Blockchain Networks and European Private International Law

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Blockchain technology and its offspring have recently attracted considerable attention in both media and scholarship. Its decentralised nature raises several legal questions. Among these are, for example, the challenges that blockchain technology poses to data protection laws and the threats it creates with regard to the effective enforcement of legal claims.

This post sheds light on issues of private international law relating to blockchain networks from a European perspective.

The concept of blockchain technology and its fields of application

Blockchain technology – put simply – involves two fundamental concepts. *Firstly*, data is written into so-called "blocks". Each block of data is connected to its respective predecessor using so-called "hashes" that are calculated for each individual block. Consequently, each block does not only include its own hash but also the hash of its predecessor, thereby fixating consecutive blocks to one another. The result is a chain of blocks – hence the name blockchain. *Secondly*, the entire blockchain is decentrally stored by the networks' members. Whenever a transaction concerning the blockchain is requested, it isn't processed by just one member. On the contrary: several members check the transaction and afterwards share their result with the other members in what can best be described as a voting mechanism: From among potentially different results provided by different members, the result considered correct by the majority prevails. This mechanism bears the advantage that any attempt to tamper with data contained in a blockchain is without consequence as long as only the minority of members is affected.

The potential fields of application for blockchain technology are manifold and far from being comprehensively explored. For example, blockchain technology can replace a banking system in the context of cryptocurrencies such as Bitcoin or it can be used to de-personalize monitoring and sanctioning of non-performance within a contractual relation. In short: Blockchain technology is an option whenever data is to be stored unalterably in a certain order without a (potentially costly) centralised monitoring entity.

Applicable rules of private international law

The first issue regarding blockchain technology and private international law concerns the applicable conflict rules. Blockchain technology involves a technical voting mechanism and, hence, requires a certain degree of cooperation between the members of the network. One might, therefore, be tempted to assume that blockchain networks constitute some kind of company. If this were indeed the case, the written conflict rules, especially those of the Rome I Regulation, would not be applicable (cf. Art. 1(1) lit. f) Rome I Regulation) and the unwritten conflict rules relating to international companies would claim application instead. However, this approach presupposes that the factual cooperation within a blockchain network suffices to create a company in the sense of European private international law. This is, however, not the case. The constitution of blockchain networks is only cooperative in a technical way, not in a legal one. The network is not necessarily based on a (written or unwritten) cooperation agreement and, therefore, lacks an essential prequisite of a company. Consequently, the determination of the law applicable to blockchain technology is not necessarily a question of international company law. Parties are, however, not precluded from creating a company statute that reflects the decentral structures of blockchain technology, whereas the mere decision to engage in a blockchain network does not suffice to create such a company.

Thus, the private international law of blockchain technology must also take into account the Rome I Regulation as well as the Rome II Regulation. Unfortunately, blockchain networks *per se* are not suitable as connecting factors: *firstly*, a *de*centralised network naturally escapes the classical European principle of territorial proximity. *Secondly*, the use of blockchain technology is usually not an end in itself but functionally subordinate to the purpose of another act, e.g. a contract, a company or a tort. This factor should, however, not be seen as a problem, but as a hint at a potential solution: although a *super*ordinate act may

render a blockchain network insufficient to determine the substantive law, the superordinate act itself can serve as a connecting factor.

The following two examples illustrate the proposed method of accessory connection and show that the European legal framework relating to private international law is capable to cope with several questions raised by novel phenomena such as blockchain technology. The remaining questions have to be dealt with on the basis of the principle of proximity.

First scenario: blockchain networks within centralised contracts

Blockchain technology often serves to achieve the goal of a centralised act. In this case, legal questions regarding the use, misuse and abuse of blockchain technology, e.g. access rights and permissions to write regarding data contained in a blockchain, should be governed by the substantive law governing the superordinate act.

To give an example: The parties of a supply chain decide to implement a blockchain in order to collectively store data concerning (1) when and in what quantity products arrive at their warehouse and (2) certificates of quality checks performed by them. As a result, production routes and quality control become more transparent and cost-efficient along the supply chain. Blockchain technology can thus be used e.g. to ensure the authenticity of drugs, food safety etc. The legal questions regarding the smart contract should in this scenario be governed by the substantive law governing the respective purchase agreement between the parties in question. The choice of law rules of the Rome I Regulation, hence, also determine the substantive law regarding the question how blockchain technology may or may not be used in the context of the purchase agreement. The application of blockchain technology becomes a part of the respective contract.

If one were to apply the substantive law governing the contract only to the contract itself but not to blockchain technology, one would create unjust distinctions: The applicable law should not depend on whether the parties pay an employee to regularly check on their warehouse and issue certificates in print, or whether they employ blockchain technology, achieving the same result.

Second scenario: blockchain networks within *de*centralised companies

The scenario described above shows that the decentralised nature of blockchain networks does not necessarily require special connecting criteria. This is a consequence of the networks' primarily serving function to the respective superordinate entity.

Difficulties arise when parties agree on a company statute whose content reflects the decentralisation of blockchain technology. In this scenario, there is a decentral company that utilises only decentral technology as its foundation. A much-discussed case of this kind was "The DAO", a former company based on blockchain technology. The DAO's establishment was financed by investors providing financial resources in exchange for so-called tokens. These tokens can be described as the digital counterpart of shares and hence as an expression of the respective investor's voting rights. Within the resulting investment community, voting rights were exercised in order to decide on investment proposals. The results of the votes were implemented automatically. The company thus consisted only of the investors and information technology but had no management body, no administrative apparatus, and no statutory seat.

Hence, the DAO did not only lack a territorial connection on the level of information technology, but also on the level of the companies' legal constitution: it neither had an administrative seat nor a statutory seat. The connecting factors usually applied to determine the law applicable to companies were, therefore, ineffective. Because the DAO was a company, it was also exempt from the scope of the Rome I Regulation (cf. Art. 1 (2) lit. f. Rome I Regulation).

This vacuum of traditional conflict rules necessitates the development of new ones. There is no other valid connecting factor that could result in a uniform *lex societatis*: Especially the habitual residence or nationality of the majority of members is arbitrary as the company is built on a concept of decentralism and territorial detachment. Moreover, possible membership changes would lead to an intertemporally fluctuating statute whose current status could hardly be determined. The lack of a uniform connecting factor raises the question whether or not the ideal of a uniform *lex societatis* can be upheld. The fact that members of the DAO do not provide a feasible uniform connecting factor suggests a fragmentation of the applicable law (*dépeçage*).

Assuming that there is no uniform *lex societatis* for the DAO and that the applicable substantive law has to be fragmented, acts by the company become conceivable connecting factors. One might, for example, assume that preliminary questions concerning the company, i.e. its legal capacity, are subject to the substantive law that would govern the act in question. If the DAO enters into a contract that – given its validity – is governed by German substantive law according to Art. 4 of the Rome I-Regulation, German law should also determine the legal capacity of the DAO with respect to this particular contract. One might object that the Rome I-Regulation exempts both companies and legal capacity from its scope of application. This, however, only means that the Regulation is *not binding* within those fields. As the conflict rules of International company law do not lead to conceivable results, the principle of proximity has to be the guiding factor in the search for a new unwritten conflict rule. As the closest territorial connections of decentral organisations are their respective acts, e.g. contracts, the principle of proximity suggests that the respective act is what determines the closest connection of the company. The resulting conflict rule states an accessory subjection of the *lex societatis* to the law governing the company's respective acts. While the proposed solution does indeed lead to an *indirect* application of the Rome I Regulation, it nonetheless constitutes a self-reliant, unwritten conflict rule which is consequently not precluded by the catalogue of exemptions contained in the Rome I Regulation.

This fragmentation of applicable laws turns a membership in the DAO into a risky und legally uncertain endeavour, as – neglecting the tremendous practical and legal problems of the enforcement of claims – different legal orders impose different requirements for legal capacity, limitation of liability and other privileges.

Concluding thoughts

Blockchain technology is a novel phenomenon, but it does – in most cases – not necessitate new connecting factors or conflict rules. If, however, the legal entity in question mirrors the decentralised structure of a blockchain network, the legal assessment becomes more complicated.

In those cases, the usually uniform *lex societatis* has to be fragmented which leads to a high chance of personal liability of the members. Whether or not one accepts this fragmentation largely depends on the definition of the hierarchy of technical-

economic progress and the *lex lata*. In my opinion, technical developments may and should act as an impetus to *legislators*for legislative amendments but should not prevail over the existing rules of law. Those who desire legal advantages – such as a limitation of liability or even a uniform statute – must in exchange fulfil and adhere to the laws' requirements.

This post is based on A. Zimmermann, Blockchain-Netzwerke und Internationales Privatrecht – oder: der Sitz dezentraler Rechtsverhältnisse, published in IPRax 2018, 568 ff. containing references to further literature.