IS INSISTING ON SPECIFIC PERFORMANCE UNDER SMART CONTRACTS DESIRABLE UNDER ENGLISH CONTRACT LAW? INFLEXIBILITIES OF SMART CONTRACTS AND POTENTIAL SOLUTIONS

İngiliz Hukukunda Akıllı Sözleşmelerde Borcun İfasında Israr Etmek Gerekir mi?: Olası Sorunlar ve Çözüm Önerileri

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Abstract

Smart contracts, as written by computer code, would secure the performance of the contract. It is believed that this feature of smart contracts is marketed as the solution to traditional contracts, which can be easily breached. The potential benefits of automated performance, such as predictability and certainty, would bring benefits to all parties. However, this idea of automated performance would not be desirable all the time. Not allowing for a breach by insisting on the specific performance required by a smart contract would be considered practically and economically inefficient, and which might deter their widespread use. As an illustration of this inflexibility, "efficient

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breach theory" will be used to prove that insisting on the specific performance of the obligation secured by a smart contract would not be desirable for the contractual parties. After showing this inflexibility, a feasible solution for this concern will be presented within the design of contracts. Before discussing this issue, in the second section, the definition of smart contracts and, and its potential benefits, will be explained. In the third section, as the main issue, how automated performance can cause inflexibilities, the difficulty of predicting future events, and the impossibility of a breach will be analysed. After detecting these problems, whether the design of a smart contract can help to alleviate these inflexibilities will be discussed. This article discusses the validity of smart contracts and the specific performance of obligations according to the English contract law.

Keywords: Smart Contracts, Law and Economics, Efficient Breach Theory, Specific Performance, English Contract Law.

Özet

Bilgisayar koduyla yazılan akıllı sözleşmeler, sözleşmenin ifasını güvence altına alacaktır. Akıllı sözleşmelerin bu özelliği, kolayca ihlal edilebilen geleneksel sözleşmelere alternatif olarak önerilmektedir. Sözleşmenin ifasının otomatikleştirilerek teminat altına alınması taraflara öngörülebilirlik ve kesinlik gibi faydalar sağlayacaktır. Bununla birlikte, bu otomatik ifa fikri her zaman arzu edilmeyecektir. Akıllı bir sözleşmenin gerektirdiği belirli bir borcun ifası üzerinde ısrar etmek ve bir ihlale izin vermemek, pratik ve ekonomik olarak verimsiz kabul edilebilir ve bu da akıllı sözleşmelerin geniş çaplı kullanımlarını engelleyebilir. Bu verimsiz durumu tasvir etmek ve akıllı sözleşmede aynen ifa konusunda ısrar etmenin sözleşme tarafları için arzu edilmeyeceğini kanıtlamak için "etkin ihlal teorisi" kullanılacaktır. Bu verimsiz durum gösterildikten sonra, akıllı sözleşmelerin tasarımında bu sorunun çözümü için uygulanabilir bir çözüm sunulacaktır. Bu konuyu tartışmadan

önce, ikinci bölümde akıllı sözleşmelerin tanımı ve potansiyel faydaları açıklanacaktır. Üçüncü bölümde, esas mesele olan, akıllı sözleşmelerde borcun ifasının otomatik olarak gerçekleşmesindeki olası sorunlar ele alınacak ve gelecekteki olayları tahmin etmenin zorluğu ve sözleşmeyi ihlalin imkansızlığı halleri analiz edilecektir. Bu sorunları tespit ettikten sonra, akıllı bir sözleşmenin tasarımının bu sorunların çözümünde nasıl bir rolü olacağı tartışılacaktır. Bu makalede, akıllı sözleşmelerin geçerliliğine ve aynen ifaya ilişkin tartışmalarda İngiliz sözleşme hukuku esas alınmış ve tartışmalar bu çerçevede yapılmıştır.

Anahtar Kelimeler: Akıllı Sözleşmeler, Hukuk ve Ekonomi, Etkin İhlal Teorisi, Aynen İfa, İngiliz Sözleşme Hukuku.

INTRODUCTION

Smart contracts, as written by computer code, would secure the performance of the contract. It is believed that this feature of smart contracts is marketed as the solution to traditional contracts,[1] which can be easily breached. The potential benefits of automated performance, such as certainty, would bring benefits to all parties. However, this idea of automated performance would not be desirable all the time. Not allowing for a breach by insisting on the specific performance required by a smart contract would be considered practically and economically inefficient, and which might deter their widespread use. As an illustration of this inflexibility, "efficient breach theory" will be used to prove that insisting on the specific performance of the obligation secured by a smart contract would not be desirable for the contractual parties. After showing this inflexibility, a feasible solution for this concern will be presented within the design of contracts.

[1] Traditional contracts as a term describes the contractual relations which do not secure the performance of the contracts technically.

Before discussing this issue, in the second section, the definition of smart contracts and its relationship with blockchain technology, and its potential benefits, will be explained. In the same section, whether a variety of smart contracts fall within the scope of English contract law will be assessed. In the third section, as the main issue, how automated performance can cause inflexibilities, the difficulty of predicting future events, and the impossibility of a breach will be analysed. After detecting these problems, whether the design of a smart contract could help alleviate these inflexibilities will be discussed.

I. SMART CONTRACTS: DEFINITION, GOALS AND LEGAL ASPECTS

A. The Definition of Smart Contracts: Is It Smart or Mere Automation?

The definition and scope of the smart contract have been discussed extensively in the literature. Szabo defined "smart contract" by saying that contractual terms into the software to execute and enforce them without any intermediary intervention by the trusted parties.[2] From Szabo's perspective, this concept hinges on the ensured execution of the contractual terms, which means it is related to the "performance of the contract". Cuccuru considered the concept of smart contracts as "a channel of online agreements", which means that they are not themselves truly contracts in a legal sense.[3] Smart contracts are constructed as an autonomous execution of a piece of code "whose input or output

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[2] Nick Szabo, "Smart Contracts: Building Blocks for Digital Markets," accessed March 20, 2020, http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html/.

[3] Pierluigi Cuccuru, "Beyond bitcoin: an early overview on smart contracts," *International Journal of Law and Information Technology* 25, no. 3 (Autumn 2017): 179–195, https://doi.org/10.1093/ijlit/eax003.

can include money".[4] The definition of a smart contract is sometimes broadly understood as an if-then relationship, without taking into account the broader context.[5] In this essay, even if it is conceded that smart contracts sometimes refer to mere code executing pre-determined instructions[6], it will be regarded as computer codes ensuring the automated execution of the contract. This feature differentiates smart contracts from traditional contracts.[7] This definition includes agreements directly concluded by codes[8] and algorithms. Admittedly the use of "smart" as an adjective, can be considered misleading since being smart in the context of contracts are more likely to reflect autonomous contracting, which is surely more than mere automated process. Due to the broad and vague definition of smart contracts, Scholz coined "algorithmic contracts" for contracts concluded by algorithms which would be legally enforceable.[9] This article will analyse these types of contracts under the definition of smart contract, that is, where contractual performance is secured by code. It is believed that coining

4 Ari Juels, Ahmed Kosba and Elaine Shi, "The Ring of Gyges: Using Smart Contracts for Crime," accessed March 29, 2020, http://www.arijuels.com/wp-content/uploads/2013/09/Gyges.pdf.

5 Michèle Finck, "Smart contracts as a form of solely automated processing under the GDPR," *International Data Privacy Law* 9, no. 2 (May 2019): 80, https://doi.org/10.1093/idpl/ipz004.

6 Marco Dell'Erba, "Demystifying Technology. Do Smart Contracts Require a New Legal Framework? Regulatory Fragmentation, Self-Regulation, Public Regulation," (2018): 22, http://dx.doi.org/10.2139/ssrn.3228445.

7 Primavera De Filippi and Aaron Wright, *Blockchain and the law: the rule of code*, (Cambridge, Massachusetts: Harvard University Press, 2018): 74.

8 Michael Bacina, "When Two Worlds Collide: Smart Contracts and the Australian Legal System," *Journal of Internet Law* 21, no. 8 (2018): 17.

9 Lauren Henry Scholz, "Algorithmic Contracts and Consumer Privacy," in *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms,* eds. Cristina Poncibò, Larry A. DiMatteo and Michel Cannarsa, (Cambridge: Cambridge University Press, 2019): 256.

different terms for each example would exacerbate concerns related to the definition of the contract.

B. The Relationship Between Smart Contracts and Blockchain Technologies: Is It Indispensable?

The use of the blockchain has positively influenced how the smart contract has been developed. The network, the ledger and the consensus are three main elements of blockchain. To add a new block into the chain, the consensus model requires users to prove themselves by solving the extreme computational mathematical problems requiring high energy and computing power. Solving these problems to add the new block into the chain is called mining. When a majority of notes confirms this solution and consensus is reached, the block is added into the blockchain and becomes immutable due to the impracticability of the modification of blocks.[10] The immutable nature of the blockchain ensures the transfer of digital assets between parties without any intermediation. This nature of blockchain enhances the secured performance of smart contracts. Due to this relation with blockchain, Greenspan defines the concept of a smart contract by specifically referring to the role of blockchain.[11] He states that "A smart contract is a piece of code which is stored on a Blockchain, triggered by Blockchain transactions, and which reads and writes data in that Blockchain's database."[12] Similarly, Savelyev suggests that the definition of a smart contract must be limited by the use of blockchain.[13] He argues that smart contracts will be innovative only if complete self-enforcement and trust

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10 Alexander Savelyev, "Contract law 2.0: 'Smart' contracts as the beginning of the end of classic contract law," *Information & Communications Technology Law* 26, no. 2 (2017): 118-119, https://doi.org/10.1080/13600834.2017.1301036.

11 Gideon Greenspan, "Beware of the Impossible Smart Contract," accessed April 23, 2020, https://www.the-blockchain.com/2016/04/12/beware-of-the-impossible-smart-contract.

12 Greenspan, "Beware."

13 Savelyev, "Contract law 2.0," 127.

are ensured by blockchain technology.[14] In conclusion, due to the positive impact of blockchain, smart contracts seem to be inextricably associated with it, according to some authors.

Nevertheless, a smart contract can be designed without blockchain technologies. Blockchain is not a requirement for the implementation of these contracts because other technologies can maintain automatic execution.[15] Mik points out that smart contracts are not synonyms with blockchain transactions and smart contracts involve running code on top of blockchain technologies to ensure the self-enforceability of these transactions.[16] Besides, in the example of the vending machine, Dell'Erba challenged the automatic association of smart contracts with blockchain-enabled contracts by considering the vending machine as such.[17] It is conceded that blockchain enhances self-execution; however, it is possible to have automatic execution of a transaction embedded in codes without the use of blockchain technology. However, blockchain technology facilitates the transfer of digital assets on a "peer-to-peer basis in the digital realm, just as they do offline."[18] The added value of blockchain technologies would not be disregarded. Thus, defining smart contracts as a transactional layer on top of blockchain would be an appropriate construction of the relationship between blockchains with smart contracts. To

14 Savelyev, 131.

15 Florian Möslein, "Legal Boundaries of Blockchain Technologies: Smart Contracts as Self-Help?," in *Digital Revolution - New challenges for Law (Forthcoming),* eds. Alberto Franceschi et. al., (2019): 3, accessed April 25, 2020, https://ssrn.com/abstract=3267852.

16 Eliza Mik, "Smart contracts: terminology, technical limitations and real world complexity," *Law, Innovation and Technology* 9, no. 2 (2017): 281, https://doi.org/10.1080/17579961.2017.1378468.

17 Dell'Erba, "Demystifying Technology," 12.

18 Tatiana Cutts, "Smart Contracts and Consumers," *LSE Legal Studies Working Paper,* no. 1 (2019): 15, accessed April 28, 2020, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3354272.

conclude, if the automated execution is embedded in code, this would be sufficient to make it a smart contract.

C. The Validity of Smart Contracts in the Current Legal Framework: Are Smart Contracts Compatible with English Contract Law?

The flexible nature of contract law allows the application of the current legal system to smart contracts as long as they can be qualified as a "contract" under the applicable law of disputes. Under English law, there must be a meeting of minds (agreement), consideration, and legal intention to have a legally enforceable contract.[19] If these requirements are met, smart contracts fall within the scope of contract law. Conceiving smart contracts outside contract law is no more than a fiction.[20] When smart contracts are legally binding under contract law will be discussed below.

Meeting of minds under contract law can occur explicitly through offer and acceptance or implicitly by conduct. If a smart contract is constructed only to provide automated execution, this means that a contract is concluded *a priori* between the parties. In such an instance, a smart contract would not call into question the existence of legal contract since the parties have an underlying contractual relationship where the terms are embedded in the code after the conclusion of the contract.[21]

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19 Robert Duxbury, *Contract Law: Textbook Series*, (London: Sweet & Maxwell, 2014): 1.008.

20 Andrew Murray, Information technology law: the law & society (Oxford, United Kingdom : Oxford University Press, 2019), 435; European Commission, Study on Blockchains. Legal, governance and interoperability aspects (SMART 2018/0038) (Luxembourg: Publications Office of the European Union, 2020), 60, https://op.europa.eu/s/pi6i; Savelyev, "Contract law 2.0", 123.

21 Kristian Lauslahti, Juri Mattila and Timo Seppala, "Smart Contracts – How Will Blockchain Technology Affect Contractual Practices?" *ETLA Reports*, no. 68 (2017): 21, accessed April 21, 2020, https://ssrn.com/abstract=3154043.

When it comes to smart contracts which are concluded and enforced within the code, the autonomous negotiation can be used in the conclusion phase might cause uncertainty concerning the agreement between the parties. Scoca illustrates the autonomous negotiation process by considering a fictive dynamic Service Level Agreement (SLA).[22] In this example, the negotiation algorithm determines the provider which is most compatible with customer requests. Assume that both parties use these algorithms to not only negotiate but also to conclude the contract. In this case, how the meeting of minds occurs can cause uncertainty as algorithms conclude and execute the contract without the parties' intervention. Lord Hodge points out a similar example in which computers with machine learning capabilities autonomously interact with each other to generate transactions.[23] It could certainly be argued that there is no meeting of minds in these transactions as the parties do not explicitly or implicitly agree on the conclusion of the contract. They would be outside the scope of contract law as they are fully concluded by computers.[24] Nonetheless, the flexibility of contract law can accommodate this scenario on the basis that these autonomous structures are delegated by parties to form these contracts, and the parties must then agree on what these autonomous structures agree. Dell'Erba appropriately observes that a fully automated process initially triggered by the parties

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22 Vincenzo Scoca, Rafael Brundo Uriarte and Rocco De Nicola, "Smart Contract Negotiation in Cloud Computing," *2017 IEEE 10th International Conference on Cloud Computing,* (Honololu, HI, USA: IEEE, 2017): 596, https://doi.org/10.1109/CLOUD.2017.81.

23 The Right Honourable Lord Hodge, "The Potential and Perils of Financial Technology: Can the Law Adapt to Cope?" *The First Edinburgh FinTech Law Lecture*, (Edinburgh Law School, South Bridge, Edinburgh, March 14, 2019), 12, accessed April 24, 2020, https://www.law.ed.ac.uk/sites/default/files/2020-09/speech-190314%20-%20Acc.pdf.

24 Savelyev, "Contract law 2.0", 121.

can be constructed as a contract in the legal sense.[25] Triggering the autonomous structure for the conclusion of the contract can be constructed as a tacit agreement to the terms the machines agree. The use of these agents should not change the occurrence of the meeting of minds. In conclusion, as long as the smart contracts are triggered by the parties, and these codes agree on the same terms of the agreement, the requirement for a meeting of minds will be met. It must be noted that this form of a contract might be a truly smart contract as the autonomous conclusion of contracts reflects the notion of smartness.

Intention to be legally bound is another requirement for an enforceable contract under the English law. This requirement is concerned with whether the parties intend to be bound by the agreement legally. Even parties can agree on certain terms and conditions; they do not want to be legally bound by their agreements.[26] For commercial transactions, there is a strong presumption that the parties intend to be bound by their agreements.[27] Dell'Erba gives an example of the use of smart contracts concerning the "Internet of Things".[28] The intention to be legally bound would not be so problematic in smart contracts provided that they are designed to engage commercially with others. However, having smart contracts might imply that the parties chose an "alternative regulatory system",[29] as the nature of smart contracts ensures the enforceability of the contract without the support of the courts, thus, there is no intention to be legally bound with the conclusion of smart contracts. Similarly, Werbach and Cornell state that transacting through smart contracts would mean that parties are not intended to have

25 Dell'Erba, "Demystifying Technology," 39.

26 Duxbury, Contract Law: Textbook Series, 3-012.

27 Duxbury, 3-020.

28 Dell'Erba, "Demystifying Technology," 37-38.

29 Savelyev, "Contract law 2.0," 123.

a legally enforceable contract as legal enforcement is not needed.[30] They detect the misleading nature of that thinking by underlying that the intention of the parties to use smart contracts as a means of self-execution does not mean that they do not want to enforce their contract legally.[31] In light of the strong presumption of intention to be bound in commercial transactions, preferring the use of a smart contract does not directly lead to the conclusion that the parties have chosen another regulatory system. Therefore, inasmuch as the intention of the parties is derived from smart contracts, they would create legally binding contracts regardless of the autonomous nature of smart contracts.

According to English law, the consideration must be present to have an enforceable contract. This requirement ensures that only bargains are enforceable under English law rather than mere promises.[32] Smart contracts in the commercial context do not challenge the notion of consideration as they generally include mutual bargains. It can be stated that as enforceability is ensured by a smart contract, there is no need to analyse whether the requirement of consideration is met. However, in the case of total failure of consideration, the claimant is entitled to recover what he pays based on unjust enrichment. In *Fibrosa Spolka Ackyjna v Fairbairn Lawson Combe Barbour Ltd*, the Polish company paid a deposit for goods ordered.[33] However, it did not receive anything in return. The Court held that the claimant is entitled to recover what it pays on the basis of total failure of consideration. In the case of smart contracts, after the

30 Kevin Werbach and Nicolas Cornell, "Contracts ex machina," *Duke Law Journal* 67, no. 2 (2017): 339, accessed May 4, 2020, https://scholarship.law.duke.edu/dlj/vol67/iss2/2.

31 Werbach and Cornell, "Contracts ex machina," 340.

32 Duxbury, Contract Law: Textbook Series, 4.001.

33 Fibrosa Spolka Ackyjna v Fairbairn Lawson Combe Barbour Ltd, [1943] A.C. 32.

performance of the contract, the claimant might seek recovery as grounded on unjust enrichment due to the failure of consideration. Therefore, it must be concluded that smart contracts should include the consideration to be legally enforceable.

II. THE AIMS OF SMART CONTRACTS: REMOVING TRUSTED INTERMEDIARIES AND THE DECREASE IN TRANSACTION COSTS

A. Removing Trusted Intermediaries: Are Blockchain Miners, New Intermediaries?

The idea behind smart contracts is the removal of trusted intermediaries such as courts or financial institutions by putting a piece of code in place as an alternative. Intermediaries record the transaction and solve disputes if such arise from the contract. Since smart contracts aim to allow for the self-execution of a contract, the need for an intermediary might be removed. Blockchain technology helps smart contract replace trusted third parties.[34] Cutts insightfully points out that the blockchain technology provides disintermediation in digital asset sales.[35] This disintermediation is provided by miners who solve "the cryptographic puzzles based on the transaction in a proposed new block on the blockchain."[36] Due to the role of miners in the smart contracts hosted on blockchain, they can be considered part of any intermediation considering the reward they gain for their role. It is stated that the concept of disintermediation stems from the fact that verifiers and users constitute the same group.[37]

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34 Werbach and Cornell, "Contracts ex machina," 329; Daniel Macrinici, Cristian Cartofeanu and Shang Gao, "Smart contract applications within blockchain technology: A systematic mapping study," *Telematics and Informatics* 35, no. 8 (2018): 2338, https://doi.org/10.1016/j.tele.2018.10.004.

35 Cutts, "Smart Contracts and Consumers," 20.

36 Mik, "Smart contracts," 276.

37 Cutts, "Smart Contracts and Consumers," 19.

However, even if users transact between themselves, other nodes in the blockchain will continue to verify such transaction. For this reason, it may be noted that there is no actual disintermediation in the case of blockchain-enabled smart contracts. Nevertheless, the distributed nature of intermediation in blockchain removes the need for central intermediation.

B. Reducing Transaction Cost: Does It Reduce Transaction Cost or Move the Cost Upfront?

Smart contracts might reduce transaction costs as there is no litigation or enforcement procedures in the case of a breach as the code ensures the performance of the contract. Giancaspro states that smart contracts reduce transaction costs related to enforcement procedures before courts as the performance of the obligations is guaranteed by a piece of software.[38] This argument seems compatible with the goal of a smart contract targeting self-execution. In contrast to this idea, while decreasing the enforcement and litigation costs, the design process of the smart contract would inflict a much higher cost on the parties. It is contended that the smart contractware design must be carried out meticulously to ensure that the wills of the parties are genuinely incorporated into the software.[39] Furthermore, the designed system must be secure from the malicious attack,[40] which requires additional financial resources to increase its robustness. Considering design costs, Murray notes that the

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38 Mark Giancaspro, "Is a 'smart contract' really a smart idea? Insights from a legal perspective," Computer Law & Security Review 33, no. 6 (2017): 827, https://doi.org/10.1016/j.clsr.2017.05.007; For same view: Savelyev, "Contract law 2.0," 127.

39 Jeremy M. Sklaroff, "Smart Contracts and The Cost of Inflexibility," *University of Pennsylvania Law Review* 166, no. 1 (2017): 277, accessed April 21, 2020, https://scholarship.law.upenn.edu/penn_law_review/vol166/iss1/5.

40 Amritraj Singh et. al., "Blockchain smart contracts formalization: Approaches and challenges to address vulnerabilities," *Computers & Security* 88, (2020): 2, https://doi.org/10.1016/j.cose.2019.101654.

costs people incur are merely reallocated to the design phase in smart contracts.[41] Design and negotiation costs in the smart contract show that the total cost would not be decreased but allocated to the preparation phase rather than the enforcement phase.

III. AUTOMATIC EXECUTION AS A DISTINCT FEATURE OF SMART CONTRACTS

Smart contracts differ from traditional ones by their automatic enforcement as provided by their software protocols. This automatic performance is the consequence of embedding the required performance into the code.[42] However, this performance can be halted by a cyberattack, which makes this code vulnerable in this regard. Additionally, one party would control the execution of the code, which would cause the alteration of the smart contract unless both parties mutually control the code. In blockchain-enabled smart contracts, the immutability is enhanced as code is inserted into the blockchain technology by which the whole network is dispersed, and the underlying software ensures that the copies are updated as and when there is a new connection to the network.[43] Additionally, when the code is executed in the blockchain, it is highly resistant to alteration. However, this is not impossible if a majority of the miners in the blockchain "collectively decide to unwind previously recorded transactions or to block certain accounts or smart contracts."[44] Considering this potential for alteration,

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41 Murray, Information technology law, 432.

42 Mik, "Smart contracts," 274.

43 De Filippi and Wright, *Blockchain and the law*, 35-36.

44 De Filippi and Wright, 36; Grimmelmann mentioned that how the forks are coming out in the case of disagreement about the upgrade in the blockchain result in forks. For a detailed explanaton, see: James Grimmelmann, "All Smart Contracts Are Ambiguous," *Journal of Law & Innovation* 2, no. 1 (2019): 17, accessed April 21,2020,h ttps://scholarship.law.upenn.edu/cgi/viewcontent.cgi? article=1006&conte xt=jli.

parties should take these features into account while using blockchain-enabled transactions. Consequently, the idea is that the distinct feature of a smart contract is securing performance, despite the potential alteration. This feature is also considered a positive feature of the smart contracts as it allegedly reduces transaction cost and removes trusted intermediaries. However, this would bring inflexibilities to smart contracts which would deter parties from using them.

On the other hand, it must be noted that the modification in smart contracts are possible. As described in the previous section, smart contracts exist on top of blockchain technologies. Interestingly, Marino and Juels underline the difference between "contract states" and "code" in Etherum platforms.[45] They stated that 'contract states' on the blockchain are not immutable. They further noted that nodes "run contract code and maintain and adjust contract states in a virtual machine they all host, the Etherum Virtual Machine." By this virtual machine, it is possible to modify contracts or to rescind or to terminate them.[46] Also, oracles can be used to adopt contracts to changing circumstances. How these features can alleviate the inflexibilities of the contract will be discussed for the inflexibilities mentioned.

A. The Inflexibility of Smart Contracts: Are They Unsolvable?

1. The Incompleteness of Contract: The Unpredictability of Future Events

The problem of the incompleteness of contracts should be discussed in the context of smart contracts to show their

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45 Bill Marino and Ari Juels, "Setting Standards for Altering and Undoing Smart Contracts," in *Rule Technologies. Research, Tools, and Applications*, eds. Jose Julio Alferes et. al., (Cham: Springer International Publishing, 2016): 158, https://doi.org/10.1007/978-3-319-42019-6_10, 158.

46 Marino and Juels, "Setting Standards," 162.

inflexibility. Aderlini and Felli define incomplete contracts by saying "a contract is incomplete if and only if it does not incorporate some information about the state of nature that it would have been optimal for the contracting parties to include."[47] In other words, it is not plausible to predict all future events in the contractual relations even in traditional contracts to have an optimal contractual relation. Even though parties foresee a contingency, they rationally prefer not to negotiate to reduce transaction costs.[48] This incompleteness will cause gaps and ambiguities.[49] Parties would renegotiate the contract after the unforeseen contingency occurs or the courts would adjudicate if a dispute arises from the unforeseen contingency. This characteristic reflects how traditional contracts adapt to changing circumstances. When it comes to smart contracts, it is accepted that blockchain-enabled smart contracts accommodate highly complex contractual relations.[50] However, this complexity would not encapsulate the prediction of all events in the future. Sklaroff points out that modelling the potential behaviours of the contractual parties is too complex to be designed.[51] Additionally, the immutable nature of smart contracts exacerbates the problem of the incomplete contract as the terms and conditions of these contracts cannot be modified as a rule. This might cause a more rigid application of smart contracts which would deter people from using them.

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47 Luca Anderlini and Leonardo Felli, "Bounded rationality and incomplete contracts," *Research in Economics* 58, no. 1 (2004): 11.

48 Richard A. Posner, "The Law and Economics of Contract Interpretation," *Texas Law Review* 83, (2005): 1583.

49 Oliver Simon D'Arcy Hart, *Firms, Contracts, and Financial Structure*, (New York: Oxford University Press, 1995), 30

50 Eric Tjong Tjin Tai, "Force Majeure and Excuses in Smart Contracts," *European Review of Private Law* 26, no. 6 (2018): 790.

51 Sklaroff, "The Cost of Inflexibility," 279-280.

On the other hand, this inflexibility arising from the structure of smart contracts would be alleviated by a modification mechanism embedded in the code. Contractual parties can write renegotiation clauses into their smart contracts[52] to solve this rigidity. Marino and Juels discuss how the contract can be modified in smart contracts on Etherum platforms.[53] They describe three ways by which the parties can undertake such modification: 'modification of variable-captured terms, deletion of function-captured terms, and addition or alteration of function-captured terms.'[54] These modification mechanisms would also provide renegotiation mechanisms.

These modification mechanisms, with the secured self-execution of the performance, would solve the problems arising from the flexibility of traditional contracts. Having the possibility of modification after the conclusion of a traditional contract might be threateningly used by one party to gain an increased benefit from another without reciprocity if the other party makes a "sunk, relationship-specific investment."[55] This problem has been coined the 'hold-up' problem.[56] The possibility of this problem would render flexibility of renegotiations inefficient as one of the parties gets benefits unfairly without offering any associated value.[57] Smart contracts with a modification mechanism would solve the hold-up problem as the self-execution of the main performance is secured in

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52 Richard T. Holden and Anup Malani, "Can Blockchain Solve the Hold-up Problem in Contracts?" *The National Bureau of Economic Research Working Papers*, no. 25833 (2019): 32.

53 Marino and Juels, "Setting Standards," 162.

54 Marino and Juels, 162.

55 Benjamin E. Hermalin and Michael L. Katz, "Information and the Hold-Up Problem," *The RAND Journal of Economics* 40, no. 3 (2009): 405. accessed April 22, 2021, http://www.jstor.org/stable/25593717.

56 Hermalin and Katz, "Information," 405.

57 For many cases illustrating the hold-up problem, see: Holden and Malani, "Can Blockchain Solve," 7.

advance. Based on the self-execution of the contract, Holden and Malani perceptively argue that the secured performance and designing the modification mechanism under the smart contract would prevent the hold-up problem since smart contracts would not then allow opportunistic modifications to be imposed by one party on another.[58] Therefore, the possibility of modification and renegotiation of a smart contract would be considered more secure flexibility since it is more likely to solve the hold-up problem arising from the elastic nature of contract law.

Contracts include a variety of clauses to govern the relations between parties to facilitate their transaction and to remove uncertainties, at least insofar as this is possible. Smart contracts would not be desirable in the case of a complex transaction if there is no connection between the smart contract and the real world. For instance, parties prefer to stipulate the condition precedent, which triggers the performance of the contract. In traditional contracts, these conditions can be easily incorporated into the contract, but even so, how the parties react to the occurrence of the condition bears a degree of uncertainty. When it comes to smart contracts, the relation with the real world must be maintained to have self-execution even in complicated contracts. Therefore, other contingencies foreseen by the parties must be incorporated; otherwise, mere secure performance would not be sufficient to allow for the extensive use of smart contracts.

Uncertainties about real-world incidents in smart contracts could be alleviated by using oracles.[59] Having a trusted oracle may soften these limitations by using external data to trigger specific conditions in smart contracts. These oracles can be divided into three types: automated, trusted third party, and

58 Holden and Malani, 28.

59 Grimmelmann, "All Smart Contracts," 15.

expert oracles.[60] As an illustration of automated oracles, signals from a self-driving car in a car accident would be considered the input for a smart contract.[61] Trusted third party and expert oracles can incorporate human views into smart contracts.[62] Lamberti proved the complex and flexible use of smart contracts in the initial coin offerings by incorporating different variables into these transactions.[63] Incorporating the human viewpoint into smart contracts by way of oracles can make these contracts more flexible. Responding to the changes in near real-time led some authors to think that smart contracts were more dynamic than traditional contracts.[64] Having objective inputs from the automated oracles will contribute to the flexibility of smart contracts. However, having a subjective view from experts would prejudice securing performance since the perspective of a third party would be wrong or biased. Therefore, contracting parties must consider this issue while drafting a smart contract.

2. Not Allowing A Breach Of Contract

The appealing characteristic feature of smart contracts has been determined as their automatic execution. It has been described that this characteristic of smart contracts acts as a form of self-help to get the specific performance agreed under the contract. This view hinges on the idea that this type of contract is a private action by the parties to resolve disputes without any

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60 Tjong Tjin Tai, "Force Majeure," 791; All type of oracles are defined as getting information from trusted third party source, See for this definition: De Filippi and Wright, *Blockchain and the law*, 75.

61 Tjong Tjin Tai, "Force Majeure," 791.

62 Tjong Tjin Tai, 791.

63 Valentina Gatteschi, Fabrizio Lamberti and Claudio Demartini, "Technology of Smart Contracts," in *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms,* eds. Larry A. DiMatteo, Michel Cannarsa and Cristina Poncibò, (Cambridge: Cambridge University Press, 2019), 45.

64 De Filippi and Wright, *Blockchain and the law : the rule of code*, 75

further assistance of third parties.[65] As stated below, this is a distinguishing feature of smart contracts from traditional contracts and other forms of electronic legal agreements.[66] This feature can be a mere manifestation of *pacta sund servanda*[67] and can be applauded as a proper solution and deterrent to post-opportunistic behaviours by the parties. On the other side of the coin, a strict application of the no-breach idea might be considered stringent. Allowing a breach by the parties in contract law allows business life to be more flexible to accommodate contingencies. The occurrence of a breach itself does not mean that parties will go to litigation to seek a remedy. Before the litigation phase, parties can have an informal dialogue to restore their contractual relationship. Sklaroff emphasises on how this informal dialogue solves the dispute arising from opportunistic behaviours of one party at a low cost, proposing more business in the future.[68] Levy underlines that non-enforcement of the contract would have the same benefits as enforcement in the courts.[69] Self-enforcement, as secured by smart contracts, deprives parties of recourse to informal dialogue or other ways to ensure a more efficient solution to their dispute(s). Even if informal dialogue does not end with an efficient compromise, traditional contract law would offer other ways to restore the relationship via remedies, which would be

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65 Cristina Poncibò and Larry A. Dimatteo, "Smart Contracts: Contractual and Noncontractual Remedies," in *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms,* eds. Larry A. DiMatteo, Michel Cannarsa and Cristina Poncibò, (Cambridge: Cambridge University Press, 2019), 126.

66 Werbach and Cornell, "Contracts ex machina," 331.

67 Savelyev, "Contract law 2.0," 130.

68 Sklaroff, "The Cost of Inflexibility," 277-278; For similar view, see Karen E. C. Levy, "Book-Smart, Not Street-Smart: Blockchain-Based Smart Contracts and The Social Workings of Law," *Engaging Science, Technology, and Society* 3, (2017): 9.

69 Levy, "Book-Smart," 10.

more effective than the self-execution of a contract after a change in circumstances. Therefore, not allowing a breach of the contract reflects the inflexible side of smart contracts.

IV. IS INSISTING ON SPECIFIC PERFORMANCE BY AUTOMATIC EXECUTION DESIRABLE UNDER ENGLISH CONTRACT LAW

As smart contracts do not allow breach of contract, this feature can be regarded as a strict persistence of the main obligation under the agreed contract. In other words, the design of smart contracts presumes the desirability of specific performance under the contract. Thus, the essential question related to the practicality of smart contracts is whether their automatic execution is always desirable by the contractual parties. It must be acknowledged that smart contracts provide contractual parties commercial and legal certainty by their self-executing nature. Mik justifiably contends that the legal and economic certainty is guaranteed technically with the unbiased and objective nature of the code.[70] In most instances, this will attract businesses' attention to the use of smart contracts.

On the other hand, after the agreement, circumstances surrounding contracts might change, which may alter parties' views in terms of performing their obligations under the contract. Such a change in view is not limited to an opportunistic move by one of the parties, it might occur due to unforeseen circumstances beyond the parties' control, such as force majeure[71] or a more valuable offer from a third party. Due to these changes, parties would prefer to breach the contract instead of performing it.

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70 Mik, "Smart contracts," 280; For similar view, see: Dell'Erba, "Demystifying Technology," 20.

71 For a detailed analysis of how the force majure can be incorporated into the smart contract, see: Tjong Tjin Tai, "Force Majeure," 787.

Breach of contract is one of the possibilities foreseen in contract law systems in contrast to the idea of a smart contract. Werbach and Cornell identify contract law as "remedial institution."[72] These remedies contain paying a variety of damages or insisting on specific performance. The party who breached the contract will pay the expectation damages[73] instead of fulfilling specific performance if a breach of contract has occurred in English law. Seeking damages is considered a primary remedy, as opposed to the civil law countries in which specific performance as a primary remedy persists.[74] The possibility of paying expectation damages in traditional contracts instead of performing the contract would prove how contractual parties have a right to change their minds. It should be noted that this change would not completely prejudice the expectation of the other party as they can be satisfied with damages. By contrast, the idea of self-execution of a smart contract would be incompatible with people's right to change their minds. Mik points out that self-enforcement does not allow the parties to deviate from the conditions of the contract, which hinders changing one's mind.[75] This lack of discretion might well be considered an inflexible side of the idea of a smart contract.

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72 Werbach and Cornell, "Contracts ex machina," 106.

73 Expectation damages aims at putting the innocent party in the same position as if the contract had been performed.

74 Liao, Wenqing, *The Application of the Theory of Efficient Breach in Contract Law: A Comparative Law and Economics Perspective*, (Cambridge: Intersentia, 2015), 298; For the reasons why specific performance is not primary remedy, see: Tareq Al-Tawil, "English Contract Law and the Efficient Breach Theory: Can They Co-Exist?" Maastricht Journal of European and Comparative Law 22, no. 3 (2015): 414, https://doi.org/10.1177%2F1023263X1502200305; For the risk of disproportionate consequences of specific performance, see: Henrik Lando and Caspar Rose, "On the enforcement of specific performance in Civil Law countries," *International Review of Law & Economics* 24, no. 4 (2004): 483-484, https://doi.org/10.1016/j.irle.2005.01.005.

75 Mik, "Smart contracts," 280.

A. Efficient Breach Theory as an Illustration of the Inflexibility of Smart Contracts

In this section, voluntary breach of a contract in the expectation of increasing welfare will be discussed to show that insisting on securing performance would not be the mere choice the parties want; sometimes, breach of contract can be efficient for the parties. Before delving into the concept of efficient breach, the law and economics approach to contract law must be briefly analysed to make this theory intelligible.

According to law and economics theory, enforcing contracts enables people to cooperate to "maximise the gain" when the contract law "creates efficient incentives for performance and reliance."[76] The function of law is to facilitate people's capacity to maximise their welfare, thus incentivising people to behave appropriately.[77] Therefore, this theory assumes that people expect to gain benefit from a contract. If a contract does not produce a total efficiency for the parties, contract law should not enforce a requirement for these parties to perform their contractual obligations. Why should a party breach a contract if he/she anticipates economic gain from the contract? Liao gives three reasons for a breach of the contract: "uncertain risks, opportunistic behaviours and alternative to paying damages."[78] When people enter into a contract, the conditions of their performance in the future might not be certain. After the

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[76] Robert Cooter and Thomas Ulen, *Law and Economics*, (Harlow, Essex : Pearson, 2014), 305; See also Richard A. Posner, "The Economic Approach to Law," *Texas Law Review* 53, (1975): 761.

[77] Alan Devlin, *Fundamental Principles of Law and Economics,* (London: Routledge, 2015), 178. See for general overview of the historical development of law and economics theory, Herbert, Hovenkamp, "Law and Economics in the United States: a brief historical survey," *Cambridge Journal of Economics* 19, no. 2 (April 1995): 331, https://doi.org/10.1093/oxfordjournals.cje.a035316.

[78] Liao, *The Application,* 45-46.

agreement, it might turn out that the contract is no longer going to be advantageous to the parties. In this case, contract law should induce people to act appropriately, including renegotiation and the breach of contract. Concerning opportunism, the law must deter this kind of behaviour in order to increase total welfare.[79] If instead of performing the obligation paying damages would be more efficient to the parties, then they can breach the contract to ensure this.

Efficient breach theory is developed by law and economics scholars to theorise how parties might breach a contract voluntarily for the sake of efficiency. This theory was has been developed by Richard Posner.[80] Holmes stated that a party to the contract could has discretion to either perform the obligations or pay the damages for the loss suffered by the other party due to non-performance.[81] This theory states that contractual parties are allowed to breach a contract and pay expectation damages if the breaching party concludes that breaching the contract would be more efficient than paying the expectation damages.[82] This theory is only feasible if other party's expected gain is lower than the breached party's gain.[83] Contract law would play a decisive role in efficient breach theory by limiting the damages sought by the other party with regard to their expectation from the contract, otherwise contractual parties would be induced to perform the contract even if it were inefficient to do so. Liao

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79 Timothy J. Muris, "Opportunistic Behavior and the Law of Contracts," *Minnesota Law Review* 65, (1981): 521.

80 Richard A. Posner, *Economic analysis of law* (Boston: Little Brown, 1973).

81 Oliver Wendell Holmes, "The Path of the Law," *Harvard Law Review* 10, (1897): 462.

82 Gregory Klass, "Efficient Breach," in *Philosophical Foundations of Contract Law*, eds. Gregory Klass, George Letsas and Prince Saprai, (Oxford, United Kingdom: Oxford University Press, 2014), 396.

83 Richard A. Posner, *Economic analysis of law* (Austin, USA : Wolters Kluwer for Aspen Publishers, 2007), 47.

emphasises that imposing punitive damages for breach of the contract would deter efficient breach as this damages intentions to cover more than the expected profits.[84] Therefore, expectation damages as the primary remedy under common law are compatible with the idea of efficient breach.[85]

Even though there is no explicit and direct reference to the efficient breach theory in the cases in the English law,[86] Kilvington provides a variety of case law which is related to the efficient breach theory and ıts compatibility within the English contract law.[87] As an example from Supreme Court, in *Morris-Garner v One Step (Support) Ltd*[88] the respondent had purchased a firm from the appellants that provided help to young people who had been in foster care. They agreed to a non-compete and non-solicitation clause in their contract. However, then the non-compete and non-solicitation clause was breached. The Supreme Court held that except in extraordinary circumstances, common law damages for breach of contract could not be given only for the purpose of depriving the defendant of profits earned as a result of the breach. The defendant agreed that he intentionally breached the contract, which is in line with the characteristic with efficient breach theory. Secondly, when the Court quantifying the compensatory damages, the Court did not deprıve the defedant of the profıts made as a result of breach.

84 Liao, The Application, 47.

85 For the view that English law does not allow efficient breach, see: Al-Tawil, "English Contract Law," 413; See for the argument that specific performance can be considered as efficient as paying damages, Alan Schwartz, "The case for specific performance," *The Yale Law Journal* 89, (1979): 305-306.

86 Liam David Kilvington, "Justfying the application of the theory of efficient breach specifically within the context of commercial contracting," (PhD Thesis, University of York, September 2018), 152, accessed April 28, 2020, https://etheses.whiterose.ac.uk/23552/1/Liam%20Kilvington%20PhD%20Thesis%20Revised%20for%20Final%20Submission.pdf.

87 Kilvington, *Justfying*, 153.

88 Morris-Garner v One Step (Support) Ltd, [2018] UKSC 20.

This approach also is in line with efficient breach theory since it allows contractual parties to get further benefit from the breach of the contract.

Even though law and economics theory relies on economic theory to justify efficient breach, it is not safe from a variety of criticisms. The first is, understandably, the moral disapproval of this theory. Klass reiterates that promises create a moral obligation to perform a contract, and the law should not incentivise the breach of a contract despite its efficient results.[89] Specific performance, as a primary remedy in civil law, hinges on this moral theory to justify its position. Secondly, this theory considers performance interest to be the same as compensation interest on the basis that the expectation damages are sufficient for the breach of the contract. Tareq rebukes this understanding by noting that performance interest is a primary interest in the conclusion of a contract.[90] Kimel defends the idea that deviation from the specific performance of the obligation to the remedies requires a justification.[91] Thirdly, it is argued that efficient breach theory disregards the transactional costs incurred in the litigation or settlement procedure.[92] The costs incurred in these procedures would ultimately produce inefficient results due to the associated consumption of resources after the breach occurs. Even though these defences against efficient breach theory are fair, the possibility of an efficient breach reflects a potential response by contractual parties if a fortunate contingency comes to light after the agreement is finalised. This theory is merely a good illustration of how people can change their minds after the conclusion of a contract. For this reason, it will be used as an example to show the inflexibilities of smart contracts.

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89 Klass, "Efficient Breach," 367.

90 Al-Tawil, "English Contract Law," 399-400.

91 Dori Kimel, From promise to contract: towards a liberal theory of contract, (Oxford: Hart Publishing, 2003), 113.

92 Klass, "Efficient Breach," 367-68.

The idea of the smart contract would ignore people's tendencies to pursue more profitable transactions even after the conclusion of another contract. Specific performance is automated and guaranteed without any human intervention. At a glance, it seems to represent an effective solution for parties who want to secure the performance of the contract. This function of the smart contract would make it appealing in most such instances. However, due to circumstances that might occur after the conclusion of the contract, it would be more efficient for parties to avoid specific performance and pay expectation damages instead. Because of the immutability of smart contracts, parties would not be able to benefit from this choice and would be forced to perform their obligations. For instance, in *Vitol SA v Beta Renowable Group SA*[93], the contract is made for the claimant to purchase a certain amount of biofuel from the defendant and have it delivered between June 16 and June 30, 2016. The claimant agreed to designate a vessel by the 27th of June. The claimant hedged the contract against price volatility by selling gasoil futures contracts at a predetermined price, which is usual procedure in the biofuels market. On June 1, 2016, the defendant informed the claimant that it would be unable to fulfill its contractual obligation of providing biofuel. The defendant suggested on June 14 to supply a lesser amount than was contracted for, but stated that it would be unable to do so between June 16 and 30. The claimant responded with a request for more delivery information. It did not name a vessel by the 27th of June, but warned the defendant that if full delivery did not occur in accordance with the contract, it would hold it in breach of contract. The claimant gave notice of contract termination on July 7th. It claimed that by failing to perform its contractual obligations, the defendant was in repudiatory breach, and that it had accepted that breach either by not designating a vessel or by terminating the contract on July 7th.

93 Vitol SA v Beta Renowable Group SA, [2017] EWHC 1734 (Comm).

At the end, it is clear that the defendant intentionally avoid the performance of the contract and tried to renegotiate the contract[94] and also agreed to pay damages but they did not agree on the amount of the compensation. Assume that the whole process are automated with the use of smart contracts and there is no way of escaping from the performance of the contract. It would mean that the automatic execution of the specific performance would not be always an ideal solution. Dell'Erba considers the efficient breach theory to be a challenge against the automated performance provided by smart contracts.[95] This lack of flexibility would negatively affect how the smart contract is perceived among its potential users. Having the right to change their mind, even after the conclusion of a contract, would have to be provided in smart contracts or the uniform approach towards securing specific performance would be considered a barrier to their widespread use.

B. The Possible Solution within Smart Contracts: Securing the Liquidated Damages

It can be argued that allowing a breach of contract would make the smart contract useless as it is the distinct feature of smart contracts. This article maintains that this distinct feature would not be eroded because this particular characteristic of smart contracts can be manifest in other ways, such as securing compensation for non-performance. Securing compensation as well as specific performance would facilitate the adaptation of smart contracts to the possibility of the efficient breach without losing its advantages. Accordingly, smart contract developers would dilute the inflexible consequences caused by the immutable nature of smart contracts by allowing parties to

94 *Vitol v Beta*, [17]- [18].

95 Dell'Erba, "Demystifying Technology," 20.

incorporate liquidated damages,[96] as a form of compensation, to smart contract code.

This type of structure gives the parties two choices, either paying liquidated damages or specific performance. This basic structure can be achieved by giving limited discretion to the contractual parties the choice of either. In this scenario, the automatic performance feature will not be compromised due to this discretion since the liquidated damages are secured. When the liquidated damages clause triggers can be inserted into the smart contract. Holden and Malani confirm the use of liquidated damages as part of the renegotiation mechanism in smart contracts.[97] Oracles would help parties to feed relevant data to the smart contract to determine whether the condition of liquidated damages has occurred or otherwise one of the parties can make a choice between fulfilling the obligation or paying the liquidated damages. As both the specific performance and liquidated damages are secured, the distinct feature of the smart contract is protected but with the flexibility of paying liquidated damages. For instance, A and B agree to transfer of shares which are digitally registered and transferred on the blockchain on May 31, 2020. If A and B agree to integrate a liquidated damages clause by which the pre-determined sum is secured technically, as well as the transfer of the share by the smart contract. If there is an unexpected increase in the value of the share, A can choose to pay the liquidated damages instead of transferring the shares, believing that this option is more advantageous to him. This illustration shows that inserting the liquidated damages clause

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96 Liquidated damages are defined as a fixed money agreed under a contract becomes payable if the breach of the contract is occurred. Under English law, the liquidated damages is valid and enforceable as long as it equals to the estimated loss of the parties. However, If the pre-determined sum by the parties is far more than the estimated loss, this clause is considered penalty clause and invalid, see: Duxbury, *Contract Law: Textbook Series*, 16.052-53.

97 Holden and Malani, "Can Blockchain Solve," 5-6.

would provide flexibility for parties by enabling them to avoid specific performance and instead pay the pre-determined sum in the context of smart contracts. Having two options within smart contracts does not prejudice the distinct feature of a smart contract because the automatic execution of damages is retained instead of specific performance.

CONCLUSION

Smart contracts have attracted people's interest over the last few years. This essay discusses smart contracts from a legal perspective. The distinct feature of the smart contract is determined as the guaranteed performance of the associated obligations. As the use of blockchain facilitates the automatic execution of the performance, smart contracts are sometimes defined with reference to the features of blockchain. Indeed, blockchain technology, by its extended immutability and distributed nature and integration of oracles, has contributed to the improvement of the smart contracts. However, smart contracts are the code written on top of blockchain technology and can exist without it.

Regarding the legal nature of smart contracts, due to the flexible nature of contract law, smart contracts can fall within the current scope of contract law. If the meeting of minds, intention to create legal relations and consideration occur, a smart contract can be considered enforceable under the current framework. Using algorithms in the conclusion of a smart contract would not change enforceability since these algorithms are delegated by the parties.

Even the technical guarantee of the performance seems desirable for contractual parties; this guarantee would result in inflexibility, which might deter the widespread use of smart contracts. Firstly, the secured performance of the contract might exacerbate the incompleteness of the contract problem as the performance, as a principle, cannot be stopped even should an unfortunate contingency arise, and there is a need to renegotiate

to adjust people's obligations under the new contingencies. However, integrating the renegotiation mechanism into the smart contract is one option by which this problem could be alleviated. Additionally, the use of oracles can bring real-life changes to the smart contract, relieving its inflexibility.

More importantly, even though the secured performance of the contract is one of its distinct features, not allowing for the possibility of breach of the contract could be considered inflexible because of the occurrence of contingencies, be they fortunate or unfortunate. Breach of the contract might well be the more efficient route for contractual parties rather than specific performance in such circumstances. Accordingly, the law and economics approach posits "efficient breach theory". By applying this theory to the smart contract relations, it is maintained that insisting on the specific performance of the obligation under a smart contract would not be desirable for the contractual parties. Therefore, in the design of smart contracts, liquidated damages can be added in addition to specific performance to secure, such as an alternative to specific performance if the breach is efficient for one of the parties. Granting this choice to the parties would not prejudice the advantages of using a smart contract as compensation is secured. Therefore, the possibility of adding liquidated damages must be considered in the design phase of smart contracts.

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