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Tokens and blockchain evidence in international commercial arbitration: its current status?

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ABSTRACT

The token economy is rapidly advancing and if fully realized will change the financial sector significantly. This paper will examine the development, application and use of tokens, and blockchain technology along with their impact to the rules of evidence in international commercial arbitration. The technology is formidable and will require new skills. It calls on arbitration institutions, as a starting point, to develop guidance notes for the technical application of blockchain and tokens used in evidence. This paper highlights how a recent addition to the legal framework is the Token Service Agreement, which incorporates an arbitration clause and the use of blockchain. This, along with the many other agreements that have recently been developed, for instance, in cybersecurity and data, will all be important components to the evidence that an arbitral tribunal will need to consider. More specifically, expert evidence is and will become crucial to being able to trace the actual dispute of the token (its supporting technology) and blockchain. The paper concludes calling for further research to be undertaken about how blockchain and tokens will need to be considered as evidence in international commercial arbitration.

1. INTRODUCTION

The development, application, and use of blockchain technology have begun to create an environment of change in relation to the rules of evidence in international commercial arbitration. Blockchain as a technology is changing the way we work, live, and play. The technology has rapidly evolved and is impacting 'many sectors of industry including, for instance, financial services, supply chain management, manufacturing, transport, healthcare, fashion and entertainment'.[1] Its impact and transformation across the financial sector could change the way cash

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[1] D Tapscott and A Tapscott, *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World* (Penguin Random House, UK 2016) 10–25.

is dealt with across the entire world. This paper will explore and discuss the evolving token economy.[2] It will highlight the challenges in international commercial arbitration from the use of blockchain technology that is used to facilitate token transactions. Specifically, this paper will demonstrate the emerging challenges faced by an arbitral tribunal, from the use of blockchain technology and tokens when evaluating evidence.[3] If fully implemented, it could be argued that the current use of cash and cards may well be obsolete in a decade. This new technology will make it more efficient to transact around the world. Notably though, there will be commercial disputes from this new and evolving economic activity.

Therefore, international arbitration is a suitable option for resolving complex transnational commercial disputes that involve tokens and the technology that supports and facilitates these transactions. James Metzger highlights how a blockchain is 'a time-stamped series of immutable record [*sic*] of data that is managed by cluster computers not owned by any single entity. Each of these blocks of data (i.e. block) are secured and bound to each other using cryptographic principles (i.e. chain)'.[4] Metzger goes further stating that 'one way blockchains are often described is as a distributed ledger that contains all of these records in ways that are independently verifiable'.[5] Yet, the blockchain itself comes in three forms. One is the public, the second is the private and the third is the consortium. First, the public blockchain has been described by Metzger, in referring to Vitalik Buterin,[6] as 'a blockchain that anyone in the world can read; anyone in the world can send transactions to and expect to see them included if they are valid; and anyone in the world can participate in the *consensus process* – the process for determining what blocks get added to the chain'.[7] It therefore provides an open platform for all to engage.

Viewed this way, however, the public blockchain could be open to the wild west, whereby individuals and entities can easily gain access, with little regulatory oversight. Notably though, and in reality, the people that are transacting on the public blockchain do have a level of security because the 'identities of the parties that are engaging in those transactions remain private'.[8]

The private blockchain has been described by Dominique Guegan as constituting a 'consensus process is that controlled by a preselected set of nodes. The private blockchain does not use mechanisms based on cryptography. In the case of the private blockchain, there is no mining, no proof of work and minimal remuneration. This is what differentiates the public and private: though different types of storages and transmission technologies'.[9] The ability to trace token transactions will also vary on both public and private blockchains. That said, security is one of the most significant features that differentiates the public from the private blockchain. The private blockchain has restricted access to only those individuals who are provided access, whereas anyone can access a public blockchain and participate because permission is not required. Notably, the non-remuneration, proof of work, and mining would be problematic when used for token transactions.

Third, the consortium blockchain is where a group of organizations have a level of protected access. This could be in the form of, for example, 10 organizations that exclude the world from accessing the blockchain. An example of the use of a consortium blockchain might be a group of banks or financial institutions that are conducting and facilitating cross-border transactions of tokens. The group of banks or financial institutions would require access to the blockchain,

[2] R Weerawarna, SJ Miah and X Shao, 'Emerging Advances of Blockchain Technology in Finance: A Content Analysis' (2023) 27 Pers Ubiquit Comput 1495 <https://doi.org/10.1007/s00779-023-01712-5>.
[3] Ibid 1495.
[4] J Metzger, 'The Current Landscape of Blockchain-Based, Crowdsourced Arbitration' (2019) 19 Macquarie Law Journal 81.
[5] Ibid.
[6] Ibid 84; V Buterin, 'On Public and Private Blockchains' *Ethereum Blog* (Blog Post, 6 August 2015) <https://ethereum.github.io/blog/2015/08/07/on-public-and-private-blockchains/>.
[7] Ibid.
[8] Ibid.
[9] D Guegan, 'Public Blockchain Versus Private Blockhain' (2017) 3 <https://shs.hal.science/halshs-01524440/document>.

while denying access to non-participant banks and financial institutions. Doing so protects these cross-border transactions and personal data of customers that are being used by the banks-financial institutions in these transactions. The benefit of a consortium blockchain for organisations is that it strengthens collaboration, accountability and transparency. It also provides for efficiencies that can lower transaction costs for banking and financial institutions, as the transactions are actuated in real time. This is a major transformation to the current banking and financial cross border framework, which requires a high level of clearance approval. In addition, the security of transactions, personal and commercial data from a consortium blockchain is enhanced, because it only provides permission for access to those that are formally part of the consortium. Conversely though, where there is a lack of cooperation amongst the consortium entities that are given permission to access the blockchain, this is likely to pose challenges to its application, which could result in disputes that may require arbitration to resolve.

Based on the above, there is a further distinct and important difference between a private and public blockchain. Guegan also points out that centrally, the 'private blockchain can be categorized into three categories:

i) applications for the transfer of assets (monetary use, but not only: securities, votes, industrial patents, connected objects, security of diplomas, stocks, bonds, etc.);

ii) applications of the blockchain as a register: this ensures better traceability of products and assets; and

iii) smart contracts, which are stand-alone programs that automatically execute the terms and conditions of a contract without requiring human intervention once started'.[10]

In reinforcing the above, the public blockchain allows 'each participant to read and use it to carry out transactions but also everyone can participate in the process of creating the consensus'.[11] On that basis, there is 'no central register, nor a trusted third party, and the governance of public channels, is as a result of the open-source movement and cypherpunk that places 'Code as Law'.[12] The accentuating question is whether the Code can constitute Law? Arguably, this proposition is not fully settled.

Against the backdrop of the above, contracts [smart] and other forms of agreements can be developed and used on a blockchain. A smart contract that is applied by blockchain relies on a 'code to be self-executing'.[13] This however, does not resolve the question of whether the code is the law. From a technologist's perspective, it can be argued that code is the law. However, and on the other side, code that is used by blockchain has not been defined by statute law of any jurisdiction, including the European Union and its proposed Artificial Intelligence Act.[14] The formal regulation of artificial intelligence (AI)[15] is in its infancy and out of scope of this article. Yet, it is argued that jurisdictions are taking different approaches as they grapple with what and how to govern AI. Thus, blockchain is supported and 'powered by, and, integrated with AI'.[16] Soori, Dastres, and Arezoo explain how 'tokens and smart contracts leverage AI and blockchain integration. That is, blockchain facilitates the tokenisation (the token[17]) of physical and digital

[10] Ibid 5.
[11] Ibid 2.
[12] Ibid 2.
[13] D Drummer and D Neumann, 'Is Code Law? Current Legal and Technical Adoption Issues and Remedies for Blockchain-Enabled Smart Contracts' (2020) 35 Journal of Information Technology 339 <https://doi.org/10.1177/0268396220924669>.
[14] European Commission, Regulation (EU) 2024/ … of the European Parliament and of the Council of … laying down harmonized rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) <https://www.europarl.europa.eu/doceo/document/TA-9-2024-0138-FNL-COR01_EN.pdf>.
[15] S Jacob, 'AI Regulations Around the World: A Comprehensive Guide to Governing Artificial Intelligence' (2024) <https://www.spiceworks.com/tech/artificial-intelligence/articles/ai-regulations-around-the-world/>.
[16] M Soori, R Dastres and B Arezoo, 'AI-Powered Blockchain Technology in Industry 4.0: A Review' (2023) 1 Journal of Economy and Technology 222–41 <https://doi.org/10.1016/j.ject.2024.01.001>.
[17] P Freni, E Ferro and R Moncada, 'Tokenomics and Blockchain Tokens: A Design-Oriented Morphological Framework' (2022) 3 Blockchain: Research and Applications 2. <https://doi.org/10.1016/j.bcra.2022.100069>.

assets. AI algorithms can analyse patterns and behaviours related to tokenised assets, providing insights for better asset management and investment/s.'[18] Any patterns analysed would confirm a level of evidence of the transactions in tokens and their assets.

In turn, tokens can form part of smart contracts[19] along with licensing agreements,[20] cybersecurity agreements, cybersecurity service agreements,[21] data agreements,[22] data storage agreements, data privacy agreements, token holder agreement,[23] service level agreements,[24] and to a lesser extent intellectual property such as patents, trademarks, and copyright. These contracts and agreements can be developed and governed on a blockchain. Importantly, they will need to be considered as part of the evidentiary process, where they provide for arbitration to trace a token dispute. They will need to be considered and form part of the arbitration agreement. Conceivably, where these contracts and agreements are governed by a blockchain, the blockchain could manage and record the evidence. Put another way, where the entire cycle of the token is on a blockchain, the evidence would be stored on the blockchain, no different to that of a computer disk or hard drive (internal or external).

Part 1 of this paper introduces the growing interest in tokens and the technology of blockchain that will support their use. Part 1 (1.1) also discusses the distributed ledger as a type of blockchain. Part 2 highlights the evidence from and of blockchain that will influence and shape international arbitration. It further discusses the evidence rules that are available to manage tokens and blockchain by international commercial arbitration institutions. Part 3 analyses and compares a selected number of arbitration institutional rules. Part 4 concludes this paper, making the case for further research. The paper also makes the case that arbitration institutions may require specific draft clauses and guidelines to manage blockchain and tokens, in the same way personal data and cybersecurity has now become mainstream issues. The difference is that personal data and cybersecurity, today, are extensively regulated, whereas tokens and blockchain are not. It may be that blockchain is never regulated, but the token itself is[25] through taxation, property rights, and intellectual property.

Tokens can and do reside on a distributed ledger technology (DLT), and thus, come in many forms and offer a huge number of different use cases. It has been reported that a DLT is a form or type of blockchain;[26] however, there are subtle differences. First, not all DLTs are blockchains.[27] Second, blockchain is a set of blocks.[28] Third, a DLT is a decentralized data base.[29] Yet, they can perform similar functions and can govern tokens along with smart contracts and agreements.

[18] Ibid (n 15) 231.

[19] A Sunyaev and others, 'Token Economy' (2021) 63 Business Informations Systems Engineering 457–78 <https://doi.org/10.1007/s12599-021-00684-1>. See also CRYPTIX Tokenisation <https://tokenlaunchpad.eu/2024/02/tokenization-and-cybersecurity/>.

[20] TokenBridge End User Licensing Agreement and Terms of Service<https://porini.foundation/end-user-licensing-agreement/>.

[21] Y Nugraha, A Martin, 'Cybersecurity Service Level Agreements: Understanding Government Data Confidentiality Requirements' (2022) 8 Journal of Cybersecurity 1 <https://doi.org/10.1093/cybsec/tyac004>.

[22] C Allen and others, 'Data Governance and Data Sharing Agreements for Community-wide Health Information Exchange: Lessons from the Beacon Communities' (2014) 2 EGEMS (Wash DC) 1057 <https://doi.org/10.13063/2327-9214.1057>.

[23] Token Holder Agreement <https://assets.website-files.com/62ceab51b248edd7589f22da/630405e9d16e7ceaedcefe2e_CC%20Token%20Agreement.pdf>. These agreements deal with cybersecurity amongst other related issues. See also Token Service Agreement United States Securities and exchange Commission <https://www.sec.gov/Archives/edgar/data/1725129/000162827919000099/filename7.htm>.

[24] Y Nugraha, A Martin, 'Cybersecurity Service Level Agreements: Understanding Government Data Confidentiality Requirements' (2022) 8 Journal of Cybersecurity 2.

[25] R Walters, *Digital Finance Law: Common and Civil Law Approaches* (forthcoming book 2024/2025 Routledge).

[26] M Khan, D Schaefer and J. Milisavljevic-Syed, 'A Review of Distributed Ledger Technologies in the Machine Economy: Challenges and Opportunities in Industry and Research' (2022) 107 Procedia CIRP 1169, <https://doi.org/10.1016/j.procir.2022.05.126>.

[27] 'What is the Difference Between DLT and Blockchain' (2018)<https://www.bbva.com/en/innovation/difference-dlt-blockchain/>.

[28] Ibid.

[29] Ibid.

A DLT can be generated at the protocol layer inherent to a specific ledger. The resulting effect is that a token or coin can be governed by a smart contract.[30] As noted by Sunyaey *et al.* 'smart contracts are programmed to process sensor readings so that when events happen to the physical asset, such as a physical movement, a change of ownership, a change of status, or a physical transformation – its digital counterpart is updated on the DLT application'.[31] The partners, if given permission rights, all store identical replications of a tamper-resistant record of events.[32] Importantly, there must be a level of permission provided to a partner to gain access to the smart contact over a blockchain. This will be crucial evidence during an arbitration dispute.

Centrally, the complexity in the technology and functional requirements of smart contract technology is something that is not necessary for legal scholars and practitioners to fully understand. Yet, it is argued that, where there is a commercial dispute involving these new and emerging modern-day financial products, practitioners and arbitral tribunals will be forced to have a basic level of knowledge of this technology. The formal and functional arrangements of the DLT, 'offers a new approach based on asset tokenisation, smart contracts for processing transactions pertaining to the asset, and a tamper-proof ledger shared by all authorised parties.[33] Significant too, is how smart contract(s) and DLT[34] are often talked of in the same terms, but, are distinct technologies – albeit complementary and, in some instances, symbiotically linked. However, the DLT has created a platform on which smart contracts can be hosted and executed. This has allowed smart contract concepts to be included into the mainstream'.[35] These concepts are based on traditional law of contracts in both common and civil law jurisdictions. Yet, the full extent of the application and use of smart contracts today, and applying well settled legal concepts and principles to these contracts, is not fully understood.

Notwithstanding the above, it has been identified that one of the most powerful interrelationships between smart contracts and DLT is how 'computers can automatically execute the code'.[36] Functionally, the 'contracting parties program a computer to automatically execute a payment under a contract [i.e. a transaction using a token] upon satisfaction of pre-defined conditions, for a pre-defined price'.[37] Problematic, though, is when one party does not accept and use the other party's code, thus developing their own separate code. In reconciling this dilemma, the code itself can be housed on the DLT. In short, this establishes a single point of contact for the transaction and contractual arrangements that are binding on the parties. Arguably by adopting this approach the contract itself is self-enforcing,[38] and would not require a court or arbitral tribunal to enforce it. On the other side, this may not overcome a dispute where the DLT has not been used. This is because, 'smart contracts and DLT are distinct from each other, and come with their own respective challenges'.[39] This has been highlighted where the DLT raises the issue of *situs*:

[30] Ibid 464. See also ISDA Linklaters, 'Whitepaper, Smart Contracts and Distributed Ledger – A Legal Perspective' (2017) 4–5 <https://www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf>. Smart legal contracts and smart contract code are two separate domains, yet the reality is there is a relationship between them. For a smart legal contract to be implemented, it will need to embed one or more pieces of code designed to execute certain tasks if pre-defined conditions are met—that is, pieces of smart contract code. Smart legal contracts, therefore, are functionally made up of pieces of smart contract code—but, crucially, under the umbrella of an overall relationship that creates legally enforceable rights.

[31] Ibid 466.

[32] Ibid 466.

[33] Ibid.

[34] ISDA Linklaters, Whitepaper, 'Smart Contracts and Distributed Ledger – A Legal Perspective' (2017) 8 <https://www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf>.

[35] Ibid.

[36] Ibid.

[37] Ibid.

[38] Ibid.

[39] Ibid.

> Under various legal regimes, it is necessary to identify the location of an asset or contract to determine the applicable legal jurisdiction for various legal questions relating to it – for example, whether a property right has been created. In the case of dematerialised financial assets where ownership is recorded on a register, it is often the place where the register is held or where the registrar is situated that is deemed to be the situs of that financial asset. However, the distribution of the register across nodes in multiple jurisdictions raises a seemingly intractable problem – under current legal principles at least – as to where the situs should be.[40]

Viewed this way, the *situs* is where and how to evaluate the location of the property. The *situs* provides the basis where the 'something' exists and where it can be located. A further dilemma is how the technology of the DLT could have significant legal consequences, because of the location of the DLT itself, rather than the smart contract. For instance, the DLT could be located in the United Kingdom (UK), and therefore, the question arises, where was that smart contract entered onto the DLT? Was it in the UK or another nation state? Similar to traditional contracts that are prepared in one state and a party is located in another state, the clauses of a smart contract will need to be carefully drafted. Nonetheless, smart contracts raise their 'own legal issues but they are distinct issues from those that arise from the DLT'.[41] This will arise as an issue related to evidence in arbitration.

Arguably, the legal status of smart contracts and DLT, whether combined or on their own, remains unsettled. Generally, the smart contract will fall within the contractual legal framework of where the contract itself has been prepared. On the other side, I argue that this has not been fully settled by many states, and further research is required. Pertinent too, is that the drafting stage[42] of the contract itself will likely become more complex. Smart contracts on a blockchain know no national borders. Under transnational contract law arrangements, resent research has affirmed that the Convention on the Sale of Goods 1980 (CISG) can apply to these contracts.[43] Additionally, in 2021, the UK Law Commission released its report in relation to Smart Contracts[44] and noted that under the law of England and Wales, there are several requirements for the formation of a legally binding contract. These include an agreement; consideration; certainty and completeness; intention to create legal relations; and formality requirements.[45]

Thus, it can be argued that under these arrangements a smart contract will follow the existing concepts and principles of contract law, whether in a common or civil law jurisdiction. However, within those national contract law legal frameworks, a level of clarification is still required. They diverge, whereby jurisdictions have codified contract law, whereas others do not. This is because some common law jurisdictions such as the United Kingdom and India have codified the long-standing concepts and principles of contract law into statute. On the other hand, other common law jurisdictions such as Australia have left it to the judiciary to decide on how the contract law principles and concepts will be applied. The most significant differences between the two jurisdictions is the application of doctrines within contract law. For instance, in the context of Australia, with the changes to section 80 of the *Judiciary Act 1903* in 1988 reference to the 'common law of England' was deleted and replaced with the 'common law in Australia.' Justice James Allsop stated that 'the common law of England had ceased, literally overnight, to be law, but had become a source of law

[40] Ibid.
[41] Ibid.
[42] M Woebbeking, 'The Impact of Smart Contracts on Traditional Concepts of Contract Law' (2019) 10 JIPITEC 112.
[43] R Walters, *Commercial and Arbitration Law of the Digital Economy A Comparison of Asian, European and North American Jurisdictions* (Routledge 2024), chapter 3.
[44] Law Commission, 'Smart Legal Contracts Advice to Government' (2021) <https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2021/11/Smart-legal-contracts-accessible.pdf>. R Walters, *Commercial and Arbitration Law of the Digital Economy A Comparison of Asian, European and North American Jurisdictions* (Routledge 2024) 82–86.
[45] Ibid 39.

for legal development'.[46] As noted by Paul Finn, this is relevant to contract law, as there are separate bodies of English and Australian common law, not 'merely in isolated and specific court rulings, but also in differing casts of mind, distinctive methodologies and markedly different contexts (particularly legislative ones) in which the respective bodies of common law do their work.[47] This has been particularly so for the doctrines of equity, damages common mistake and unconscionability in contracts.[47] What has not been fully settled is whether an encoded contract [smart] created over a blockchain is subject to the same concepts and principles (offer, acceptance, intention to create legal relations amongst others) of the well settled contract legal regime. This is because under the traditional contractual development phase a human is part of the entire process. Most importantly, to ascertain the existence of a contract under this framework will require 1. an examination of the code as to whether it provided an offer that enabled humans to negotiate, or, 2. an examination as to whether it was an automated offer that removed humans altogether. If the latter, the party receiving the offer may not be in a position to negotiate the terms, which in practice this is unlikely because any party to a contract would want to negotiate its terms. The point is that this negotiated step requires further research and the question is how the coded contract would deal with it.

Despite the above, an emerging dilemma could be where disputes are solely resolved via the smart contract, because the arbiters have automatically been pre-selected, and they reside on the blockchain. To govern such a dispute 'both parties agree on a set of arbiters. Simply put, the pre-selected arbiters can vote, within a specified time period, either yes or no on whether a breach occurred'.[48] Furthermore, to overcome this dilemma, the question arises 'should a minimum number of arbiters vote, and the majority of those who vote agree that a breach occurred, the smart contract can automatically enforce monetary penalties'.[49] Thus, and because this process is exclusively developed and governed over a blockchain, the ensuing issue is how the arbiters are selected, and how or what number of arbiters would get to vote? That is, preselected arbitrators would need to be agreed upon by the parties. Effectively though, in this situation, the parties would need to agree on a pool of arbitrators to be selected, to ensure that when a dispute arises, an arbitrator or panel of arbitrators is available. This in and of itself is somewhat problematic, because the blockchain would need to have a restricted level of access available only to those arbitrators who will be determining the dispute. To ensure the current-day arbitration rules are complied with, the blockchain and any smart contract code would need to have the rules embedded within, to ensure that any evidence is not tainted. This would also ensure that the final selected arbitrators have access to the arbitration agreement. Therefore, the question arises what, when all preselected arbiters are unavailable, do the parties do? Would the blockchain and/or smart contract need to be re-coded to add further arbitrators? This issue needs to be addressed.

Under these arrangements, a further accentuating issue arises as to how the arbiters are included into the technology and base a decision on votes. In practice, which has not been fully applied, and remains at the conceptual stage, 'when instantiated, the lawyers must provide parameters to populate the text template, a list of parties who can update the state of the action, and a list of independent arbiters who can adjudicate the dispute'.[50] The consequences however are not entirely clear. That is, where the arbiters are in disagreement, the proposed practice is that a vote would be undertaken to confirm whether to update the action state.[51] In addition,

[46] James Allsop, 'Some Reflections on the Sources of Our Law' (Speech delivered at the Supreme Court of Western Australia Judges, Conference, 18 August 2012) 7 [20] <http://nswca.jc.nsw.gov.au/courtofappeal/Speeches/allsop180812.pdf>. In Paul Finn, Common Law Divergence, Melbourne university Law Review, Vol 37:509, (2013), https://law.unimelb.edu.au/__data/assets/pdf_file/0006/1699017/37_2_7.pdf

[47] Andrew Pang, Yihan Goh, Contract Law in Commonwealth countries, Uniformity or divergence? SACLJ (2019), 171-235.

[48] R Rahman, K Liu and L Kagal, *From Legal Agreements to Blockchain Smart Contracts*(2020) 3–4 <https://blockhack.osive.com/_downloads/d03a87ab494069c6ab2ac242ec7a429e/49.pdf>.

[49] Ibid 3–4.

[50] Ibid 2.

[51] Ibid. The study generated another 100 one-action, one-clause agreements with between 10 and 100 parties and arbiters.

what was not clear is the number of arbiters to be preselected? How they would be selected? Whether the traditional arbitrator selection process would be applied? Based on the above, the study neither confirmed whether they were human arbiters or technology arbiters that had been created by an algorithm. Should this become an accepted practice, arbitration institutions would need to set clear guidelines. Significant too, is that present-day arbitral laws and rules do not support this approach.

Currently, arbitrators are renumerated for their time to assess and hand down a decision (arbitral award). The accentuating question is whether a voting arrangement would constitute a decision-award under the current legal framework? This paper will demonstrate how the proposed voting arrangements by arbiters over a blockchain or smart contract are not fully settled. A further dilemma, based on a voting system and the possible number (odd or even) of arbiters required to vote, is they are all remunerated for their time in reviewing the contract itself. If so, this could potentially increase the costs of arbitration. Put another way, in order for a vote (i.e. a determination of a contractual breach), to be cast, the arbitrator would need to undertake a high level of research to understand the dispute. No doubt more research is required to fully understand whether this scenario could be expanded beyond Ethereum-based blockchain, to other blockchain models. The study by Álvarez, Vidal and Vallespinós raises many more questions than answers.[52] The current arbitration legal framework, arguably, has been designed to be implemented by humans[53] and not for technology to be the arbitrator. Should the above be realized, a further question would be how do the arbiters deal with evidence? The next section discusses evidence captured by blockchain and potentially used in an arbitral proceeding.

2.EVIDENCE

Evidence captured and used over blockchain has the potential to transform the collection and use of evidence used in international arbitration. Importantly though, when evaluating evidence on blockchain that can be used by an arbitral tribunal there are two distinct elements. First is the evidence that blockchain technology acquires. Second are the rules or law of evidence that is applied by the arbitral tribunal during an arbitral proceeding.

In responding to the first point above, a recent study undertaken by Alvarez, Vidal, and Vallespinos noted that 'the value of blockchain evidence provides proof of transactions carried out within the system itself. The transaction can be proved through a blockchain receipt, as it is tracked, validated, registered and time-stamped in the chain through a hash. If admissible, it would be a verified proof of the time, place and nature of the transaction; and as an authentication system for information produced outside the blockchain.'[54]

In adopting this approach, more efficient means of validation would easily be accepted by any arbitration tribunal. Problematic though is how digital evidence would be presented to an arbitral tribunal, due in part to the functioning and security of the blockchain.[55] On this basis, three challenges have emerged. First is blockchain evidence. Second is the application and use of blockchain to submit evidence such as documents. Third is the rules of evidence across the common and civil law divide and how they are applied to such a dispute. On this third point, the accentuating issue is that the rules of evidence in common law jurisdictions of Australia, the United States of America (USA), and the UK require that it be relevant and reliable. Therefore, and unless blockchain

[52] O Álvarez, O Vidal and L Vallespinós, 'Unlocking Blockchain Evidence in International Arbitration' (2022) 2022 Spain Arbitration Review, Revista del Club Español del Arbitraje 19, Wolters Kluwer España.

[53] R Walters, *Commercial and Arbitration Law of the Digital Economy A Comparison of Asian, European and North American Jurisdictions,* Routledge (2024) ch 2.

[54] O Álvarez, O Vidal and L Vallespinós, 'Unlocking Blockchain Evidence in International Arbitration' (2022) 2022 Spain Arbitration Review, Revista del Club Español del Arbitraje 19, Wolters Kluwer España.

[55] Ibid 20.

evidence conclusively falls within these rules, the tribunal is likely to be reluctant to rely on its use and admit the evidence. On the other side, and as highlighted below, the general rules for evidence are left to the tribunal to determine, which can allow a level of flexibility for the use of both blockchain evidence and submission of evidence by blockchain. As such, the tribunal will need to look at the institutional rules and the use of electronic documents as one element of evidence.

While the rules of evidence in arbitration have been settled for some time, the rules of evidence may vary depending on the international arbitration institute rules being used and applied. For instance, Article 27 of the Chartered Institute of Arbitrators [institutional rules] provides that 'each party shall have the burden of proving the facts relied on to support its claim or defence'.[56] On this basis, the burden of proof is a form of standard of proof. The standard of proof has been defined as a rule whose function is to indicate the party bearing the burden of proof. Arguably, the burden and standard of proof are far from settled when it comes to blockchain evidence.

In other words, it pertains to 'how much cogent or convincing the evidence must be to conclude that a fact actually happened'.[57] In referring to well-understood cases from the USA and the UK, Ezurmendia and Gonzalez noted the Supreme Court of the United States held that the standard of proof is 'to instruct the fact-finder about the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type of adjudication'.[58] The authors further state that in England and Wales, this has been conceptualized by Lord Hoffman in Re B (Children) (Sexual Abuse) as follows:

> If a legal rule requires a fact to be proved (a fact in issue), a judge or jury must decide whether or not it happened. There is no room for finding that it might have happened. The law operates a binary system in which the only values are 0 and 1. The fact either happened or did not. If the tribunal is left in doubt, the doubt is resolved by a rule that one party or the other carries the burden of proof. If the party who bears the burden of proof fails to discharge it, a value of 0 is returned and the fact is treated as not having happened.[59]

Viewed this way and in applying the approach under the UK and Australia legal systems, the burden or standard of proof is based on the balance of probabilities for civil matters and beyond a reasonable doubt for criminal matters. Importantly, these tests have varying thresholds. It is well understood that the balance of probabilities is a lower threshold. Moreover, Ezurmendia and Gonzalez believe that the 'general rules of evidence are not vastly considered in this regard, because one of the main features of arbitration is its flexibility'.[60] By adopting this approach, 'arbitrators practising their functions usually decide on the main evidence and proof matters, such as exclusion and admissibility, without specific or clear rules'.[61] More specifically, the arbitrator must 'establish a procedure for the gathering of evidence'.[62] Generally, this will be done according to the institutional rules that have been agreed upon to be used by the parties. This is determined by the arbitration agreement,[63]

[56] The Chartered Institute of Arbitrators, Arbitration Rules 2015, art 27. Also see, Chartered Institute of Arbitrators, 'Guidelines for Witness Conferencing in International Arbitration' (April 2019).

[57] J Ezurmendia and M Gonzalez, 'A Comparison Between the Standard of Proof Applicable in Arbitration and Formal Adjudication' (2021) 25 The International Journal of Evidence & Proof 5 <https://doi.org/10.1177/1365712720943333>.

[58] Ibid, *In Re Winship* 397 US 358, 370 (1970).

[59] Ibid, quoting *Re B (children)* [2009] AC 11.

[60] Ibid 7.

[61] Ibid 7.

[62] Ibid 7.

[63] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985, 2006 amendments <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-09955_e_ebook.pdf>.

whereby the arbitration institution is identified, and by automatic default those institutional rules are applied.

Therefore, where the arbitration agreement has been developed and settled either on a blockchain or via a smart contract, this will need to be evidenced. What is problematic is where the situation arises that there is no arbitration clause within the contract (that has been developed on a blockchain or smart contract), and therefore it is questionable whether the parties can be forced to arbitration by the courts? The relevance to evidence in an arbitration is whether the arbitration agreement itself has been established on a smart contract or on a blockchain. Therefore, the agreement to arbitrate needs to be clearly specified and accessible either on the code of the smart contract or the blockchain itself. In taking the traditional approach, the case of Jagdish stated clearly that '[T]he words used should disclose a determination and obligation to go to arbitration and not merely contemplate the possibility of going for arbitration'.[64] More importantly an arbitration agreement has to be in writing. This long-standing requirement was expressed by the Court in case No 44, where it noted 'the requirement that an arbitration agreement be in writing under article 7 (2)'.[65] A failure to provide for an arbitration agreement that provides binding obligations on the parties to arbitrate will pose many challenges, and the courts will need to make a determination and possibly force the parties to arbitration. In responding to the above, Article 8 would need to be considered. Article 8 provides that a where an arbitration clause is null and void, inoperative, or incapable of being performed, the court cannot intervene and impose arbitration on the respective parties.[66] Article 8(2) goes onto provide that where an action referred to in paragraph (1) of this article has been brought, arbitral proceedings may nevertheless be commenced or continued, and an award may be made, while the issue is pending before the court.

In determining whether an arbitration agreement is null and void, inoperative, or incapable of being performed, the courts will look to consent[67] and the intention[68] of a party or parties.[69] On the third point 'the assignee of a claim is bound by the arbitration clause contained in the contract out of which the claim arose'.[70] Moreover, the court will need to determine whether the arbitration agreement continues to be in effect.[71] The Court in case No 382 refused to send the parties to arbitration in London, based on the interpretation of Article 8 that the existence of a dispute was required in order to refer the parties to arbitration and that a court was entitled to consider this prerequisite in applying Article 8.[72] Furthermore, arbitration may be refused where the arbitration agreement is invalid.[73] The Court in *Dell* highlighted how Article 8(1) of the Model Law is almost identical to that of Article II(3) of the New York Convention.

[64] *Jagdish Chander v Ramesh Chander & Ors*, Supreme Court, India, 26 April 2007, para 8 <https://indiankanoon.org/doc/1913246/>.

[65] CLOUT case No 44 [*William Company v Chu Kong Agency Co. Ltd. and Guangzhou Ocean Shipping Company*, High Court—Court of First Instance, Hong Kong, 17 February 1993], [1993] HKCFI 215 <https://documents.un.org/doc/undoc/gen/v93/899/70/img/v9389970.pdf?token=qhbsjFMMTDfiH3QVcr&fe=true>.

[66] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985, 2006 amendments, art 8 <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-09955_e_ebook.pdf>.

[67] CLOUT case No 507 *Liberty Reinsurance Canada v QBE Insurance and Reinsurance (Europe) Ltd.* 20 September 2002, published in English: [2002] Ontario Judgments No 3599 <https://documents.un.org/doc/undoc/gen/v04/600/35/pdf/v0460035.pdf?token=5VyywdlPeHKh2nl8Fj&fe=true>.

[68] *Mariana Maritime S.A. v Stella Jones Inc.*, Federal Court—Court of Appeal, Canada, 24 May 2002 [2002] FCA 215, para 20 <https://www.canlii.org/en/ca/fca/doc/2002/2002fca215/2002fca215.htm>.

[69] CLOUT case No 1046 [*PS Here, L.L.C. v Fortalis Anstalt*, Court of Appeal of Quebec, Canada, 19 March 2009] <https://documents.un.org/doc/undoc/gen/v11/811/89/pdf/v1181189.pdf?token=sonxJegZJ6kWLIW6MZ&fe=true>.

[70] Ibid.

[71] CLOUT case No 382 [*Methanex New Zealand Ltd. v Fontaine Navigation S.A., Tokyo Marine Co. Ltd., The Owners and all Others*, Federal Court—Trial Division, Canada, 9 January 1998], [1998] 2 FC 583 <https://documents.un.org/doc/undoc/gen/v01/847/23/pdf/v0184723.pdf?token=55BYOtHyxjVeXXg7Rj&fe=true>.

[72] Ibid.

[73] *Dell Computer Corp. v Union des Consommateurs*, Supreme Court, Canada, 13 July 2007 [2007] SCC 34, [2007] 2 SCR 801, para 74 <https://decisions.scc-csc.ca/scc-csc/scc-csc/en/item/2374/index.do>.

Moreover, Article 16 of the Model Law expressly recognizes the competence–competence principle, whereby the tribunal may rule on its own jurisdiction, including any objections with respect to the existence or validity of the arbitration agreement.[74] This in and of itself provides the tribunal with a level of discretion that is also available when applying the rules of evidence.

A further important point to also take into consideration is the national law. For instance, the UK *Arbitration Act 1996*[75] section 34 provides that 'the tribunal is to decide all procedural and evidential matters, subject to the right of the parties to agree any matter'.[76] The approach under the Australian *International Arbitration Act 1974*,[77] section 23J, allows the tribunal or a person specified in the order to inspect, photograph, observe, or conduct experiments on evidence that is in the possession of a party to the arbitral proceedings and that may be relevant to those proceedings (the relevant evidence). For experts, Article 26 of the UNCITRAL Model Law[78] applies according to section 23J, in Australia.

Notably, the arbitrator will need to deal with a level of abstract rules of evidence. Practically, the arbitrator will have to apply the 'rules of the standard, to determine whether the burden of proof has been discharged'.[79]

Ezurmendia and Gonzalez also argue that the 'arbitrator should apply the rules of burden and standard contained in the law, or use rules that are generally applied by the civil court. Nonetheless, the arbitrator will assign a burden to one of the parties and apply a given standard, although he/she may not explicitly mention it'.[80] Subsequently, the 'arbitrator could not arrive at a rational conclusion regarding the veracity of the facts proposed by the parties, to subsequently apply the proper law to those facts'.[81] This is reaffirmed by Article 19 of the UNCITRAL Model Law[82] whereby the parties are free to agree on the procedure to be followed by the arbitral tribunal in conducting the proceedings. Second at Article 19(2), failing such agreement, the arbitral tribunal may, subject to the provisions of this Law, conduct the arbitration in such manner as it considers appropriate. The power conferred upon the arbitral tribunal includes the power to determine the admissibility, relevance, materiality, and weight of any evidence.[83] This could be applied according to the institutional rules that have been agreed upon by the parties. Importantly, here, the rules of admissibility and relevance are considered and will again be applied according to the institutional rules, or national law(s) of evidence, that the tribunal applies.

In addition, Article 24 becomes important and provides that 'subject to any contrary agreement by the parties, the arbitral tribunal shall decide whether to hold oral hearings for the presentation of evidence or for oral argument, or whether the proceedings shall be conducted on the basis of documents and other materials. However, unless the parties have agreed that no hearings shall be held, the arbitral tribunal shall hold such hearings at an appropriate stage of the proceedings, and if so, requested by a party'.[84] Where there is a request by a party for an oral hearing, it is important that the arbitrator take this request seriously. Most significantly,

[74] Ibid.
[75] United Kingdom Arbitration Act 1996, s 34 <https://www.legislation.gov.uk/ukpga/1996/23/section/34>.
[76] Ibid.
[77] Australian Arbitration Act 1974 <https://www.legislation.gov.au/Details/C2022C00086>.
[78] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985.
[79] J Ezurmendia and M Gonzalez, 'A Comparison Between the Standard of Proof Applicable in Arbitration and Formal Adjudication' (2021) 25 The International Journal of Evidence & Proof 7 <https://doi.org/10.1177/1365712720943333>.
[80] Ibid.
[81] Ibid.
[82] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985, 2006 amendments <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-09955_e_ebook.pdf>.
[83] Ibid, art 19.
[84] Ibid, art 24.

in case 659 the Court determined that according to Article 24[85] it was required to reconcile the approach taken by the Tribunal as to whether to allow for an oral hearing-evidence to be adduced with this principle That is, 'during the arbitral proceedings, the claimant requested an oral hearing, so as evidence could be put to the tribunal. The arbitrator, however, informed the parties that he would decide the case on the basis of documents only and set a time limit of three weeks for the respondent to reply to the request'.[86] The Court held:

> 'the refusal of an oral hearing did not constitute a violation of the right to be heard. The principle of oral hearing did not apply in arbitral proceedings to the same extent as in court proceedings. Thus, in arbitral proceedings the right of the parties to be heard is respected if the parties have at least the possibility to file a statement of defence. The peculiar manner in which the right of defence is exercised (i.e. in an oral hearing instead of written submissions) cannot be unilaterally decided by a party (Article 24 (1)'.[87]

In the above case, the court had decided that a statement of defence was necessary for the party's evidence to be heard, but that it need not be presented orally. Put another way, Article 19 provides that parties are free to agree on the procedure. Moreover, a Canadian Court[88] noted that a 'an arbitration agreement shall be evidenced in writing; it is deemed to be evidenced in writing if it is contained in an exchange of communications which attest to its existence or in an exchange of proceedings in which its existence is alleged by one party and is not contested by the other party'.[89] Additionally, 'an arbitration agreement which provides for the arbitration to be dealt with on written submissions only (thus without cross-examination of witnesses) was held to be valid and not contrary to the law or public policy'.[90] Therefore, an arbitration agreement can restrict the use of evidence by the tribunal. Even so, the above reaffirms that the arbitration agreement is to be in writing, yet, the tribunal can rely on written documentary evidence, oral evidence or both.

In reconciling the above, and in addition to the arbitration agreement, the ensuing developments and rapid growth in tokens have resulted in specific [token] agreements[91] being established to govern the applying protocols using a blockchain. More specifically, such agreements extend to the token sponsor who provides digital tokens to the public in conjunction with the launch of the Token Sponsor's protocol.[92] Notably, in the example of a Token Service Agreement (TSA), it can provide for an arbitration clause, whereby it states:

> The Parties agree that any controversy or claim arising out of or relating to this agreement, or the breach thereof, shall be settled by arbitration administered by the American Arbitration Association under its commercial arbitration rules. The number of arbitrators shall be one. The place of arbitration shall be the northern district of California. Judgement on the award rendered by the arbitration may be entered in any court jurisdiction thereof.[93]

[85] CLOUT case No 659 [Oberlandesgericht Naumburg, Germany, 10 sch 08/01, 21 February 2002] <https://documents.un.org/doc/undoc/gen/v06/567/83/pdf/v0656783.pdf?token=SswzBUWdkyMHV63SOC&fe=true>.
[86] Ibid.
[87] Ibid.
[88] *Desputeaux v Éditions Chouette* (1987) inc., Supreme Court, Canada, 21 March 2003 [2003] 1 SCR 178, 2003 SCC 17 <http://canlii.ca/t/1g2jh>.
[89] Ibid.
[90] Ibid. See also UNCITRAL Digest of Case Law on the Model Law on International Commercial Arbitration, 2012 <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/mal-digest-2012-e.pdf>.
[91] Token Service Agreement United States Securities and Exchange Commission <https://www.sec.gov/Archives/edgar/data/1725129/000162827919000099/filename7.htm>.
[92] Ibid.
[93] Ibid. See also Token Purchase Agreement <https://www.sec.gov/Archives/edgar/data/1693656/000110465919039476/a18-15736_1ex1a6matctrctd9.htm>.

The importance of highlighting the above adds a further layer of evidentiary consideration to an already complex area of evolving law. Not only will the tribunal need to consider the existence of a contractual arbitration agreement, it will need to consider the TSA to confirm or otherwise any dispute resolution clause. These agreements could be developed and governed on a blockchain. They are, in and of themselves, going to provide a level of important evidence that will need to be considered by the arbitration tribunal.

Article 27 of the UNCITRAL Model Law on International Commercial Arbitration provides that the arbitral tribunal or a party with the approval of the arbitral tribunal may request from a competent court assistance in taking evidence.[94] In addition, the court may execute the request insofar as it is within its competence and according to its rules on taking evidence. This means that the court can decide on the rules of taking evidence to be used by the arbitration tribunal. However, it can be argued that Article 27, can be viewed as being discretionary as it is not a mandatory obligation on the parties to produce documents of evidence. It is left to the tribunal to determine the admissibility, relevance, materiality, and weight of the evidence offered.[95] On the one hand, Article 28[96] states the arbitral tribunal shall 'decide the dispute in accordance with such rules of law as are chosen by the parties as applicable to the substance of the dispute'.[97] The tribunal thus has a level of flexibility to determine the conditions for the presentation of oral evidence. This includes in person or via video camera. On the other hand, the rules are particular in that the individual presenting the evidence must be in the camera's picture frame. That is, they must be able to be viewed.

More centrally, expert witnesses[98] are important to an arbitral proceeding. It can be argued they will become increasingly more important for commercial disputes related to tokens and blockchain. In the case of blockchain technology, the code, storage of data, token development, facilitation, use, valuations, smart contracts, and the technology to facilitate digital forms of finance are at this juncture new categories that may require experts to give evidence. Where the token is used on blockchain via a smart contract that is also on blockchain, an ensuing challenge will be where and whether the token is commodities-backed or otherwise. Thus, there will need to be careful drafting of the arbitration agreement to ensure consideration of all evidence to be adduced and made available.

Doug Jones notes that there are 'three broad categories of expert evidence that can be identified: strictly technical expertise, legal expertise, and expertise on delay'.[99] Jones goes onto say that the importance of 'technical experts is that they assist when a dispute involves a specialist area of knowledge on which the tribunal may require assistance'.[100] Jones further points out how under 'international arbitration, the procedure for the taking of evidence is a combination of both common law and civil law traditions. Subject to any express agreement between the parties, experts can be appointed by a party or by the tribunal. The use of party-appointed experts is the norm in practice, despite the extensive involvement of counsel and arbitrators with civil law background'.[101] Simply put, there can be party experts or tribunal

[94] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985, 2006 amendments, art 27 <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19- 09955_e_ebook.pdf>.

[95] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985, 2006 amendments, art 24 <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-09955_e_ebook.pdf>.

[96] Ibid, art 28.

[97] Ibid, art 28.

[98] Ibid, art 29.

[99] Doug Jones, 'Methods for Presenting Expert Evidence', Global Arbitration Review, 2021 <https://globalarbitrationreview.com/guide/the-guide-evidence-in-international-arbitration/1st-edition/article/methods-presenting-expert-evidence>.

[100] Ibid.

[101] Ibid.

appointed experts,[102] however, it is important to look at the institutional rules as they may vary. Article 26 of the UNCITRAL Model Law[103] provides for the appointment of experts, and in the Singapore case of *Luzon*,[104] both parties agreed to the appointment of Mr Shorland as an expert technical assistant for the tribunal.[105] Notably, in this case, it was put forward that the appointment of the expert went beyond what was required. The Court also stated it would 'not permit it to mount what appeared to be a back-door appeal by attacking the manner in which the tribunal had made use of the expert when there was no evidence but only speculation that the expert had overstepped his bounds'.[106] The point is that experts are fundamental to arbitration in providing specific evidence. They have a specific role and parties should not appeal the award based only on speculation that the expert did not operate within the agreed parameters of the appointment. Despite the above, a further dilemma that is worth consideration is the selection of arbitrators over a smart contract that is supported by a blockchain. Notably, this is different to selecting arbitrators on a blockchain. That is, the blockchain is the platform for the smart contract to operate. How this applies in practice is that a smart contract is a code that is written into or onto the blockchain by an individual. This would include the relevant information regarding an arbitration and the pool of arbitrators, whereas information concerning an arbitration can be directly placed onto a blockchain. More specifically, all the information related to the arbitration such as parties, contracts, arbitrators and evidence can be directly placed onto the blockchain. The ensuing question is how the arbitrators are selected and how do they vote on either a smart contract or blockchain? First, the preselected arbitrators would need to be selected by the parties. Therefore, in this situation, the parties would need to agree on a pool of arbitrators to be selected and that information would form part of the smart contract code. Conversely, the names of the pool of arbitrators would need to be directly placed onto the blockchain. Under both situations, this in and of itself is problematic because there could be a situation that arises where the preselected pool of arbitrators is not available. Therefore, either the smart contract code or blockchain would need to be updated. For the blockchain, it cannot be updated; rather information would need to be added to the other information that already exists. Practically, this is unlikely to pose any issues to the arbitration, provided the access continues to be restricted to only those that have permission. On that basis, and under both situations, there would be a need for the arbitration rules to be clearly set out in the smart contract code and on the blockchain specifying the number of arbitrators that can have access to the arbitration information at any one time. The restrictions on permission to access, whether on the smart contract or blockchain, would need to be carefully managed. In relation to voting, this potentially poses a greater challenge to the security of the arbitration. This is because, for arbitrators to vote, they must have access to all the information and evidence whether that be on a smart contract or a blockchain. It is well understood that in arbitration there is the long-standing practice of confidentiality. Thus, under the above framework, confidentiality is likely to be compromised, due to the fact that the entire pool of arbitrators selected may have permission to access the evidence and information. If this is not managed according the rules of arbitration, evidence could be tainted. Therefore, to ensure that this process of confidentiality and the number of arbitrators continues to conform with the current-day rules, either the smart contract code or blockchain

[102] For example, International Bar Association, Rules on the Taking of Evidence in International Arbitration ('IBA Rules of Evidence') <https://www.ibanet.org/MediaHandler?id=def0807b-9fec-43ef-b624-f2cb2af7cf7b>. See also, The Chartered Institute of Arbitrators, Arbitration Rules 2015, art 29.

[103] United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration, adopted by the United Nations Commission on International Trade Law on 21 June 1985.

[104] *Luzon Hydro Corp. v Transfield Philippines Inc,* High Court, Singapore, 13 September 2004 [2004] SGHC 204 <https://www.elitigation.sg/gdviewer/s/2004_SGHC_204>.

[105] Ibid, para 20.

[106] Ibid.

needs to have access restricted only to those arbitrators that have accepted the matter. It must conform to the current odd number of arbitrators that has been established by the rules.

Undoubtedly, this will apply to experts that will be called upon in commercial disputes to provide evidence about smart contracts, tokens, blockchain, code, amongst others. In a concluding salutary point, where there are multiple parties, contracts, and arbitration agreements, the consideration of evidence will need to be carefully thought through according to the relevant institutional rules and national laws, along with the arbitration agreement. It is inevitable that this will have to be dealt with where smart contracts and blockchain, including tokens, are involved.

3.INSTITUTIONAL ARBITRATION RULES ON EVIDENCE

This section will analyse the arbitration rules from a selected number of Arbitral Associations. It will be restricted to the rules of evidence and expert evidence.

3.1The International Bar Association

The International Bar Association[107] (IBA) Rules on the Taking of Evidence, Article 1 provides that 'whenever the Parties have agreed or the Arbitral Tribunal has determined to apply the IBA Rules of Evidence, the Rules shall govern the taking of evidence, except to the extent that any specific provision of them may be found to be in conflict with any mandatory provision of law determined to be applicable to the case by the Parties or by the Arbitral Tribunal.'[108] Article 1.2 goes onto provide that 'where the Parties have agreed to apply the IBA Rules of Evidence, in whole or in part, they shall be deemed to have agreed, in the absence of a contrary indication, to the version as current on the date of such agreement'.[109] Of further note is Article 1.3 that deals with the 'conflict between any provisions of the IBA Rules of Evidence and the General Rules [the institutional, ad hoc, or other rules that apply to the conduct of the arbitration], the arbitral tribunal shall apply the IBA Rules of Evidence in the manner that it determines best in order to accomplish, to the extent possible, the purposes of both the General Rules and the IBA Rules of Evidence, unless the Parties agree to the contrary'.[110] Nonetheless, where there is a 'dispute regarding the meaning of the IBA Rules of Evidence, the Arbitral Tribunal shall interpret them according to their purpose and in the manner most appropriate for the particular arbitration.'[111]

Arguably, the IBA rules on evidence are applying the purposive approach to interpretation and application of the evidence rules. The purposive approach is widely adopted across common and civil law jurisdictions. For instance, under the Australian *International Arbitration Amendment Act 2010* (Cth) ('*Amendment Act*'), the objective is to facilitate 'international trade and commerce by encouraging the use of arbitration as a method of and facilitate the use of made in relation to international trade and commerce; and facilitate the recognition and enforcement of made in relation to international trade and commerce'.[112] In addition; this gives effect to Australia's obligations under the 'Convention on the Recognition and Enforcement of Foreign Arbitral Awards; and the UNCITRAL Model Law on International Commercial'.[113] Significant too, the Australian *Acts Interpretation Act 1901* (Cth) s 15AA requires Commonwealth legislation

[107] International Bar Association, IBA Rules on the Taking of Evidence in International Arbitration<https://www.ibanet.org/MediaHandler?id=def0807b-9fec-43ef-b624-f2cb2af7cf7b>.
[108] Ibid, art 8.
[109] Ibid, art 1.2.
[110] Ibid, art 1.3.
[111] Ibid.
[112] *International Arbitration Amendment Act 2010.*
[113] A Anastasi, B Hayward and S Brown, 'An Internationalist Approach to Interpreting Private International Law, Arbitration and Sales Law in Australia' (2022) 44 Melbourne University Law Review 1, 16.

to be interpreted so as to best achieve its purposes.[114] It must be noted that this concept is not the sole test used by the judiciary when interpreting legislation or rules in Australia.

In 1969, the Law Commission of England and Wales, together with the Scottish Law Commission, recommended the adoption of a purposive approach to the construction of statutes.[115] This report in referring to the House of Lords in the case of '*Ellerman Lines v Murray*' established that, where an:

> international convention is referred to in the long and short titles of an Act, which also contains a preamble stating that the purpose of the Act is to give effect to the convention and sets out the relevant part of the convention in a schedule, it is nevertheless not proper to resort to the convention in order to give a section other than its "natural meaning'.[116]

Across the common and civil law divide, four key areas have been identified to interpret the law of evidence to include the 'text, context, teleology and history'.[117] This level of harmonization has served the modern-day international legal framework well by providing a common set of principles to be applied. On the other hand, the application of the rules of evidence will diverge when applied by a Tribunal. This, in part, will depend on the location or nation state where the tribunal is seated. Despite this, the rules and application of evidence in international commercial arbitration when conducted under civil or common law rules will generally diverge. Centrally though, and as stated above, the standard of proof under the common law is the balance of probabilities. On the other hand, under the civil law the standard is the 'inner conviction test, which asks whether the the arbitrator regards the evidence to have reached a level at which the arbitrator is personally satisfied of the veracity of an allegation.'[118] Other scholars have argued that under the civil law the standard of proof[119] in most cases is the 'balance of probabilities or preponderance of evidence'.[120] Today, arguably, there is more convergence than divergence, particularly in international arbitration.

Despite the above, Andrea Bjorklund has taken the position that 'international commercial arbitration requires at a minimum the intersection of three "systems" the procedural law applicable to the arbitration, the procedural rules that govern the arbitration, and the substantive law or laws that govern the dispute. The laws of the places where an arbitral award might eventually be enforced can also be in issue, as might be the laws of place where key evidence might be located'.[121] Put another way, 'in arbitration, as opposed to litigation in a court of law where applicable rules are established and known in advance of an adjudicative hearing, the arbitral tribunal is generally required to determine the necessary procedural tools to answer the ultimate questions. These building blocks can be distilled to: the burden of proof; the means to determine what evidence is to be received and how it should be taken into account through the critical prism of relevance and other necessary exclusionary rules. Furthermore, the standard of proof pursuant to which assessment of the evidence is undertaken', will need to be considered.[122] Thus, it is important for the rules of evidence to be established and communicated to the parties, from the outset. Generally, in the 'practice of taking evidence the arbitrators take into account the

[114] Ibid 17.

[115] *The Interpretation of Statutes*, Law Com. No 21 (1969) <https://cloud-platform-e218f50a4812967ba1215eaecede923f.s3.amazonaws.com/uploads/sites/30/2016/08/LC.-021-SC.-011-THE-INTERPRETATION-OF-STATUTES.pdf>.

[116] Ibid 9 and [1931] AC 126.

[117] Ibid 12.

[118] N O'Malley, *Rules of Evidence in International Arbitration* (2nd edn, Informa Law from Routledge 2019) 215–16.

[119] R Pietrowski, 'Evidence in International Arbitration' (2006) 22 Arbitration International 1, 379, <https://doi.org/10.1093/arbitration/22.3.373>.

[120] M Carreteiro, 'Burden and Standard of Proof in International Arbitration: Proposed Guidelines for Promoting Predictability' [2016] Kluwer International Law 87.

[121] A Bjorklund, 'International Arbitration' [2020] McGill Law Journal 91.

[122] P Vickery, 'Evidence in International Commercial Arbitration—Exploring a New Framework' [2019] The Arbitrator & Mediator 41 <https://www8.austlii.edu.au/au/journals/ANZRIArbMedr/2019/5.pdf>.

relevant laws at the seat of the arbitral tribunal'.[123] Gary Born asserts that the 'burden of proof raises questions of choice of law, and requires the tribunal to decide whether to apply the law of the arbitral seat'.[124] Thus, the discretion continues to reside with the tribunal. Just as important though, Born is of the view that a tribunal in applying the burden of proof should be undertaken according to the applicable substantive law and the procedures adopted in the arbitration.[125] Therefore, while the seat of the tribunal will influence the rules of evidence to be applied, the tribunal retains the discretion of the jurisdictional evidence rules to be applied.

3.2Indian International Centre for Arbitration

The Indian International Centre for Arbitration Domestic Rules (the Rules)[126] that pertain to arbitrations 'where parties are individuals who are nationals of India, a body corporate which is incorporated in India, or anybody or department of the Government of India.'[127] That is, the rules are restricted to arbitration where the parties are Indian nationals or the entity in dispute is incorporated in India. The Rules are silent on the use of expert evidence, although Rule 52[128] provides that the use of any evidence from a witness is to be by affidavit and must be available for cross-examination. It could be argued that expert evidence would be governed by Rule 52. Correspondingly, under Rule 63, where arbitrators have been replaced, the evidence already presented and used will be retained by the incoming Tribunal. There is no reference to computer technology, blockchain, AI, or otherwise. In fact, the rules come with a level of discretion to their application and use. Additionally, section 19 of the Arbitration and Conciliation Act 1996[129] does not specifically require the rules of evidence pertaining to the local jurisdictional evidence laws to be applied. The Tribunal has the power to 'determine the admissibility, relevance, materiality, and weight of any evidence.'[130]

3.3Australian Centre for International Commercial Arbitration

The Australian Centre for International Commercial Arbitration Rules[131] are similar to those of its counterparts compared in this paper. According to Article 35, the Tribunal has the discretionary option to apply the IBA rules[132] on the taking of evidence. Article 35.3 ensures that agreements between the parties on the taking of evidence prevail over the IBA rules. However, for this to apply, the parties would have had to agree on the process of the taking of evidence. Article 35.4 goes onto provide that a party can request that the presentation of evidence by a witness or expert can be in the form of oral argument. In short, and unlike India, while affidavits may be used, there is discretion for the parties to request for oral evidence to be heard. Arguably, this provides a greater level of flexibility for the parties and the tribunal. Where there is complex technical evidence about how a blockchain is developed and used, oral evidence may well be more appropriate than relying solely on a complex technical document or report. Expert evidence can thus be presented to the tribunal, provided that the parties are consulted.[133] Under

[123] R Trittmann and B Kasolowsky, Taking Evidence in Arbitration Proceedings Between Common Law and Civil Law Traditions—The Development of a European Hybrid Standard for Arbitration Proceedings' (2008) 31 University New South Wales Law Journal 331.

[124] G Born, *International Commercial Arbitration, Volume II: International Arbitral Procedures* (3rd edn, Kluwer Law International BV 2021) 2488.

[125] Ibid 2489.

[126] Indian Council of Arbitration Rules of Domestic Commercial Arbitration of the Indian Council of Arbitration <https://icaindia.co.in/pdf/Rules%20of%20Arbitration%20and%20Conciliation_As%20amended%20on%20and%20with%20effect%20from%2017%20January%202022.pdf>.

[127] Ibid 5.

[128] Ibid, Rule 52.

[129] Arbitration and Conciliation 1996 <https://www.indiacode.nic.in/bitstream/123456789/1978/3/a1996-26.pdf>.

[130] Ibid, s 19.

[131] Australian Centre for International Commercial Arbitration, Arbitration Rules <https://acica.org.au/wp-content/uploads/2022/11/ACICA_Rules_2021-WFF7.pdf>.

[132] Ibid, art 35.

[133] Ibid, art 36.1.

Article 36.2, the expert shall, before accepting appointment, provide the parties a description of his or her qualifications. This will become particularly important when tokens, blockchain, AI, algorithms, cybersecurity, and data governance form part of the overall dispute. Of further importance is Article 36.3, requiring the parties to arbitration provide an expert that has been appointed with relevant information and documents. This will be critical in disputes of tokens. Moreover, the parties are to be afforded a copy of the expert's report[134] upon receipt by the tribunal, and can request that the expert at the hearing present the report for examination. Preservation[135] of evidence can be issued by the Tribunal. This will become important to ensure where there is evidence stored on a blockchain that evidence is not discarded. Yet, storage of this evidence could be located anywhere in the world. This, could pose further legal challenges to be reconciled with the local laws, about having access and discovery of the evidence.

3.4London Court International Arbitration

The London Court International Arbitration (LCIA) Rules[136] allow for a tribunal to direct written submissions, statements, evidence, and expert witnesses.[137] Article 20 goes onto provide for witnesses and the use of experts. Importantly Article 22(vi) provides that the Tribunal has the power to 'decide whether or not to apply any strict rules of evidence as to the admissibility, relevance or weight of any material tendered by a party on any issue of fact or expert opinion'.[138] Arguably, the LCIA Rules provide the Tribunal with a lot of discretion as to how the rules of evidence will be applied. They are equally discretionary with the use of expert evidence.

3.5International Chamber of Commerce

Similar to the LCIA, the International Chamber of Commerce (ICC) is quite general in its approach to the rules of evidence. Article 3.4 provides a Tribunal with the 'discretion to adopt such procedural measures as it considers appropriate. In particular, the arbitral tribunal may, after consultation with the parties, decide not to allow requests for document production or to limit the number, length and scope of written submissions and written witness evidence (both fact witnesses and experts)'.[139] This discretion extends further to allow a tribunal to decide on how it will deal with the evidence presented. That is, according to Article 3.5 the Tribunal, 'after consulting the parties, can decide the dispute solely on the basis of the documents [evidence] submitted by the parties, with no hearing and no examination of witnesses or experts'.[140] Additional evidence can be requested by the tribunal[141] at any time.

The institutional rules regarding arbitration vary significantly. It can be argued that while they provide enough flexibility for the application and use of evidence that will involve tokens and blockchain technology, the rules across all of the above institutions could be strengthened. Redfern and Hunter make the point that where 'tribunals composed of three experienced international arbitrators from different legal systems approach the question of the reception of evidence in a pragmatic way. Whether they are from common law or civil law countries, they tend to focus on establishing the facts necessary for the determination of the issues between the parties and are reluctant to be limited by technical rules of evidence that might prevent them from achieving this goal'.[142] Pertinent too, Gary Born is of the view that the 'principal reasons that this

[134] Ibid, art 36.4.
[135] Ibid, art 37.2.
[136] London Court International Arbitration, 2020 <https://www.lcia.org/Dispute_Resolution_Services/lcia-arbitration-rules-2020.aspx>.
[137] Ibid, art 15.7.
[138] Ibid, art 22 (vi).
[139] International Chamber of Commerce, Arbitration Rules, Expedited Procedural Rules, Appendix VI, 2021, 77.<https://iccwbo.org/wp-content/uploads/sites/3/2020/12/icc-2021-arbitration-rules-2014-mediation-rules-english-version.pdf>.
[140] Ibid, art 3.5.
[141] Ibid, art 25.4.
[142] N Blackaby and others, *Redfern and Hunter on International Arbitration* (2015) 377.

procedural autonomy is granted so as to enable the parties and arbitrators to fashion procedures "tailored" to particular disputes'.[143] It is argued that this approach will serve disputes that arise in tokens from the use of blockchains well. Problematic, though, is ensuring that the Tribunal has the skills to deal with new and emerging disputes. While experts in the field will likely be called upon, there will be a need for arbitrators to re-skill and understand a level of operation of tokens and blockchain. To further reconcile the complexity of this developing new financial activity whilst applying the rules above, customized procedures will need to be adopted by the Tribunal. Doing so will ensure evidence is optimized, and minimize the need for court intervention. More broadly, and while out of scope of this paper, arbitration institutions may be required to develop specific clauses and/or guidelines in the same way that has been undertaken to manage privacy and data protection issues for blockchains and tokens.

4.CONCLUSION

A new and emerging frontier in the financial sector is the tokenization of the economy. Central banks, governments, and regulators around the world are taking notice of this new financial activity. It will bring with it many benefits of efficiency, transparency, and accountability in being able to reduce illegal financial transactions. However, and while this paper did not address the issue of cybersecurity specifically, it will pose many challenges to tokens being used over a blockchain.

In the words of Kubalczyk, the current-day institutional rules are silent when it comes to detailed conduct of the proceedings, especially in relation to evidentiary matters.[144] They define procedural issues such as the request for arbitration, constitution of the tribunal, place of arbitration, the language, and the other case management provisions; however, when it comes to the establishment of facts of the case, they usually contain only few generic articles, leaving the details to be set by the parties or the tribunal.[145] Importantly, Kubalczyk further notes that in cases where the parties come from different legal traditions, finding a common ground as to the gathering of evidence might be problematic and lead to further conflicts.[146] Arguably, this will be a constant and particular feature of arbitration proceedings that apply to blockchain and tokens. This is because many of the transactions will not be restricted by international borders. Subsequently, there is likely to be a large number of intranational transactions. Therefore, as this activity evolves, further research is needed to understand the number and impact on evidence where disputes arise and they go to arbitration. What Kubalczyk is arguing is the need for more detailed rules of evidence to be developed to ensure the arbitration dispute is conducted promptly.[147] In agreeing with this proposition, a starting point is the need to develop guidance notes by arbitration institutions to provide a level of detail for arbitrators and parties in dispute. This will provide a level of certainty and clarity to the parties and the arbitrator/s.

Another important feature of arbitration is the generally accepted rule that the burden of proving a case lies with the party bringing the claim. On that basis alone, the party that brings a dispute to arbitration in relation to the use of tokens and blockchain will be required to provide detailed evidence supporting their claim. This will and could be in a number of different forms. Apart from the traditional contract and arbitration agreement, a further layer exists today, unlike before, whereby smart contracts, licensing agreements, cybersecurity agreements,

[143] G Born, *International Commercial Arbitration* (2nd edn, Kluwer Law International 2014) 85.
[144] A Kubalczyk, 'Evidentiary Rules in International Arbitration—A Comparative Analysis of Approaches and the Need for Regulation' (2015) 3 Groningen Journal of International Law: International Arbitration and Procedure 95.
[145] Ibid 95.
[146] Ibid 95.
[147] Ibid 95.

cybersecurity service agreements, data agreements, data storage agreements, data privacy agreements, token holder agreement, service level agreements, and, to a lesser extent, intellectual property such as patents and copyright could all form part of a blockchain and token dispute. That being said, it is arguable that such issues are likely to be aggregated into a single agreement, provided the parties facilitating the token transactions have clear arrangements with the blockchain technology holder. This will vary from entity to entity. The security arrangements are likely to be multilayered and different to that of the entity providing the token, and will take into consideration storage, data, and authentication. This will require careful consideration of evidence to ensure any contractual or agreement obligations are between the parties in dispute and not with a third party (which provides, for example, cyber security).

The most recent addition to the contractual and agreement/s framework has been the token agreement. They provide for an arbitration clause and specifically align the token to being facilitated by blockchain technology. This is a clear indication that arbitration will be an important resolution mechanism for token disputes. These new agreements will be increasingly important to the evidence presented by the parties to an arbitration. It will require another level of understanding by the arbitrator.

Even more pertinent will be the identification and management of expert witnesses under the arbitration rules. By and large, all the rules examined in the paper provide for the use of expert witnesses. For evidentiary purposes, the tribunal will need to call experts in blockchain technology, AI, algorithms, and possibly code. It also may require experts in the field of the technology that has been used to create the token. Of significance in the evidentiary process will be understanding evidence from the expert or person who installed the code. This will also extend and include the jurisdiction [country] in which the code was installed. That is, the location where the code was installed is likely to be a determining factor that will influence the rules of evidence deemed applicable. Moreover, evidence will be required about where the token was developed and the facilitation of the transaction of the token; for example, where did the transaction take place? Was it in Australia, the UK, or the USA? This, it is argued will be crucial to understand the evidentiary issues, and what rules of evidence to apply. Essentially, the arbitration tribunal will be required, in part, to undertake a comprehensive traceback to determine all relevant evidentiary point of the token agreement and exchange over the blockchain.

In industry parlance, a further and more accentuating issue in addition to the above will require the arbitrator to reconcile whether and what evidence the blockchain has acquired. The expert evidence is likely to determine this. It will be an important area of evidence to differentiate the technology of the token and the blockchain—and their role in the dispute. Where such an event is under the governance of a smart contract, this may pose a further dilemma in evidence gathering and determination, to separate out the role of the blockchain from the smart contract versus the token.

The paper highlighted a proposal that has been put forward for parties to nominate and agree on a number of arbiters, which could be preselected over a blockchain. However, it is argued that there could be inherent problems that arise from such a proposal. A difficulty in scope and number of arbiters is not yet clear, should it be an even or odd number? The proposal put forward has not fully considered the evidentiary requirements that the arbiters are to vote upon. That is, to what extent, if, for example, will the arbiters be provided with all the evidence? Additionally, it is well understood that the current-day rules generally provide for a single arbitrator or a panel of three. So, to achieve this, the arbitration institutional rules would need to be amended, where the blockchain is providing for a higher number of arbiters than the rules allow. Yet, this is a well settled area of the law, and it is argued it does not need to be changed. That is, current arbitration rules are well settled in respect of the numbers of arbiters. This paper is arguing to retain the status quo with respect to odd numbers of arbitrators. Apart from this, and

in part, a possible way to reconcile this new development is through the smart contract or other agreement/s that are used by the parties. Even so, the current rules for arbitration also include confidentiality and impartiality, along with the arbitrator being a person. It was not clear from the study discussed whether the arbiter was a person or technology. While the study referred to in this paper highlighted how arbitrators could be automatically identified to vote on a particular issue in an arbitration proceeding, it did not conclude substantially whether the arbitrators were humans. What requires further clarification and research is where an arbitrator is a human or a form of technology such as an algorithm that has been included into a robot or some other form of technology that replaces the human arbitrator.

The rules on evidence in international commercial arbitration are generally left to the tribunal to determine with the parties, unless they are specified in a contract or agreement. Noteworthy too, is the recently established 2018 Prague Rules[148] on the conduct of Taking of Evidence in International Arbitration. They have been established to close the gap and divergence between the common and civil law. Although they have not been widely adopted, none of the arbitration institutions discussed in this paper are supportive of them. A salutary point is how the IBA Rules have been very successful in developing a nearly standardized procedure in international arbitration, at least for proceedings involving parties from different legal traditions. However, the IBA Rules are still closer to the common law traditions, as they follow a more adversarial approach with document production, fact witnesses, and party-appointed experts.[149]

What is remarkable is the way in which the economy is transitioning at a breakneck speed that many individuals and entities cannot keep pace with. The tokenization of the economy is a fascinating new area of legal development, yet there are going to be formidable challenges that lie ahead for which this paper has not even scratched the surface, for instance, tax, intellectual property, insurance, amongst others. Finally, this paper has confirmed and demonstrated that there are a number of existing legal and practical gaps that need to be reconciled. The selected analysis has also demonstrated how the current-day international arbitration legal framework, including institutional arbitration rules, can deal with tokens and blockchain technology. Despite this, the arbitration rules and law need to be reviewed. There is a need for further research to ensure arbitration tribunals are ready for the ensuing token economy.

[148] *Rules on Conduct of the Taking of Evidence in International Arbitration* ("The Prague Rules") <https://praguerules.com/upload/iblock/a00/a00568c6787a8bc955f4fdfe93db5a10.pdf> and <https://praguerules.com/supporters/organisations/>.

[149] A Duffy, *Evidence in Arbitration* (2019) 14 <https://amtac.org.au/wp-content/uploads/2019/11/EVIDENCE-IN-ARBITRATION.pdf>.