THE UNITED NATIONS CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS (CISG) AND THE EMERGENCE OF SMART CONTRACTS AND CRYPTOCURRENCIES: SHOULD WE TRY TO TEACH AN OLD DOG SOME NEW TRICKS?

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Abstract

The United Nations Convention on Contracts for the International Sale of Goods (hereinafter the "CISG" or "Convention") came into effect in 1988 and is arguably one of the most successful private law conventions of all times. The drafters of the CISG have tried to create a flexible and technology-neutral law that is able to adapt to new circumstances. But what about the latest digital developments such as smart contracts and cryptocurrencies, which have the potential to revolutionize international trade? Can you still teach an old dog like the CISG (which dates from 1980) new tricks or does the emergence of smart contracts and cryptocurrencies ultimately leads to unsolvable problems for the Convention? From the numerous possible problems to be discussed in this context, the article focuses on three of them, namely (1) the payment with cryptocurrencies under the CISG, (2) the sales of cryptocurrencies under the CISG, and eventually (3) the possible lack of discernibility of consumer sales contracts and the element of internationality of the contract due to smart contracting.

I. INTRODUCTION

The United Nations Convention on Contracts for the International Sale of Goods (hereinafter the "CISG" or "Convention") came into effect in 1988 and has been adopted by 95 States worldwide from all continents, including China and almost all important industrial nations.[1] Several thousand CISG court decisions and arbitral awards have been published in the meantime.[2] The CISG governs around 80-90% of the international sale of goods (unless the contracting parties exclude the applicability of the Convention according to article 6 CISG)[3] and therefore it is arguably one of the most successful private law conventions of all times.[4]

[1] CISG: TABLE OF CONTRACTING STATES, https://iicl.law.pace.edu/cisg/page/cisg-table-contracting-states (last updated Aug. 21, 2021).

[2] SEARCH CASES IN THE CISG DATABASE, https://iicl.law.pace.edu/cisg/search/cases (last updated Aug. 21, 2021).

[3] United Nations Convention on Contracts for the International Sale of Goods, Apr. 11, 1980, S. Treaty Doc. No. 98-9, 1489 U.N.T.S. 3. Art. 6 CISG: The parties may exclude the application of this Convention or, subject to article 12, derogate from or vary the effect of any of its provisions.

[4] Peter Schlechtriem & Ulrich G. Schroeter, Internationales UN-Kaufrecht para. 16. (7th ed., 2022).

According to article 1(1) CISG the Convention applies to the sale of goods contracts between parties whose places of business are in different States and (a) those States are either Contracting States, or (b) where the rules of private international law lead to the application of the law of a Contracting State.[5] According to article 4 s. 1 CISG, the convention regulates the contract formation and the rights and obligations of the seller and the buyer arising from such a contract.[6] Other issues such as the validity of the contract or of any of its provisions or of any usage, the effect that the contract may have on the property in the goods sold (article 4 s. 2 CISG), and issues closely related to tort law (article 5 CISG),[7] do not fall within its scope of application. Questions in this respect must be answered by the applicable domestic law. Many national legislators have also taken the CISG as a model for their own domestic law or have at least been inspired by it, such as the German legislator when revising the domestic law of obligation in 2002 or the Netherlands when creating its Civil Code of 1992.[8] In short, the CISG is of central importance both in international trade in goods and as a model for national jurisdictions.[9]

The drafters of the CISG have tried to create a flexible and technology-neutral law that is able to adapt to new developments. However, in the context of digitalization, there is an elephant in the room: the content of the CISG dates from 1980 and has never been changed since then. It is therefore clearly a pre-digital age law, an analog law so to speak. Article 13 CISG is a good example of this when it says that "[f]or the purposes of this Convention 'writing' includes telegram and telefax" - means of communication which are hardly used anymore.[10] At that time, the drafters of the CISG could not foresee and take into account the development of electronic communication such as emails, which are part of our everyday life today. But what about the latest, even much more advanced digital developments such as smart contracts and cryptocurrencies, which have the potential to revolutionize the way international trade is conducted? Needless to say that 1980 no one could also foresee things like smart contracts and cryptocurrencies. But can you teach an

[5] Art. 1(1) CISG: This Convention applies to contracts of sale of goods between parties whose places of business are in different States: (a) when the States are Contracting States; or (b) when the rules of private international law lead to the application of the law of a Contracting State.

[6] Art. 4 CISG: This Convention governs only the formation of the contract of sale and the rights and obligations of the seller and the buyer arising from such a contract. In particular, except as otherwise expressly provided in this Convention, it is not concerned with: (a) the validity of the contract or of any of its provisions or of any usage; (b) the effect which the contract may have on the property in the goods sold.

[7] Art. 5 CISG: This Convention does not apply to the liability of the seller for death or personal injury caused by the goods to any person.

[8] Also soft law such as the UNIDROIT Principles of International Commercial Contracts 2016 (PICC) has been heavily influenced by the CISG. On this, *see* André Janssen & Navin G Ahuja, *Bridging the Gap: The CISG as a Successful Legal Hybrid between Common and Civil Law. . ., in* UNIFORM RULES FOR EUROPEAN CONTRACT LAW. . . - A CRITICAL ASSESSMENT 137, 158 (Francisco de Elizalde ed., 2018).

[9] On the role of the CISG as a model for national legislators, *see* Janssen & Ahuja, *supra* note 8, at 159.

[10] United Nations Convention on Contracts for the International Sale of Goods art 13, Apr.4, 1980, S. Treaty Doc. No. 98–9, 1489 U.N.T.S. 3 "For the purposes of this Convention 'writing' includes telegram and telex."

old dog like the CISG new tricks or does the emergence of smart contracts and cryptocurrencies ultimately leads to insoluble problems for the Convention? So are they the beginning of the end of the CISG or it is just much ado about nothing? And if they do indeed challenge the CISG in its present form, what needs to be done?

This article attempts to answer these questions. The next part explains the phenomenon of smart contracting, before the following part deals with some legal challenges that smart contracting could possibly entail for the CISG. It goes without saying that this cannot be done comprehensively within the framework of such an article. The topic of cryptocurrencies is included here, but only to the extent that it is relevant to the actual topic of smart contracts and the CISG. An in-depth discussion of the admissibility of cryptocurrencies and their legal nature must be omitted here. From the numerous possible issues, this article focuses only on three of them, namely (1) the payment with cryptocurrencies under the CISG, (2) the sales of cryptocurrencies under the CISG, and eventually (3) the possible lack of discernibility of consumer sales contracts and the element of internationality of the contract due to smart contracting. An outlook concludes this article.[11]

II. SMART CONTRACTS IN A NUTSHELL

An introduction to the world of smart contracting is necessary if one wants to grasp the legal problems that may arise in the context of the CISG.[12] This

[11] This article will concentrate on the CISG itself and will not focus on other possibly relevant conventions such as the United Nations Convention on the Use of Electronic Communications in International Contracts in particular. On the one hand, the United Nations Convention on the Use of Electronic Communications in International Contracts has only entered into force in a few countries (it is not yet applicable in China) and is therefore rarely applied in practice. On the other hand, the space available does not allow me to deal with this convention in depth.

[12] On smart contracts *see e.g.*, Christina Buchleitner & Thomas Rabl, *Blockchain und Smart Contracts Revolution oder alter Wein im digitalen Schlauch. . .*, 1 ECOLEX 4, 6 (2017); Anthony J. Casey & Anthony Niblett, *Self-Driving Contracts*, 43 J. CORP. L. 1, 1–33 (2017). This part on smart contracts contains elements from my previous publications Mateja Durovic & André Janssen, *Formation of smart contracts under contract law*, *in* THE CAMBRIDGE HANDBOOK OF SMART CONTRACTS, BLOCKCHAIN TECHNOLOGY AND DIGITAL PLATFORMS 61, 61–79 (Larry A. DiMatteo, Michel Cannarsa, & Cristina Poncibò eds., 2019); Mateja Durovic & André Janssen, *The Formation of Blockchain-based Smart Contracts in the Light of Contract Law*, 26 EUR. REV. PRIV. L. 753, 753–72 (2016); Nikolas Guggenberger, *The Potential of Blockchain Technology for the Conclusion of Contracts*, *in* CONTRACTS FOR THE SUPPLY OF DIGITAL CONTENT: REGULATORY CHALLENGES AND GAPS 83, 83–98 (Reiner Schulze, Dirk Staudenmayer & Sebastian Lohsse eds., 2017); André Janssen, *What are smart contracts. . .: An attempt at demystification*, *in* DIGITAL TECHNOLOGIES AND THE LAW OF OBLIGATIONS 121, 121–32 (Zvonimir Slakoper & Ivan Tot eds., 2021); Markus Kaulartz & Jörn Heckmann, *Smart Contracts–Anwendung der Blockchain-Technologie*, 32 COMPUTER UND RECHT 618, 618 (2016); Markus Kaulartz, *Herausforderungen bei der Gestaltung von Smart Contracts*, 4 INNOVATIONS- UND TECHNIKRECHT 201, 205 (2016); Eliza Mik, *Smart Contracts: Terminology, Technical Limitations and Real World Complexity*, 9 LAW, INNOVATION AND TECH. 269, 269 (2017); Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. R. 304, 305–06 (2017) (discussing the concept of smart contracts); Jeremy M. Sklaroff, *Smart Contracts and the Cost of Inflexibility*, 166 U. PA. L. REV. 263, 263–303 (2017); Eric Tjong Tjin Tai, *Smart contracts en het recht*, 92(3) NEDERLANDS JURISTENBLAD 176, 176–83 (2017); Kevin Werbach & Nicolas Cornell, *Contracts ex machina*, 67 DUKE L. J. 313, 313 (2017).

part will therefore briefly define the general notion of "smart contracts", then explain the importance of the blockchain technology for the development of smart contracting and conclude with some potential areas of application of smart contracts.[13]

A. Defining Smart Contracts

Smart contracts raise interesting questions about their legal nature. It is often only said that they are neither particularly smart nor strictly speaking legally binding contracts at all.[14] Any discussion about smart contracts must therefore begin with the definition of the concept of smart contracts. There are numerous definitions of smart contracts.[15] They are often defined as a special protocol intended to contribute, verify, or implement the negotiation or performance of the contract in a trackable and irreversible manner without the interference of third parties.[16] One can go back to *Nick Szabo*, who in the 1990s, defined for the first time a smart contract as a:

> computerized transaction protocol that executes the terms of a contract. The general objectives of smart contract design are to satisfy common contractual conditions (such as payment terms, liens, confidentiality, enforcement, etc.), minimize exceptions both malicious and accidental, and minimize the need for trusted intermediaries like banks or other kinds of agents.[17]

Related economic goals of smart contracts include reducing loss by the fraud, enforcement costs, or other transaction costs. They are presumed to be able to provide full transparency of the transaction and to grant a high degree of privacy contemporaneously.[18] *Szabo's* definition can be simplified to a computer code that is created to automatically execute contractual duties upon the occurrence of a trigger event as a "digital condition precedent,"[19] or

[13] This part on smart contracts contains elements from my previous publications *see* Mateja Durovic & André Janssen, *The Formation of Blockchain-based Smart Contracts in the Light of Contract Law*, 26 Eur. Rev. Priv. L. 753, 753–72 (2016); Mateja Durovic & André Janssen, *Formation of Smart Contracts under contract law*, *in* THE CAMBRIDGE HANDBOOK OF SMART CONTRACTS, BLOCKCHAIN TECHNOLOGY AND DIGITAL PLATFORMS 61, 61–79 (Larry A. DiMatteo, Michel Cannarsa & Cristina Poncibò eds., 2019).

[14] Samuel Bourque & Sara Fung Ling Tsui, *A Lawyer's Introduction to Smart Contracts*, *in* SCIENTIA NOBILITAT REVIEWED LEGAL STUDIES 4, 4–23 (Dušan Stanek, Marián Vrabko, Markéta Selucká, Vladislav Mičátek & Robert Siuciński eds., 2014); Reggie O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 177–78 (2017).

[15] For a good overview over the difference smart contracts definitions, *see* Michèle Finck, *Grundlagen und Technologie von Smart Contracts*, *in* SMART CONTRACTS 1–12 (Martin Fries & Boris P. Paal eds., 2019).

[16] See, e.g., Thomas E. Söebbing, Smart Contracts und Blockchain: Definitionen, Arbeitsweise, Rechtsfragen, IT-RECHTS-BERATER 43, 43 (2018).

[17] Nick Szabo, *Smart Contracts*, http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html (last visited Aug. 21, 2021).

[18] Christina Buchleitner & Thomas Rabl, Blockchain und Smart Contracts Revolution oder alter Wein im digitalen Schlauch. . ., 1 ECOLEX 4, 6 (2017); NIKOLAS GUGGENBERGER, The Potential of Blockchain Technology for the Conclusion of Contracts, in CONTRACTS FOR THE SUPPLY OF DIGITAL CONTENT: REGULATORY CHALLENGES AND GAPS 83, 83–98 (Reiner Schulze, Dirk Staudenmayer & Sebastian Lohsse eds., 2017).

[19] Philipp Paech, *The Governance of Blockchain Financial Networks*, 80 MODERN L. R. 1072, 1082 (2017) (discussing the automatic execution of smart contracts).

agreement wherein execution is automated, usually by a computer program.[20] A minimum consensus definition can be distilled: a smart contract is a form of computer code that is self-executing and self-enforcing.[21] As the current smart contracts work without self-learning systems they neither need artificial intelligence nor any kind of deep learning.[22]

Needless to say, there are many debates and confusion on the legal concept of smart contracts. For blockchain-based smart contracts, a useful dichotomy can be drawn between the "smart contract code", which is the computer code stored, verified, and executed in a blockchain, and the "smart legal contract", which is a complement (or maybe even a substitute) for a legal contract to apply such technology.[23] In essence, a "smart legal contract" is a combination of the "smart contract code" and traditional legal language.[24] A smart contract is a computer code that specifies in "if this happens that shall happen" language, in a way understandable to a computer. Once verified, it will self-execute and self-enforce by recognizing an occurred triggering event and dispensing the assets accordingly.[25]

It is evident that the term smart contract is a misnomer.[26] A smart contract as we know it right now is independent of the applicable law as it is not a contract in the legal meaning. The choice of such a name for the concept of a self-executing and computer-coded agreement is unfortunate as it exacerbates confusion. Some theoretical similarities, however, exist between smart contracts and legal contracts insofar as both are frameworks for regulating the interaction between different entities.[27]

As for the question regarding how a smart contract works in practice and how it is concluded, *Szabo* uses his famous vending machine analogy.[28] A vending machine takes coins and dispenses change and products according to the displayed price. Once the coins are inserted, there is no further human

[20] Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. R. 304, 305–06 (2017) (discussing the concept of smart contracts).

[21] *E.g.*, Andreas Börding, Tim Jülicher, Charlotte Röttgen & Max von Schönfeld, *Neue Herausforderungen der Digitalisierung für das deutsche Zivilrecht: Praxis und Rechtsdogmatik*, 33 COMPUTER UND RECHT 134, 138 (2017) (Ger.); Eliza Mik, *Smart Contracts: Terminology, Technical Limitations and Real World Complexity*, 9 LAW, INNOVATION AND TECH. 269, 269 (2017); Reggie O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 179 (2017).

[22] Markus Kaulartz & Jörn Heckmann, *Smart Contracts – Anwendung der Blockchain-Technologie*, 32 COMPUTER UND RECHT 618, 618 (2016) (Ger.).

[23] Josh Stark, *Making Sense of Blockchain Smart Contracts*, Coindesk (June 5, 2016, 1:39 AM), www.coindesk.com/making-sense-smart-contracts/ (last visited Aug. 21, 2021).

[24] Markus Kaulartz, *Herausforderungen bei der Gestaltung von Smart Contracts*, 4 INNOVATIONS UND TECHNIKRECHT 201, 205 (2016) (Ger.).

[25] Tai, *supra* note 12, at 177.

[26] Christina Buchleitner & Thomas Rabl, Blockchain und Smart Contracts Revolution oder alter Wein im digitalen Schlauch. . ., 1 ECOLEX 4, 6 (2017) (Austria).

[27] Cheng Lim, TJ Saw & Calum Sargeant, *Smart Contracts: Bridging the Gap Between Expectation and Reality*, Oxford Business Law Blog (July 11, 2016), www.law.ox.ac.uk/business-law-blog/blog/2016/07/smart-contracts-bridging-gap-between-expectation-and-reality (last visited Aug. 21, 2021).

[28] N. Szabo, *Formalizing and Securing Relationships on Public Networks*, First Monday, https://doi.org/10.5210/fm.v2i9.548 (last visited Aug. 21, 2021).

intervention required to conclude and later execute the contract. Similar to a smart contract, a contract concluded through a vending machine is also in principle immutable and self-enforcing. Even if a person were forced to buy something from the vending machine, the machine would still give the product to the person regardless of the fact that the transaction is legally invalid ex tunc due to duress. Furthermore, in theory, anybody with coins can participate in an exchange with the vendor, regardless of the legal capacity of the contracting parties. Where smart contracts go further is "in proposing to embed contracts in all sorts of property that is valuable and controlled by *digital means*" (emphasis added).[29] Essentially, once both parties agree on a smart contract, its execution is taken from their control.

B. Blockchain Technology as the Driver for Smart Contracting

Smart contracts do not necessarily require blockchain technology.[30] However, there is little doubt that the main reason for the increasing importance of smart contracts is the rise of blockchain technology, as it allows smart contracts to use their full automation potential. The cryptocurrency Bitcoin, which proliferated this technology, led ultimately to the establishment of Ethereum,[31] a sophisticated and prominent blockchain platform allowing more complicated (i.e. smart contract) transactions beyond transfers of cryptocurrencies.[32] In the meanwhile, several other blockchain-based smart contract platforms have entered the market as well.

Blockchain technology demonstrates how a network could be set up so that once a transaction is set in motion, the network can produce outputs autonomously without the direct intervention of any party or other intermediaries.[33] Because of this feature, it is said that the contracting parties do not need to trust each other. They can rely on the system as a whole to carry out transactions knowing that the other party cannot frustrate the intended outcome. Blockchain technology not only allows verification of each transaction through the nodes (the computers in the chain), but it also, by storing the contract in a "block" and sending it to the nodes, makes the execution automatic and immutable. Thus, smart contracting allows the "digitalization of trust through certainty of execution" and the "creation of efficiency through the removal of intermediaries and the costs they bring to the 'transactions'".[34]

[29] Id.

[30] Blockchain (technology) is sometimes also referred to as distributed ledger (technology) or shared ledger (technology). While these three notions still remain in flux (and some authors consider them to designate different forms of technology), this contribution will for the sake of simplicity only use the term blockchain (technology).

[31] *See* https://ethereum.org/en/ (last visited Aug. 21, 2021).

[32] *See* for more details Tai, *supra* note 12, at 177.

[33] Clifford Chance, *Smart Contracts. Legal Agreements for the Digital Age*, https://www.cliffordchance.com/ briefings /2017/06/smart_contracts_-legalagreementsforth.html (last visited Aug. 21, 2021).

[34] J. I-H Hsiao, Smart Contract on the Blockchain-Paradigm Shift for Contract Law, 14 US-CHINA L. REV., 685, 687 (2017).

These characteristics are perhaps the greatest appeal of blockchain-based smart contracts.

When describing the actual process of formation of smart contracts, the concept can be best explained through Ethereum's process.[35] First, the user first types out the contract in Ethereum's coding language called "solidity",[36] for which the user must download the Ethereum software and be part of its network. Then he will "propose" a specific contract by making it available in the system. The contract will have its own identification number and function as an autonomous entity within the system. Another user may then accept the proposed contract by communicating with it. For instance, he communicates by making a payment, regularly in "Ether (ETH)", the cryptocurrency of Ethereum. After that communication of the other party, the smart contract will automatically execute itself. It should be noted that to conduct a transaction or to execute a contract on the Ethereum blockchain platform the users need to pay "gas", which is a computation fee.[37] Gas is priced in small fractions of Ether called "gwei" and it is used to allocate resources of the Ethereum Virtual Machine (EVM) so that decentralized applications such as smart contracts can ultimately self-execute in a secured but decentralized way. The fee is paid to the miners for mining transactions, putting them into blocks.[38]

C. Some (Potential) Fields of Application for Smart Contracting

There are many (potential) fields of application for smart contracts. Besides the well-known smart refrigerator example (the refrigerator "orders" automatically food or beverages within a previously concluded delivery smart contract) the "pay as you drive-principle" is subject to discussions in the insurance industry right now.[39] Here the policyholder concludes a (smart) car insurance contract with the insurance company. The contract contains a "pay as you drive-provision" which means the riskier the policyholder drives, the higher his premium. For data collection, the policyholder's car has a blockchain interface and the blockchain-based smart (insurance) contract automatically adjusts the amount of the payable premium according to the manner the insured car is driven. A similar idea is "drive as long as you pay" where a car can only be driven as long as the premiums are paid. If premiums have not been paid, the blockchain-based smart insurance contract uses the smart lock of the car to

[35] *See* https://ethereum.org/en/ (last visited Aug. 21, 2021).

[36] *See* https://solidity.readthedocs.io/en/develop/ (last visited Aug. 21, 2021).

[37] *See* Jake Frankenfield, *Gas (Ethereum): How Gas Fees Work on the Ethereum Blockchain*, INVESTOPEDIA, https://www.investopedia.com/terms/g/gas-ethereum.asp (last updated Sept. 27, 2022).

[38] The users are paying for the computation, regardless of whether the transaction succeeds or not. Even if it fails, the miners must validate and execute your transaction, which takes computational power. Hence, users must pay for that computation just like they would pay for a successful transaction. The exact price of the gas is determined by supply and demand between the network's miners. They can decline to process a transaction if the gas price does not meet their threshold, and users of the network who seek processing power.

[39] Christina Buchleitner & Thomas Rabl, *Blockchain und Smart Contracts*, 1 ECOLEX 4, 7 (2017); Markus Kaulartz & Jörn Heckmann, *Smart Contracts – Anwendung der Blockchain-Technologie*, 32 COMPUTER UND RECHT 618, 618 (2016).

block the further use of the vehicle.[40] There is also the idea of combining smart contracts and smart meters in order to automatically cut off the supply of gas, water, and electricity in case of unpaid bills.[41] As smart contracts can help to reduce transaction costs and enhance trade efficiency companies are also exploring the potential of smart contracts for international trade. Some companies e.g. envision the Incoterms 2020 as smart contracts. Ideally, those smart contracts would then seamlessly execute the chosen Incoterms 2020 rule for the contracting parties.[42] But even beyond the Incoterms 2020 just mentioned, work is being done on the international smart sale of goods contracts. It does therefore not take wonder that some authors argue that smart contracts for international trade agreements will become pervasive in the future.[43]

III. HOW SMART CONTRACTS MIGHT CHALLENGE THE CISG: SOME POSSIBLE EXAMPLES

It has been written quite extensively about smart contracts in general and smart contracts in the context of national legal systems. The situation is different, however, regarding the question of smart contracts and the CISG. Here, the discussion is just beginning to unfold and contributions focusing on this topic are still rare.[44] Where contributions do focus on this topic more intensively, they mainly deal with the questions of the validity of smart contracts (article 4 s. 2 CISG) and the formation of (smart) contracts (article 14 et seq. CISG) under the CISG.[45] Without denying the importance of these issues, this article would like to focus on another question, namely whether the CISG applies to smart contracts at all. Also, because if this question is answered in the negative, all further questions concerning the CISG and smart contracting would actually be redundant.

As I said at the beginning of this contribution, I will now take a closer look at three smart contract problems that could call into question the applicability of the CISG. These are the payment with cryptocurrencies under the CISG, the sales of cryptocurrencies under the CISG, and eventually a possible lack of

[40] Franz Hofmann, *Smart contracts und Overenforcement*, *in* SMART CONTRACTS 125, 128 (Martin Fries & Boris P. Paal eds., 2019).

[41] Id.

[42] *See How can blockchain technology optimise Incoterms® 2020. . .*, INTERNATIONAL CHAMBER OF COMMERCE, https://iccwbo.org/media-wall/news-speeches/incoterms-rules-2020-blockchain-dorjee-sun-dap-fob-fca-exw-cfr-cpt/ (last visited Aug. 21, 2021).

[43] Anna Duke, What Does the CISG Have to Say About Smart Contracts. . . A Legal Analysis, 20 CHI. J. INT'L L. 141, 176 (2019).

[44] *But see* Emir Bayramoğlu, *A Legal Analysis on CISG's Scope of Application from Smart Contracts' Perspective*, TURKISH LAWBLOG, https://turkishlawblog.com/read/article/193/a-legal-analysis-on-cisg-s-scope-of-application-from-smart-contracts-perspective (last visited Aug. 21, 2021); Duke, *supra* note 43, at 141-77.

[45] Duke, *supra* note 43, at 141-77.

discernibility of consumer sales contracts and the element of internationality of the contract due to smart contracting.

A. Payment with Cryptocurrency Under the CISG

The "payment with cryptocurrencies" is not necessarily a sole smart contract problem, because also "traditional non-smart contracts" can provide for a "payment" with a cryptocurrency. Nevertheless, it is currently the case that this problem arises *primarily* with smart contracts as smart contracts which run on Ethereum, or other smart contract platform regularly require a payment in cryptocurrency (e.g., in "Ether"). Therefore, it seems to be justified to identify this issue primarily as a "smart contract problem".

As already stated before, this article will not go into the legal nature etc., of cryptocurrencies. Nevertheless, a brief look at them seems useful for a better understanding. A cryptocurrency has been defined as:

> a digital representation of value that (i) is intended to constitute a peer-to-peer ('P2P') alternative to government-issued legal tender, (ii) is used as a general-purpose medium of exchange (independent of any central bank), (iii) is secured by a mechanism known as cryptography and (iv) can be converted into legal tender and vice versa.[46]

There are a growing number of companies especially in the US and in Europe - from big tech to airlines - who are embracing cryptocurrencies, allowing customers to use them as an official method of payment for their goods and services.[47] Most of the countries in the world do not have explicit systems that restrict, regulate, or ban cryptocurrencies.[48] While in the majority of states, cryptocurrencies are legal and can be transferred more or less freely, China has decided to ban them. Some states are even considering the introduction of their own "state cryptocurrency" such as the so-called "e-krona" in Sweden.[49]

In order to get closer to the actual problem to be examined here, let us start from the following scenario. A seller and a buyer each have their places of business in different Member States of the CISG and respectively want to buy and sell certain goods for economic purposes. As they want that their contract to run as efficiently as possible, the two parties conclude an Ethereum-based smart contract. The payment by the buyer is to be made in Ether, the

[46] Robby Houben & Alexander Snyers, *Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion*, EUROPEAN PARLIAMENT (June 2018), https://www.europarl.europa.eu/cmsdata/150761/TAX3%20Study%20on%20cryptocurrencies%20and%20blockchain.pdf (last visited Aug. 21, 2021).

[47] David Walsh, *Paying with Bitcoin: These are the major companies that accept crypto as payment*, EURONEWS (December 4, 2021), https://www.euronews.com/next/2021/07/14/paying-with-cryptocurrencies-these-are-the-major-companies-that-accept-cryptos-as-payment (last visited Aug. 21, 2021).

[48] Prableen Bajpai, *Countries Where Bitcoin Is Legal and Illegal*, INVESTOPEDIA, https://www.investopedia.com/articles/forex/041515/countries-where-bitcoin-legal-illegal.asp (last visited Aug. 21, 2021).

[49] *See* for more details https://www.wiwo.de/finanzen/boerse/konkurrenz-fuer-den-bitcoin-staatliches-krypto-geld-aus-schweden-china-venezuela/20867706-2.html (last visited Aug. 21, 2021).

cryptocurrency of Ethereum. The parties have not excluded the CISG and the law applicable to the question of the validity of the agreement does not impose any restrictions regarding payments with cryptocurrencies.[50]

As can be seen from article 1 CISG, the CISG only applies to "sales contracts." The CISG itself does not contain a legal definition of this term, but the interaction of article 30 CISG and article 53 CISG makes it clear what is meant by "sales contract."[51] In a sales contract under the CISG, the seller undertakes to deliver the goods, hand over the relevant documents and transfer the property in the goods, while the buyer is obliged to pay the price for the goods and take delivery of them. The core question for the application of the CISG in our example is therefore whether a "payment with cryptocurrency" is a "payment of the price" under article 53 CISG. If this is the case, it is also a "sales contract" in the sense of the CISG. Otherwise, one would have to assume an "international barter contract", which is not subject to the Convention.[52]

An obligation to pay the price under article 53 CISG means the buyer's obligation to pay a sum of money expressed in a common means of payment. The purchase price must therefore be paid in *money*.[53] But what is meant by "money" and, in particular, are cryptocurrencies to be regarded as such under the CISG? One view draws a parallel to the interpretation in the case of unclear agreements regarding the currency to be paid (for example, if an American seller and an Australian buyer agree without further specification only on payment in "dollars").[54] In the case of unclear agreements regarding the currency to be paid, either the seller's place of business pursuant to article 57(1)(a) CISG or the place of payment is to be used to determine the agreed currency. According to this view, this should also apply if payment in cryptocurrency was contractually agreed by the parties. Hence, whether the payment in cryptocurrency is a payment under the CISG would depend either on the law where the seller has his place of business or on the place of payment.

However, this approach should be rejected. Already, the parallel drawn is not convincing. If it is unclear which currency was contractually agreed, the conduct of the parties themselves must be interpreted based on article 8 CISG. If cryptocurrency is agreed as a means of payment, on the other hand, there is

[50] As stated above, the CISG does not deal with questions of validity (article 4 CISG).

[51] Article 30 CISG: The seller must deliver the goods, hand over any documents relating to them and transfer the property in the goods, as required by the contract and this Convention; Article 53 CISG: The buyer must pay the price for the goods and take delivery of them as required by the contract and this Convention.

[52] Franco Ferrari, *article 1 CISG*, in KOMMENTAR ZUM UN-KAUFRECHT (CISG) no. 30 (Ingeborg Schwenzer et al. eds., 7th ed. 2019); Dieter Martiny, *Virtuelle Währungen, insbesondere Bitcoins, im Internationalen Privat- und Zivilverfahrensrecht*, PRAXIS DES INTERNATIONALEN PRIVAT- UND VERFAHRENSRECHTS, 553–561 (2018); Loukas Mistelis, *article 1 CISG*, in UN-CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS (CISG) no. 30 (Stefan Kröll et al. eds., 2nd ed. 2018). ("[I]t is clear that barter falls outside the definition of contract of sale.").

[53] Ferrari, *supra* note 52.

[54] Dieter Martiny, *Virtuelle Währungen, insbesondere Bitcoins* [*Virtual Currencies, Especially Bitcoins*], 38 INTERNATIONALEN PRIVAT- UND ZIVILVERFAHRENSRECHT [INTERNATIONAL PRIVATE LAW AND CIVIL PROCEDURAL LAW] 553, 563 (2018) (Ger.).

complete certainty about the means of payment. Only the legal classification of the cryptocurrencies is doubtful and must be solved on the basis of article 7(1) CISG.[55] The two described situations are therefore already very different and cannot be compared with each other. Moreover, the view must also be rejected because of the results it produces. The applicability of the CISG to international (smart) contracts could differ depending on whether the respective determining legal system regards cryptocurrencies as "money" or not. This would in turn be opposed to the stated objective of the Convention, namely the uniform interpretation of the CISG pursuant to article 7(1) CISG. An approach according to which an identical contract is subject to the CISG on one occasion and not on another merely because of different connecting factors for cryptocurrencies is not convincing. Contracting parties must know beyond doubt at an early stage before the conclusion of the contract whether a contract that provides for payment in cryptocurrency is subject to the CISG or not.

It is rather correct that the question whether a payment with cryptocurrency must be regarded as a payment of price (in money) under article 57 CISG has to be answered solely on the basis of the CISG itself. The guideline for the interpretation is, as already mentioned, article 7(1) CISG, according to which "regard is to be had to its international character and to the need to promote uniformity in its application." An autonomous interpretation must be ensured. Therefore, recourse to national law for the interpretation of the CISG is not permissible. As far as can be seen, there is no CISG case law on this subject. Nevertheless, the better arguments speak for an equal treatment of payment in cryptocurrency and payment in money. If payment in cryptocurrency is agreed upon in an international contract, which is potentially subject to the CISG, this seems to be functionally comparable to payment in money. Although cryptocurrencies are not "money" in the proper sense and are also still afflicted with deficits, they ultimately pursue the same three goals as money, namely being a means of exchange, a unit of account, and store of value.[56] This should be all the more true if cryptocurrencies, as it now appears, become more and more accepted as a means of payment in business life and are no longer seen merely as an object of speculation.[57] Should cryptocurrencies prevail in the

[55] Art. 7(1) CISG: In the interpretation of this Convention, regard is to be had to its international character and to the need to promote uniformity in its application and the observance of good faith in international trade.

[56] The same conclusion is ultimately reached by Bayramoğlu, *supra* note 44.

[57] Some legislators have already reacted and put cryptocurrencies explicitly on an equal footing with "money" as a means of payment. *E.g.* the Directive (EU) 2019/770 on certain aspects concerning contracts for the supply of digital content and digital services (hereafter: Digital Content Directive) defines the term "price" in article Art. 2(7) Digital Content Directive, according to which "price" means money "or a digital representation of value that is due in exchange for the supply of digital content or a digital service". Recital 23 of the Digital Content Directive provides further information on the background to the inclusion of "digital representations of value" and what exactly is meant by this. According to that recital "[d]igital representations of value should also be understood to include virtual currencies (…). Differentiation depending on the methods of payment could be a cause of discrimination and provide an unjustified incentive for businesses to move towards supplying digital content or a digital service against digital representations of value." In Directive

long run, the lack of inclusion of payment in cryptocurrency in the scope of application of the CISG could otherwise lead to a far-reaching irrelevance of the Convention. Such a threatening loss of significance can be counteracted with the interpretation advocated here.[58]

At this point it can be noted that already under the existing Convention, payment with cryptocurrency can be equated with payment with money.[59] In both cases, the CISG can be applied, provided of course, that the other conditions are also met.

B. Sales of Cryptocurrency Under the CISG

Let us move to the next problem to be discussed herein the context of "CISG and smart contracts." Cryptocurrencies are not only used as means of payment (when a smart contract was concluded), but smart contracts are also used to sell cryptocurrencies. If the purchase has an international element, the question arises whether the CISG also governs an international (smart) contract for the *sale of cryptocurrency*. [60] According to article 1(1) CISG, it would then have to be a sale of *goods*. Goods are generally defined as tangible, moveable items.[61] Based on this definition, it is apparent that the CISG cannot be applied to the sale of cryptocurrency due to a lack of corporeality. Some authors, however, seem to recognize cryptocurrencies as "goods" in the sense of the Convention.[62] They do so with reference to the sale of standard software, which they argue is in principle subject to the CISG. In addition, they refer to a change in meaning of the term "goods" in international trade and this change would make an extended application of the CISG to purely digital content (and thus, also the application of the CISG to international (smart) contracts on the sale of cryptocurrencies) possible.

However, this view is not convincing. It overlooks the fact that, according to the prevailing view, the CISG only applies to standard software if it has been sold on a *physical data carrier*.[63] Pure downloads of standard software, on the other hand, are still not subject to the CISG. Also, the previously mentioned change in meaning (if it exists at all) does not have progressed so far that (standardized) pure digital content and cryptocurrencies can now be seemingly subsumed under the term "goods."[64]

(EU) 2019/771 regarding certain aspects of contracts for the sale of goods (hereinafter: Sale of Goods Directive), however, such an explicit equalization of cryptocurrency and money is missing.

[58] *See also* André Janssen & Navin Ahuja, *The Imperfect International Sales Law: Revamp, Supplement or Leave It Alone. . .*, 20 INTERNATIONALES HANDELSRECHT [INTERNATIOANL TRADE LAW] 1, 4 (2020) (Ger.).

[59] The same conclusion is ultimately reached by Bayramoğlu, *supra* note 44.

[60] *See also*, Janssen & Ahuja, *supra* note 58.

[61] Ferrari, *supra* note 52, at no. 34; Mistelis, *supra* note 52, at no. 37.

[62] Dieter, *supra* note 54, at 561.

[63] Ferrari, *supra* note 52, at no. 38; Janssen & Ahuja, *supra* note 58; Mistelis, *supra* note 52, at no. 40.

[64] *See also* Directive (EU) 2019/770, of the European Parliament and Council of 20 May 2019 on Certain Aspects Concerning Contracts for the Supply of Digital Content and Digital Services, 2019 O.J. (L 136) 1; Directive (EU) 2019/771, of the European Parliament and Council of 20 May 2019 on Certain Aspects

But let us hypothetically assume that cryptocurrencies could indeed be understood as "goods" in the sense of article 1(1) CISG. However, this would by no means be the last word on the applicability of the CISG, even if this is sometimes apparently overlooked. The sale of cryptocurrencies must overcome another legal hurdle in order to open the scope of application of the Convention for this type of sale. This hurdle is formed by article 2(d) CISG, according to which the CISG does not apply to "sales of stocks, shares, investment securities, negotiable instruments or money". [65] The purpose of this largely declaratory provision is to ensure that the CISG only applies to sales of goods and not to sales of rights.[66] In addition, infringements with (mostly mandatory) national provisions are to be prevented. Article 2(d) CISG thus ultimately seeks to ensure that all financial instruments are removed from the Conventions' sphere of applicability.[67] As said before it is not the purpose of this contribution to classify cryptocurrencies in legal terms, but it seems obvious that they are a kind of financial instrument. The closest thing would be to equate cryptocurrencies with "money" also here, in accordance with what has been said above when it was discussed whether a payment with cryptocurrencies can be considered as a payment of price. In this way, the interpretation of article 2(d) CISG and article 57(1) CISG would be consistent. This would then also result in the inapplicability of the CISG pursuant to article 2(d) CISG to any type of (smart) contract in which the subject matter of the contract is cryptocurrencies.[68]

C. Possible Lack of Discernibility of Consumer Sales Contracts and the Element of Internationality of the Contract

Let us now turn to the last "CISG and smart contract-problem" to be discussed here, which is perhaps "somewhat hidden", but could thereby possibly develop particular explosive force. According to article 1(1) CISG, the Convention only applies to *international* sales contract. For the element of internationality to be fulfilled, it is a minimum requirement that the contracting parties have their places of business in different States. However, article 1(2) CISG introduces an important, sometimes overlooked restriction. According to that provision:

> the fact that the parties have their places of business in different States is to be disregarded whenever this fact does not appear either from the contract or from any

Concerning Contracts for the Sale of Goods, Amending Regulation (EU) 2019/2394 and Directive 2009/22/EC, and Repealing Directive 1999/44/EC, 2019 O.J. (L136) 28. (both distinguishing their scope of application precisely according to whether the contract concerns "goods" (or "goods with digital elements"; the Sale of Goods Directive is applicable then) or "digital content" or "digital service" (the Digital Content Directive is applicable then)).

[65] *See also* Janssen & Ahuja, *supra* note 58.

[66] Spohnheimer, *article 2 CISG*, in UN-CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS (CISG) at no. 32.

[67] Id.

[68] *See also* Janssen & Ahuja, *supra* note 58.

> dealings between, or from information disclosed by, the parties at any time before or at the conclusion of the contract.

In short, the international character of the contract must be apparent to the contracting parties at the latest at the time of the conclusion of the contract. If this is not the case, the CISG does not apply, and the applicable domestic law governs the sales contract instead.

According to article 2(a) CISG, the Convention does not apply to sale of "goods bought for personal, family or household use". Thus, business to consumer sales contracts is to be excluded from the scope of application of the CISG. However, the exclusion of consumer sales contracts does not apply if "the seller, at any time before or at the conclusion of the contract, neither knew nor ought to have known that the goods were bought for any such use." The CISG is therefore only excluded if the fact that the contract is a consumer sales contract was apparent to the seller before or at the time the contract was concluded. The rationale of this exclusion is that the international seller does not find himself unexpectedly exposed to national consumer protection law.[69]

Thus, both provisions require certain elements to be discernible. For article 1(2) CISG this is the international character of the contract (for the CISG to apply), for article 2(a) CISG the character as a consumer sales contract (for the CISG not to apply). What does the emergence of smart contracts mean for these two requirements of discernibility for the applicability of the CISG? Here, we must distinguish according to how the smart contracts ultimately came into existence.

There are no particularities for cases where the sales contract has traditionally been concluded "off-chain" and the contracting parties only use the smart contract for the efficient execution of the contract. Here, the traditional (paper) contract works as a sort of "legal wrapper" for the smart contract.[70] Currently, some law firms still recommend such a traditional contract as a "legal wrapper" for the actual smart contract in order to counter the legal uncertainties of smart contracting.[71] In this case, there are no special features with regard to the discernibility of the internationality of the contract, or the capacity of the buyer as a consumer as there exists a traditional contract as a "legal wrapper" for the smart contract.

However, the problems with the element of discernibility begin where the smart contract constitutes the entirety of the agreement and the contracting parties have exclusively "met" on the smart contract platform itself - so no traditional contract as a "legal wrapper" exists. The problem in this scenario is that the smart contract platforms work as described before with identification

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[69] Ferrari, *article 2 CISG*, in KOMMENTAR ZUM UN-KAUFRECHT (CISG), *supra* note 52, at no. 15.

[70] *See also* Mateja Durovic & André Janssen, *Formation of smart contracts under contract law*, *in* THE CAMBRIDGE HANDBOOK OF SMART CONTRACTS, BLOCKCHAIN TECHNOLOGY AND DIGITAL PLATFORMS 61, 72-76 (Larry A. DiMatteo, Michel Cannarsa, & Cristina Poncibò eds., 2019) (providing more details).

[71] Clifford Chance, *Are Smart Contracts Contracts. .* .https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2017/08/are-smart-contracts-contracts.pdf (last visited Aug. 21, 2021).

number and personal keys only. This means that in the case of (smart) contracts concluded exclusively "on-chain", it is not possible to identify with whom the contract is actually concluded with. Hence, it is not known where the contractual partner has his place of business or whether he is a consumer or not – at least this information cannot be extracted from any personal data (such as address etc.,). The contracting parties remain "incognito," so to speak. For the further solution, one will have to distinguish between the discernibility for the seller that the buyer acted as a consumer and the discernibility of the internationality of the sales contract for the contracting parties.

Whether the status of the buyer as a consumer is discernible under article 2(a) CISG when a smart contract was concluded "on-chain" does not have to be assessed in a significantly different way than an ordinary (Internet) purchase. Under this provision, objective discernibility of the status as consumer is sufficient; positive knowledge on the part of the seller is not necessary.[72] As in the case of an ordinary (Internet) purchase, the objective discernibility results above all from the type and number of goods to be delivered and not from the exact individual who appears as the buyer. For example, when buying individual pieces of leisure clothing, one can assume a consumer purchase, at least as long as it is a question of individual items.[73] If, on the other hand, larger quantities are purchased, it will no longer be possible to assume that the purchase is a consumer sales. The emergence of smart contracts concluded "on-chain" will therefore not pose significant, previously unknown problems to article 2(a) CISG.

The relationship of smart contracts concluded exclusively "on-chain" to the element of discernibility of the internationality of the contract according to article 1(2) CISG is considerably more problematic. Whether the internationality of the contract was discernible is, like the discernibility of a consumer purchase, determined by objective criteria, i.e., the internationality must only have been objectively discernible to the contracting parties.[74] The sources of knowledge listed in article 1(2) CISG are the contract itself, previous dealings between the parties or any disclosed information which shows the traditional picture of the CISG regarding the conclusion of a contract. In the case of a purchase via the Internet, the use of certain top level-domains such as ".de" or ".cn" will allow conclusions about the domicile of the contracting parties and thus about the internationality of the contract.[75] Now, not all smart contracts concluded "on-chain" are identical. However, one can nevertheless conclude that the question of discernibility of the internationality of the contract will arise much more often here than, for example, in the case of an ordinary

[72] Spohnheimer, *article 2 CISG*, in UN-Convention on Contracts for the International Sale of Goods (CISG), supra note 52, at no. 16 et seq.

[73] Ferrari, *article 2 CISG*, in KOMMENTAR ZUM UN-KAUFRECHT (CISG), *supra* note 52, at no. 13.

[74] Ferrari, *supra* note 52, at no. 53. This means that even in the case of an international sales contract concluded between two machines (Machine to Machine Contract), it is only important whether the contracting parties were objectively able to identify the international nature of the contract.

[75] *Id.* at no. 54.

international sales contract concluded over the Internet. This is because important factors that normally indicate an *international* sales contract are missing in the case of smart contracts concluded "on-chain" due to the anonymity of the contracting parties. The question of the discernibility of internationality could therefore play a significant role in the future for these contracts.

Should smart contracts become increasingly prevalent in international sales contracts, the interpretation of article 1(2) CISG in accordance with article 7(1) CISG will be of decisive importance. If the courts interpret the provision broadly, the CISG will often be excluded due to the lack of a discernible international character of the contract. If, on the other hand, the provision is interpreted narrowly, the CISG will remain largely applicable to smart contracts even when they are exclusively concluded "on-chain." However, one would then accept that contracting parties who assumed a purely domestic transaction would suddenly find themselves confronted with the CISG.[76]

The future relationship between the CISG and smart contracts will therefore be largely determined by the decision on this question. In my opinion, the better reasons speak for a narrow interpretation of article 1(2) CISG. The provision is an exemption and as such is to be interpreted narrowly.[77] Moreover, the danger of a future extensive inapplicability of the CISG to smart contracts seems so great that a narrow interpretation is appropriate to ensure that the CISG is future ready. Nevertheless, one will have to wait and closely observe the further development of the case law in this respect.

IV. OUTLOOK

This article has taken a closer look at the relationship of smart contracts and cryptocurrencies to the CISG. But what conclusions can be drawn from this study? Will the emergence of smart contracts and cryptocurrencies lead to a revival of the so-called Swiss Proposal, calling for a new project on international sales law because "the CISG cannot satisfy all the needs of the international commercial community anymore?"[78] Such a project "CISG 2.0," which could then also deal with issues such as smart contracts and cryptocurrencies, is not currently on the political agenda, quite apart from the legal challenges of this idea. Realization therefore does not appear realistic in the foreseeable future.

The idea of an UNCITRAL Convention that will specifically address international smart contracts and their formation, on the other hand, has at the moment greater chances of realization. Such an approach is not improbable, as UNCITRAL is intensively involved with the digitalization of international

[76] *Id.* at no. 58 (with further references).

[77] Id.

[78] UNCITRAL, Possible Future Work in the Area of International Contract Law: Proposal by Switzerland on Possible Future Work by UNCITRAL in the Area of International Contract Law, UN Doc A/CN.9/758 (May 8, 2012).

trade, as shown, for example, by the United Nations Convention on the Use of Electronic Communications in International Contracts. However, the author is not aware of any concrete plans by UNCITRAL to draft a smart contract convention, even though some authors consider such a convention as "likely."[79]

The fact that both approaches, the creation of a CISG 2.0 (which would then also cover topics such as smart contracts and cryptocurrencies) or the creation of a new convention supplementing the CISG in matters of smart contracts (and cryptocurrencies), are problematic, has already been explained elsewhere by me and will not be discussed further here.[80] But quite independently of the disadvantages of both approaches, the crucial question of the *actual necessity* of new legal rules must be asked first. Are they *really* absolutely necessary to tame smart contracts and cryptocurrencies for international sales law? This article has shown that at least the problems discussed here can already be mastered by interpreting the provisions of the CISG. Before the international community breaks out into actionism and adopts a new convention (which might then hardly be applied), courts and arbitral tribunals should first try to cope with the new phenomena using the "old" CISG. Because until now the CISG has, despite its flaws, always shown that it is flexible enough to handle new developments. Only if judges and arbitrators cannot come to a satisfactory interpretation of the CISG for smart contracting and cryptocurrencies, new rules in the form of a new convention supplementing the CISG should be considered as ultima ratio. But until then, it is better trying to teach the old dog some new tricks than getting a new one.

[79] Duke, *supra* note 43, at 141, 176–77 (2019). "Thus, is it likely that a future UNCITRAL convention will specifically addresses smart contracts and their formation, just as the UNCITRAL created the Electronic Communications Convention (E.C.C.) to address the rise of the use of emails in international trade."

[80] Janssen & Ahuja, *supra* note 58, at 7.