The sovereignty of blockchain dispute resolution

ABSTRACT: Blockchain is a technology that is used as a digital data storage system that is connected through cryptography. The use of blockchain technology cannot be separated from Bitcoin and Cryptocurrency, although there are many sectors that can take advantage of this technology. When viewed from the naming system, blockchain itself consists of two words, namely block which means group, and chain or chain. This reflects how blockchain works, which utilizes computer resources to create interconnected blocks (chains) to execute a transaction. Blockchain technology acts as an infrastructure for self-executing smart contracts. Simply put, the way blockchain works is that it starts when a block stores new data. The blockchain system itself consists of two types of records, transactions and blocks. Uniquely, each block contains a cryptographic hash that forms a network. However, because the contract is flawed, and some parties are opportunistic, this new contract option poses challenges in resolving disputes. For example, will smart contracts be recognized and any disputes (in this case) resolved in the courts of the jurisdiction? In this article, we first outline some of the organizational governance options (e.g., mediation, private arbitration, courts) to create a boundary (options) for dispute resolution for the parties. Second, we provide case studies of emerging blockchain-based mechanisms for resolving dispute resolution challenges. Blockchain-based smart contracts can create dispute resolution problems and act as a technology for entrepreneurs to create new mechanisms for resolving disputes, including those arising from traditional legal contracts. Contracting parties will inherently choose the most effective governance mechanism for resolving disputes and will change the costs of dispute resolution over time through institutional innovation processes.

KEYWORDS: Blockchain, Online Dispute Resolution, Distributed General Office Technology.

I. PENDAHULUAN

The main difference between smart contracts and traditional legal contracts is implementing the terms and conditions of the contract. In addition, smart contract terms are written in an executable programming language.[1] While contract terms can be more dynamic, it is also more difficult to execute a contract to return. Because of this, the introduction of automated blockchain-based smart contracts has created new types of legal disputes. The idea of smart contracts as protocols for recognizing relationships in computer networks[2] dates back to before the advent of blockchain-based technologies. However, this article considers smart contract cases as pieces and pieces of code that run on the blockchain. Adopting blockchain-based smart contracts will require courts and other dispute resolution bodies to face several problems when smart contractual disputes arise, including code interpretation, jurisdictional issues, and the application of the traditional contractual legal principles.[3]

How will smart contract disputes be resolved after the implementation of smart contracts? The answer to dispute resolution goes beyond whether smart contracts will be recognized and enforced by courts based on jurisdiction.[4]

When the parties enter into a smart contract, they must determine how the dispute will be resolved. We see different ways in which those disputes are resolved as a matter of governance. The parties to the contract face a wider choice of sovereignty; What is the best institutional governance mechanism for resolving contractual disputes? Ways to govern a contract - to reduce contract costs and facilitate the exchange - vary from the courts to arbitration. In addition, the range of institutional options faced by the parties is open to institutional entrepreneurship, as these options change over time and are

---

[1] Allen, D. W. E. 2017. "The Private Governance of Entrepreneurship: An Institutional Approach to Entrepreneurial Discovery", PhD Thesis, School of Economics, Finance and Marketing, College of Business, RMIT University, Melbourne.

[2] Allen, D. W. E. Forthcoming. Entrepreneurial Exit: Developing the Cryptoeconomy. In M. Swan, J. Potts, S. Takagi, P. Tasco, & F. Witte (Eds.), Blockchain Economics, World Scientific.

[3] Allen, D. W. E. , and Berg, C. 2017. "Subjective Political Economy," 13 New Perspectives on Political Economy 19-40.

[4] Allen, D. W. E. , Berg, C. , Davidson, S. , Novak, M. , and Potts, J. 2018. "Blockchain Tradetech. " Presented at APEC Study Centres Consortium Conference (ASCCC). Port Moresby, Papua New Guinea.

discovered as new dispute resolution mechanisms. This paper focuses on the governance option that contracting parties face throughout the resolution of the smart contract dispute, a study that crosses the line between law, economics, and political economy. We can analyze the choice of these alternatives using new institutional economies and comparative economies. We have two goals. First, design and determine a theoretical framework for understanding that dispute resolution governs the option. And second, case studies of emerging new governance possibilities. We focus on new comparative economies[5], institutional cryptocurrencies[6], and emerging blockchain[7] and dispute resolution.[8]

Our analysis is as follows: Section 1 introduces the nature of smart contracts as a contract technology. How are smart contracts different from traditional contracts? What problems do they cause? In Section 2, we examine the options faced by the parties to the contract by providing the threshold for resolving disputes as an institutional facility boundary application. Section 3 explores new dispute resolution mechanisms under consideration within the blockchain ecosystem through several emerging case studies, resolving disputes in practice. Section 4 provides an overview of the findings from the case studies. Section 5 discusses the implications of our framework and our findings, and the final section is the results.

II. METHOD

This paper uses a literature review and legal analysis view to investigate the sovereignty of blockchain dispute resolution.

---

[5] Allen, D. W. E. , Berg, C. , Lane, A. M. , and Potts, J. 2018. "Cryptodemocracy and its Institutional Possibilities," July The Review of Austrian Economics 1-12.

[6] Berg, C. , Davidson, S. , and Potts, J. 2017. "Blockchains Industrialise Trust. " Working paper. RMIT Blockchain Innovation Hub. Available from SSRN : < https://papers. ssrn. com/sol3/papers. cfm?abstract_id=3074070>

[7] Bernheim, D. B. , and Whinston, M. D. 1998. "Incomplete Contracts and Strategic Ambiguity," 88 The American Economic Review 902-932.

[8] Catchlove, P. 2017. "Smart Contracts: A New Era of Contract Use. " Working paper. Available from SSRN: <https://papers. ssrn. com/sol3/papers. cfm?abstract_id=3090226>

III. SMART CONTRACTS

For this article, we define smart contracts as contracts in general or as part of encrypted contracts on a blockchain and can be executed automatically when certain conditions are met. For example, a certain period or the occurrence of a certain event may pay a deposit to one party. At the same time, the concept of smart contracts goes back several decades.[9] A new interest in smart contracts has emerged since the development of blockchain. Blockchain was developed a decade ago through several technologies, including peer-to-peer networks, asymmetric cryptography (public key), timestamp, and social workflow proofing. In particular, blockchain is a set of digital technologies that combine encryption, data management, networking, and incentive mechanisms with supporting the review, execution, and recording of transactions between parties.[10]

Blockchain is an institutional governance technology[11], which acts as an infrastructure for smart contracting platforms. This means that blockchain acts as an infrastructure for smart contracts to execute decentralized and as a potentially reliable source of information to get those contracts up and run.[12] The research summarizes the four key features of smart contracts; 1- Electronic form 2- Conditional framework 3- Boli logical presentation of a higher level of reliability 4- Centralized performance and execution.[13]

How can smart contracts be used in practice? Recall that smart contracts can manage financial transactions between cars, vehicles, humans, legislators, government, and financial service providers.[14] There is a lot of discussion about the potential for smart contracts to protect consumers in the online

---

[9] Darcy W. E. Allen et al. February 2019, "The Governance of Blockchain Dispute Resolution" See discussions, stats, and author profiles for this publication at:
https://www.researchgate.net/publication/331155400

[10] Davidson, S. , De Filippi, P. , and Potts, J. 2018. "Blockchains and the economic institutions of capitalism," 14 Journal of Institutional Economics 639-658.

[11] De Filippi, P. , and Hassan, S. 2018. "Blockchain Technology as Regulatory Technology: From Code is Law to Law is Code," Available from< https://arxiv. org/abs/1801. 02507 .>

[12] De Filippi, P. , and Wright, A. 2018. Blockchain and the Law: The Rule of Code ,Cambridge: Harvard University Press.

[13] Deck, C. A. , and Farmer, A. 2006. "Bargaining over an Uncertain Value: Arbitration Mechanisms Compared," 23 Journal of Law, Economics, and Organization 547-579.

[14] Djankov, S. , Glaeser, E. , La Porta, R. , Lopez-de-Silanes, F. , and Shleifer, A. 2003. "The new comparative economics," 31 Journal of Comparative Economics 595-619.

marketplace. [15] Allen explore how smart contracts can change political, organizational, and corporate governance.[16] There is currently a range of entrepreneurial efforts to develop smart contracting platforms for professions and industries, from betting to supply chain management And beyond as a regulatory technology is variable.[17]

Smart contracts have also been suggested to offer online dispute resolution. Smart contracts are important because more trust through self-employed agreements may increase business and exchange, especially online. Gans argues that the scope of enforceable contracts can be expanded by improving visibility and reducing contractual enforcement costs.[18] The potential for large-scale enforcement of smart contract terms stems from their capacity to reduce opportunism and industrial trust. One of these ways is the previous execution is more accurate and stronger. If contractual obligations are coded, and therefore human discretion is removed, the parties can trust that enforcement will occur. The industrialization of trust in this way, however, requires that contracts be written in code-based rules and often based on objective information from third-party oracles. One particular advantage is that there is limited scope for the maintenance obligation - where one party invests in certain assets, and the other party subsequently refuses to perform his contract unless the first party agrees to the terms. It is better to agree. The idea of flawed contracts is that it is seldom recognized by the parties to consider any possibility in bargaining.[19]

Given the non-zero transaction costs, contracts are necessarily incomplete and cannot be inherently comprehensive. Incomplete contracts may be due to a combination of limited rationality (the parties may not predict all

---

[15] Fairfield, Joshua A. T. 2014. "Smart Contracts, Bitcoin Bots, and Consumer Protection ", 71 Washington and Lee Law Review Online 35-50.

[16] Electronic copy available at: https://ssrn. com/abstract=333467418 Gans, Joshua S. 2019. "The Fine Print in Smart Contracts," NBER Working Paper 25443 , Available from <http://www. nber. org/papers/w25443>

[17] Gainsbury, S. M. , and Blaszczynski, A. 2017. "How blockchain and cryptocurrency technology could revolutionize online gambling," 21 Gaming Law Review 482-492.

[18] Goldenfein, J. , Leiter, A. (2018), Legal Engineering on the Blockchain: 'Smart Contracts' as Legal Conduct, Law Critique, vol. 29, pp. 141-149.

[19] Governatori, G. , Idelberger, F. , Milosevic, Z. , Riveret, R. , Sartor, G. , Xu, X. 2018. "On legal contracts, imperative and declarative smart contracts, and blockchain systems," 26 Artificial Intelligence Law 377-409.

situations, including unknowns Transaction costs predicting and negotiating all predictable future situations may be too expensive. Future status may be difficult to prescribe, measure or evaluate. On the other hand, contracts may be intentionally flawed for other strategic reasons. Any contract that is not complete will potentially lead to a dispute if there is a performance issue, while smart contracts may save on operating costs compared to traditional contracts. In this regard, Skarov - suggests that smart contracts create negotiation costs by requiring the parties to fully and accurately define all future contract situations and that smart contracts are the costs of negotiating. Increase response to violations by eliminating execution flexibility. [20] Accordingly, while blockchain and smart contracts may complement additional contracts or parts of the contract, the problem of incomplete contracts is likely to continue. The encrypted nature of smart contracts is not easily reconciled with incomplete contracts that lead to dispute resolution challenges. For example, what happens if the code does not comply with the parties' intent to the agreement due to unforeseen circumstances that disrupt or sterilize the contract? What happens if the contract assumes that something will happen but does not? What happens if an oracle predictor is inefficient or corrupt in measuring performance? What happens if there is a problem in understanding the cryptographic language and its implications for contractual interpretation? Therefore, a fundamental question remains: how will smart contract disputes be resolved after that?

There are currently two different approaches to resolving smart contract disputes. The first approach accepts that smart contracts can operate within existing contract laws and regulations and can be tried and adjudicated by existing courts or dispute resolution methods.[21] In this way, an intelligent contract allows the parties to commit to the original contract with more confidence and take advantage of the potential to avoid potential commitment problems to maintain the commitment[22]. This approach can

---

[20] Grigg, I. 2004. "The Ricardian Contract," Proceedings of the First IEEE International Workshop on Electronic Contracting 25-31.

[21] Grossman, S. J. , and Hart, O. D. 1986. "The costs and benefits of ownership: A theory of vertical and lateral integration," 94 Journal of Political Economy 691-719.

[22] Hart, O. D. , and Moore, J. 1990. "Property Rights and the Nature of the Firm," 98 Journal of Political Economy 1119-1158.

add to other problems of contract performance and implementation. This approach is supported by valid jurisprudence; Ordinary contract principles must be applied - unless customary law is developed, no customary law exists to date.[23]

The second approach places smart contracts as distinct legal instruments instead of digital alternatives to traditional legal contracts. From this perspective, blockchain technologies and smart contracts may create new legal systems or a cryptographic dictionary.[24] In this approach, Cal and Calcutta argue that some features of blockchain-based technologies and smart contracts, such as anonymity, automated execution, and counter-aggression (resistance to aggression), mean that existing legal infrastructures cannot meet the challenges. Resolve legal disputes with cryptocurrency disputes. Instead, these disputes require distributed jurisdiction - which is blockchain-based governance. Such distributed jurisdiction must be created and developed through a process of institutional innovation. Case studies in this article provide several examples. Smart contracts expand the possible forms of governance that contractual parties face and raise whether they will provide a superior contractual alternative.[25]

These two perspectives have advantages and limitations, and while a contractual legal framework may provide the legal certainty created by jurisprudence, it may not have the distinctive features of intelligent contracts such as self-enforcement. Conversely, a new cryptographic culture will consider such features as key elements in a new regulatory regime whose parameters are still a matter of debate and uncertainty. The next section proposes a single framework that integrates both approaches to resolving smart contract disputes. This framework recognizes that the individual parties to a contract face an option of institutional sovereignty with alternative dispute resolution. The most effective governance strategy depends on the precise nature of the contract they face, while the options

---

[23] Holden, R. , and Malani, A. 2018. "Can Blockchains Solve the Holdup Problem with Contracts?" Working Paper No. 2018-12, University of Chicago.

[24] Kaal, W. A. , and Calcaterra, C. 2017. "Crypto Transaction Dispute Resolution," 73 Business Lawyer 109-153.

[25] Koulu, R. 2016. "Blockchains and Online Dispute Resolution: Smart Contracts as an Alternative to Enforcement," 13 SCRIPTed 40-69.

open to them are not fixed and are themselves open to institutional innovations.

IV. DISPUTE RESOLUTION

How can we develop and expand a coherent theoretical understanding of the range of dispute resolution options available to the parties to the contract? We refer to the new comparative economics to apply the possible institutional boundary to dispute resolution governance. Our new framework - what we define as the possible institutional boundary of dispute resolution - demonstrates the balancing of governance between the costs of disruption and the costs of dictatorial rule over dispute resolution systems and the integration of decentralized governance structures. Makes it acceptable. This framework combines the two dispute resolution perspectives outlined above into a coherent framework. In this section, before returning to the new blockchain dispute resolution companies (start-ups) in Section 4, we draw a threshold for the possibility of dispute resolution. Most contracts are necessarily incomplete due to our limited rationality and inherent uncertainty about the future, which leads to further contract problems. For centuries, communities have coordinated, developed, and expanded mechanisms to reduce contract costs to facilitate permanent voluntary exchange. Eleanor Osterm described a range of collectively developed institutions that helped overcome the catastrophe, from irrigation systems to fishing villages. Recently, Edward Stringham (2015) clarified the subject of a set of private governance mechanisms discovered to address governance challenges from the first stock exchanges (securities exchanges) to modern credit card fraud. These governance structures include creating companies and employment contracts, credit mechanisms that lead to social monopoly (deprivation), and customary court and legal policies enforced by the government. This institutional economic perspective on governance shows that different governance structures comparatively solve economic problems by reducing transaction costs.[26]

---

[26] Lesaege, C. , and Ast, F. 2018. "Kleros: Short Paper v1. 0. 6," Available at < https://kleros. io/assets/whitepaper. pdf>

While smart contracts can reduce the commitment to keep promises and other forms of opportunism, their nature may increase dispute resolution problems, especially with the enforcement or enforcement solutions. Are existing governance structures sufficient to resolve smart contract disputes? In other words, can intelligent contracting parties rely on existing governance structures to solve the problems they face? For example, how is it possible to enforce dispute resolution judgments outside the chain - for example, through the courts? This example exacerbates problems with the jurisdiction and identity of the parties to a contract.

Contrary to Cal and Calcutta, we suggest several ways dispute resolution mechanisms can advance smart contracts. For example, a new set of standards for judging smart contracts can help them act as predictors. Standards setting can overcome issues of interoperability between encrypted smart contracts and standard forms of dispute resolution. We do not emphasize or support any institutional possibility or dispute resolution. Instead, our approach is to map out some of the open governance options to contracting parties. To do this, we use the New Adaptive Economies framework of the institutional possibility threshold.

The institutional threshold framework is based on the notion that all institutions face a balance or a lightweight burden between the double costs of disruption and dictatorship. The costs of the disruption arising from the expropriation of private property or a failure to coordinate. The expropriation of the public bears the costs of dictatorship. No organizational facility can completely minimize these costs, and each is adaptively effective in solving a particular governance problem. To shape the threshold for dispute resolution 15, we have described and plotted the following four institutional possibilities understood in our mental order; Private arrangements, arbitration, courts, regulatory status. Analyzing these institutions concerning the costs of disruption and dictatorship enables us to see how existing dispute resolution mechanisms work with intelligent contractual disputes. Thus, resolve subsequent disputes, such as distributing deposited funds or Allows a complete setback of the contract. Theoretical arrangement of these possibilities at a threshold of dispute resolution possibilities is useful because it enables us to choose the potential governance options of the parties to the

contract based on the concept that the parties will choose (what they see as the cost savings point closest to Is the principle), to interpret. What are some options for resolving arbitrary disputes for smart parties? Non-binding negotiation and mediation (optional); The parties can stipulate in an intelligent contract that they will seek voluntary settlement mechanisms that are non-binding negotiation or mediation in the event of a dispute. Negotiations are bilateral, between the parties to the dispute, in While mediation always involves an independent third party acting as a facilitator, there is theoretically a high level of disruption cost associated with both bilateral negotiation and mediation, especially since agreements are non-binding. (This means that the success of this mechanism requires mutual consent). And so the remaining problems (commitment to keep the promise) continue. In addition, given that both mechanisms are non-binding, their results do not automatically return or receive feedback on the smart contract and execution.[27]

Binding private arbitration by a selected institution; The parties can appoint an arbitrator to resolve disputes. In conventional arbitration, the arbitrator rules on matters as he sees fit. Interestingly, this institutional possibility can be theoretically binding because the results and outputs of the dispute can provide feedback on smart contracts as a predictor. However, for such an approach to be effective, arbitration results must be standardized and executed automatically. Thus we expect this institutional possibility to have lower disruption costs (due to the reduced capacity of individuals to stop or ignore dispute resolution results) but higher levels of dictatorial costs (due to the more centralized power of the arbitrator). Jurisdiction of the local court and binding judgments are several ways in which these judgments are binding. If the parties have similar jurisdiction to the jurisdiction, they can enforce their contracts through the government itself. Instead, courts can standardize judgments that serve as predictors of smart contracts. Once again, this form of dispute resolution provides feedback to smart contracts, which reduces the potential for termination. The court judges require certain standards to give feedback to the code of smart contracts. Otherwise, the

---

[27] LTO Network. 2018. "Blockchain for Decentralized Workflows," available at< https://lto. network/documents/LTO%20Network%20-%20Technical%20Paper. pdf>

judgment relies on the parties to the contract to which they have jurisdiction. In addition, there are potentially dictatorial costs in this organizational possibility, given the uncertainty about how local courts will consider blockchain infrastructure.

Our last explanatory institutional possibility stems from the regulatory situation. An existing jurisdiction can require any smart contract to include some of the mandatory dispute resolution codes included. It is effectively a government-controlled gateway to the contract and is very similar to the current cryptocurrency debate. In the United States, several state jurisdictions have specific rules regarding blockchain and smart contracts. Compared to other available options, this creates the potential for government abuse (e.g., dictatorship costs) and assumes a suitable solution for all, i.e., dictatorship costs and disruption are proven to be the same among different classes of smart contracts. We have presented a range of potential avenues for disputes arising from blockchain-based smart contracts: Each of these governance structures has different characteristics. The parties to the contract must fundamentally evaluate and choose what they consider to be economically viable. However, organizational capabilities for dispute resolution are not fixed, and the invention and application of new technologies are discovering new points that are getting closer to the source. Blockchain technology can act as a foundation for smart contracts, thus challenging Opens the legal and economic. It may also reinforce and motivate the development of a new range of institutional options for dispute resolution. Several blockchain-based dispute resolution start-ups are currently exploring these new avenues.[28]

V. CASE STUDIES

Not only can blockchain create legal and economic challenges through cryptic tensions and incomplete contracts, but it can also motivate and facilitate new dispute resolution opportunities. For example, there is potential for new decentralized private dispute resolution mechanisms. Here we review a case study conducted in Cal Valkatra (which examines Aragon

---

[28] McKinney, S. A. , Landy, R. , and Wilka, R. 2018. "Smart Contracts, Blockchain, and the Next Frontier of Transactional Law," 13 Washington Journal of Law, Technology & Arts 313-347.

and interval market platforms and proposes an open-source platform for resolving smart contract disputes). We also rely on information available from the websites of listed companies, which varies in analytical quality. While most of the writing is advertising, some of these organizations have published concept papers that provide case studies and mindfulness plans for resolving disputes.

A. Metrium

Metrium is a legal technology company consisting of lawyers, cryptographers, and software engineers that provides itself as a "legal, technical, and commercial infrastructure layer" for chain control (chain and transfer of rights related to digital assets, intellectual property, and commodities). Introduces a decentralized commercial smart property registration system (operating through automated smart contracts that guarantee property rights and the enforcement and dispute resolution). This registration facilitates the transfer of ownership of the chain through an intelligent contract, which in effect becomes a legal contract without the need for legal protection. The contract protocol in the sense of Ricardian contracts as EP. Smart LLC is defined as the legally enforceable transfer of property rights that links the complex and bureaucratic legal world and the fast-paced digital world of data. Focus on avoiding disputes by setting up a system Where a guardian or custodian is The deacon who becomes the legal owner and registrar of an asset for the duration of the contract, thus enabling its execution. However, it is also acknowledged that issues related to the implementation of resolution decisions will remain, and therefore, "competent technical mediators" will resolve any remaining disputes within the ecosystem. In another post, the CEO of Metrium points to a "decentralized commercial arbitration tribunal" recognized as an arbitral tribunal under the 1958 New York Convention, and therefore able to issue binding legal judgments by domestic courts in almost all countries.

Metrium reports a case study in partnership with the Ocean Protocol, artificial intelligence service and information platform that demonstrates integration (rather than adding a dispute resolution mechanism in a customer's "ecosystem." It describes the functions (functions of the OP

ecosystem. Then, it provides a newly created role (judge) and how judgment and decision-making processes can be integrated into the system. Similarly, dispute resolution is a layer. It is governed by pre-defined frameworks, missions, goals, and principles. The established OP ecosystem consisted of five stakeholders, to which the role of the judge was added along with four basic elements for resolving disputes. 1.Evidence, including contract confirmation information, 2. Intensification options vary from mediation to adjudication, 3. Decision-making, 4. Execution (for example, redistribution of tokens), the basic argument is that a layer of the rule of law Is required and can be flexibly added to markets and subsets of markets or market participants or sub-markets.[29]

B. LTO Network

LTO Network is a Dutch start-up company launched in 2014. The LTO platform created a "live contract" on a private blockchain (each private contract node in the network). A live contract is like a smart contract in which the password follows an automated logic and can be executed in a reliable and trustworthy manner. This is with those smart contracts that involve the exchange of value in When conditions are met, unlocking is different, while live contracts do not include value but specify how two or more parties interact and communicate (idem). For example, a non-disclosure agreement is made differently because it is impossible to fully retain the penalty as a deposit in the event of a breach of contract (idem). Another important difference between live contracts and smart contracts running on platforms such as Atrium or HyperLedger lies in the logic of the predictors. In these platforms, predictors, data feeds to smart contracts are not part of the internal logic of the contract, but in live contracts, predictors are embedded in the workflow so that they may be approved or possibly disputed by all parties involved. To be placed. In addition, the LTO workflow creates divisions (sub-streams under a given mental scheme by each party. These divisions may be used to convince a previous event and provide a solution for correcting it. So in practice, they can be used to resolve disputes if the parties agree on them. The platform can also resolve out-of-chain

---

[29] O'Shields, R. 2017. "Smart Contracts: Legal Agreements for the Blockchain," 21 North Carolina Banking Institute Journal 177-194.

disputes by negotiating with a reputable third party (mediation and judgment by a judge or arbitrator).[30]

C. Seaguiz

Seaguiz is a pre-agreement dispute resolution service established in 2017. The point of sale is that the lack of a remedial option can jeopardize smart contracts, and it offers hypothetical mental schemes where the inadequacy of the master code can make a difference. They argue that just as inherent disputes are decentralized interactions and market neighborhoods, resolving formal disputes guarantees trust and confidence in the blockchain.[31] For this purpose, Seaguis uses a protocol "software development package embedded in the smart contract. Seaguiz, a software development package, acts as a third-tier software that can be used as a traditional arbitration condition in a contract in anticipating issues such as The following should be considered: 1. Variable quality of smart contract code, 2. Lack of technical knowledge by contract stakeholders, 3. Gray areas and unforeseen results, 4. Potential for dispute and need for arbitration Software development packages by monitoring the contract implementation process Provide systematic alerts, provide notifications of strengths, and have a mechanism for freezing and upgrading defective or outdated smart contracts. Use smart contract disputes Disputes can be resolved by a third party specified in the smart contract; the third party decides who should be convicted and then enables immediate execution of the decision.[32]

D. Chlorosis

Founded in 2017, Kloros proposes online dispute resolution that combines outsourcing technologies, blockchain, and game theory justice mechanisms. Given historical justice practices, such as the Athenian chlorohydrin of accidental crowdfunding, Chlorus advocates for a platform of choice in court

---

[30] Ostrom, E. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press.

[31] Raskin, M. 2017. "The Law and Legality of Smart Contracts," 1 Georgetown Law Technology Review 305-341.

[32] Rule, C. , and Nagarajan, C. 2011. Crowdsourcing Dispute Resolution Over Mobile Devices, in M. Poblet (ed.). Mobile Technologies for Conflict Management: Online Dispute Resolution, Governance, Participation. Dordrecht: Springer.

that uses crowdfunding jurors; A history of what can be done in community court.[33]

Chlorus employs a decentralized third party built on top of the atrium. In smart contracts, they must first determine Chlorus as their arbitrator in the event of a dispute and the type of court (Chloros will expand an ecosystem of specialized courts), and the number of arbitrators to attend. When a dispute arises, Chloros accidentally refers the dispute to a crowdfunding jury of his selection of experts who analyze the evidence and evaluate it for sentencing. The smart contract will then transfer the money to the winner. Predators are used to providing real-world information to help resolve disputes. The platform also relies on anonymity, information-based procedures, and internal mechanisms to correct bias (discrimination) and provide reasons for decision-making.

Similarly, their framework emphasizes this; 1. The expertise of arbitration in resolving disputes and law, 2. Independence of impartial and anonymous arbitrators), 3. Impartiality (random selection of judges without special interests), 4. Transparency (all processes are documented and logical).[34]

E. Blockchain Arbitration Assembly

The Blockchain Arbitration Forum was formed in 2018 by a team of technical and legal experts, an independent service that offers smart model contracts (with arbitration and mediation terms), and a group of members of the association specializing in resolving disputes in both.[35] The blockchain arbitration panel refers to these services as voluntary dispute resolution because it has a flexible approach to tailoring dispute resolution and assigning judges to the prevailing circumstances and needs of the parties to a contract. The Blockchain Arbitration Assembly also provides an intelligent contract arbitration library containing a set of encrypted rules (judgments) (based on the rules of the United Nations Commission on International Trade Law

---

[33] Ryan, P. 2017. "Smart Contract Relations in e-Commerce: Legal Implications of Exchanges Conducted on the Blockchain," 7 Technology Innovation Management Review 10-17.

[34] Nakamoto, S. 2008. "Bitcoin: A peer-to-peer electronic cash system. " Available online :
<http://bitcoin. org/bitcoin. pdf .>

[35] Sagewise, 2019. "Smart contract legislation updates by state" Available at <https://www. sagewise. io/smart-contracts-state-legislation .>/

that allow contract parties to terminate an intelligent contract, from, In addition, the arbitration library connects the software to the people who act as arbitrators, breaking a contract provides an example of how an automated mechanism works. Who sees the other party as violating the legal contract, stops the execution of the smart contract, and starts the "stop and send to arbitration" action in the arbitration library, which automatically acts as a so-called appointing authority as defined in the blockchain regulation arbitration announces.[36]

F. jury Online

jury Online provides a platform for securing investments in ICU projects that are, in short, a decentralized deposit service guaranteed by the digital intermediation feature. The service specifies the file and mechanisms for the online jury's smart contract protocol. The dispute resolution components are as follows: When a party to the contract agrees, the terms and financial resources (and the allocation of costs for possible disputes are agreed upon. When disputes arise, a panel of judges, judges, and Or an arbitrator is selected from and selected from a panel of experts. Potential judges are experts whose terms and qualifications have been accepted to be part of the panel. They are constantly updated to include "active judges." When a dispute arises, the judges or potential jury are randomly selected and anonymously and independently review the relevant evidence, each judge makes a decision that is encrypted, and then decisions are made to form a majority decision. The parties can have the option of selecting only one qualified judge to review the decision. The system is used to ensure arbitrariness and impartiality in the blockchain protocols. As they state, the "bad code" pursues human goals. Does not. Therefore, Online protocol juries combine machine and human expertise to judge emerging disputes.[37]

G. Mystery

The riddle began in 2015 as a research project at MIT, a decentralized computing platform based on privacy in design. Riddle OS provides a

---

[36] Sanga, S. 2018. "Incomplete Contracts: An Empirical Approach," 34 Journal of Law , Economics, and Organization 650-679.

[37] Shleifer, A. 2005. "Understanding Regulation," 11 European Financial Management. 439-451.

protocol that enables users to create smart privacy contracts, secret contracts distributed over the network. If secret contracts, as the puzzle developers put it, the key difference is that the input, output, information to the contract itself is hidden from the nodes that run the calculations. This enables Depp developers to put sensitive information in their smart contracts without centralized (and less secure) transfer to centralized systems.[38]

Riddle does not discuss resolving disputes for smart contracts but shows the problems of placing sensitive or confidential information in a decentralized blockchain environment. The code implemented on the puzzle ensures that this information can be used as input for smart contracts because both run in the blockchain (public sectors and private puzzle sectors or computationally intensive sectors). In the latest update available from the project (December 22, 2018), the riddle team emphasizes the ultimate goal of decentralizing the decentralized web layer. When you run a hidden node, you are helping the puzzle secure the decentralized web). Crypto-economies are the stability of underlying nodes based on a share-proof consensus model that is currently under development.

V. DISCUSSION

We consider each organization's distinct modes of dispute resolution and a specific method for implementing the selected mechanism. We have identified two main identifiable approaches to resolving disputes in the blockchain ecosystem[39]; 1. Alternative dispute resolution as an independent service and 2. Dispute resolution mechanisms embedded in the contracts. Embedded forms of dispute resolution use different methods of judgment and expertise to reach a decision (for example, pre-dispute monitoring, which can modify the code of the smart contract during its execution to avoid potential disputes[39]. These two different approaches are necessarily They are not unique in that, in some cases, they can be integrated into successive

---

[38] Skarbek, D. 2014. The social order of the underworld: How prison gangs govern the American penal system. Oxford University Press.

[39] Skaroff, J. M. 2017. "Smart Contracts and the Costs of Inflexibility," 166 University of Pennsylvania Law Review 263-303.

stages of an automated workflow. [40] The issue of dispute resolution enforcement has not yet been resolved and is one of the main factors in assessing the effectiveness of dispute resolution protocols. They have not provided empirical demonstrations to show the effectiveness of their processes. As their reporting is largely publicity, the issue of online dispute resolution in blockchain remains theoretical, and it is clear that the implementation of smart contracts creates new types of disputes that require forms.[41] In most cases, such disputes still require human intervention, and in the next section, we will discuss the implications of these blockchain-based governance mechanisms for both the governance of smart blockchain contracts and the resolution of We examine the differences between traditional legal contracts.[42]

Our case studies show new institutional possibilities in the dispute resolution threshold space beyond existing dispute resolution systems. These entrepreneurial applications use blockchain as a new tool for new governance possibilities in resolving disputes. [43] In this case, whether the dispute resolution problem can be resolved more effectively through blockchain-based mechanisms (for example, Metrium or an online jury) or exploiting existing governance solutions (for example, the courts).[44] We expect smart contract parties to choose a governance solution closest to the principle using the dispute resolution threshold framework.[45] That is, a way of governing that minimizes the costs of both disruption and dictatorship. If new forms of blockchain-based dispute resolution better minimize the costs of disruption and dictatorship and thus the contracting parties begin to accept them - we can see this as an internal change on the verge of resolving the

---

[40] Sokolov, M. 2018. Smart Legal Contract as a Future of Contracts Enforcement. Working paper. Available at SSRN: <https://ssrn. com/abstract=3208292 > .

[41] Staples, M. , Chen, S. , Falamaki, S. , Ponomarev, A. , Rimba, P. , Tran, A. B. , Weber, I. , Xu, X. , and Zhu, J. 2017. Risks and opportunities for systems using blockchain and smart contracts, Data61 (CSIRO), Sydney. Available online <:https://www. data61. csiro. au/~/media/052789573E9342068C5735BF604E7824. ash .>

[42] Stringham, E. P. 1999. "Market Chosen Law," 14 Journal of Libertarian Studies 53-77.

[43] Stringham, E. P. 2011. Anarchy and the Law: The Political Economy of Choice (Vol. 1 .) Transaction Publishers.

[44] Stringham, E. P. 2015. Private Governance: Creating Order in Economic and Social Life, Oxford: Oxford University Press

[45] Szabo, N. 1997. "Formalizing and Securing Relationships on Public Networks," 2 First Monday Available at: <https://ojphi. org/ojs/index. php/fm/article/view/548/469>

dispute. [46] There are several reasons why we cannot pinpoint the exact relationship between the new institutional facilities outlined in Section 5 and other common dispute resolution solutions. First, as mentioned above, the points we have described are both explanatory and theoretical.[47] The location of different points on the threshold of the possibility of resolving disputes for the contracting parties is shown only over time and through discovery and testing. [48] Second, and more fundamentally, the costs of disruption and dictatorship that the parties to the contract receive, which means lightening and weighing between alternatives, are subjective. The location of an entity in the threshold space of the possibility of resolving disputes cannot be determined objectively. There is always uncertainty about the exact location and relationships between institutional facilities. Third, the threshold space for dispute resolution possibilities that changes over time is fleeting. Entrepreneurs, as shown, create new governance options. The expansion of institutional possibilities will affect an evolutionary selection process where the parties decide in their particular contractual context. This demonstrates a competitive dynamic in line with the findings of Allen, who claim that blockchain has expanded the institutional capacity for democratic decision-making. The choice of potential dispute resolution systems depends on many factors, including the level received and the perception of contract imperfection. This dynamism of new systems of government, which compete with existing government systems, is found in the literature on (monitoring) private sovereignty of private law. Historically, commercial courts have emerged to overcome international trade disputes, and private companies have expanded institutions to settle disputes or facilitate exchanges. Likewise, the need to resolve decentralized disputes for blockchain-based smart contracting demands new and innovative solutions. Blockchain entrepreneurs may be motivated to create dispute resolution mechanisms in the open market as a form of institutional entrepreneurship to serve blockchain-based platforms. This is because dispute resolution governance

---

[46] Verstraete, M. 2018. The Stakes of Smart Contracts, Arizona Legal Studies Discussion Paper No. 18-20, University of Arizona.

[47] Werbach, K. , and Cornell, N. 2017. "Contracts Ex Machina," 67 Duke Law Journal382-313 .

[48] Williamson, O. E. 1975. Markets and Hierarchies: Analysis and Antitrust Implications ,New York: Free Press.

structures complement other blockchain applications and platforms (see Allen forthcoming); they emerge as demand for a new governance solution. Will blockchain-based dispute resolution systems be more effective than government-based judicial systems? Determining their success rate will take time. Blockchain dispute resolution systems may serve the blockchain industry and smart contracts and extend to dispute resolution services for traditional legal contracts.[49]

VI. CONCLUSION

The purpose of this paper was to provide a coherent framework for analyzing the dispute resolution issues faced by the parties to the contract. To achieve this goal, we use the institutional feasibility threshold to examine the weighting of these existing dispute resolution mechanisms, thus forming the dispute resolution threshold. This framework incorporates existing dispute resolution mechanisms and enables us to integrate new innovative governance structures seamlessly. This means that in addition to existing dispute resolution mechanisms that can provide feedback on blockchain-based smart contracts, we have demonstrated through case studies entrepreneurial efforts to utilize blockchain technology to develop new dispute resolution mechanisms. This showed that while smart contracts have created dispute resolution issues. This technology has also opened new institutional possibilities for those challenges through the problems of incompleteness and automatic implementation of this technology. These new dispute resolution mechanisms have been both facilitated and enhanced by blockchain technology. They also serve the status of blockchain-based smart contracts. We conclude by outlining some of the challenges, this poses to the legacy of dispute resolution.

Given that the dispute resolution and enforcement process is not limited to a single institutional possibility, we anticipate a new competitive dynamic between existing dispute resolution mechanisms and new blockchain-based

---

[49] Williamson, O. E. 1985. The Economic Institutions of Capitalism. New York: Free Press.

dispute resolution systems. The margins from which this process will result from subjective perceptions of the relative costs of disruption and dictatorship for the parties to a smart contract. At a higher level, this is a political-economic relationship beyond the comparative productivity of blockchain-based rights and the prevailing jurisprudence law, and individual, organizational choices drive a dynamic. So we started with the legal challenges of smart dispute resolution and saw how blockchain technology might create new entrepreneurial dispute resolution mechanisms. And so, we conclude how these mechanisms might be relatively effective in comparison to a traditional service legal contract.

COMPETING INTEREST

There is no conflict of interest.

REFERENCE

[Allen, D. W. E. 2017. "The Private Governance of Entrepreneurship: An Institutional Approach to Entrepreneurial Discovery", PhD Thesis, School of Economics, Finance and Marketing, College of Business, RMIT University, Melbourne.

Allen, D. W. E. Forthcoming. Entrepreneurial Exit: Developing the Cryptoeconomy. In M. Swan, J. Potts, S. Takagi, P. Tasco, & F. Witte (Eds.), Blockchain Economics, World Scientific.

Allen, D. W. E. , and Berg, C. 2017. "Subjective Political Economy," 13 New Perspectives on Political Economy 19-40.

Allen, D. W. E. , Berg, C. , Davidson, S. , Novak, M. , and Potts, J. 2018. "Blockchain Tradetech. " Presented at APEC Study Centres Consortium Conference (ASCCC). Port Moresby, Papua New Guinea.

Allen, D. W. E. , Berg, C. , Lane, A. M. , and Potts, J. 2018. "Cryptodemocracy and its Institutional Possibilities," July The Review of Austrian Economics 1-12.

Berg, C. , Davidson, S. , and Potts, J. 2017. "Blockchains Industrialise Trust. " Working paper. RMIT Blockchain Innovation Hub. Available from SSRN : < https://papers. ssrn. com/sol3/papers. cfm?abstract_id=3074070>

Bernheim, D. B. , and Whinston, M. D. 1998. "Incomplete Contracts and Strategic Ambiguity," 88 The American Economic Review 902-932.

Catchlove, P. 2017. "Smart Contracts: A New Era of Contract Use. " Working paper. Available from SSRN: <https://papers. ssrn. com/sol3/papers. cfm?abstract_id=3090226>

Darcy W. E. Allen et al. February 2019, "The Governance of Blockchain Dispute Resolution" See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/331155400

Davidson, S. , De Filippi, P. , and Potts, J. 2018. "Blockchains and the economic institutions of capitalism," 14 Journal of Institutional Economics 639-658.

De Filippi, P. , and Hassan, S. 2018. "Blockchain Technology as Regulatory Technology: From Code is Law to Law is Code," Available from< https://arxiv. org/abs/1801. 02507 .>

De Filippi, P. , and Wright, A. 2018. Blockchain and the Law: The Rule of Code ,Cambridge: Harvard University Press.

Deck, C. A. , and Farmer, A. 2006. "Bargaining over an Uncertain Value: Arbitration Mechanisms Compared," 23 Journal of Law, Economics, and Organization 547-579.

Djankov, S. , Glaeser, E. , La Porta, R. , Lopez-de-Silanes, F. , and Shleifer, A. 2003. "The new comparative economics," 31 Journal of Comparative Economics 595-619.

Fairfield, Joshua A. T. 2014. "Smart Contracts, Bitcoin Bots, and Consumer Protection ", 71 Washington and Lee Law Review Online 35-50.

Electronic copy available at: https://ssrn. com/abstract=333467418 Gans, Joshua S. 2019. "The Fine Print in Smart Contracts," NBER Working Paper 25443 , Available from <http://www. nber. org/papers/w25443>

Gainsbury, S. M. , and Blaszczynski, A. 2017. "How blockchain and cryptocurrency technology could revolutionize online gambling," 21 Gaming Law Review 482-492.

Goldenfein, J. , Leiter, A. (2018), Legal Engineering on the Blockchain: 'Smart Contracts' as Legal Conduct, Law Critique, vol. 29, pp. 141-149.

Governatori, G. , Idelberger, F. , Milosevic, Z. , Riveret, R. , Sartor, G. , Xu, X. 2018. "On legal contracts, imperative and declarative smart contracts, and blockchain systems," 26 Artificial Intelligence Law 377-409.

Grigg, I. 2004. "The Ricardian Contract," Proceedings of the First IEEE International Workshop on Electronic Contracting 25-31.

Grossman, S. J. , and Hart, O. D. 1986. "The costs and benefits of ownership: A theory of vertical and lateral integration," 94 Journal of Political Economy 691-719.

Hart, O. D. , and Moore, J. 1990. "Property Rights and the Nature of the Firm," 98 Journal of Political Economy 1119-1158.

Holden, R. , and Malani, A. 2018. "Can Blockchains Solve the Holdup Problem with Contracts?" Working Paper No. 2018-12, University of Chicago.

Kaal, W. A. , and Calcaterra, C. 2017. "Crypto Transaction Dispute Resolution," 73 Business Lawyer 109-153.

Koulu, R. 2016. "Blockchains and Online Dispute Resolution: Smart Contracts as an Alternative to Enforcement," 13 SCRIPTed 40-69.

Lesaege, C. , and Ast, F. 2018. "Kleros: Short Paper v1. 0. 6," Available at < https://kleros. io/assets/whitepaper. pdf>

LTO Network. 2018. "Blockchain for Decentralized Workflows," available at< https://lto. network/documents/LTO%20Network%20-%20Technical%20Paper. pdf>

McKinney, S. A. , Landy, R. , and Wilka, R. 2018. "Smart Contracts, Blockchain, and the Next Frontier of Transactional Law," 13 Washington Journal of Law, Technology & Arts 313-347.

O'Shields, R. 2017. "Smart Contracts: Legal Agreements for the Blockchain," 21 North Carolina Banking Institute Journal 177-194.

Ostrom, E. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press.

Raskin, M. 2017. "The Law and Legality of Smart Contracts," 1 Georgetown Law Technology Review 305-341.

Rule, C. , and Nagarajan, C. 2011. Crowdsourcing Dispute Resolution Over Mobile Devices, in M. Poblet (ed.). Mobile Technologies for Conflict Management: Online Dispute Resolution, Governance, Participation. Dordrecht: Springer.

Ryan, P. 2017. "Smart Contract Relations in e-Commerce: Legal Implications of Exchanges Conducted on the Blockchain," 7 Technology Innovation Management Review 10-17.

Nakamoto, S. 2008. "Bitcoin: A peer-to-peer electronic cash system. " Available online : <http://bitcoin. org/bitcoin. pdf .>

Sagewise, 2019. "Smart contract legislation updates by state" Available at <https://www. sagewise. io/smart-contracts-state-legislation .>/

Sanga, S. 2018. "Incomplete Contracts: An Empirical Approach," 34 Journal of Law , Economics, and Organization 650-679.

Shleifer, A. 2005. "Understanding Regulation," 11 European Financial Management. 439-451.

Skarbek, D. 2014. The social order of the underworld: How prison gangs govern the American penal system. Oxford University Press.

Skaroff, J. M. 2017. "Smart Contracts and the Costs of Inflexibility," 166 University of Pennsylvania Law Review 263-303.

Sokolov, M. 2018. Smart Legal Contract as a Future of Contracts Enforcement. Working paper. Available at SSRN: <https://ssrn. com/abstract=3208292 > .

Staples, M. , Chen, S. , Falamaki, S. , Ponomarev, A. , Rimba, P. , Tran, A. B. , Weber, I. , Xu, X. , and Zhu, J. 2017. Risks and opportunities for systems using blockchain and smart contracts, Data61 (CSIRO), Sydney. Available

online <:https://www. data61. csiro. au/~/media/052789573E9342068C5735BF604E7824. ash .>

Stringham, E. P. 1999. "Market Chosen Law," 14 Journal of Libertarian Studies 53-77.

Stringham, E. P. 2011. Anarchy and the Law: The Political Economy of Choice (Vol. 1 .) Transaction Publishers.

Stringham, E. P. 2015. Private Governance: Creating Order in Economic and Social Life, Oxford: Oxford University Press

Szabo, N. 1997. "Formalizing and Securing Relationships on Public Networks," 2 First Monday Available at: <https://ojphi. org/ojs/index. php/fm/article/view/548/469>

Verstraete, M. 2018. The Stakes of Smart Contracts, Arizona Legal Studies Discussion Paper No. 18-20, University of Arizona.

Werbach, K. , and Cornell, N. 2017. "Contracts Ex Machina," 67 Duke Law Journal382-313 .

Williamson, O. E. 1975. Markets and Hierarchies: Analysis and Antitrust Implications ,New York: Free Press.

Williamson, O. E. 1985. The Economic Institutions of Capitalism. New York: Free Press.