to crypto-tokens can be recognised and developed by the courts through incremental development of the common law. We conclude that this reasoning can also be extended to other third category things.

Paragraph 6.124

Conclusion 4.

10.10 We conclude that under the law of England and Wales, crypto-token intermediated holding arrangements can be characterised and structured as trusts, including where the underlying entitlements are (1) held on a consolidated unallocated basis for the benefit of multiple users, and (2) potentially even commingled with unallocated entitlements held for the benefit of the holding intermediary itself.

10.11 We conclude that the best way to understand the interests of beneficiaries under such trusts are as rights of co-ownership in an equitable tenancy in common.

Paragraph 7.54

Conclusion 5.

10.12 We conclude that recognition of a control-based legal proprietary interest could provide the basis for an alternative legal structure for custodial intermediated holding arrangements in addition to trusts. This could take the form of holding intermediaries being recognised as acquiring a control-based proprietary interest in held crypto-token entitlements that is subject to a superior legal title retained by users.

Paragraph 7.115

Conclusion 6.

10.13 We conclude that it would be constructive for the courts to develop specific and discrete principles of tortious liability by analogy with, or which draw on some elements of, the tort of conversion to deal with wrongful interferences with third category things.

Paragraph 9.83

Appendix 1: Terms of reference

The Law Commission is asked to:

(1) Set out the current law in relation to crypto/intangible assets, drawing on the conclusions of the UK Jurisdiction Taskforce's legal statement (with reference to the questions listed in part A of the Appendix, and the questions in part B where the Law Commission considers this to be appropriate).

(2) Make recommendations to solve the problems caused by English law's approach to the "possession" of crypto/intangible assets, based on a comprehensive review of the law in England and Wales and a brief comparative analysis of the approach in other jurisdictions.

(3) Make such other recommendations as the Law Commission considers necessary or desirable to ensure that the law is capable of accommodating

(4) crypto/intangible assets insofar as the timetable allows.

(5) Identify areas for future consideration – this could cover both wider crypto/intangible assets issues and/or smart contracts.

The Law Commission's work at this stage will not include:

(6) Producing draft legislation to implement our recommendations.

(7) Questions as to jurisdiction or choice of law.

(8) Other areas of law insofar as they relate to crypto/intangible assets such as tax, data protection etc.

ANNEX TO TERMS OF REFERENCE

Part A: key questions

1.2 Under what circumstances, if any, would the following be characterised as personal property:

(1) a crypto/intangible asset;

(2) a private key?

1.3 In particular:

(1) What are the key characteristics that a crypto/intangible asset must have to be considered property?

(2) What characteristics would prevent a crypto/intangible asset from being considered property?

1.4 If a crypto/intangible asset is capable of being property:

(1) Is that as a thing in possession, a thing in action or another category of property?

(2) How is title to that property capable of being transferred?

1.5 Is a crypto/intangible asset capable of being the object of a bailment?

1.6 Can security validly be granted over a crypto/intangible asset and, if so:

(1) How?

(2) What forms of security may validly be granted over a crypto/intangible asset?

1.7 Can a crypto/intangible asset be characterised as “property” for the purposes of the Insolvency Act 1986?

1.8 Can crypto/intangible assets be characterised as “goods” under the Sale of Goods Act 1979?

1.9 In what circumstances is a distributed ledger capable of amounting to a register for the purposes of evidencing, constituting and transferring title to assets?

Part B: Possible additional questions for consideration

1.10 If crypto/intangible assets can be characterised as property:

(1) What are the key characteristics that a DLT system must have so that crypto/intangible assets on that system can be considered property?

(2) What characteristics would prevent any crypto/intangible assets on a DLT system being considered property?

1.11 The Legal Statement found that private/public keys in themselves are not private property.[1292]

(1) Does the Law Commission agree?

(2) If so, what are the implications for cryptoasset wallets (especially in a theft scenario)?

1.12 Crypto/intangible assets may be represented "off-chain" (outside the DLT) by other digital assets. Crypto/intangible assets may also be linked to underlying physical assets.[1293] In such case:

(1) How are assets, services or other things that are linked to cryptoassets to be treated?

(2) Would linkage create separate legal rights, such that bailment is possible in certain circumstances?

1.13 Could a crypto/intangible asset be characterised as:

(1) a documentary intangible?

(2) a document of title?

(3) negotiable?

(4) an "instrument" under the Bills of Exchange Act 1882?

[1292] There are wallet providers for many cryptoassets. These companies provide cryptoasset wallets which store public and/or private keys which can be used to track ownership of a cryptoasset, but they do not store the cryptoasset itself which remains on the decentralised DLT. Germany has developed specific regulation to cover wallet providers. See Legal Statement paras 43 and 65**.** The Legal Statement considers a cryptoasset as consisting of a "parameter" of data, including private keys.

[1293] See Eversheds Sutherland LLP's commentary on the role of the underlying asset.

Appendix 2: Acknowledgements

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Bournemouth University

Dickson Poon School of Law (King's College London)

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Businesses and financial institutions

Aimichia Technology Co Ltd

Binance

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Digital Pound Foundation

Meta

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Village Mall Pty Ltd

Law firms

Ashurst LLP

Clifford Chance LLP

Eversheds Sutherland LLP

Gunnercooke LLP

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Linklaters LLP

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Russell-Cooke LLP

Stirling & Rose LLP

Groups and associations

The Association for Financial Markets in Europe (Post Trade Legal Committee) (AFME) and the Association of Global Custodians (AGC) (joint response)

Association of Pension Lawyers

Bar Council's Law Reform Committee

CILEX

Clifford Chance LLP Industry Group

The Commercial Bar Association (COMBAR) and the Chancery Bar Association

Company Law Committee of the City of London Law Society

Crypto Council for Innovation

DeCaDe

Digital Commerce Committee of the Business Law Section of the Law Council of Australia

Digital Law Association

Digital Token Identifier Foundation

Electronic Money Association

Financial Law Committee of the City of London Law Society

Financial Markets Law Committee

International Digital Assets Counsel Association and CryptoUK (joint response)

International Securities Lending Association

International Standards Organization

International Swaps and Derivatives Association

LawFiDAO

Scottish Government Expert Reference Group on Digital Assets

Society of Trust and Estate Practitioners (STEP)

TechUK

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Euroclear UK & Ireland Limited

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Outlier Ventures

Tech Nation

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Groups and associations

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International Swaps and Derivatives Association

Society of Computers and Law

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