2021 Birkenhead Lecture

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The private law of digital assets: what is it and what should it be?

My subject today is the private law of digital assets. I will talk in more detail in a minute as to what digital assets I am talking about, but just to get started, let us say that these are assets which are held on an electronic system designed to enable them to be transferred without any human or institutional intervention. Examples are bitcoin and tokenised securities. These are held on systems using blockchain and distributed ledger technology. I am not going to refer much to the technology, but only the actual consequences of the use of the technology: this is partly because I will probably get the details wrong, and partly because we need private law to be technologically neutral and focused more on the actual consequences of the use of the technology. The existence and use of these types of assets has increased exponentially over the last few years, and whether we like it or not, they are a phenomenon that requires attention, not only by regulators but of those who work with and shape private law.

I should first set out a few boundaries for the subject matter of the lecture. It is just about private law and not regulation, although I will mention regulation once or twice. By private law I mean the law relating to rights and obligation between natural and legal persons, including contract law, tort law and property law and, by extension, insolvency law. What I want to do today is to explore how the existing law applies to digital assets, and where we might need new law, which could be judge-made or legislation.

I will talk largely about English law though informed by my work with UNIDROIT in trying to develop more general global principles.[1] Just in case you are not familiar with UNIDROIT, it is an inter-governmental organisation based in Rome which produces instruments focusing on the harmonisation and unification of private law.

The Law Commission of England and Wales is working on the English law of digital assets, including trade documents and crypto-assets[2] and I have benefitted greatly from discussions with the Law Commission team. Quite a lot of what I will say comes from the submission I, and Professor David Fox, made to the Law Commission Call for Evidence earlier in the year. The ideas in this talk have emerged, and been refined, as a result of my conversations with Professor Fox (to whom I owe an enormous debt of gratitude for his clear-thinking discussion) and also with others, including those involved

[1] https://www.unidroit.org/work-in-progress/digital-assets-and-private-law/
[2] https://www.lawcom.gov.uk/project/digital-assets/

in the digital assets project that Professor Jennifer Payne and I have run at Oxford for several years. I should mention in particular Hin Liu, my former graduate student, with whom I have co-written. And, as I mentioned, the more general ideas in this talk are informed by the discussions of the UNIDROIT Working Group, where we are trying to develop global principles for the private law of digital assets, which are not just technologically neutral but also legal culture neutral: no easy task.

Today I want to focus on a number of challenges for private law that digital assets present. First, how do we define a digital asset, and by this I mean the type of digital asset that can be, and has been held by English courts to be, property. I have put 'property' on this slide with a question mark but in fact, at least for those falling within the definition I am going to discuss, it is reasonably clear that it be property within English law. As it is property, other issues arise: how is legal title transferred? How do you take security over it? How can one hold it? And, lastly, where a digital asset is linked to another asset (increasingly common) what is the link and how effective is it to enable a transfer of the digital asset to transfer title to the linked asset?

The key concept to enable us to start to answer these questions is control. In the UNIDROIT working group we have developed the factual concept of control: it focuses on what can actually be done rather than the legal right to do it or prevent it being done. There are three elements:

First, the system on which this data is recorded can only be changed by a person who has the specific means of doing so.

Second, if a person has that specific means, it can prevent anyone else changing the system without using those specific means. [The language that is used for those specific means is that of a 'key' and it does act somewhat like a key. If I have a house to which there is only one key, I control access to the house: only I can open the door and I can stop anyone else opening the door unless I choose to give them my key, or a copy of my key. The analogy is not exact, because the key to the digital asset enables the holder to change the record on the system : we would say, to transfer the digital asset, rather than to get access to it to do anything else eg to use what is contained in it (like in a house or a locked box). However, the general idea of a key enabling the holder to do something is similar.

Many of you will probably know how the public key / private key cryptography system works: basically it is that the digital asset is associated with a public key (which is public so anyone can see it) but which only works to change the system if combined with a private key. So only a person with the private key can change the record. The change in the record that can be made is that the digital asset is then associated with another public key, which requires a different private key to change the record.

If I use my private key to change the record so that the digital asset is then associated with the public key which requires your private key to change the record (that is, your public key) then I have transferred control of the digital asset to you.

The system also has the effect that I no longer have any control of that digital asset, so I can't transfer the same asset again. There can be no 'double spend'. To use the analogy of physical money, if I have a £1 coin, and I give it to you, then I can no longer

give it to anyone else. One of the most important features of the blockchain/DLT system is that the system is designed to prevent double spending. It is thus often said that a digital asset held in this way is rivalrous, ie only one person can have it at any one time.

This factual concept of control is what I mean when I use the word 'control' in the rest of this talk. It has a direct impact on most of the questions I raised. First, we can define a digital asset as a controllable electronic record. It is that controllability, plus some other features, that means that it can be classified as property. I will argue in a minute that to transfer legal title there must be a change of control. One of the key issues in relation to security is whether a security interest over a digital asset should be registrable in a situation where the secured creditor has control. We can think of custody of digital assets as where, broadly speaking , the custodian has control and the client does not but has ownership. I'm afraid the concept of control can't really explain the link to other assets: that remains a mystery, but one which I will try and explore a little later on.

We can say, then, that a digital asset is electronic data or electronic information or an electronic record (three ways of saying the same thing) but, crucially, one that can be controlled. However, in relation to some types of digital assets, there is a paradox. The asset is not the data, information or the record. That isn't what the owner of a digital asset wants. It is, in itself, pretty useless. Depending on the system, the data is a UTXO (an unspent transaction output) (as in Bitcoin) or a record of an account (as in Ethereum). These work rather differently but the basic idea is the same: they are a record of transactions, which, when interpreted by software, let you know how much you have to spend.

But that record would be no use to you at all unless you had the ability to spend the balance. The only reason the record has value is because you, as holder of the private key, can change the record so that some of that unspent balance can be transferred to someone else, ie can become associated with that person's public key. The thing of value is the ability to change the system, not the data.

Some digital assets (we can call them exogenous assets) are linked to real assets outside the system. Here the value is obvious. Let us assume that a digital asset is linked to a piece of gold. The gold is valuable. So the digital asset is valuable, to the extent that 'owning' the digital asset means that you own the gold (I'll talk later about how and whether that can be achieved). Having the ability to change the record means that you can sell the gold. But what about a digital asset that is not linked to anything (an endogenous asset like Bitcoin)? The only value is in the ability to change the record. You can sell that ability, but why would anyone pay for it? The answer is that someone will pay them for it and so on.

So what is a digital asset? I think Professor David Fox has it right when he conceptualises it as a transactional power: the power to make transactions according to the rules of the system. But this is quite hard to get your head round, particularly because we usually think of a power as something we have in relation to a thing (I have the power to grant you good title to my bicycle) or against a particular person. Here there is no thing, and the power is in relation to the system not against one or more persons. So we use a metaphor. We call this power a digital asset (also, often, a

'token') and we talk about it as though is it a thing which can be controlled, and transferred. And so that is what I am going to do for the rest of this talk.

So are endogenous digital assets (those not linked to any real world asset) property? This is quite well trodden ground, and you can read a lot of the argument for yourself. So I will just give some pointers as to the discussion, and where we are in English law and then move on.

First, why does it matter? If a digital asset is property, then it can be the subject of proprietary rights, such as ownership or a security right. Some of the conclusions flowing from this are on the slide: the owner can follow the asset in the event of an unauthorised disposition, or perhaps trace its value, various procedural remedies are available to someone making a proprietary claim, it can be used to secure an obligation and it forms part of the assets available for distribution on the insolvency of its owner.

It is now reasonably well settled in the common law that an endogenous digital asset is property. Although not a binding authority, the UK Jurisdictional Task Force, in its Legal Statement of November 2019 concluded that it was property. This conclusion was followed by Mr Justice Bryan, after considerable discussion of the issue, in *AA v Persons Unknown*[3] which was an application for a proprietary injunction. After a very fully argued hearing, the same conclusion was reached in New Zealand in the case of *Ruscoe v Cryptopia Ltd*[4] in April 2020. A number of UK cases concerning digital assets have since proceeded on the basis that AA was correctly decided and that endogenous digital assets are a form of property under English law, including the Fetch.AI and Litecoin cases.[5] While it is still possible to argue that digital assets are not property in English law (and it is not entirely clear whether they are choses in action or 'other intangible property') such an argument is very unlikely to succeed, especially given a growing international consensus that they can be the subject of proprietary rights.

There are a number of features of digital assets which make it appropriate for them to be classed as property. Versions of these features appear in cases and scholarly discourse on the nature of property, and they are relied upon by the UK Task force. They can be individuated, ie each one is individual and can be identified. This is how the system works: the system records transactions and so each digital asset will have a unique transaction history and is therefore distinct from any other. However, this is a different point from whether digital assets can be seen as fungible ie interchangeable. That is a matter for the relevant parties, and often for the relevant market. If transfer of any digital asset of a particular type (for example, bitcoin, can be used to comply with an agreement or obligation to transfer, then the digital asset is fungible. Most are, although, for example, non-fungible tokens are not fungible (the clue is in the name!!).

Going back to the features of property, digital assets can be controlled (as I have already explained), and they are rivalrous, as I also said earlier. They can be transferred and they have a degree of permanence (there is no requirement that property has to be

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[3] [2019] EWHC 3556 (Comm)

[4] [2020] NZHC 728

[5] *Toma v Murray* [2020] EWHC 2295 (Ch) (where it appears to be assumed that bitcoin are property though it is not necessary for the decision); *Fetch.AI Ltd v Fetch.AI Foundation Pte. Ltd* [2021] EWHC 2254 (Comm) [9], [14]; *Litecoin Foundation Ltd. v Inshallah* [2021] EWHC 1998 (Ch) [3]

permanent, merely that it has a degree of permanence). Since all these are features of digital assets, it seems appropriate that they are 'property'.

How is legal ownership transferred?

Here I will set out an argument that I, together with Hin Liu, have made elsewhere. While it is made slightly tentatively, I do think this is what the law should be. If this is right, then, although it would be possible for the courts to go down this route and for the rule to be judge-made, in the interests of certainty it might be better were it to be confirmed by legislation, particularly if the rule at the bottom of the slide: a taking free rule, were thought to be desirable as legislation would probably be necessary for this.

The argument is that change of control is a necessary but not sufficient condition for transfer of legal ownership under English law. It is not sufficient as there needs to be intention to transfer, and the person transferring must also have the right to transfer (either as owner or as because they are authorised by the owner). A transfer by any means other than by change of control takes effect in equity.

Why do I say that change of control is a necessary condition? Digital assets cannot be transferred by assignment or novation as they are not rights against any person. Although a digital asset is clearly an intangible, the nearest analogy when thinking about a transfer (though not an complete analogy) is the transfer of legal title to goods. This is effected in English law by three methods: a deed or bill of sale, by delivery or by sale. Transfer by deed or bill of sale is clearly unsuitable for digital assets, since the whole point is that transfer can be immediate and electronic. In a sale, property (legal title) passes when parties intend it to pass.[6] This rule is unsuitable for digital assets, since if legal title could be transferred whenever the parties intended, as opposed to a change of control on the system, the record constituted by the system would quickly become desynchronised from the actual location of legal title, and legal ownership would be completely hidden.

Of course, if the parties want 'hidden' ownership, this can be effected by a transfer in equity ie off the system. It is much more appropriate for the transfer of legal title to digital assets to only take place when there is the equivalent of delivery. A delivery of goods is a transfer of possession, but since there can't be a transfer of possession of an intangible digital asset, there needs to be a transfer of control instead. This has the benefit that, at least prima facie, the record on the system will be synchronised with the location of legal title.

However, it is only prima facie. As I said, the transferor might not have the right to transfer. This raises a separate question which I don't have time to consider: whether there should be a rule that a good faith acquirer takes free even of a prior legal interest (as was established in relation to money in *Miller v Race*[7]). The UNIDROIT working group have decided that the principles will suggest that there should be such a rule, because of the need for security of transactions, but in terms of English law this is very much an open question.

Security

[6] Sale of Goods Act 1979 s.17

[7] *Miller v Race* (1758) 1 Burr 452 at 457–458

Looking at the four categories of security interest under English law, it is reasonably clear that, since possession can only be taken over tangibles under English law, digital assets cannot be the subject of a pledge or a lien. However, they could be the subject of a mortgage or a charge, which is non-possessory.

The big question is whether, at least when considering mortgages or charges created by companies, a mortgage or charge over a digital asset needs to be registered under the Companies Act[8] in the situation when the secured creditor has control of the digital asset. There are two possible policy arguments in favour of the registration requirements being disapplied in this situation.

The first is that control by the secured creditor (which would normally create a legal mortgage if this were intended) gives sufficient publicity of the security interest. After all, the mortgagor could no longer transfer control of the asset to anyone else (ie sell or give a legal mortgage over it), and this inability would show a potential secured creditor that there is likely to be a security interest over the asset, or that the debtor does not own the asset. However, the mortgagor could create a charge over the asset (which would not require a change of control), and without registration there is no easy way for the potential chargee to find out the true position.

Even if the publicity argument does not convince, it could be said that there are market-based reasons for exempting a security interest, involving change of control, from registration. Such interests could be short term in a rapidly changing market, and registration could be said to be too cumbersome (making a similar argument as that advanced for securities traded on the capital markets). Moreover, in a market where transactions are effected by smart contracts, registration, which involves human action, could be seen as inappropriate.

If this argument convinces, there is still the question as to how to achieve the desired result? Should there be specific legislation, or is the answer to extend the Financial Collateral Arrangements (No 2) Regulations to cover digital assets? The latter might require careful thought, since there are other consequences if a security interest falls within the regulations, such as disapplication of various parts of insolvency law.

Of course, it could be said that, rather than use control-based *security* interests, parties will just use title transfer collateral arrangements which need not be registered anyway. The problem with such arrangements is that the collateral provider is at risk of the counterparty's insolvency to the extent of any surplus value in the collateral, which could be a danger in a market where values change quickly.

How are digital assets held?

Given the time, I can only explain this in outline, although as co-chair of the sub-group on custody for the UNIDROIT project I have spent quite a lot of time thinking about the principles relating to this area. The first challenge is to define what we mean by custody as opposed to other ways of holding a digital asset.

If A owns a digital asset there are at least 3 possibilities.

[8] Companies Act 2006 sections 859A et seque

The first is that A controls the digital asset herself, either because she is a node or controls it through a wallet. I have called this a 'non-custodial wallet' on the slide, although, of course, what the parties call the wallet may not be definitive, and in any particular case a wallet could in fact give rise to custody. In this situation, A continues to own the asset

The second possibility is that A can transfer control to a person who holds the asset on A's behalf. A no longer has control of the asset. This is what I would call custody. This relationship could arise in a number of situations, including where A transfers an asset to an exchange who then sells it on A's behalf and the situation where an exchange acquires a digital asset on A's behalf, as well as where the parties actually call the relationship custody. A will continue to have a proprietary interest in the asset: I would suggest that the English law analysis is that the custodian holds the asset on trust for A.

The third possibility is where A transfers control AND ownership of the digital asset to another person (B) who then owes A a merely contractual obligation to transfer back an equivalent digital asset. An example of where this would be the case is where B lends out the digital assets it owns and earns interest some of which is passed on to clients. A real world example of this is a platform called Celsius. The analogy with a bank deposit is clear, and the legal analysis is the same. What A has is a right against B. B and not A owns the asset (and B may well dispose of the asset and have no proprietary rights in relation to it at all). A therefore bears the insolvency risk of B.

Custody is clearly an area where regulatory provisions are required, at least to protect vulnerable customers from risk they do not appreciate and probably to bring custodians within the regulatory net. However, apart from providing an analytical structure, what can private law say about custody?

I think it can say two things. First, to ensure that clients of custodians (ie the second category) have proprietary protection against the insolvency of the custodian, probably by the use of the trust, that is, that the custodian holds the asset on trust for the client. Second, if the trust is used, we need to consider whether anything more than general trust law is needed to ensure that there are some non-excludable duties imposed on custodians, such as a duty of care in relation to safeguarding, a duty to comply with the client's instructions, limits on right of use (that is, the right of the custodian to dispose of the assets, in part or in whole for its own benefit), segregation from custodian's own assets and a duty to maintain accurate records.

Exogenous assets: what is the link?

Now I turn to one of the most interesting areas of the private law in relation to digital assets, but one which is, I think, clearly governed by national law and which will vary considerably from jurisdiction to jurisdiction. This is where a digital asset purports to be linked to a 'real world' asset.

After many many discussions in the UNIDROIT working group, we think that it is best to see the digital asset as a separate thing to the other, real world, asset, but linked in some way to that asset. So the holder of the digital asset had two things: the digital asset and the linked asset.

The benefit of this view is that the same rules can then apply to an endogenous or exogenous digital asset. So, for example, the same concept of control can apply to both, and we can realistically think of the digital asset being the thing which is the subject of custody, even though, if the link is close enough and the real world asset is intangible, it could also make sense to say that the real world asset is also the subject of custody.

What real world assets are we talking about here? Here are some ideas. The intangibles include the obvious: equity and debt securities (there are many actual examples) as well as any rights (usually contractual) against another person to money (ie debts), or to goods or services. Another possibility is a link to money itself (although that will normally be in the form of a right against a bank or a central bank) or to another digital asset. Another (theoretical) possibility is IP.

The list of tangibles is short, because there are really only two types of tangibles: land and goods. I have put in brackets documentary intangibles, such as documents of title to goods and negotiable instruments, as these are strictly speaking tangibles, but it does seem very unlikely that they would be linked to digital assets. In fact, as I will explain, it is very difficult to have an effective link between a tangible asset and a digital asset, and the easiest way to do this is for a special purpose company to buy the asset, eg land, and for the shares in that SPV to be linked to the digital assets.

Then there is a link to .... Nothing. I will talk briefly about NFTs in a few minutes, but basically, in a typical NFT, the link is to nothing that could be seen as property, so although there is a purported link, the holder gets nothing more than control (and ownership) of the NFT.

Where statute provides specifically for the link: Register
The first, and simplest, way the link between the digital asset and the real world asset can occur is if statute provides specifically for the link. There are various possibilities.

One is that the system on which the digital asset is held is legislatively designated as a register of ownership, or, alternatively, that statute provides that a register which has previous existed in paper or other electronic form (such as an electronic register controlled by a registrar) can now be constituted by a system recording digital assets.

An example of the first would be if a statute were to provide that any system recording digital assets which tracked the supply chain of wholesale diamonds was conclusive evidence of the ownership of those diamonds, so that the person who controlled a digital asset on the system was the owner of the diamond to which it related. There is actually such a system using DLT/Blockchain technology: called Tracr. There probably couldn't actually be such a statute in reality, since the supply chain in diamonds is so international that no one country could legislate effectively, but it is quite a good illustration of where a digital system which already exists could be given legislative force so that registration became legal title.

An example of the second type of legislation would be one which provided that a share register of a company could be held using a system recording digital assets. This happened in Delaware, US in 2017, when sections 219 and 224 of the Delaware Code, Corporations Law were amended to allow the 'stock ledger' to be held on a DLT

system. Section 219 says that the stock ledger is a record in accordance with section 224, and section 224 says that the record can be held electronically including on 1 or more distributed electronic networks or databases.[9]

Specific Legislation

It is also possible for specific legislation to provide more generally for there to be a legal link between digital assets and other assets. Lichtenstein's Blockchain Act, passed in 2019 provides that a digital asset is what is colloquially called a 'container', or, in the Act, a 'token'. The container can be empty (that is the endogenous digital asset) or can contain a right to property or against a person.[10] Article 7 of the Act provides that "Disposal over the Token results in the disposal over the right represented by the Token." This seems pretty conclusive, but there is obviously some doubt, because subsection (2) of Article 2 provides that If the legal effect under (1) does not come into force by law, the person obliged, as a result of the disposal over the Token, must ensure through suitable measures that: a) the disposal over a Token directly or indirectly results in the disposal over the represented right, and b) a competing disposal over the represented right is excluded. I am told by Lichtenstein experts that if the person obliged doesn't carry out that obligation, then the real world asset is not transferred and the putative transferee only has a contractual claim. So the system is not entirely foolproof even with this type of legislation.

Documentary intangible

Another analysis is for the digital asset to be treated as a documentary intangible, such as a negotiable instrument or a document of title to goods. As I'm sure you all know, documentary intangibles are pieces of paper which represent either ownership rights (so that transfer of the document transfers ownership) or possessory rights (so that transfer of the document transfers constructive possession). Thus, the transfer of a negotiable instrument which represents a debt transfers the right to be paid that debt, and transfer of a bill of lading transfers constructive possession to the goods to which it relates. The idea of a documentary intangible is that a document, which is easy to transfer, can effect the transfer of something that it is not easy to transfer by locking up the right to the thing in that document.

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[9] **§219(c)** For purposes of this chapter, "stock ledger" means 1 or more records administered by or on behalf of the corporation in which the names of all of the corporation's stockholders of record, the address and number of shares registered in the name of each such stockholder, and all issuances and transfers of stock of the corporation are recorded in accordance with § 224 of this title. The stock ledger shall be the only evidence as to who are the stockholders entitled by this section to examine the list required by this section or to vote in person or by proxy at any meeting of stockholders.

§224. Form of records.

Any records administered by or on behalf of the corporation in the regular course of its business, including its stock ledger, books of account, and minute books, may be kept on, or by means of, or be in the form of, any information storage device, method, or 1 or more electronic networks or databases (including 1 or more distributed electronic networks or databases), provided that the records so kept can be converted into clearly legible paper form within a reasonable time

[10] Art 2(c): "Token": a piece of information on a TT System which:

- 1. can represent claims or rights of memberships against a person, rights to property, or other absolute or relative rights; and
- 2. is assigned to one or more TT Identifiers;

This idea, then, maps quite well onto the exogenous digital asset situation, since we have something of no real value in itself, the transfer of which transfers a valuable right. However, there is a snag. It took hundreds of years for the law on negotiable instruments and documents of title to goods to develop. The law on negotiable instruments was eventually codified in the Bills of Exchange Act 1882. What counts as a document of title to goods is, at common law, a matter of mercantile custom. In the absence of mercantile custom, there needs to be a statute.

Unless the idea of mercantile custom has speeded up considerably since bills of lading were considered to be documents of title, it is very unlikely that at the moment there would be held to be a mercantile custom to that effect in relation to digital assets. More importantly, a digital asset is not a document or an instrument as it si not a piece of paper. Both these points were mentioned by the UK Task Force in reaching the conclusion that digital assets were not, at the moment, documents of title.

However, it would be possible for statute to provide that certain classes of digital assets (those which mirrored documents which are currently documentary intangibles) to have the same effect as documentary intangibles. This is being considered at the moment by the Law Commission. Even this development not trouble free. First, the statute would need to specify to which types of documents the digital assets need to be completely analogous, and in any given case the digital asset would need to fall within that definition. One could foresee, of course, that once there was a statutory definition, those setting up a system for exogenous digital assets would be able to structure the digital asset so that it fell within it. Second, the Law Commission need to work out what is the equivalent to possession of a documentary intangible when applied to digital assets, which, being intangible, cannot be possessed. The most obvious candidate is "control" as I have defined it earlier.

If legislation were passed this would mean that when these criteria were met, transfer of the digital asset would transfer the right to which it related.

If the real world asset is an obligation

Now we are getting to situations which don't involve a statute. Therefore, we're moving away from the relative certainty of being within a legislative provision, to where parties try to set up a structure which means that the control of the digital asset is very strong evidence of ownership of the linked asset. I should qualify this by saying that this statement is rather general, and assumes that the person controlling the digital asset owns it. As I said, there are situations such as custody where this is not the case, but I will concentrate on the basic situation where control and ownership are aligned. As to how to structure a system where control of the digital asset is strong, or best, evidence of ownership of the linked asset, I will outline a couple of methods which probably will work, at least as a matter of commercial practice, while also mentioning some of the things that could go wrong.

First, if the real world asset consists of a personal right, such as a right to be paid, with a correlative obligation on the payer, it is possible to create the obligation to pay in such a way that it can only be discharged by payment to the person who controlled the digital asset. Take an issue of debt securities. It is possible to issue debt securities saying that the obligation is only discharged if the payment is made to a person falling

within a specified class or description: here it would be the person or persons who controls the relevant digital assets. However, that may not be enough.

Suppose that a person (A) who controls the digital asset, rather than transfer the digital asset to a transferee, assigns the right to receive payment to a person (B) by a statutory assignment under s.136 LPA (notice given to the issuer), but A does not transfer control of the digital asset to B. Under a statutory assignment the obligor must pay the assignee, and can only get a good discharge from the assignee. There would then, at least in practice, be a problem for the issuer: who should it pay? It would probably argue that it can only get a good discharge against A (according to the terms of the debt) and so that implies that the debt cannot be assigned to someone who did not control the digital asset. But to be really sure, the bond issue's terms should also contain a clause restricting assignment of the debt to anyone who did not control the linked digital asset.

That method should work for any obligation, providing that the documentation is clear enough and in theory would work for any contractual obligations (ie not just obligations to pay money).

Tangible asset

However, it is much more difficult if the real world asset is something other than an obligation. Let us take the most difficult case: that of a tangible asset. It is often said that a digital assets system can facilitate trading in tangibles because ownership of the tangible (or even an undivided share in the tangible) can be transferred by transfer of the digital asset. But can this really work?

Let us take a bar of gold as an example. If a digital asset was linked to that bar of gold, the control of the digital asset could be evidence of ownership of the gold. The ownership will start off synchronously, ie A owns the gold and the digital asset. If A transfers both the gold and the digital asset to B, then this would retain the link between the two. The problem is that, unlike with the contractual right, there is no way to make the gold unable to be transferred to a person except to a digital asset holder. So there would be nothing to stop B transferring the digital asset to C and selling the gold to D. B would not even need to give D possession of the gold, since property in goods can be transferred by sale without delivery. Of course, A could get B to make a contractual promise not to transfer the gold to a person who was not also the transferee of the digital asset, but that promise will only give A personal rights against B and won't bind third parties such as D. So the link between the digital asset and the gold can be broken, so that the transferee of the digital asset (C) has no proprietary interest in the gold, and only has a claim against B for breach of contract. Because of this possibility, the digital asset system is not best evidence of ownership, and its value in this regard is less than 100%.

Of course, there are things that can be done to make the lack of synchronisation I have described less likely in practice. One would be if steps were taken to inform potential buyers that the tangible gold was linked to a digital asset. An example would be if the gold was in the custody of a warehouse which was instructed only to make actual or constructive delivery of the tangible gold ONLY to the current holder of the digital asset. Since property in the gold could be transferred without delivery, it would not be impossible as a matter of law for someone to buy the gold without being the transferee

of the digital asset, but it is commercially very unlikely. The more steps like this that are taken, the greater is the strength of the evidence of ownership provided by the holding of the digital asset.

Where transfer of the real world asset requires registration

The link becomes even weaker where the transfer of the real world asset requires a formal step, such as registration. Examples might be shares, Intellectual property or land. Here, the mere transfer of the digital asset will not transfer legal title to the real world asset, even if that is what the parties intend it to do, although the transfer might be effective in equity. This problem would, of course, be overcome if the system on which the digital asset was held was in fact a statutory register (as I mentioned earlier in relation to Delaware). Otherwise, the necessary link is broken, and the holding of the digital asset is just evidence of intention to transfer the real world asset, which could give rise to a personal claim against the transferor for failure to effect the real world registration.

Non-fungible tokens

Finally, a very brief word about a very topical linked asset: the Non-Fungible token. This is a token linked to something, usually digital, which can be easily copied and so is difficult to 'own': unlike a digital asset it is non-rivalrous. The token, the digital asset, is created and, as we have seen, can be owned and is individuated. Unlike bitcoin and so on, it is not treated as fungible by the market: it is designed to be unique. So far, so good.

The problem is that the token is not linked to anything that can be owned. Unlike physical art, there is no unique thing (such as a framed canvas) for the NFT holder to own. Because the digital thing to which the token is linked is non-rivalrous, it is not property. So the analysis based on evidence of ownership will not apply. The NFT holder may have viewing rights, but, then, usually so does everyone else.

There may be, of course, intellectual property connected with the digital thing. But with an NFT, there is not even an attempt to link the intellectual property in the digital thing (such as a digital art) to the token. Even if that were the case, it would be very difficult to link the transfer of the token to the transfer of the IP, at least under English law, for the reasons mentioned above. But in fact that isn't how NFTs are set up: the IP remains with the creator of the art. The holder of the token cannot stop anyone else from copying or downloading the art. So what does the holder of the NFT get? Just the warm feeling that comes from owning an individuated token that purports to be linked to something : the cynical would say that the holder has 'bragging rights'.

Conclusion

So how should we answer the original question I posed: where do we need new law?

Many private law aspects of digital assets can be addressed by using existing English law, and particularly the trust and other equitable devices. This slide shows a list of what I think would be new. I am assuming that the classification of endogenous digital assets as property is already established by case law.

A definition of 'control' as a factual concept is key to a lot of the rest of the analysis. Outside the sphere of digital assets, 'Control' is a term used in many contexts, often

denoting a legal concept , eg where X promises Y he will not dispose of an asset. The factual concept of control for digital assets is one which needs to be clearly defined to dovetail with the factual features of these assets which make them appropriate to be called 'property'. Although this concept could be developed by the courts, it is so key that it is likely to need to be established by legislation.

If it were thought that change of control were a necessary requirement for transfer of legal title, as I have argued, this, too, would probably require legislation, as would a taking free rule for good faith acquirers, if that was desired.

If we wanted a security interest taken by change of control to be exempt from registration, this would certainly require legislation. This could be by extension of the FCARs, but we would have to think very hard whether we wanted the other consequences of the FCARs, such as disapplication of some insolvency provisions, to apply to digital assets. In any event we would probably need to amend the FCARs to apply to tokenised securities.

In my view, we clearly need regulation in relation to custody, but also development of proprietary and contractual protection for clients. The private law development could probably take place by case law, in the way that trust law has been developed to apply to the holding of securities through intermediaries.

Finally, if we want certainty in relation to exogenous assets, or some of them, legislation is probably desirable here, either to provide for blockchain/DLT registers, or to provide for digital assets to be documentary intangibles. I am more sceptical as to whether the Lichtenstein route would really work for the other categories of 'linked' assets I discussed.

I hope that has given you an overview of at least some of the private law issues arising in relation to digital assets. I'm sure there are many other issues that will arise, but these seem, at the moment, to be the most significant, and merit much more detailed and careful attention than I have been able to give them today. Luckily, as well as the academics who are thinking about these issues, the Law Commission is thinking very hard about them at the moment, and I have every confidence that their consultation paper, due in 2022, will contain very thoughtful and measured proposals in this difficult area of the law.