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Crypto-assets: legal characterisation and challenges under private law
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*E.L. Rev. 251  Abstract
Are our legal systems, and in particular that of private law, prepared to deal with crypto-assets in a way that ensures legal protection for the rights and obligations of citizens and private firms, without hindering innovation? After defining the new phenomenon of crypto-assets and its complex relationship with established legal concepts, this article deals with how the courts have characterised crypto-assets and the rights they are considered to confer; how these rights can be enforced; and the actions the judiciary and especially the legislator could undertake, among prohibition, benign neglect, regulation or extensive interpretation, and compulsory insurance, to allow our legal systems to adapt and ensure that crypto-assets prosper without shifting risk on society. Given the global nature of the crypto-assets phenomenon, only an international approach will be able to tackle this challenge.

Introduction
Crypto-assets are a relatively new phenomenon, which, especially in view of the anonymity that they may grant their holders, pose numerous widely discussed challenges to public (administrative) law both within the EU regulatory environment and at a global level. These challenges are particularly evident in the fields of anti-money laundering and cyber security, and can also pose challenges in the field of privacy and data protection. The potential deployment of crypto-assets as store of value (for example, in the case of stable coins), as means of payment and/or as means of investment, does not always fit within existing regulatory and legal frameworks; in the European Union, for example, it is unclear whether crypto-currencies fall within the scope of the Electronic Money Directive (EMD2), the Payment Services Directive (PSD2) or the Markets in Financial Instruments Directive (MiFID2), respectively. It is clear that the phenomenon of crypto-assets is complex to capture from a legal, regulatory and oversight standpoint.

The defining characteristics of crypto-assets (especially anonymity and non-materiality) also create challenges in the—relatively less explored—domain of private law. To tame this new phenomenon, public authorities (including supervisors and overseers) can try to regulate crypto-assets and monitor compliance; but another question, which forms the subject of this article, is whether our legal systems, and in particular that of private law, are prepared to deal with crypto-assets in a way that ensures legal protection for the rights and obligations of citizens and private firms, without hindering innovation. In brief, how prepared is the existing private law framework when it comes to crypto-assets?

After better defining the new phenomenon of crypto-assets and its complex relationship with existing and established legal concepts, this article deals with how the courts have characterised crypto-assets and the rights they are considered to confer, how these rights can be enforced, and the actions the judiciary and especially the legislator could undertake to allow our legal systems to adapt and ensure that crypto currencies prosper without shifting risk on to society. The article concludes that, given
the global nature of the crypto-assets phenomenon, only an international agreement, or at least the adoption of international standards, will be able to tackle this challenge.

What are crypto-assets? A subset of digital assets, in an uneasy relationship with existing law

The term "digital asset" describes any asset in digital form. The simplest examples are electronic money or securities in dematerialised form—a non-controversial legal notion. Nowadays, we are witnessing the creation (and, to an extent, the use) of an increasing number of new digital asset, whether used as a means of payment or store of value. Some of these approximate a speculative asset more than a unit of money, whereas others function like vouchers to access software or other goods or services. This "digital flourishing" reflects the development of digitalisation as a means to continue doing old things in a newer, faster and more efficient way. The impact of digitalisation within the financial sector has predominantly been the digital transformation of existing money and securities. Such a transformation has unleashed new markets and services, and has supported the cross-border provision of financial services.

Crypto-assets constitute a special category of digital assets, as they are based on the extensive use of cryptography. If all crypto-assets are digital assets, from a technology standpoint, not all digital assets are crypto-assets. Because of their indigenous characteristics, crypto-assets do not simply leverage on the gained level of efficiency due to digitalisation, but also spearhead the creation of new/complementary financial ecosystems.

Historically and sociologically, crypto-assets developed as a result of a mistrust of the establishment and the financial and regulatory architecture supported by that establishment: their rise coincides with a growing dissatisfaction with the existing monetary system. It is no coincidence that Bitcoin, for instance, was launched in the immediate aftermath of the 2008 crisis, embodying an explicit attempt to replace fiat money with a peer-to-peer platform for the production of a digital token whose scarcity is algorithmically secured against political interference—and the exchange thereof. The introduction of crypto-assets was clearly an attempt to get out of the regulated environment by substituting rules with technical requirements ("code is law"). This seems to suggest an alternative to the primacy of the rule of law, which is a pillar of civil society, introducing another method to ensure that rights and obligations are respected and enforced with certainty. It seems clear that mistrust of the authorities and of the existing monetary system does not necessarily translate into a more general mistrust of the legal system and a rejection of the protection and enforcement of rights—as disgruntled users of crypto-assets seeking access to the judicial system are currently demonstrating. It is therefore essential to find ways for our legal systems to adapt and incorporate the new developments brought by crypto-assets and ensure judicial protection, unless it is concluded that sufficient protection for all stakeholders is already provided by the code (which remains doubtful at present).

The novelty of crypto-assets challenges the existing financial and regulatory architecture in a number of ways: first, they are created and transferred using cryptographic methods. Secondly, they do not give rise to a right against an entity. Thirdly, most crypto-assets do not represent either a financial claim or a financial liability. Fourthly, they are themselves an asset with intrinsic value. Finally, for decentralised networks, without a regulated gatekeeper to ensure the integrity and safety of transactions, it is difficult, if not impossible, for the competent authorities to step in and intervene in crisis situations, given the non-materiality and the anonymity of crypto-assets. Therefore, the rights of individuals might not be effectively recognised or enforced. Given the potential for the rapid expansion of crypto-assets among retail investors, it is not unrealistic to suggest that these risks will materialise.

Legislators, regulators and overseers are under pressure to find a suitable way to regulate and oversee crypto-assets while ensuring the protection of the rights of their holders. So far, that pressure has called for either a flexible interpretation of the existing legal and regulatory framework or for changes to the legal environment as we know it. Until the necessary changes are identified, agreed and fully implemented, the protection to be provided by the existing legal framework depends on a taxonomy exercise of the legal characterisation of crypto-assets, based on the interpretation of legislation and on the enforceability of related rights and obligations based on the various taxonomy scenarios. These two aspects are analysed in the next two sections.

The legal characterisation of crypto-assets in case law—can they be subject to property rights or do they confer a claim for damages only?

Legal characterisation is critical to the application of private law to transactions involving crypto-assets. Intangible objects of economic importance are recognised by the existing legal system in different ways. For example, data, as an intangible object, is not subject to individual rights under property law or intellectual property law; rights related to data, however, are recognised by law. The question arises, therefore, whether crypto-assets (digital data) give rise to rights in rem, which can be exercised...
generally, or give rise to rights in personam, which can only be exercised against a specific person or persons. There is no clear answer to that question, and therefore the novelty of crypto-assets enters a legislative lacuna.

If crypto-assets are not subject to property rights and therefore cannot be owned, it follows that ownership thereupon cannot be transferred or in rem rights on them asserted if they are misappropriated. Conversely, if crypto-assets are indeed recognised as property, it is necessary to understand the precise legal nature of such property (res, claim or as another form of personal property, such as intellectual property).

It is only recently that the courts have been faced with the need to determine the legal characterisation of crypto-assets. In the existing legislative lacuna, the resulting—divergent—jurisprudence on the legal nature of crypto-assets does not come as a surprise. It is, however, worthwhile to examine the various conclusions offered by the courts, which demonstrate the difficulty of determining the legal characterisation of crypto-assets and the need to work at the international level to tackle this novel and global development. Some representative judgments are examined below.

Obiter dictum in an EU Court judgment—Bitcoins not tangible property
To date, EU Courts have dealt mainly with taxation and money-laundering aspects of crypto-assets—while adding obiter dicta on certain property aspects. In *Skatteverket v Hedqvist*, for example, the Court of Justice of the European Union ruled that the services of a Bitcoin exchange in exchanging Bitcoin for a traditional (fiat) currency is exempt from VAT on the basis of the "currency" exemption of the VAT Directive. In its judgment, the Court stated: *E.L. Rev. 256*

"It must be held, first, that the ‘bitcoin’ virtual currency with bidirectional flow, which will be exchanged for traditional currencies in the context of exchange transactions, cannot be characterised as ‘tangible property’ within the meaning of Article 14 of the VAT Directive, given that … virtual currency has no purpose other than to be a means of payment ... It is common ground that the ‘bitcoin’ virtual currency is neither a security conferring a property right nor a security of a comparable nature." [Emphasis added.]

Bitcoins as intangible objects entitling claimant to compensation rights only—a Spanish and a Japanese judgment
In June 2019, the Spanish Supreme Court issued its first judgment on Bitcoin in a case involving a trader who failed to reinvest the cryptocurrency he had received from five investors in high-frequency trading operations. In their appeal to the Supreme Court, the investors/plaintiffs argued that ss.110 and 111 of the Spanish Criminal Code (on civil liability and its scope) require the return of the asset that is the object of the crime, meaning that it would be appropriate for the judgment to order the return of the misappropriated Bitcoins, and only if those were not returned at the enforcement stage of the proceedings, to then agree on the valuation and appropriate compensation for the damages or losses caused. In this regard, the Spanish Supreme Court ruled that:

"Although this court’s case law has expressed the obligation to return any assets that are the object of a crime, including money, the plaintiffs were not defrauded of bitcoins that should be returned to them. Instead, the misappropriation of property that must be remedied involved money in euros that, through deception inherent to the fraudulent acts, they handed over to the defendant for investment in assets of that type. In addition, the so-called Bitcoin is not susceptible to being returned, since it is not a material object, and it does not have the legal consideration of money either." [Emphasis added.]

"… Bitcoin is nothing more than an intangible asset, in the form of an account unit defined by computer and cryptographic technology called bitcoin, whose value is that each unit of account or its portion reaches through the offer and the demand in the sale of these units is done through bitcoin trading platforms." [Emphases added.]

Subsequently, as a result of its characterisation of Bitcoin, the Court went further to state that it,

"cannot agree to restitution of the bitcoins, since the appropriate way to repair the loss and compensate the damages is as indicated in the contested judgment, i.e., to return the amount of the monetary contribution (damages) to the injured parties, increased by the amount of lost profits that would have resulted from the price variation of the Bitcoin units between the time of the investment and the maturity dates of their respective contracts." [Emphasis added.]
The Spanish Supreme Court confirmed the defendant’s sentence to two years in prison. The victims, however, were only entitled to receive compensation in lieu rather than restitution of the Bitcoins. *E.L. Rev. 257* 26 Depending on the calculation method, such compensation in lieu could result in a sum equal or superior to the one invested.

Another interesting Court judgment is the older case of MtGox, a cases involving a crypto-assets exchange that filed for bankruptcy protection in Japan in February 2014.

In examining the legal claims brought against MtGox, the Japanese Courts ruled that Bitcoins are not cognisable as "things" capable of being owned under the Japanese Civil Code. This is because they do not satisfy the legal definition of a "thing", as Japanese law defines things as (1) tangible, spatio-temporal entities that can (2) be made subject to one’s exclusive control. As a result, the company’s creditors were left with damages claims rather than claims based in ownership.27

**Bitcoins capable of being subject to property rights and entitling claimant to restitution—a Dutch judgment**

From a diametrically opposing perspective, in February 2018, the District Court of Amsterdam concluded in favour of a claimant who was owed 0.591 Bitcoin by a private company called Koinz Trading BV.28 The Court deliberated on whether a claim for payment in Bitcoin should be regarded as a claim that qualifies for verification (verifieerbare vordering). The Court held that Bitcoin has all the characteristics of a "property right" (vermogensrecht), meaning that Bitcoin represents a value and is transferable.29

A claim to transfer Bitcoin under property rights was therefore found to be valid. According to the Court, Bitcoin exists owing to a unique, digitally encrypted series of numbers and letters stored on the hard drive of the right holder’s computer. Bitcoin is "delivered" by transferring Bitcoin units from one wallet to another. Bitcoins are stand-alone value files, which are delivered directly to the payee by the payer in the event of a payment. As a result, under Dutch law, a Bitcoin represents a transferable value.

The Court concluded that there was a lawful and binding contract between the claimant and Koinz Trading BV, and considered the legal relationship as giving rise to a civil law obligation to pay for the contracted mining service and the violation of the obligation to pay in Bitcoins for this mining activity. Most importantly, the Court stated that since the obligations were undertaken in Bitcoin, the amount should also be returned in Bitcoin. Following the approach of the Dutch Court, the only risk the claimant assumes is the inherent volatility of Bitcoin—a risk (and opportunity) accepted and pursued when buying Bitcoin.

**Bitcoins capable of being subject to property rights and entitling the trustee to include them in the insolvency estate—a Russian judgment**

Similarly, but in an insolvency context, a recent award by the 9th Arbitration Court of Appeal of Moscow30 relied on art.128 of the Russian Civil Code31 to decree that Bitcoins are "an object of civil law rights", and therefore within the legal perimeter of the Russian Federation’s civil law. The context of the case was an *E.L. Rev. 258* individual declared insolvent, who was—as per the evidence—maintaining and using a crypto-currency wallet in his name, even after the insolvency determination. As a result of its interpretation of art.128 of the Russian Civil Code to include digital currencies, the Arbitration Court of Appeal of Moscow deemed that Bitcoins held by the insolvent individual in a cryptocurrency wallet should be included in the insolvency estate. A major consideration in that reasoning was the nature of the legal protection under insolvency law, i.e. to safeguard and increase the value of the insolvency estate to the benefit of the insolvency creditors. In the words of the Court,

"[u]nreasonable exclusion of any property from an insolvency estate based on grounds not provided by law can prevent creditors from satisfying their claims to the fullest by using the procedures stipulated by the Federal Law ‘On Insolvency.’” 32

Another interesting aspect of this case is that the Court resourcefully resolved the thorny issue of crypto-asset delivery by obliging the insolvent to "transfer access (the password) to his cryptocurrency wallet to the administrator for adding its contents to the estate".33

**In view of the specificities of the platform, the Nano XRB must be qualified as fungible assets and therefore an "irregular deposit"—an Italian judgment**
In the context of the bankruptcy of BG Services Srl, which managed a crypto-assets exchange platform called Bitgrail, the Court of Florence concluded that the exchange operator did not have controls in place to prevent the fraudulent removal of crypto-assets (mainly Nano XRB) from the platform and was therefore liable for damages.

With regard to the legal characterisation of crypto-assets, the Court of Florence stated that crypto-assets can be considered "assets" pursuant to art.810 of the Italian Civil Code as they may be the subject of rights. In addition, the Court also affirmed that crypto-assets were to be considered, in that case, fungible by nature, in view of the fact that the platform had full and exclusive control of the crypto-assets entrusted to it by users, and even the right to the independent use of those cryptocurrencies. Accordingly, the contractual relationship between the exchange and the user had to be qualified as an "irregular deposit" pursuant to art.1782 of the Italian Civil Code, according to which the depositary acquires the property of the fungible goods and is obliged to restitute the same amount of the same fungible goods. The Court continued that, even if the contractual relationship were to be qualified as a "regular" deposit, or as a contract of mixed nature (regular-irregular deposit), the responsibility of the platform manager for the damages would remain, as the conditions foreseen in the civil code to exempt the depositary from responsibility did not exist in the case considered by the Court.

It is also worth noting that the Court held that the trading of crypto-assets takes place among parties "only on a voluntary basis", and that "there is no legal obligation of participants in the ‘microsystem’ to accept payments for goods or services with crypto-assets".

**Bitcoins implicitly "recognised" as legal property—an English judicial order**

Another pertinent example (this time from a common law jurisdiction) is offered by the recent case Robertson v Persons Unknown before the Commercial Court, Queen’s Bench Division of the High Court of Justice of England & Wales. In the context of approximately £1.2 million in Bitcoin extracted from a cryptocurrency fund in a phishing attack, the Court granted an "asset preservation order", an interim ruling that prevents assets from being dissipated or transferred.

The order was in favour of Liam Robertson, chief executive of the claimant, i.e. the digital asset management firm Alphabit Fund. The Court considered whether cryptocurrencies are property and therefore subject to claims to own a specific asset or sum of money. Under the common law, personal property is categorised in two ways: a "chose in possession", that is, a "thing" that can be possessed physically, and a "chose in action", which can only be claimed or enforced by legal action, and not by taking physical possession. Currently, English law does not expressly treat Bitcoin as either. Because of its intangible nature, Bitcoin cannot be considered a physical thing in law ("chose in possession") and English law-makers have made it clear that information or data is not property in itself, nor does owning Bitcoins create contractual rights against anyone ("chose in action").

The English Courts, prior to making an authoritative determination as to whether Bitcoins are legal property (under the common law), were waiting for a legal statement to be published by the UK Jurisdiction Taskforce (UKJT), a group tasked with tackling the legal uncertainty regarding crypto-assets. The legal statement published in November 2019 covers private law aspects of crypto-assets only as opposed to other areas of law insofar as they relate to crypto-assets or smart contracts (regulatory characterisation and treatment, taxation, criminal law, partnership law, data protection, consumer protection, settlement finality, regulatory capital, anti-money laundering or counter-terrorist financing).

The determination of whether the common law would treat a particular crypto-asset as property ultimately depends "on the nature of the asset, the rules of the system in which it exists, and the purpose for which the question is asked". The legal statement concluded that "crypto-assets have all of the indicia of property", and are not disqualified as such because of their novel or distinctive features (intangibility, cryptographic authentication, use of a distributed transaction ledger, decentralisation, rule by consensus) and the fact that they are considered pure information (which in turn, would not render them classifiable either as things in possession or as things in action).

On 17 January 2020, the High Court judgment AA v Persons Unknown (handed down in December 2019) was published. In its judgment, the High Court adopted the reasoning in UKJT’s Legal Statement on the Status of Cryptoassets and Smart Contracts, finding that cryptocurrency is to be considered property under English law and therefore capable of being the subject of a proprietary injunction. The Court granted such an injunction to assist in the recovery of Bitcoin that had been paid to satisfy a malware ransom demand. This decision is expected to have wide ramifications.
Even before this decision, Bitcoin was effectively treated as property by market players drafting contracts and UK government agencies such as Her Majesty’s Revenue & Customs, which has declared that crypto-assets will be considered property for the purposes of inheritance tax. Outside of fraud litigation, the question as to whether crypto-currencies are property at all, and, if so, whether they are treated as "things" or "rights", is relevant in a variety of commercial situations, including taxation and insolvency proceedings.42

**Bitcoins as personal property that can be the subject of a trust—a Singapore judgment**

In *Robertson v Persons Unknown*, the claimant’s position that digital assets are to be treated as property relied on the 2019 decision of Simon Thorley IJ of the Singapore International Commercial Court in *B2C2 Ltd v Quoine Pte Ltd*.43 This case concerned seven trades relating to the exchange by electronic market maker B2C2 of the cryptocurrency Ethereum with Bitcoin in April 2017. The trades were automatically performed by Singapore-registered Quoine’s cryptocurrency exchange platform. Owing to a defect in Quoine’s software, the trades in question were executed at a rate approximately 250 times the Ethereum and Bitcoin market exchange rate, in favour of B2C2’s trades. The next day, Quoine reviewed the trades and realised that a serious error had occurred, and cancelled the trades by reversing the transactions.

B2C2 brought proceedings against Quoine, claiming that Quoine’s decision to reverse the trades was a breach of the contractual terms between the two parties. B2C2 further argued that, owing to the way Quoine’s platform operated, Quoine held the virtual currencies in B2C2’s user account on trust, and its unilateral reversal of the trades (and consequent disposal of B2C2’s assets) was a breach of that trust. In response, Quoine argued that it was entitled to reverse the trades as they had erroneously been entered into, and were therefore void.

As regards B2C2’s claim that Quoine’s decision to reverse the transactions was a breach of contract, the Court viewed the case as straightforward, noting that the general terms and conditions of the platform expressly stated that "once an order is filled, you are notified via the platform and such action is irreversible".44

On the question of whether the cryptocurrencies are capable of being considered as property, the Court concluded that cryptocurrencies meet all the requirements of the classic definition of property, i.e. "[are] definable, identifiable by third parties, capable in its nature of assumption by third parties, and have some *E.L. Rev. 261* degree of permanence or stability".45 While cryptocurrencies are not considered legal tender, they do have the fundamental characteristic of intangible property as being an identifiable thing of value.

As regards B2C2’s claim that Quoine’s unilateral reversal of the transactions was a breach of trust, the Court noted it first had to be established whether such a trust had been created, and concluded this was the case. On 24 February 2020 the Singapore Court of Appeal in *Quoine Pte Ltd v B2C2 Ltd* reversed this conclusion, stating that "the B2C2 breach of trust claim would fail because... we consider that there was no certainty of intention to create a trust" and that the facts of the *Quoine* case suggest that the transaction was "more akin to deposits being made with a bank".46 The Court of Appeal on the other hand, laying down existing case law, confirmed that crypto-currencies are to be considered property, refraining however from defining the type of property, concluding that such a definition is "not necessary" for the case at hand.47

**An assessment of the diverse positions in the case law**

To conclude, Courts in different jurisdictions recognise crypto-assets in some way, but characterise them differently under private law. Depending on the type of law the Court had to examine, crypto-assets are either subjects of ownership or of a claim; and, as a consequence, different types of remedies would be available to crypto-assets holders, such as right to restitution or right to damages, and different ways to transfer crypto-assets would be available.

The enforceability of rights and obligations protected by the legal system, in particular in view of the technical features crypto-assets are built with, and the decentralised network on which they are exchanged, is essential to ensuring the protection of rights. This issue is discussed in the next section.

**The enforceability of rights conferred by crypto-assets**

Apart from the legal uncertainties surrounding the issue of the legal characterisation of crypto-assets as property under existing legal regimes, an additional *vulner* to the legal protection of individuals may come from the (decentralised or even centralised) nature of the crypto-assets network. Currently, the design of our legal systems entrusts the liability and responsibility to identifiable entities. As far as enforceability is concerned, it would be challenging on the one hand to enforce a decision against a
crypto-assets holder, given their anonymity. On the other hand, when the right has to be enforced against the network and where a crypto-asset is designed for decentralised networks, it is difficult to identify the entity liable and responsible for the network’s operations. Indeed, first, it would be difficult to identify the individuals running the network’s nodes; secondly, it would be impossible to identify a single point of failure (i.e. a liable gatekeeper). Above all, it would be challenging to determine the law(s) according to which a claim can be brought and enforced; this issue, already complex in case of centralised networks, becomes almost impossible to solve in decentralised networks.

Conversely, in a centralised network, it would be relatively easier to determine who is subject to obligations and against whom rights can be enforced; it would be simpler to bring a claim against the gatekeeper(s) to whom the regulatory provisions refer. However, enforcement may not be de facto successful even in this case, to the extent that the entity lacks sufficient financial resources.

For lack of a uniform enforcement regime, it is apposite to examine this issue through two hypothetical cases of different crypto-assets, each with its own set of characteristics. It is important to note that these are rather "absolute" categories—in reality, there will always be more shades of grey in between the extremes.

Hypothetical Case 1—decentralised crypto-assets network, less prone to control and accountability: "bitcoin-type network"

A well-known example of decentralised crypto-asset is Bitcoin. It is a digital token, non-existent in physical form. Bitcoins are created ("mined") and exchanged de-centrally (i.e. rather than through the central record of a single issuing entity) in the blockchain, a Distributed Ledger Technology network.

In a first hypothetical "Bitcoin-type" decentralised trading platform that does not rely on an operator to hold users’ funds and internalise transfers in crypto-assets, all individual trades settle in the distributed ledger. The crypto-assets are therefore transferred on a peer-to-peer basis, among (possibly) unauthenticated users. The current regulatory approaches, which envisage a single service provider or a series of licensed network’s gatekeepers, by design do not appear to be suited to decentralised gatekeeping activities that do not foresee the involvement of an identifiable intermediary.

In order to indirectly regulate crypto-asset gatekeeping services and, at the same time, safeguard the regulated intermediaries/infrastructures with which those decentralised networks may interact, a set of principles to be applied to decentralised networks (and the cryptographic algorithms and protocols they are built upon) would first need to be developed.

A BIS Working Paper has already usefully proposed such principles, dealing with technological integrity of, transparency in and auditability of service performance, stress-tested operational security and cyber-resilience. Once suitable principles have been identified and adopted, they need to be enforced by network users and/or the supervisors. Some cases might involve a counterparty to whom the rules could assign a precise responsibility, in the absence of a gatekeeper. For instance, the wallet provider could be assigned responsibility for the user who can no longer access his wallet owing to a technical issue; the developer of the algorithm could be assigned the responsibility for the correct performance of the service or for enabling an audit; and the exchange could be assigned the responsibility for the correct and timely conversion of digital currency balances into traditional payment methods, and vice versa. However, such an assignment of responsibility would be problematic when the technological integrity and the management of the whole network are at stake. This lack of assignability has serious regulatory consequences: if no party can be identified as responsible for maintaining a certain standard or ensuring the respect of stated principles, no sanction is feasible, even if the users collectively exercise a monitoring role, and therefore legal obligations cannot be enforced.

Hypothetical Case 2—centralised crypto-assets network, subject to a higher degree of control: "global stablecoin-type network"

A recent (but still, theoretical) example of centralised crypto-assets network, backed by a plurality of entities possibly competing with the State, is "Libra". Libra is designed as a global stablecoin initiative supported by Facebook and several other partners. From a functional perspective, the Libra asset is designed primarily as a payment asset and, under certain circumstances, may serve as a store of value, as well as an investment instrument (which investors will be able to buy on trading venues and crypto exchanges). This complexity is reflected in the Libra arrangement, which entrusts to the Libra Association, its members and
third parties a set of several different functions and activities, including the issuance of the asset, the operation of the value transfer infrastructure, the custody and the management of reserve assets, and the provision of end-user services.

In principle, the nature and characteristics of the products and services provided and the risks they might entail should determine which rules apply. In the concrete case of Libra, the product overview (the first version of Libra’s White Paper) is vague on the rights and obligations attached to the Libra asset (coins). Given the information available, it is unclear how the Libra asset would be classified (security; e-money; coupon). Even if the legal qualification of the Libra asset became clearer, regulatory gaps may emerge in relation to the multiple and novel aspects of the Libra undertaking.

More generally, in a "global stablecoin-type network", as far as enforceability is concerned, and without venturing into any specific legal characterisation of global stablecoin-type "coins", two possible scenarios emerge:

- the holder of the stablecoin has either (a) an indirect claim on the "Association"; and/or (b) a direct claim on the underlying assets (i.e. "Reserve") and/or (c) a claim on the relevant reseller; or
- the holder of the stablecoin does not have any of the claims listed under the first scenario.

Under the first scenario, it would be possible for a holder of the stablecoins to have enforceable rights, for instance on the basis of non-performance or negligent performance of the relevant services/contracts the holder entered into with the stablecoin network "body" and/or the reseller (for instance, mismanagement of the stablecoin "Reserve" or non-redeemability).

Under the second scenario, it would still be possible to bring a claim (for instance under the law of torts) against one of the (identifiable) stablecoin network entities (i.e. the stablecoin "Association", the reseller(s), the "Stablecoins Founding Members"). However, depending on the level of regulation to which the relevant stablecoin entities are subject, assessing liability might be difficult.

In addition, depending on the level of capitalisation of the organisation, the enforcement may be de facto (un)successful. Currently, and in abiding by the tenet "same activities, same risks, same regulations", requirements as robust as those imposed on traditional payment systems, payment schemes or providers of payment services are necessary to protect the rights of holders of crypto-assets.

The way forward—ways to allow crypto-assets to prosper, while mitigating third-party risk

Crypto-assets pose new challenges for our existing legal frameworks. Their characteristics are atypical, and our legal systems are not designed to deal with them. However, at the same time, a democratic society must consider all new phenomena and ensure the protection of the rights of the individuals and the certainty of the law, in order to maintain a peaceful society. The question becomes, therefore, which instruments do our legal systems possess, to deal with these new phenomena and their networks? Will they adapt by introducing new rules? Or will the interpretation of existing rules be widened? Which instruments are best suited to tackle this issue in the private law sphere, and which are most effective in the public and regulatory law sphere?

The first instrument that comes to mind is judicial interpretation of existing rules, as they are applied to these new phenomena. For existing law on property and contracts to be able to keep up with the fast-moving development of these phenomena, while ensuring the necessary level of legal protection to crypto-assets investors, a more flexible approach may be required. As discussed above, some courts have stretched the limits of existing legal protections as far as they possibly could. In the field of private law in particular, engaging the inherent flexibility of the law through judicial interpretation might be more efficient than effecting changes to general principles that might have unintended consequences in other areas. Yet, the creativity of judges may not be enough, especially where cryptography is involved. For instance, a judge can do very little, if the cryptographic keys that secure access to a number of crypto-assets have been lost and no workaround is available. Of course, it could be argued that in such a case we are faced with a—voluntary—technology limitation rather than a failure of the legal/judicial system. Developments in cryptography and a further increase in computing capacity may be a more fitting solution to this problem than judicial activism.

The second instrument that comes to mind is the adoption of new rules to specifically integrate these new elements into the existing legal framework. The introduction of new rules by the legislator is particularly well suited to the field of public law, to address emerging financial risks. Legislators could do so by means of one of four approaches, depending on the perceived level of risk a given activity poses to society.
The first, and most extreme, approach would be to prohibit the activity itself and sanction those who exercise it, where the risk posed to society is considered unacceptable. It is already evident that in the case of crypto-assets, this approach will not be applied, as there are clear social benefits to crypto-assets.

The second approach would be the introduction of a new regulatory regime which ensures that the risk is borne by those responsible for the activity within our legal system. The aim of such a new regulatory regime would be, first, to recognise the indigenous features of crypto-assets and their digital ecosystem; secondly, to identify existing legislative/regulatory barriers under EU and national law; and lastly, to harmonise existing practices or legislative regimes in order to ensure a level playing-field when it comes to legal certainty and investor protection. This is the approach that has been recently adopted by Chinese legislators. China has established three internet courts in Hangzhou, Beijing and Guangzhou. These courts will hear "internet-related cases" online, all of which are located in the most flourishing and prosperous area of China’s internet industry. In September 2018, the Supreme People’s Court ruled that evidence authenticated with Blockchain technology is considered binding in legal disputes, declaring that internet courts should recognise digital data that is submitted as evidence if relevant parties have collected and stored this data via Blockchain with digital signatures, reliable timestamps and hash value verification or via a digital deposition platform, and can prove the authenticity of such technology used.

The third possible approach that could be applied by the legislator is a sort of "benign neglect", where activities are acknowledged but not regulated (this is applied to gambling debts in some jurisdictions, for example). Rights could not be enforced under this approach. Obligations arising from these activities would be "natural obligations": that is to say, the legal system does not recognise or support the enforcement of a certain obligation, but if the obligation is performed, the legal system will not allow a reversal of the transaction on the basis of unjust enrichment. The "benign neglect" approach could be applied to all relationships related to decentralised crypto-assets, as long as they do not jeopardise any important societal values.

The fourth approach, which is often deployed on activities entailing a considerable amount of risk, would be to impose an insurance obligation on the network or their participants. This would address the difficulties in identifying a responsible actor (especially in a decentralised network) and demonstrating their negligence, and would allow the rights of individuals who have been deprived of their crypto-assets or have suffered other damages to be enforced.

The four above-mentioned approaches represent a political choice for the legislator, which should reflect the benefits and value of these new phenomena on society as a whole.

Conclusions
Courts are dealing with numerous petitions related to crypto-assets—a trend set to continue if not increase. We can therefore expect further clarification as to the legal implications of crypto-assets. However, it is also to be expected that these clarifications will go in different directions, failing to provide the required level of legal certainty.

National legislators may take any of the four approaches discussed under the third section above. It is important to note, however, that only a coherent international legislative response would effectively address the global phenomenon of crypto-assets. Fragmented legislative responses may have some utility, for example to facilitate access to justice, but the judicial response to the rights of litigants will continue to vary if no international agreement, or at least international standards on the substantive issues, are introduced. Moreover, such fragmented responses are bound to create an uneven level playing-field and the risk for forum-shopping, exacerbating the risks resulting from the a-jurisdictional nature of crypto-assets.

This not to say that there will (or should) ever be a one-size-fits-all solution to deal with the phenomenon of crypto-assets. The risks in the different types of crypto-assets/currencies, the digital ecosystem and the cryptographic technology are inherently divergent. Given that it is near to impossible to establish a single global legislative reaction that captures all the possible variants, the legislative process may have to be reverse-engineered, taking into account characteristics and criteria that apply differently in the different crypto-assets models.

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5 Directive 2015/2366 on payment services in the

On 13 December 2019, the European Commission published the Final report of the Expert Group on Regulatory Obstacles to Financial Innovation: 30 recommendations on regulation, innovation and finance, https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/191113-report-expert-group-regulatory-obstacles-financial-innovation_en.pdf [Accessed 13 February 2020]. The report contains, inter alia, recommendations with regards to crypto-assets. In particular, under Recommendation 7, “the European Commission, in co-operation with the ESAs, the ESCB and international standard-setting bodies and other relevant authorities should accelerate its work to assess the adequacy and suitability of existing rules mitigating risk flowing from the use of crypto-assets in the context of the provision of financial services and on this basis develop a legislative solution to complement and complete the framework where necessary. This process should extend to addressing: (a) the risk and uncertainty flowing from the lack of a common taxonomy [emphasis added] in respect of crypto-assets and the consequential fragmented national approaches to classifying crypto-assets under EU rules …. In addition, Recommendation 8 states that “in order to ensure market participants’ rights and to guarantee a meaningful application of the commercial law concepts established in
EU regulation (such as InsR, SFD, FCD, BWUD, BRRD) to crypto-assets which are held on a distributed financial network, the Commission, in co-operation with the ESAs and international standard-setting bodies and other relevant authorities, should: (a) legislate a relevant conflict-of-laws rule, ideally enshrined in a Regulation, and (b) consider which further aspects of the commercial law regarding such networks and regarding the assets administered on them should be addressed at EU level" [Emphases added].


Building on advice from the European Banking Authority and the European Securities and Markets Authority, the consultation informs the European Commission’s ongoing work on crypto-assets: (1) for crypto-assets that are covered by EU rules by virtue of qualifying as financial instruments under MiFID2 —or as electronic money/e-money under EMD2, the Commission has screened EU legislation to assess whether it can be effectively applied; (2) for crypto-assets that are currently not covered by EU legislation, the Commission is considering a proportionate common regulatory approach at EU level to address, inter alia, potential consumer/investor protection and market integrity concerns.

Digitalisation is a technology/supply shock which affects the main economic aggregates—most notably via competition, productivity and employment effects, as well as through its interaction with institutions and governance. See ECB Economic Bulletin, Issue 7/2018, [Accessed 13 February 2020].
There is no current definition of crypto currencies under EU law. Instead, there is a definition of "virtual currencies" under AMLD5 where virtual currencies are defined as "a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money, but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically".


In recent times there have been few technical attempts to realise a faster off-chain trading system for Bitcoins: see P. Vigna and M.J. Casey, *The Truth Machine: The Blockchain and the Future of Everything* (New York: St Martin's Press, 2018).

L. Lessig, *Code Version 2.0* (New York: Basic Books, 2006), Ch 1: "Cyberspace demands a new understanding of how regulation works. It compels us to look beyond the traditional lawyer's scope—beyond laws, or even norms. It requires a broader account of 'regulation', and most importantly, the recognition of a newly salient regulator." Another, more optimistic, interpretation is that this was an attempt to create a different regime of co-ordination: embedding a rule in the code can better ensure compliance, making the violation impossible, and prevent abuse rather than detecting and punishing it after the fact. Digital rights management in intellectual property law can be considered an example of this trend.

In the occasional paper, crypto-assets [are] "any asset recorded in digital form that is not and does not represent either a financial claim on, or a financial liability of, any natural or legal person, and which does not embody a proprietary right against an entity". This definition does not seem to fit with the one provided in the Liechtenstein Blockchain Act adopted on 3 October 2019, https://perma.cc/H2GT-88CN [Accessed 13 February 2020], in which virtually any type of asset (including claims and other rights) can be tokenised and transferred using cryptography and Blockchain. Considering this legislation, the term "crypto-assets" could also be understood to refer to any asset that is created, stored or transferred using cryptographic principles (Blockchain); such assets could also engender certain rights.


On 20 July 2018, the Maltese Parliament enacted three related legislative acts,
namely the Malta Digital Innovation Authority Act (the MDIA Act), the Innovative Technology Arrangements and Services Act (the ITAS Act) and the Virtual Financial Assets Act (the VFA Act). The MDIA Act establishes the Malta Digital Innovation Authority (MDIA) which is responsible for the promotion, development, regulation and supervision of the innovative technology sector in Malta. The ITAS Act stipulates in detail the procedures for formal recognition of innovative technologies and the specific modalities for the exercise of the MDIA's regulatory and supervisory powers. The VFA Act regulates Initial Virtual Financial Asset Offerings and Virtual Financial Assets (VFAs) and designates the Malta Financial Services Authority (MFSA) as the competent authority to grant licences, issue rules and register VFA Agents. It also imposes licensing requirements and ongoing obligations with regard to issuers of Virtual Financial Assets and persons providing ancillary services thereto. See https://www.welcome-center-malta.com/blockchain-services-in-malta/ico-crypto-regulation-in-malta/[Accessed 13 February 2020].

It is also true that EU law treats all types of objects (in EU secondary law, usually called "assets") in the same way as long as they represent an economic value, regardless of whether they are movable or immovable, tangible or intangible. This is not just true for secondary legislation; it is mirrored by the definition of "goods" in the context of free movement of goods. Examples of things that fall within the definition of goods are electricity, natural gas, and even waste. See Costa v ENEL (C-6/64) EU:C:1964:66; [1964] C.M.L.R. 425; Commission v Italy (C-158/94) EU:C:1997:500; Commission v France (C-159/94) EU:C:1997:501 and Commission v Belgium (C-2/90) EU:C:1992:310; [1993] 1 C.M.L.R. 365 respectively. The same is true for a number of new, intangible property rights,
such as the Community Trade Mark, the Community Design, and emission trading rights. As far as the Community Trade Mark and the Community Design are concerned, the Regulations that introduce them both stipulate that they “may be given as security or be the subject of rights in rem”: see art.22 of Regulation 2017/1001 on the European Union trade mark [2017] OJ L154/1 and art.29 of Council Regulation 6/2002 on Community designs [2002] OJ L3/1.


However, it could still be possible to transfer in personam rights of a crypto-asset unit, for example, and to assert rights in case of misappropriation—similarly, in German law, while there is no right of property on know-how, s.823 of the German Civil Code recognises know-how as "another right" whereby rights under tort law can be asserted.

Skatteverket v Hedqvist (C-264/14) EU:C:2015:718.


Similarly, some commentators in France have labelled Bitcoins as "objets juridiques non identifiés". See Myriam


29 Different from the Japanese concept of "thing", which requires a tangible entity, the Dutch concept of "vermogensrecht" does not require a tangible element to the asset. This is why the Court could conclude that a Bitcoin can be owned.


31 "Objects of civil rights" means things, including, inter alia, cash and paper securities, other property, for instance money in a cashless form, paperless securities, property rights; the results of work and the provision of services; protected results of intellectual activities and the individualisation means qualifying as such (intellectual property); non-material wealth [emphasis added].


35 In particular: (i) the crypto-assets entrusted to the platform by the users were systematically merged into a single central wallet (with the nature of a hot wallet) whose private keys remained the exclusive responsibility of the operator of the same platform; (ii) as a result of this, it would no longer have been possible to distinguish which crypto-assets, among those managed by the platform through the aforementioned central wallet, belonged to which individual users, if not on the basis of the internal accounting of the platform; (iii) all exchange operations on the platform were carried out by the exchange manager executing instructions received from users who therefore had no possibility of independently managing the crypto-assets held through the same exchange. In this context, multiple erroneous withdrawal instructions (so called "double withdrawals") were generated by the exchange’s management software and sent to the Nano network. The exchange operator did not made a periodic comparison of the balance of its hot wallet with that resulting from the internal accounting, which would have made it possible to detect the fraudulent withdrawals. The Court concluded, therefore, for the liability of BG Services Srl for the damages caused.

36 The Court referred to art.1780 Civil Code; and to the liability referred to in arts 1176 and 1218 of the Civil Code.


The work on Smart Contracts in ongoing.


A similar interpretation had also been provided by D. Fox, "Cyber-currencies in Private Law" in S. Griffith, M. Honaghan and M.B. Rodriguez Ferrere (eds), The Search for Certainty: Essay in Honour of John Smillie (Wellington: Thomson Reuters, 2016).


This decision is expected to affect a variety of commercial litigation, including how insolvency practitioners/executors of estates deal with cryptocurrencies.

The main question for executors and insolvency practitioners is whether digital assets would be treated as an asset of the estate for distribution to the beneficiaries or the creditors. Classifying digital assets as property would assist with this process. While there is no English authority on the issue, Robertson relied on the 2019 decision of Simon Thorley J of the Singapore International Commercial Court in B2C2 v Quoine [2019] SGHC(I) 03, which held that Bitcoin are personal property that can be the subject of a trust: see Armstrong DLW GmbH v Winnington Networks Ltd [2012] EWHC 10 (Ch); [2013] Ch. 156.

B2C2 Ltd v Quoine Pte Ltd [2019] SGHC(I) 03.

47 Quoine Pte Ltd v B2C2 Ltd [2020] SGCA(I) 2 at [137]–
[143].

48 Private international
law, comprising rules of
jurisdiction and rules of
conflict, is, for lack of space,
outside of the scope of this
article.

49 Creation and further transfers
are grouped together to form
blocks, which are attached
chronologically to form a
chain of a comprehensive,
immutable record of
transactions. For a block to be
accepted by the Blockchain
community, "proof of work"
needs to be delivered. Most
importantly, Bitcoin is
backed by neither an issuing
authority nor underlying assets
supporting its value. It may
perform a payment function
but, given its volatility, is
also extensively used as a
speculative investment.

50 Generally, the decentralised
network is not fully
automated. It needs
maintenance by the nodes in
the network. The maintenance
is carried out in accordance
with an incentive structure
that, for instance, may be
designed on the proof-of-work
or proof-of-stake concepts.
See A. Narayanan et al.,
Bitcoin and Cryptocurrency
Technologies (Princeton, NJ:
Princeton University Press,
2016).

51 See Embedded supervision:
how to build regulation into
blockchain finance, BIS
Working Papers No.811
(16 September 2019),
https://www.bis.org/publ/
work811.pdf [Accessed 13
February 2020].

52 See the case of Quadrigacx: R.
Armstrong, "Cryptocurrency
exchange boss's death locks
away $150m in digital assets",
Financial
Times, 5 February
2019, https://www.bis.org/
publ/work811.pdf [Accessed
13 February 2020].

53 Higher, compared with
hypothetical case 1.

54 F.A. Hayek, Denationalisation
of Money: The Argument
Refined—An Analysis of
the Theory and Practice of
Concurrent Currencies, 3rd

55 Stablecoins can be defined
as ‘digital units of value
that are not expressed in any
of the forms of a currency
but, by relying on a set of


57 To be distinguished from the Libra investment token, which is clearly a security and entitles founding members and others to the cash flows derived from the reserve management.

58 Related elements of uncertainty include: (i) legal characterisation of Libra under MiFID (currency, commodity, ETF, money market fund, etc.); (ii) legal characterisation of Libra under PSD2 and EMD; (iii) oversight and supervision over the Libra network and its operator(s); (iv) potential interference with central bank monetary policy and access to systemically important payment systems; (v) compliance with data protection provisions; (vi) governance arrangements of the Libra Association Council; (vii) investor protection measures in case of failure of the Libra Association and/or Calibra; (viii) application of the AML provisions to Libra’s users and transactions; (ix) un-coordinated approaches at international level and global nature of Libra; (x) compliance with competition law. See also D. Zetzsche, R. Buckley and D. Arner, "Regulating LIBRA: The Transformative Potential of Facebook’s Cryptocurrency and Possible Regulatory Responses” University of New South Wales Law Research Series [2019] UNSWLRS 47, esp. Ch.III.

59 It is important to emphasise that these scenarios refer to a hypothetical global stablecoin-type network and not to Libra itself. Indeed, scenarios (i) (a) and (i)(b) are currently
excluded based on the Libra project as given out.

In a theoretical stablecoin, not in Libra: the *current* Libra project does not provide for any contract between the holder and the Association.

Particularly interesting is the analysis of Justice Jonathan Mance, in his Dissenting Opinion in *Quoine Pte Ltd v B2C2 Ltd [2020] SGCA(I) 2*, on whether the legal principles work, or may need to adapt, when traders hand their affairs to computers operating by algorithm, and whether there is a role for equity in case of a unilateral mistake which would allow for the reversal of the trade.

According to the "Provisions of the Supreme People's Court on Several Issues Concerning the Trial of Cases by Internet Courts", the court has jurisdiction over the following first-instance civil and administrative internet-related cases: (1) contractual disputes over online shopping, services, and *financial* loans, etc; (2) online copyright disputes; (3) disputes over internet domain names; (4) disputes over using the internet to infringe on others' personal and property rights; (5) disputes over product liability as a result of online shopping; (6) internet-related public interest lawsuits brought by procuratorial organs; (7) administrative litigation arising out of administrative internet management of administrative organs.

The Internet Court is a primary people’s court, so its court of second instance is the local intermediate people’s court.