October 2020

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Private International Law Aspects of Smart Derivatives Contracts Utilizing Distributed Ledger Technology: Irish Law

CONTENTS

INTRODUCTION

This paper considers the private international law, or conflict-of-law, aspects of derivatives contracts governed by the laws of Ireland involving distributed ledger technology (DLT).

The development and implementation of new technologies such as DLT within the derivatives industry have the potential to create a more robust financial markets infrastructure, achieve operational efficiencies through increased automation and reduce costs for market participants.

As these technologies mature, it is important to understand the evolving legal treatment of derivatives traded on DLT platforms. Given the novel complications over where data, assets and even counterparties are located in a DLT environment, it is useful to examine key questions on how to determine which law applies and how to evaluate conflicts of governing law. While some jurisdictions[1] have produced analysis on areas of perceived legal uncertainty, these issues remain untested in many of the jurisdictions and cross-border environments important to the derivatives industry.

In January 2020, ISDA, R3, Clifford Chance and the Singapore Academy of Law jointly published *Private International Law Aspects of Smart Derivatives Contracts Utilizing Distributed Ledger Technology*[2]. This paper considered the private international law, or conflict-of-law, aspects of derivatives contracts governed by the laws of England and Wales or Singapore involving DLT.

These issues include:

- Whether the introduction of DLT or a DLT platform provider to a traditional trading relationship might create additional legal rights and obligations for the trading parties. These may be governed by different laws to those governing the trading documentation, which could have implications for the resolution of contractual disputes.

- How to identify the legal situs of digital assets for effecting payments or exchanging collateral on certain DLT platforms.

These issues are critically important for derivatives market participants that want to ensure the legal enforceability of their contracts and the associated netting and collateral arrangements are not undermined by an unexpected change in governing law or by an inability to enforce judgements. As derivatives are often traded on a cross-border basis, it is important these issues are examined and understood as clearly as possible from the perspective of the governing laws and jurisdictions typically used in ISDA documentation.

As a result, ISDA (in association with R3 and local counsel) has published additional papers that consider these issues from French, Irish, Japanese and New York law perspectives[3,4].

[1] See the UK Jurisdiction Taskforce (UKJT) Legal Statement on Cryptoassets and Smart Contracts: https://35z8e83m1ih83drye280o9d1-wpengine.netdna-ssl.com/wp-content/uploads/2019/11/6.6056_JO_Cryptocurrencies_Statement_FINAL_WEB_111119-1.pdf

[2] https://www.isda.org/a/4RJTE/Private-International-Law-Aspects-of-Smart-Derivatives-Contracts-Utilizing-DLT.pdf

[3] ISDA has published forms of ISDA Master Agreement and associated collateral documentation governed by the laws of England and Wales, New York, Ireland, France and Japan

[4] These papers can be accessed here: https://www.isda.org/2019/10/16/isda-smart-contracts/

Through this analysis, ISDA hopes to support the work of international standard-setting bodies, regulators, judiciaries, market participants and other key stakeholders examining these issues. The papers are also intended to provide greater certainty to participants incorporating DLT into derivatives transactions, strengthening the industry's ability to realize the operational and cost efficiencies that greater automation will provide.

While the focus of this paper is on potential private international law issues arising from the use of smart derivatives contracts utilizing DLT, there may be other issues that need to be considered from an Irish law perspective when determining the legal status or characterization of a smart derivatives contract. These might include whether certain types of smart contract are capable of satisfying contract formation requirements under Irish law, or whether certain types of digital asset are capable of being treated as property under Irish law. Such discussions are beyond the scope of this paper[5].

[5] The UKJT recently published its '*Legal Statement on crypto-assets and smart contracts*', which provides a view on these and other issues from an English law perspective. While not having the force of law, the UKJT's statement has been cited in at least one case in the English courts where these or similar issues have been raised. Where areas of legal uncertainty exist under Irish law in relation to the use of DLT, smart contracts or digital assets, a similar statement or publication issued by an equivalent Irish body or authority could assist in creating a more robust legal and regulatory environment for the development of smart derivatives contracts under Irish law

UNCOLLATERALIZED DLT TRANSACTIONS

These papers set out two different examples in order to illustrate the relevant issues – an uncollateralized interest rate swap transaction and a collateralized interest rate swap. Both use ISDA documentation and are implemented on Corda, an open-source blockchain and smart contract platform developed by R3 that operates as a private, permissioned ledger (ie, one that only authorized parties may view and use). Types of issues that might arise when entering into derivatives transactions using DLT platforms that have different characteristics from Corda – for example, permissionless ledgers[6] – are also covered.

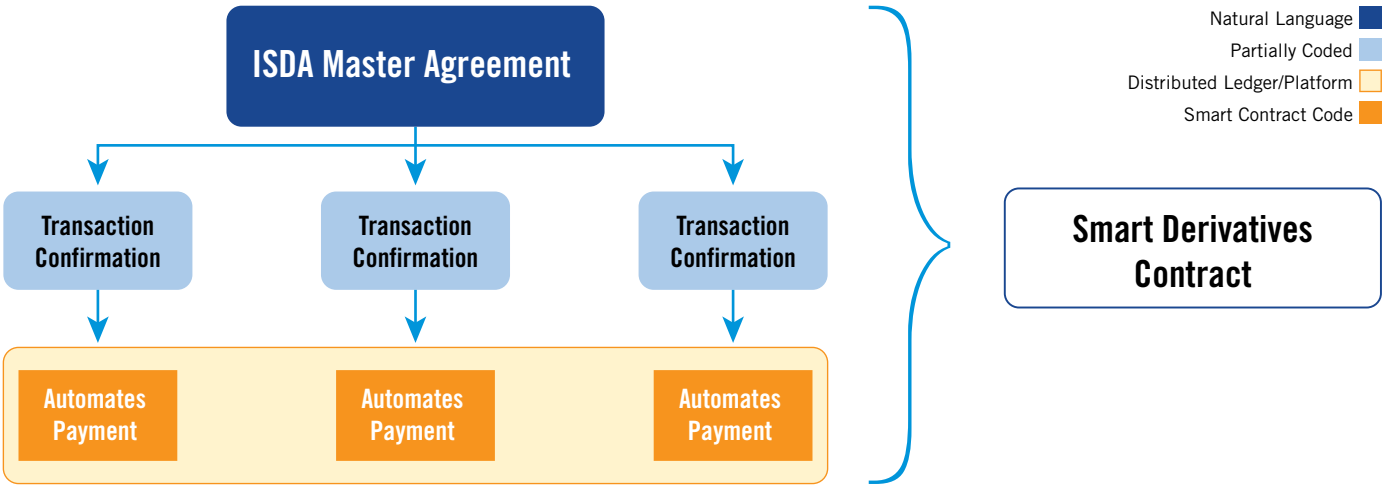
Smart Derivatives Contracts

ISDA has published a series of legal guidelines for smart derivatives contracts[7], which are intended to explain the core principles of ISDA documentation and raise awareness of important legal terms that should be maintained when a technology solution is applied to derivatives trading.

These guidelines establish the concept of a smart derivatives contract. This is a derivatives contract in which some terms are capable of being automatically performed, either by expressing those provisions using some formal representation that enables their automation, or by referring to the operation of smart contract code that is external to the contract[8].

While the guidelines are agnostic about the types of technology that could be used to implement smart derivatives contracts, they provide an illustration of a potential smart derivatives contract construct utilizing a DLT platform, where payments under a series of transactions are automated.

Figure 1



[6] A distributed ledger that is public can be viewed by members of the public, while a permissionless ledger is one that members of the public can make and verify changes to. *Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty* (London: Financial Markets Law Committee, 2018) at 8, [3.3(a)], http://fmlc.org/wp-content/uploads/2018/05/dlt_paper.pdf (FMLC paper)

[7] ISDA *Legal Guidelines for Smart Derivatives Contracts: Introduction* (January 2019), https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf, and ISDA *Legal Guidelines for Smart Derivatives Contracts: The ISDA Master Agreement* (February 2019), https://www.isda.org/a/23iME/Legal-Guidelines-for-Smart-Derivatives-Contracts-ISDA-Master-Agreement.pdf

[8] For further discussion on these smart derivatives contracts and which provisions might be well suited to automation, see ISDA and Linklaters LLP, *Smart Contracts and Distributed Ledger – A Legal Perspective* (August 2017), www.isda.org/a/6EKDE/smart-contractsanddistributed-ledger-a-legal-perspective.pdf; ISDA and King & Wood Mallesons LLP, *Smart Derivatives Contracts: From Concept to Construction* (October 2018), https://www.isda.org/a/cHvEE/Smart-Derivatives-Contracts-From-Concept-to-Construction-Oct-2018.pdf; and Christopher D Clack and Ciáran McGonagle, *Smart Derivatives Contracts: The ISDA Master Agreement and the Automation of Payments and Deliveries, Artificial Intelligence and Law* (forthcoming)

In Figure 1, the parties enter into an ISDA Master Agreement as normal. Commercial terms relating to the transaction continue to be contained in a transaction confirmation. This example assumes none of the transactions will be collateralized.

While those provisions that are automated (ie, those relating to payment obligations) could be represented in code, so that it actually forms part of the legal contract, this is not necessarily required to implement the transactions on a DLT platform.

The Uncollateralized DLT Transaction

Corda is a blockchain platform for recording and processing financial agreements. It is a private permissioned ledger – only authorized parties may view and use it. The system supports smart contracts, which R3 has defined as[9]:

> *[…] an agreement whose execution is both automatable by computer code working with human input and control, and whose rights and obligations, as expressed in legal prose, are legally enforceable. The smart contract links business logic and business data to associated legal prose in order to ensure that the financial agreements on the platform are rooted firmly in law and can be enforced […]*

In this example, the parties to the uncollateralized DLT transaction have negotiated the terms of their relationship under an ISDA Master Agreement and have documented the economic terms relating to the interest rate swap under a transaction confirmation.

The parties would also be required to enter into an agreement with a platform provider as the operator[10] of the business network that deploys applications that utilize Corda (each application is called a 'CorDapp'). This agreement requires the parties to accept a business network rule book[11]. This agreement is governed by the laws of the jurisdiction that the parties agree upon.

When implementing the uncollateralized DLT transaction on Corda, the parties would become 'nodes' on the Corda distributed ledger or blockchain, and would use a derivatives CorDapp to execute the transaction.

A CorDapp has a smart legal contract template library, with each smart contract consisting of the following elements:

- A state object: This is a digital representation of a real-world fact on the distributed ledger. For example, the ISDA Master Agreement and transaction confirmation entered into between the parties would be a state object.

- A Corda contract: This is an element setting out various rules that govern state objects – for example, 'the trade date must be after today's date', 'the fixed rate amount must be above [*a specified percentage*]', and 'the floating rate amount spread must be [*a specified figure*]'.

- A portable document format (PDF) file with parameters: This is a file containing parameters (for example, the parties' names, dates and amounts of money) that need to be filled in by the parties. The PDF is inextricably linked to the Corda contract for purposes that are explained later.

[9] Richard Gendal Brown, James Carlyle, Ian Grigg and Mike Hearn, 'Corda' in *Corda: An Introduction* (New York, NY: R3, 2016), https://docs.corda.net/_static/corda-introductory-whitepaper.pdf, at 7, [4] (original emphasis)

[10] Although there is most likely only one platform provider contracting with the parties, it is possible for there to be multiple entities operating the CorDapp

[11] A business network rule book is an agreement between the parties governing use of the CorDapps, analogous to agreements that users currently enter into to use electronic trading platforms and financial transaction platforms such as SWIFT

To structure, set up and execute the uncollateralized DLT transaction, the following steps are taken:

1) Party A obtains a smart legal contract appropriate to the transaction from the smart legal contract template library on the distributed ledger, and fills in the parameters of the PDF with the information relating to the transactions.

2) The CorDapp 'scrapes' or obtains the transaction information from the PDF and inputs this into the state object.

3) Party A runs a verify function of the Corda contract to ensure the state object does not break any of the Corda contract's predetermined rules.

4) Once the state object has been determined not to break any of the Corda contract's rules, Party A sends the transaction to Party B.

5) Party B reviews the details of the smart legal contract. When Party B has confirmed that the PDF and state object accurately reflect the transaction, Party B runs a verify function of the Corda contract to ensure the state object does not break any of the Corda contract's rules.

6) Once the state object has been determined not to break any of the Corda contract's rules, Party B digitally signs the transaction and sends it back to Party A.

7) Party A digitally signs the transaction and sends it to the notary, which is a server on the distributed ledger operated by one or more entities that execute what is known as the 'notary function'[12]. The notary checks the cryptographic hash of the state object against its record of hashes[13]. When it confirms that the state object is unique, it digitally signs the transaction and sends it back to both parties.

8) The parties record a copy of the transaction in their respective vaults on the distributed ledger.

After the uncollateralized DLT transaction has been executed in accordance with these steps, subsequent lifecycle events in respect of the transaction, such as a periodic payment, would be managed as follows:

1) On an agreed date, an oracle[14] feeds interest rate data into the smart legal contract that is in Party A and B's vaults.

2) Party A then initiates a new transaction, repeating steps (3) to (8) above. This leads to the smart legal contract being recorded in Party A and Party B's vaults with an updated record of the transaction – that is, the net amount payable by Party A to Party B or vice versa. The actual payment takes place off the distributed ledger.

[12] The 'notary function' can be performed by a collection of servers known as a 'notary cluster'

[13] A cryptographic hash is an electronic signature uniquely identifying a state object that is created by running the contents of the state object through a complex mathematical formula

[14] A service provided by a third party that feeds real-world information into a distributed ledger, which can then be used to initiate the execution of smart contracts

In this scenario, it is not envisaged that any intermediaries, such as brokers, central banks, clearing houses and custodians of securities, would be represented on Corda. Where involved in a transaction, they would continue to operate off-ledger. However, it is possible that an intermediary such as a central counterparty could operate as a node on the distributed ledger. This could be as a party to a derivatives transaction, or as an 'observer node' that is able to receive information relating to a transaction in order to clear but is otherwise unable to participate in the transaction.

While the objective of the DLT platform is often to eliminate the need for some or all of these intermediaries, their complete removal is unlikely to be feasible or desirable. Beyond the transacting parties, there are likely to be numerous other entities that act as nodes in the ledger, including the operator(s) of (parts of) the platform and parties that facilitate communication and record maintenance[15]. For a collateralized transaction, this would also include custodians, which are required to hold and segregate collateral under initial margin requirements for non-cleared derivatives transactions[16].

The issues arising from such a use of a DLT platform are outside the scope of this paper.

[15] See Thomas Keijser & Charles W Mooney, Jr, *Intermediated Securities Holding Systems Revisited: A View through the Prism of Transparency* (Institute for Law and Economics Research Paper No. 19-13), https://ssrn.com/abstract=3376873, at 17-18 (forthcoming in Louise Gullifer & Jennifer Payne (eds), Intermediation and Beyond (Oxford: Hart Publishing, 2019))

[16] Further discussion of these regulatory requirements can be found in the ISDA *Legal Guidelines for Smart Derivatives Contracts: Collateral*, https://www.isda.org/a/VTkTE/Legal-Guidelines-for-Smart-Derivatives-Contracts-Collateral.pdf

Private International Law Rules Relating to Contracts

Based on numerous cases of derivatives transactions that have come before various courts globally, it is clear they often involve parties that are based in different jurisdictions. This paper therefore begins with a general explanation of the applicable rules of private international law that would apply to determine the governing law of the contract between the parties, the forum for deciding disputes and the applicable rules of evidence. How these rules would apply in the context of the uncollateralized DLT transaction will then be considered.

How a Court Determines the Governing Law of a Contract

The Irish courts will apply the Rome I Regulation[17] to determine the law applicable to contracts that fall within its scope. Pursuant to Article 3(1) of the Rome I Regulation, parties to a contract are generally free to choose the law that will govern their contract and it need not be the law of a European Union (EU) member state.

The parties may only choose the law of a country and not some non-national system of law, such as the *lex mercatoria*, 'general principles of law' or public international law[18]. However, they are free to incorporate such non-national principles into their contract by reference[19]. The parties' choice of law may be expressly stated or clearly demonstrated by the terms of the contract or the circumstances of the case[20].

The Rome I Regulation specifies certain matters that fall outside its scope and specific limitations on the freedom of the parties to choose the law applicable to their contracts.

The matters outside the scope of the Rome I Regulation include[21]:

- Issues of legal capacity to contract[22];
- Obligations under negotiable instruments to the extent they arise out of their negotiable character[23];
- Arbitration agreements and agreements on the choice of court[24];
- The constitution of trusts and certain related relationships[25]; and
- Obligations arising out of dealings prior to the conclusion of a contract[26].

[17] Council Regulation (EC) 593/2008 of June 17, 2008 on the law applicable to contractual obligations (Rome 1) [2008] OJ L177/6, as amended by Corrigendum to Regulation (EC) 593/2008 of June 17, 2008 on the law applicable to contractual obligations (Rome I) [2008] OJ L309/87 (Rome I Regulation)

[18] *Shamil Bank of Bahrain EC v Beximco Pharmaceuticals* [2004] EWCA Civ 19, [2004] 1 WLR 1784 and *Halpern & Ors v Halpern & Anor* [2007] EWCA Civ 291, [2008] QB 195. These cases concerned the Rome Convention (convention on the law applicable to contractual obligations opened for signature in Rome on June 19, 1980 (80/934/EEC) [1980] OJ L 266/1), which preceded the Rome I Regulation. English case law is of persuasive, although not binding, authority before the Irish courts. However, the persuasive nature of these decisions is supported by the fact that European legislature considered allowing a party to choose a non-national system of law when the Rome I Regulation was being prepared and chose not to make provision for such a choice (see the proposed Article 3(3) in the European Commission's *Proposal for a Regulation of the European Parliament and the Council on the Law Applicable to Contractual Obligations (Rome I), at 14, COM (2005) 650 final (Dec. 15, 2005)*, and see also *Council of the European Union, Note from the General Secretariat to the Committee on Civil Law Matters (Contract Law), Consolidated version of the conclusion of the Council, 5784/09 (January 27, 2009)*

[19] Rome I Regulation, recital 13

[20] *ibid, art 3(1)*

[21] See Rome I Regulation, art 1(2) for all such matters

[22] *ibid, art 1(2)(a) and (f)*

[23] ibid, art 1(2)(d)

[24] *ibid, art 1(2)(e)*

[25] *ibid, art 1(2)(h)*

[26] *ibid, art 1(2)(i)*

More generally, Article 1(1) of the Rome I Regulation limits its application to *"contractual obligations in civil and commercial matters. It shall not apply, in particular, to revenue, customs or administrative matters."*

Given (a) the commonality of terminology between Article 1(1) of the Rome I Regulation and Article 1(1) of the Brussels Regulation Recast[27], and (b) the terms of recital (7) of the Rome I Regulation, which specifies that the substantive scope and provisions of the Rome I Regulation should be consistent with Council Regulation (EC) No 44/2001 (now replaced by the Brussels Regulation Recast), the rules of interpretation applicable to Article 1(1) of the Brussels I Regulation Recast apply equally to Article 1(1) of the Rome I Regulation[28].

The Rome I Regulation is a legislative measure of the EU. Decisions of the Court of Justice of the European Union (CJEU) interpreting the Rome I Regulation are therefore authoritative and binding on the Irish courts. In addition, terms and concepts used in the Rome I Regulation must be given an autonomous meaning, so the courts of all member states apply the legislation in a uniform manner[29].

Taking these principles and relevant case law of the CJEU into account, the Irish courts[30] have identified various relevant factors in determining what constitutes matters of a civil and commercial nature. In particular, they have identified the principles applicable in determining whether a matter involves an exercise of state authority (*acta iure imperii*), meaning it falls outside the scope of the Rome I Regulation[31].

The Rome I Regulation limits the efficacy of the parties' choice of law in the following circumstances.

- If all other elements relevant to the situation at the time of the choice are located in a country other than the country of the law that was chosen, then the choice of law cannot prejudice the application of mandatory laws of that other country[32];
- If all elements relevant to the situation at the time of the choice are located in one or more EU member states (which, for this purpose, includes Denmark[33]), then the choice of a non-member state law cannot prejudice the application of mandatory provisions of EU law where appropriate as implemented in the member state of the forum[34];

[27] Council Regulation (EC) 1215/2012 of December 12, 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (recast) [2012] OJ L351/1, as extended pursuant to agreement on the subject of Council Decision 2006/325/EC of April 27, 2006 concerning the conclusion of the agreement between the European Community and the Kingdom of Denmark on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2006] OJ L120/22 (Brussels Regulation Recast)

[28] Colclough v The Association of Chartered Certified Accountants [2018] IEHC 85 [34] – [36] (Barrett J)

[29] Case C-135/15 Republik Griechenland v Grigorios Nikiforidis [2016] OJ C475/4

[30] *Colclough* (n 28) [38] (Barrett J)

[31] These include: (i) an action founded on provisions by which the legislature conferred on the public body a prerogative of its own cannot be regarded as being brought in 'civil matters'; (ii) the concept of 'civil matters' only encompasses an action provided that the basis and the detailed rules relating to the bringing of that action are governed by the rules of the ordinary law; (iii) actions between a public authority and a person governed by private law are out of scope only in so far as that authority is acting in the exercise of public powers; (iv) the concept of 'civil and commercial' must be interpreted to ensure the rights and obligations deriving from the regulations are equal and uniform; it must not be interpreted as a mere reference to the internal law of one or other of the states concerned and must be regarded as an autonomous concept to be interpreted by reference, first, to the objectives and scheme of that regulation and, second, to the general principles that stem from the corpus of the national legal systems; (v) the concept of revenue, customs or administrative matters must be assimilated to the concept of a public authority acting in the exercise of its powers

[32] Rome I Regulation, art 3(3)

[33] ibid, art 1(4)

[34] ibid, art 3(4)

- The parties' choice of law will not affect the application of *"overriding mandatory provisions"* of the law of the forum[35]. These are *"provisions the respect for which is regarded as crucial by a country for safeguarding its public interests, such as its political, social or economic organisation, to such an extent that they are applicable to any situation falling within their scope, irrespective of the law otherwise applicable to the contract under this Regulation"*[36]; and

- Effect may be given to the overriding mandatory provisions of the law of the country where contractual obligations have to be or have been performed, if those provisions render the performance of the contract unlawful. In determining whether to give effect to any such overriding mandatory provisions, the court must have regard to their nature and purpose and the consequences of their application or non-application[37].

The CJEU has acknowledged that, as a derogating measure, Article 9 of the Rome I Regulation must be interpreted strictly. It has also acknowledged that the list of the overriding mandatory provisions to which the court of the forum may give effect is exhaustive, and that Article 9 must be interpreted as precluding the court of the forum from applying, as legal rules, overriding mandatory provisions other than those of the state of the forum or the state where the obligations arising out of the contract have to be or have been performed[38].

As previously indicated, where the parties have not expressly agreed the choice of law to govern their contract, a court may determine that their choice is *"clearly demonstrated by the terms of the contract or the circumstances of the case"*[39]. In this regard, the leading textbook on English conflicts of law rules, Dicey, Morris & Collins, *The Conflict of Laws* (Dicey)[40], suggests the conduct of the parties subsequent to the formation of the contract can be taken into account to determine the parties' intentions at the time it was agreed. There is no Irish judicial authority or decision of the CJEU supporting (or contradicting) this view. However, in the absence of relevant Irish judicial authority or a CJEU decision on conflicts of law issues, the Irish courts often have regard to the relevant principle stated in Dicey as persuasive[41].

Article 4 of the Rome I Regulation sets out the rules that apply to determine the law governing the contract where the parties have not made an express or implied choice of law.

- Article 4(1) sets out the approach to be adopted in eight specific types of contract. Those most likely to be relevant in the context of the arrangements under consideration are:

    - A contract for the sale of goods or the provision of services is governed by the law of the country where the seller or service provider, as applicable, has its habitual residence;

    - A contract concluded within a multilateral system that brings together or facilitates the bringing together of multiple third-party buying and selling interests in financial instruments[42], in accordance with non-discretionary rules and governed by a single law, shall be governed by that law.

[35] ibid, art 9(2)

[36] ibid, art 9(1)

[37] ibid, art 9(3)

[38] *Colclough* (n 28) [55] (Barrett J)

[39] Rome I Regulation, art 3(1)

[40] (15th edn, Sweet and Maxwell, 2012) at paragraphs 32-037 and 32-059

[41] Any such regard will, however, be on a considered basis in light of the specific circumstances of the case before the Irish court, as is clear from the judgment in *Re Flightlease (Ireland) Ltd (In Voluntary Liquidation)* [2012] IESC 12, [2012] 1 IR 722 [78] – [79], [83], [90] (O'Donnell J)

[42] Council Directive 2014/65/EU of May 15, 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EC (recast) [2014] OJ L173/349 (MiFID II), art 4(1) point 15 and Section C of Annex I

- Article 4(2) specifies that where a contract is not covered by the eight types of contract addressed by Article 4(1), or where the elements of the contract would be covered by more than one of those types, the contract shall be governed by the law of the country where the party required to effect the characteristic performance of the contract has its habitual residence. In this regard, the Irish High Court has determined[43] that:
    - In the case of a bilateral contract requiring the payment of money by one party, it is well established that such payment does not represent the characteristic performance of the contract[44].
    - As Dicey (at para. 32-077) explains: *"It is the performance for which the payment is due which is characteristic of the contract."*
- Pursuant to Article 4(3), where it is clear from all the circumstances of the case that the contract is manifestly more closely connected with a country other than that indicated in Articles 4(1) or (2), the law of that other country shall apply.
- Pursuant to Article 4(4), where the law applicable cannot be determined pursuant to Articles 4(1) or (2), the contract shall be governed by the law of the country with which it is most closely connected.

The Irish courts have emphasized that Article 4(4) will only apply where the applicable law cannot be determined pursuant to Article 4(1) or 4(2)[45].

In cases falling outside the Rome I Regulation, the Irish courts will give effect to the parties' express choice of law in their contract. We are unaware of any decision where the Irish courts have refused to give effect to an express choice of law on the basis that the contract had no connection to the legal system chosen by the parties[46], although it is possible an Irish court would refuse to apply a law that conflicted with important principles of Irish public policy or fundamental rights. In the absence of an express choice of law, the Irish court will apply the legal system with which the contract is most closely connected, or the 'proper law of the contract'[47].

How a Court Determines the Appropriate Jurisdiction for a Dispute Regarding Contractual Obligations

The approach taken will depend on whether the parties have contractually agreed on the courts to have jurisdiction and whether any of the 1968 Brussels Convention[48], the 2007 Lugano Convention[49], the Brussels Regulation Recast[50] or the Hague Convention[51] applies.

[43] UniCredit Global Leasing Export GMBH v Business Aviation Ltd & Aviareto Limited [2019] IEHC 139 [69] – [71] (McDonald J)

[44] See, for example, Dicey, Vol. 2 at para. 32-077

[45] ibid [73] (McDonald J)

[46] Kutchera v Buckingham International Holdings Ltd [1988] IR 61 (SC)

[47] Cripps Warburg v Cologne Investment [1980] IR 321 (HC)

[48] 1968 Brussels Convention on jurisdiction and the enforcement of judgments in civil and commercial matters [1972] OJ L299/32 (including the protocol annexed to that convention). The 1968 Brussels Convention has the force of law in Ireland by virtue of the Jurisdiction of Courts and Enforcement of Judgments Act 1998

[49] Convention on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2007] OJ L339/3 and concluded on behalf of the European Community pursuant to Council Decision 2009/430/EC of November 27, 2008 concerning the conclusion of the convention on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2009] OJ L147/1 and the protocols and annexes thereto, which has the force of law in Ireland pursuant to the Jurisdiction of Courts and Enforcement of Judgments (Amendment) Act 2012

[50] Brussels Regulation Recast (n 27)

[51] Hague Convention of June 30, 2005 on Choice of Court Agreements, which has the force of law in Ireland pursuant to the Choice of Court (Hague Convention) Act 2015

Assuming none of the foregoing apply, if the parties have contractually agreed on the courts to have jurisdiction, the Irish courts have accepted[52] that effect will be given to it unless a party can show strong reasons to depart from that contractual agreement. Whether a party could show strong enough reasons to displace the other party's prima facie entitlement to enforce that contractual agreement would depend on the facts and circumstances of the particular case.

In cases not governed by the Brussels Regulation Recast or the Brussels, Lugano or Hague Convention, the Irish courts[53] have confirmed that the key principles (as identified in Dicey[54]) on the circumstances in which the English courts will exercise their jurisdiction in cases involving an international element are equally applicable in Irish law.

- The party arguing for a stay of proceedings or for permission to serve proceedings out of the jurisdiction bears the legal burden of proof. However, any party seeking to establish the existence of matters relevant to an exercise of the court's discretion in its favor bears an evidential burden of proof.

- If the court is satisfied that there is another available forum that is clearly a more appropriate forum for the trial of the action, then the burden will shift to the other party to show special circumstances whereby justice requires the trial to take place in Ireland.

- The party arguing for a stay must show that Ireland is not the natural or appropriate forum and there is another forum that is clearly or distinctly more appropriate than the Irish forum.

- The forum with which the action has the most real and substantial connection is the 'natural forum'. Factors identifying that forum include those affecting convenience or expense (such as availability of witnesses), the law governing the transaction and the places where the parties reside or carry on business. Other factors are whether the claim is part of a larger overall dispute, and whether the resolution of that claim would be damaged by being fragmented.

- If the court does not identify a clearly more appropriate forum for the trial of the action on the basis of these factors, then it will ordinarily refuse a stay.

- If the court concludes there is another available forum which prima facie is clearly more appropriate, then it will ordinarily grant a stay. The exception is when, taking all circumstances of the case into account[55], justice requires that a stay should not be granted.

[52] Abama & Others v Gama Construction Ireland Ltd & Another [2011] IEHC 308, referring to the decision of the English House of Lords in Donohue v Armco [2001] UKHL 64, [2002] 1 All ER 749. Microsoft Ireland Operations Ltd v EMI International Electronics Ltd & Ors [2010] IEHC 228, following Kutchera (n 46), a decision of the Supreme Court. The High Court decision in Abama emphasized that an Irish court has no discretion to uphold a contractual submission by the parties to the jurisdiction of the courts of another country if doing so would require the Irish court to decline jurisdiction in proceedings where, pursuant to the Brussels Recast Regulation, it had a mandatory jurisdiction. This was upheld by the Court of Appeal in Abama v Gama Construction (Ireland) Ltd and Others [2015] IECA 179 [37] – [40] (Peart J) and cited with approval in Vodafone GMBH v IV International Leasing & Another [2017] IEHC 160 [176] – [179] (Barrett J). It is our view that this approach to the mandatory jurisdiction pursuant to the Brussels Recast Regulation would not apply so as to prevent the Irish courts from upholding a contractual submission to the jurisdiction of the courts of another country if that contractual submission benefited from protections afforded by the Hague Convention, 1968 Brussels Convention (see Article 68 of the Brussels Regulation Recast) or 2007 Lugano Convention (see Article 73 of the Brussels Regulation Recast. This is based on certain CJEU case law that by analogy supports a view that secondary EU legislation, such as the Brussels Regulation Recast, may not conflict with international treaties entered into by the EU that have direct effect (see among other authorities Joined Cases C-300/98 and C-392/98 Dior and Others [2000] ECR I-11307)

[53] Irish Bank Resolution Corporation Limited & Others v Quinn & Others [2016] IESC 50, [2016] 3 IR 197 [66] – [67] (Clarke J); Dunne (A Bankrupt) v Dunne [2018] IEHC 536 [13], [17] (McGovern J); Irish Bank Resolution Corporation Limited & Others v Quinn & Others [2013] IEHC 1

[54] Op. cit

[55] Including the circumstances that go beyond those taken into account when considering connecting factors with other jurisdictions

- A stay will not be refused simply because a party will thereby be deprived of "a legitimate personal or juridical advantage" if the court is satisfied that substantial justice will be achieved in the clearly more appropriate forum that has been identified.

The common law position described above is not applicable where the claim in question is subject to any of the 1968 Brussels Convention, the 1988 Lugano Convention, the Brussels Regulation Recast or the Hague Convention. Each of these legislative instruments provides a mandatory code that determines which courts have jurisdiction. The discretion of the courts is limited and is specified in the legislative instrument itself.

Perhaps most significantly, if a contractual choice of court agreement comes within the scope of the Brussels Regulation Recast, then the Irish courts would give effect to that agreement. They could not, contrary to that agreement[56], stay an action on the basis that the courts of some other non-EU member state are a more appropriate forum, save in the limited circumstances set out in Articles 33 and 34 of the Brussels Regulation Recast. In cases governed by the Brussels Regulation Recast, the Irish courts[57] have acknowledged the following, reflecting the approach taken by the CJEU[58]:

- The common law doctrine of forum non conveniens no longer forms part of Irish law; and

- The Irish courts have no discretion to uphold a contractual submission by the parties to the jurisdiction of the courts of another country if doing so would require an Irish court to decline jurisdiction in proceedings where, pursuant to the Brussels Recast Regulation, it had a mandatory jurisdiction[59].

The nature of the claims that are within scope of the Brussels Regulation Recast are limited to civil and commercial matters. Article 1(2) of the Brussels Regulation Recast expressly excludes from its ambit certain types of claim, which seem unlikely to be of direct relevance to the potential claims under consideration in this paper[60].

The Brussels Regulation Recast also incorporates special rules regarding the courts having jurisdiction in proceedings relating to various matters that seem unlikely to be of direct relevance to the potential claims under consideration[61].

[56] Assuming such agreement is not null and void as to its substantive validity as a matter of the law of the jurisdiction that the parties have purported to choose (here Irish law), Article 25(1) Brussels Regulation Recast

[57] SGB Finance SA v The Owners and all Persons Claiming an Interest in the MV 'Connoisseur' [2018] IEHC 699 [60] (McDonald J); Vodafone (n 52); Abama v Gama Construction (Ireland) Ltd and Others [2015] IECA 179 [40] (Peart J)

[58] Case C-281/02 *Owusu v Jackson* [2005] ECR I-1383. The *Owusu* case addressed the position under the 1968 Brussels Convention, and the Irish Courts have confirmed that the same conclusion applies in respect of the Brussels Regulation Recast

[59] See footnote 52

[60] The status or legal capacity of natural persons, rights in property arising out of a matrimonial relationship or out of a relationship deemed by the law applicable to such relationship to have comparable effects to marriage; bankruptcy, proceedings relating to the winding-up of insolvent companies or other legal persons, judicial arrangements, compositions and analogous proceedings; social security; arbitration; maintenance obligations arising from a family relationship, parentage, marriage or affinity; wills and succession, including maintenance obligations arising by reason of death

[61] For example, employee and consumer claims; in rem rights or tenancies of land or property located in a member state; issues relating to the constitution, and validity of decisions of the organs, of relating to certain types of entities incorporated or organized under the laws of a member state; disputes relating to the validity of entries in public registers that are maintained in a member state; proceedings relating to the enforcement of an existing judgment of a member state.

The Hague Convention may provide a further basis for upholding a contractual choice of court agreement to which the Brussels Regulation Recast does not apply[62]. The Hague Convention encompasses certain exclusive choice of court agreements. A choice of court agreement is deemed to be exclusive for this purpose unless the parties expressly provide otherwise. The Hague Convention is expressed to apply in "international cases" to exclusive choice of court agreements "concluded in civil or commercial matters". Cases are international unless the parties are resident in the same contracting state and the relationship of the parties and all other elements relevant to the dispute, regardless of the location of the chosen court, are connected only with that contracting state.

If a contractual choice of court agreement comes within the scope of the Hague Convention, and while the issue has not been the subject of any decided authority, the Irish courts would likely give effect to that agreement[63] and would not, contrary to that agreement[64], decline to exercise jurisdiction on the basis that the courts of some other jurisdiction are a more appropriate forum[65].

There is no binding or persuasive judicial authority in Ireland regarding the interpretation of 'civil or commercial matters' for the purposes of the Hague Convention. While one might expect the Hague Convention to be interpreted in this regard harmoniously with other relevant international instruments, it is possible in principle for different conclusions to be reached on the issues.

The Hague Convention expressly excludes from its ambit certain types of choice of court agreement and claim that seem unlikely to be of direct relevance to the potential claims under consideration in this paper[66]. Unlike the Brussels Regulation Recast, there is no central judicial authority for the purpose of pronouncing on the Hague Convention. If the matter came before an Irish court, it would therefore be a matter for that Irish court to decide any issue of interpretation, although any decisions rendered by the courts of other contracting states under the Hague Convention would have particularly persuasive authority.

[62] There may appear to be some conflict between Article 25 of the Brussels Regulation Recast and Article 26.6 of the Hague Convention, in that pursuant to the Brussels Regulation Recast, it applies in every case. However, pursuant to the Hague Convention, the Brussels Regulation Recast is displaced only where all of the parties are resident in the EU (so that presumably the Hague Convention is intended to displace the Brussels Regulation Recast where one or more of the parties is resident outside the EU). Should a conflict arise regarding which of the Hague Convention and the Brussels Regulation Recast would apply to a claim, and assuming that all other requirements for the application of Brussels Regulation Recast are met, we are of the view that an Irish court would apply the Brussels Regulation Recast in determining whether to recognize the contractual submission to the exclusive jurisdiction of a court of a EU member state

[63] Hague Convention (n 51) art 5(1)

[64] Assuming such agreement is not null and void as a matter of the law of the jurisdiction that the parties have purported to choose (here Irish law), pursuant to Article 25(1) of the Brussels Regulation Recast

[65] Hague Convention (n 51) art 5(2)

[66] Choice of court agreements to which a consumer is a party, or relating to contracts of employment, including collective agreements, are excluded. The Hague Convention does not apply the status and legal capacity of natural persons; maintenance obligations and other family law matters; wills and succession; insolvency, composition and analogous matters; the carriage of passengers and goods; marine pollution, limitation of liability for maritime claims, general average, and emergency towage and salvage; anti-trust (competition) matters; liability for nuclear damage; claims for personal injury brought by or on behalf of natural persons; tort or delict claims for damage to tangible property that do not arise from a contractual relationship; rights in rem in immovable property, and tenancies of immovable property; the validity, nullity or dissolution of legal persons, and the validity of decisions of their organs; the validity of intellectual property rights other than copyright and related rights; infringement of intellectual property rights other than copyright and related rights, except where infringement proceedings are brought for breach of a contract between the parties relating to such rights, or could have been brought for breach of that contract; the validity of entries in public registers

The 1968 Brussels Convention continues to have a limited application with respect to disputes, including contractual disputes, involving certain dependencies of France and the Netherlands (Aruba). The Lugano Convention has application to disputes, including contractual disputes, with respect to Iceland, Norway and Switzerland. These apply to disputes in civil and commercial matters[67], and expressly exclude from their ambit certain types of claim[68]. They also incorporate special rules regarding the courts having jurisdiction in proceedings relating to various matters, which seem unlikely to be of direct relevance to the potential claims under consideration.

While there is some question over whether the 1968 Brussels Convention encompassed a contractual agreement by the parties to submit to the non-exclusive jurisdiction of the courts of a contracting state to that convention[69], there is Irish judicial authority upholding a non-exclusive submission to jurisdiction clause in the context of the Brussels Convention[70].

If the Lugano or Brussels Convention were to apply, decisions of the CJEU remain binding on EU member states (including Ireland) in interpreting those conventions. The decision in *Owusu* in particular would therefore apply in the same way to both the Lugano and Brussels Convention as described above in respect of the Brussels Regulation Recast – namely: (i) the common law doctrine of *forum non conveniens* would not be relevant; and (ii) the Irish courts would have no discretion to uphold a contractual submission by the parties to the jurisdiction of the courts of another country if doing so would require an Irish court to decline jurisdiction in proceedings where, pursuant to either the Lugano or Brussels Convention, it had a mandatory jurisdiction.

Admissibility of Evidence in Electronic Form

Once the governing law of a contract has been determined, together with the courts that will have jurisdiction to hear any dispute, the ability of one of the parties to enforce the terms of the contract, such as a derivatives transaction that is documented on a DLT platform, will depend on:

- Whether a contract in such electronic form is enforceable pursuant to the governing law of the contract; and
- Whether a contract in such electronic form will be admissible in evidence in the relevant courts.

In the absence of any legal requirement specific to a particular contract or class of contracts to which it belongs, Irish law does not require contracts to be written, to take any particular form or to be executed in any particular manner. They can be entered into orally or by conduct (subject to the below) or otherwise, provided there is offer and acceptance, consideration, certainty of terms and an intention to be legally bound.

[67] 1968 Brussels Convention (n 48) art 1 and Convention on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (Lugano Convention) [2009] OJ L147/5, art 1(1)

[68] See, for example, Article 1 of the 1968 Brussels Convention and Article 1(2) of the Lugano Convention

[69] Given the terms of Article 17 of the 1968 Brussels Convention

[70] GPA Group plc v Bank of Ireland [1992] 2 IR 408 (HC)

In principle, therefore, there are no restrictions on parties electronically entering into a simple contract (ie, not a deed) that is not subject to such specific legal requirements. Most classes of contract to which such legal requirements apply are unlikely to encompass derivatives transactions entered into under an ISDA Master Agreement, but that will depend on the specific terms of the parties' agreement[71]. Where a transaction falls within such a class, consideration must be given to whether the formal requirement in question can be met by electronic means in the context of the specific requirement and circumstances.

Further support for the documentation of contracts in electronic form is provided by section 19 of the Electronic Commerce Act 2000 (the E-Commerce Act). Unless excluded from the ambit of the E-Commerce Act, this expressly permits the formation and conclusion of contracts in electronic form, stating that *"an electronic contract shall not be denied legal effect, validity or enforceability solely on the grounds that it is wholly or partly in electronic form, or has been concluded wholly or partly by way of an electronic communication".*

Most of the categories of agreement that are excluded from the ambit of the E-Commerce Act[72] should not affect a derivatives transaction documented on a DLT platform. However, that will depend on the specific terms of that transaction[73].

In relation to the admissibility of electronic records in court proceedings in Ireland, section 22 of the E-Commerce Act provides that:

> "… nothing in the application of the rules of evidence shall apply so as to deny the admissibility in evidence of –
>
> (a) an electronic communication, an electronic form of a document, an electronic contract, or writing in electronic form … on the sole ground that it is an electronic communication, an electronic form of a document, an electronic contract, or writing in electronic form, or … if it is the best evidence that the person or public body adducing it could reasonably be expected to obtain, on the grounds that it is not in its original form, or

[71] Examples include: (i) section II of the Statute of Frauds 1695 requires certain documents to be in writing or evidenced in writing and signed, including guarantees, and any agreement not to be performed within one year of the making of the agreement (but section 4(3) of the Netting of Financial Contracts Act 1995 disapplies Section II with respect to 'financial contracts' within the meaning of that act, which financial contracts encompass a broad range of derivatives transactions and title transfer collateral arrangements); (ii) section 28(6) of the Supreme Court of Judicature (Ireland) Act 1877 requires a legal assignment of a debt or other chose in action to be in writing; (iii) section 51 of the Land and Conveyancing Law Reform Act 2009 requires a contract for sale or other disposition of land to be in writing; (iv) section 4 of the Sale of Goods Act 1893 provides that a contract for the sale of goods, with a value of over €12.70 is not enforceable unless the buyer has accepted part of the goods, made part payment or given something in earnest to bind the contract, or unless in writing or evidenced in writing (v) Article 7 of schedule 1 of the Arbitration Act 2010 requires written evidence of an arbitration agreement; and (vi) section 120(3) of the Copyright and Related Rights Act 2000 provides that an assignment of copyright is not effective unless in writing

[72] Pursuant to section 10 of the E-Commerce Act, these encompass: (i) a will, codicil or any other testamentary instrument to which the Succession Act 1965 applies; (ii) a trust; (iii) an enduring power of attorney; (iv) any legal instrument that involves the creation, acquisition, disposal or registration of an interest in real property (including a leasehold interest), other than contracts for the creation, acquisition or disposal of such interests; (v) affidavits and statutory or sworn declarations; and (vi) the rules, practices and procedures of a court or tribunal. An enduring power of attorney is a particular type of power of attorney that, among other criteria, must contain a statement by the donor to the effect that the donor intends the power to be effective during any subsequent mental incapacity of the donor

[73] For example, to the extent the parties' agreement in respect of any such derivatives transaction involves a trust, reliance cannot be placed on the E-Commerce Act in support of effecting the creation, execution, amendment, variation or revocation of that trust electronically. However, it could be concluded that the specific legal requirements applicable to any such creation, execution, amendment, variation or revocation could be satisfied by certain electronic means. Indeed, there is no general requirement that trusts be made or evidenced in writing, although such a requirement may arise depending on the specific circumstances (for example, if the trust assets encompassed real property) and an assignment of a trust is required to be in writing and signed by the party assigning it (Section VI of the Statute of Frauds 1695)

> (b) an electronic signature … on the sole ground that the signature is in electronic form, or is not an advanced electronic signature, or is not based on a qualified certificate, or is not based on a qualified certificate issued by an accredited certification service provider, or is not created by a secure signature creation device, or … if it is the best evidence that the person or public body adducing it could reasonably be expected to obtain, on the grounds that it is not in its original form."

Therefore, the fact that a derivatives transaction is documented electronically on a DLT platform should not, in itself, prevent its admission in evidence before the Irish courts, assuming the transaction and the parties' agreement in respect thereof is capable of being reproduced in a form that is capable of being read by the courts[74].

However, it is important to note that section 22 does not exempt electronic documents from the rules of evidence. Rather, it merely specifies that a rule of evidence may not prevent the information or document being admissible purely because it is in electronic form. Any other reason for making a document inadmissible under the rules of evidence would still apply – eg, a document is not relevant to the issues in the proceedings or, even if it is relevant, is not admissible for some reason unconnected with its electronic character (such as legal professional privilege). Electronic evidence must therefore still meet the ordinary rules of evidence.

Disputes Involving the Parties to the Uncollateralized DLT Transaction

The ISDA Master Agreement provides an explicit choice of governing law by the contracting parties, and the implementation and execution of the uncollateralized DLT transaction on Corda is premised on the existence of this agreement.

In addition, the Corda platform is premised on the legal identity of the parties being tied to the nodes transacting on a trading platform. Based on the explanation of the applicable private international law rules, there is no reason to believe that a court in Ireland would not give effect to the parties' express choice of law under the ISDA Master Agreement (whether Irish, English, New York or French law) if any disagreement arose between them with respect to a transaction. Nor is there anything to suggest the parties' express choice of law would be disapplied by an Irish court, whether due to the operation of the terms of EU law, overriding provisions of Irish law or Irish public policy.

A derivatives transaction may be implemented on a CorDapp that has little connection to the country of the law that has been selected by the parties to the transaction as the governing law. For instance, the parties may have expressly settled on Irish law pursuant to the ISDA Master Agreement, but the parties and the CorDapp may have no connection to Ireland – the computer systems on which the CorDapp runs may not be physically located in Ireland. The question then arises whether this is a ground on which the parties' choice of law might be disapplied by an Irish court.

This should not be the case in our view. Under Irish law and in a case governed by the Rome I Regulation, for a court to disregard the parties' express choice of law, it would have to find that all the elements relevant to the situation are located in a country other than the choice-of-law country, pursuant to Article 3(3) of the Rome I Regulation.

[74] The Irish Law Reform Commission in 2009 recommended the abolition of the 'best evidence rule' (ie, the rule of evidence that an original piece of evidence, particularly a document, is superior to a copy and that if the original is available, a copy will not be allowed as evidence in civil or criminal proceedings). Despite this recommendation, the best evidence rule remains in effect in practice, although it has been stated in *Ulster Bank v O'Brien* ([2015] IESC 96, [2015] 2 IR 656 [53] (MacMenamin J)) that it is a test of weight and not admissibility. Where a hard copy of the documentation does not exist, then documentation in electronic form should constitute best evidence

There is no judicial statement of binding authority in Ireland on the interpretation of that concept, but the Irish courts would likely treat the decision of the Court of Appeal of England and Wales in *Dexia Crediop SpA v Comune di Prato*[75] as persuasive authority.

That case concerned the Rome Convention and is therefore of particularly persuasive authority given the provisions of the Rome I Regulation are identical in all material respects. The Court of Appeal in that case rejected an argument based on the equivalent of this rule in the 1980 Rome Convention[76] that the choice of English law in the ISDA Master Agreement by the parties, which were both Italian, was inapplicable because all the elements relevant to the transaction were located in Italy. The court ruled that the phrase "elements relevant to the situation" includes elements that indicate an international situation, and not just elements that are local to another country[77].

Since the parties had opted to contract on the basis of the ISDA Master Agreement, which is not intended to be associated exclusively with any country, and the transaction involved back-to-back contracts with banks outside Italy, there was an international dimension to the situation. The Court of Appeal therefore determined that the choice of English law to govern the contract could not be disregarded because all elements relevant to the situation were located in Italy[78].

Given that ruling, it is likely that the Irish courts would not disregard the parties' express choice of law in the arrangements under consideration in this paper given that::

- Decisions of the English courts are of persuasive authority before the Irish courts; and
- Those arrangements share similarities with the fact pattern in Dexia; the transaction involves the ISDA Master Agreement and the use of a Corda distributed ledger based in a country other than Ireland introduces an international element to the situation,

Of course, if the parties were located in different jurisdictions, then that would provide an additional basis on which the Irish courts would determine that all elements relevant to the situation were not located in a country other than the choice-of-law country, as required by Article 3(3) of the Rome I Regulation.

It is also unlikely that an Irish court would, solely on the basis that a derivatives transaction was executed and implemented on a Corda distributed ledger based in a country other than Ireland, determine that the parties' express choice of law was not bona fide, in that it had been made solely to avoid some law that would otherwise apply to the transaction.

There could be a greater degree of uncertainty over the governing law of a transaction taking place on a permissionless distributed ledger, especially when the transaction is not backed by an off-ledger agreement and the parties are domiciled in different jurisdictions. Depending on how the system is set up, there may even be doubts about the real-world identities of the participants. Given these issues, it would seem unlikely that this type of DLT model would be suitable for the trading of derivatives transactions on a cross-border basis without greater certainty among all participants over which governing law should apply[79].

[75] [2017] EWCA Civ 428 [119]–[137]

[76] Convention on the law applicable to contractual obligations opened for signature in Rome on June 19, 1980 (80/934/EEC) [1980] OJ L 266/1, art 3(3) of which is equivalent to the Rome I Regulation, art 3(3)

[77] *Dexia* (n 75) [125]–[128] citing, among other things, *Banco Santander Totta SA v Cia Carris de Ferro de Lisboa SA* [2016] EWCA Civ 1267, [2017] 3 All ER 838 [46], [53]–[54]

[78] *Dexia* (n 75) [134]–[135]

[79] The existing uncertainty over the applicable law in this regard is acknowledged by the UKJT, *Legal statement on cryptoassets and smart contracts* (November 2019, at paragraphs 96 to 99). Although it provides valuable insight on the status of cryptoassets and smart contracts under the laws of England and Wales, the statement does not reach any conclusion on which laws apply to disputes regarding cryptoassets and which courts have jurisdiction to resolve those disputes (and acknowledges that this is a limitation on its scope. See in this regard paragraphs 89 to 99)

Disputes Involving Parties to the Uncollateralized DLT Transaction and the Platform Provider

Another category of disputes might arise from the functioning of the platform used for the derivatives transaction. Corda, like other DLT platforms, sits at the 'bottom of the stack'. This means application builders utilize Corda to build their CorDapps, with such CorDapps commonly referred to as sitting at the 'top of the stack'. It is important to note that parties using CorDapps interface with platform providers operating CorDapps at the 'top of the stack.'

It is conceivable that, due to software programming bugs or hardware issues, corrupted or otherwise incorrect data might be fed into smart contracts, or smart contracts might not function as envisaged. This would then give rise to a potential dispute between one or both of the parties to a derivatives transaction that have suffered a loss when using the CorDapp.

To participate in a Corda-enabled derivatives transaction using a CorDapp, the parties would have entered into written agreements with the platform provider containing express choices of governing law. There would generally be two types of agreements governing use of the CorDapp:

- A platform-level licensing agreement between each party and the platform provider operating the trading platform; and

- A rule book that governs the transactions.

As with the relationship between the parties to the derivatives transaction inter se, there seems no reason under current private international law rules why a court in Ireland would reject this express choice of law in the absence of any countervailing mandatory legal rule or public policy reason.

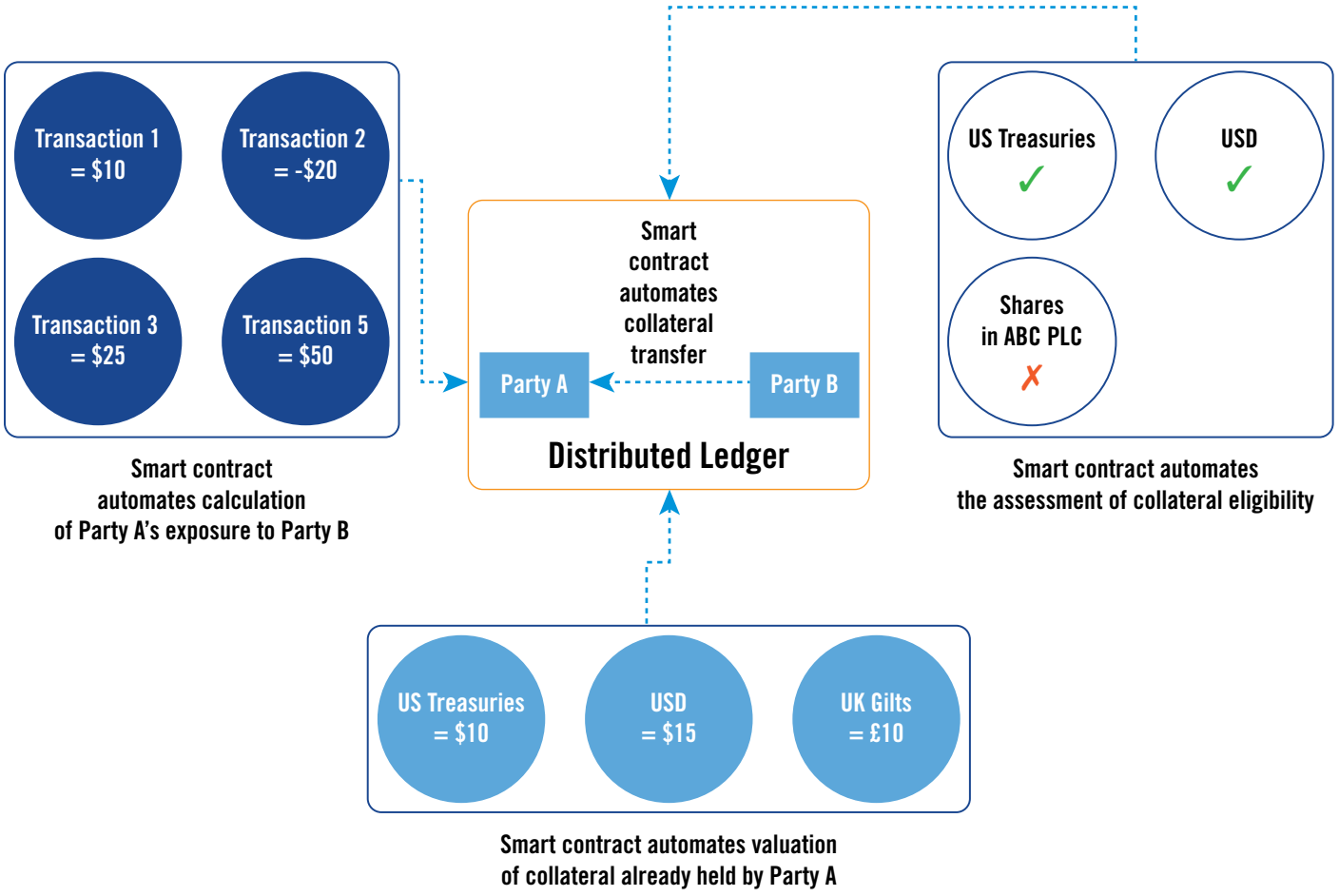
COLLATERALIZED DLT TRANSACTION

Smart Derivatives Contracts – Collateral

In September 2019, ISDA published *Legal Guidelines for Smart Derivatives Contracts: Collateral*[80]. These guidelines provide an overview of current legal standards that exist within the collateral management process, and how they can be more effectively applied to assist technology developers, collateral operations, risk management and other key stakeholders in developing technology solutions that are consistent with applicable legal and regulatory standards that govern and regulate collateral relationships and processes.

Again, these guidelines are agnostic about the types of technology and solutions that may ultimately be used. However, they do provide an illustration of a potential smart derivatives contract construct using DLT that is designed to automate certain aspects of the collateral management process.

Figure 2



[80] ISDA *Legal Guidelines for Smart Derivatives Contracts: Collateral*, https://www.isda.org/a/VTkTE/Legal-Guidelines-for-Smart-Derivatives-Contracts-Collateral.pdf

In considering the use of DLT in this context, it is useful to recall the distinction made in the ISDA *Legal Guidelines for Smart Derivatives Contracts: Introduction*[81] between different types of potential DLT implementation that could support smart derivatives contracts. In the context of collateral management, a system designed as a 'light chain' would not house any collateral, whereas a system designed as a 'heavy chain' would be able to support the key operational mechanisms of the ISDA collateral documentation. Figure 2 illustrates how, under a heavy chain implementation, the platform could house tokenized collateral assets that are native to a DLT platform and could support the transfer of such assets between the parties.

The guidelines note the importance of understanding the precise nature and location of these digitized assets, as well as any security or ownership rights attached to them. The paper also observes that achieving legal certainty in this area will be vital in assessing the efficacy of any system that supports the key operational mechanisms of the collateral management process.

This paper will explore the relevant private international law issues relating to the *situs* of digital assets by reference to a collateralized DLT transaction.

[81] Above, n 7

The Collateralized DLT Transaction

Implementation of the collateralised DLT transaction on Corda would be achieved in much the same way as the uncollateralized DLT transaction[82].

In this example, the parties to the collateralized DLT transaction will have again negotiated the terms of their relationship under the ISDA Master Agreement and documented the economic terms relating to the interest rate swap under a transaction confirmation. The parties would also have entered into a form of Credit Support Annex (CSA) published by ISDA[83].

In addition, the parties would enter into a platform agreement with the platform provider as the operator of the CorDapp.

As with the uncollateralized DLT transaction, the parties would become 'nodes' on Corda and would use a CorDapp to execute the transaction and any collateral obligation arising from it.

In this example, the CSA would be a state object in addition to the ISDA Master Agreement and transaction confirmation. A separate Corda contract would be required, setting out the various rules governing the CSA state object. For example:

> "Eligible collateral must be [a specified asset]."

The structure, set-up and execution of the collateralized DLT transaction would happen in much the same way as for the uncollateralized DLT transaction, except it is likely that collateral settlement would take place on a much more frequent basis.

It is also possible that the collateral assets could be documented as tokens[84] – whether as the representation of a real-world collateral asset that is held and transferred off-ledger, or some form of digital asset that could possess value in and of itself and could therefore be used as collateral without any corresponding real-world asset. Tokens possessing intrinsic value could be used to settle transactions without the need for any off-ledger fund transfers. This paper will explore potential issues arising under each of these scenarios.

[82] See Uncollateralized DLT Transaction section

[83] Discussion of the different types of ISDA collateral documentation can be found in the ISDA *Legal Guidelines for Smart Derivatives Contracts: Collateral* paper, https://www.isda.org/a/VTkTE/Legal-Guidelines-for-Smart-Derivatives-Contracts-Collateral.pdf

[84] A 'token' is a type of state object that is classified as a digital asset and that has an owner

Private International Law Rules Relating to Property Interests in Securities

In accordance with general conflict-of-laws rules of Ireland (and subject to certain circumstances specifically addressed by legislation), the relevant law governing the creation and maintenance of property rights in securities is the law of the location (*lex situs*) of the securities. If the law governing the creation of those securities is different to that of the location of those securities, the law governing the creation of those assets may also need to be taken into account.

There is very little relevant Irish authority as to how the location of certain types of assets may be established for the purpose of determining the law of the *lex situs*. On the basis of available authority, English judicial authority (which is of persuasive, but not binding, authority before the Irish courts) and academic commentary that is likely to be treated as persuasive before the Irish courts[85], it is our view that the following represents the better view (which, however, for the foregoing reasons cannot be expressed with a high level of certainty) of the current law in respect of the location of securities comprising:

- Equity securities transferable by registration: The place where the relevant register[86] (or principal register where there is more than one) is located[87]. It could also possibly be the jurisdiction of incorporation of the issuer (the *lex incorporationis*) if different[88].

- Debt securities transferable by registration: The place where the relevant register (or principal register where there is more than one) is located[89]. It could also possibly be the governing law of the contract or instrument pursuant to which the securities are constituted. Where such issue is governed by statute rather than contract or instrument, it could be the jurisdiction of the relevant statute.

- Equity securities in bearer form and transferable by delivery: The *lex incorporationis*[90]. If different, it could possibly be the place where the bearer instrument is located[91].

[85] See, for example, the earlier comments on the Irish courts and their regards for the principles identified in the leading textbook on English conflicts of law rules: Dicey (15th edn, Sweet & Maxwell 2012)

[86] The Supreme Court of the Irish Free State in *Re Ferguson* [1935] IR 21 (SC) 65 - 66 endorsed what it held to be settled law – that the situs of shares in a company was the place where the register of shareholders was kept in accordance with the law (the issue of bearer shares, or dematerialized shares, did not arise for consideration). It further confirmed that the same principles applied regardless of whether the interest the location of which was to be determined comprised either, or both, of the legal and beneficial interest in such shares

[87] The decision in Re Ferguson, ibid, approved the decision of Eve J in Re *Aschrott, Clifton v Strauss* [1927] 1 Ch 313 insofar as Eve J confirmed, in the case of shares of companies registered in South Africa and America but having offices in England where certificates could be produced, transfers passed, and the names of transferees entered on the register, to be property situate in the UK on the basis that "[p]rima facie their locality, and in particular in those cases where the certificates were within the jurisdiction, was in [the UK]. The evidence of title is the register, and according to the case of Attorney-General v. Higgins [2 H. & N. 339], that determines the locality of the shares". It is notable that the decision in Re *Aschrott* did not distinguish between a principal and other registers, in circumstances where it seems that, at least in the case of some of the shares in question, there may have been another register in the jurisdiction of incorporation of the company in question. That issue did not arise for consideration in Re Ferguson. It is stated in William Binchy, *Irish Conflicts of Law* (Bloomsbury 1988) at page 504 that where the company keeps registers in more than one country, the shares are deemed to be situated in "the country in which according to the ordinary course of business the transfer would be registered", citing in this regard Cheshire & North, *Private International Law* (10th edn, Butterworths 1979) 555. This is also supported by Dicey (15th edn, Sweet & Maxwell 2012) at 22-044

[88] Dicey (15th edn, Sweet & Maxwell 2012) at 22-045, citing Canadian authority (which may also be of persuasive authority before the Irish courts) to the effect that the law of the place of incorporation may always override the *lex situs* of the register or bearer instrument and that any attribute situs applies only by virtue of the law of the jurisdiction of incorporation and may be overridden or revoked by the latter

[89] By analogy with the position regarding shares. See also Joanna Benjamin, Interests in Securities (OUP 2000) at 7.32

[90] See footnote 89

[91] It is stated in Binchy's *Irish Conflicts of Law* (Bloomsbury 1988) at page 504 that "[s]hares are deemed to be situated "in the country where they can be effectively dealt with as between the shareholder and the company", quoting in this regard Cheshire & North on *Private International Law* (n 88) at page 554. Dicey (15th edn, Sweet & Maxwell 2012) at 22-044 confirms that bearer shares will be regarded where the relevant bearer instrument is situate

- Debt securities in bearer form and transferable by delivery: The place where the bearer instrument is located[92].

- Directly held dematerialized debt securities: The place where the statutory regime under which the securities are issued is established. It could potentially be another jurisdiction if that statutory regime specifies the laws of that other jurisdiction determine proprietary aspects of the securities, such as the creation and maintenance of property rights in those securities.

- Directly held dematerialized equity securities: The place where the statutory regime under which the securities are issued is established. It could potentially be another jurisdiction if that statutory regime specifies the laws of that other jurisdiction determine proprietary aspects of the securities, such as the creation and maintenance of property rights in those securities. Alternatively, if the place where the statutory regime under which the securities are issued is not the jurisdiction of incorporation of the issuer, it could be the *lex incorporationis*.

- Intermediated debt and equity securities[93]: This will likely depend on the characteristics of the rights that the holder of the relevant intermediated interest has against the relevant intermediary or system (referred to collectively as an 'intermediary').

Where the holder has only a contractual right against the relevant intermediary, which relates to the securities but is not a proprietary right in those securities (whether direct or indirect), the lex situs of that right (being a chose in action) will be the law of the location of the obligor. However, matters of contractual interpretation will be determined pursuant to the applicable governing law, assuming the choice of law is valid and proper. In these circumstances, the rights of the holder in respect of the 'intermediated securities' will comprise the rights of that holder against the intermediary, and not rights in or to the securities themselves. As a result, the location of such rights will depend on the law of the location of the intermediary.

However, where the holder's interest in the securities comprises a proprietary interest (including an indirect, proprietary interest in an unallocated pool of fungible assets), the Irish courts may choose to treat the location of such interest as the location of the relevant intermediary. That is likely to be the case even if the intermediary has located the securities elsewhere or holds the securities through a chain of subsidiary intermediaries, or the securities would, if they were held directly by the holder of the intermediated interest, be treated as located elsewhere[95].

This 'place of the relevant intermediary approach' (PRIMA) is a practical method that recognizes the uncertainties that would be created by opting for the actual physical location. There is little authority for this, but the view would be supported by an analysis that considered the relevant intermediary's book-entry system as analogous to a register, so the location of that relevant system/ register is the location of the securities.

[92] Binchy, *Irish Conflicts of Law* (n 92) at page 399, citing in this regard Dicey and Morris on *The Conflict of Laws* (10th edn, 1980) at 532. This is supported by Dicey (15th edn, Sweet & Maxwell 2012) at 22-040

[93] For example, held on a fungible basis with, or credited to the books of, an intermediary in a book-entry form or immobilized by their deposit within the international clearing and depositary system

[94] On its face, this appears to contradict the decision in Re Ferguson with respect to a beneficial interest held in certain equity securities (n 88), but that decision did not address equity securities held on a fungible basis with an intermediary in book-entry form. We believe an Irish court would not consider itself bound by the decision of the Supreme Court of the Irish Free State in In Re Ferguson to look through to the *lex situs* of the individual debt and equity securities in this regard. See also Dicey (15th edn, Sweet & Maxwell 2012) at 22-042; Benjamin, *Interests in Securities* (n 90) at 7.34 - 7.45

PRIMA would also reflect an approach taken, albeit in limited circumstances, in the Settlement Finality Regulations[95], the Collateral Regulations[96], the Winding-up Regulations[97], the Solvency II Irish Regulations[98], the Insurance Regulations[99], the Insolvency Regulation Recast[100] and the 2002 Hague Convention on the law applicable to certain rights in respect of securities held with an intermediary (which has not yet been signed or ratified by Ireland).

[95] European Communities (Settlement Finality) Regulations 2010, SI 624/2010, reg 11(3), which implement in Ireland Council Directive 98/26/EC of May 19, 1998 on settlement finality in payment and securities systems [1998] OJ L166/45

[96] European Communities (Financial Collateral Arrangements) Regulations 2010, SI 626/2020, reg 18, which implement in Ireland Council Directive 2002/47/EC of June 6, 2002 on financial collateral arrangements [2002] OJ L168/43

[97] European Communities (Reorganisation and Winding-up of Credit Institutions) Regulations 2011, SI 48/2011, reg 19, which implement in Ireland Directive 2001/24/EC of April 4, 2001 on the reorganization and winding up of credit institutions [2001] OJ L125/15

[98] European Union (Insurance and Reinsurance) Regulations 2015, SI 485/2015, reg 292, which implement in Ireland Council Directive 2009/138/EC of November 25, 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II) (recast) [2009] OJ L3.35/1

[99] European Communities (Reorganisation and Winding-up of Insurance Undertakings) Regulations 2003, SI 168/2003, reg 25, which implement in Ireland (among other matters) Council Directive 2001/17/EC of March 19, 2001 on the reorganization and winding-up of insurance undertakings [2001] OJ L110/28

[100] Regulation (EU) 2015/848 of May 20, 2015 on insolvency proceedings (recast) [2015] OJ L141/19, art 2(9)(ii)

Application of Private International Law Rules to the Collateralized DLT Transaction

Where Tokens Merely Record Real-world Assets

Under the most straightforward implementation of the collateralized DLT transaction, the real-world collateral assets (such as cash or securities) are not replaced with on-ledger tokens or digital assets that possess intrinsic value. Rather, the tokens merely record the various forms of collateral provided and exchanged.

If a dispute arose over the entitlement of a party to securities used as collateral, this would therefore be decided by the situs of the securities. This could be one of a number of places, depending on the particular situation. Where the securities are held on a fungible basis with, or credited to the books of, an intermediary in book-entry form or immobilized by their deposit within the international clearing and depositary system, this could potentially include the law of the country where the account with that intermediary or system is located.

Where Tokens Possess Intrinsic Value

A more complex implementation of the collateralized DLT transaction could involve the replacement of the real-world collateral assets with a form of token or digital asset that possesses intrinsic value (such as a cryptocurrency).

In this scenario, determining the situs of the token is more difficult as, depending on the nature of the token, the tokens will not be represented by a physical instrument transferable by delivery. There may be no lex incorporationis or identifiable title register of tokens[101], and it may not be possible to identify any single jurisdiction in which the distributed ledger system is located. The token will not be held in an account with an intermediary or deposited within the international clearing and depositary system.

One solution would be for the parties participating in the relevant distributed ledger system (the issuer of assets, the system administrator and market participants) to agree that the law governing all on-ledger transactions on that system should be the lex situs of the tokens. There is, however, no judicial authority of binding or persuasive authority before the Irish courts supporting this view. An analysis that viewed the distributed ledger as analogous to a register of real-world securities would look to the location of the register, rather than the law contractually agreed by the parties to govern transactions on the register.

Similarly, the PRIMA approach looks to the law of the location of the relevant intermediary's account, rather than the law agreed by that intermediary and its customer to govern transactions on that account. However, taking such an approach to a distributed ledger would require a location to be attributed to that distributed ledger. This may not be possible without introducing a significant element of artificiality to the analysis.

[101] The ledger may be 'located' in more than one jurisdiction with no central authority or validation point. See further section 4.6 of the March 2018 paper Distributed Ledger Technology and Governing Law: Issues of Legal Uncertainty (the FMLC Paper) published by the UK Financial Markets Law Committee (FMLC)

This 'elective *situs*' method would reflect the approach taken in the Hague Convention on the Law Applicable to Certain Rights in Respect of Securities held with an Intermediary (concluded July 5, 2006)[102]. This specifies that the law applicable to issues considered to be proprietary under Irish law[103] is that of the account agreement governing the account to which the securities are credited. A different law would apply if the participating parties have agreed that it should govern those issues. The elective *situs* approach also reflects the primary recommendation of the Financial Markets Law Committee[104], and would avoid the artificiality of imposing a deemed situs on a distributed ledger system.

If national authorities and regulators are concerned that an entirely elective *situs* approach would create unacceptable risks – eg, the possibility that participating parties would choose a system of law that is subject to significant undue external or private influence – this could be addressed by pressing for the choice to be restricted to the laws of countries where the participating parties are subject to sufficient legal and regulatory oversight[105]. However, this could prove challenging to implement and would also reduce the flexibility of such an approach.

Conceptually, having the value of the collateral represented by tokens on the distributed ledger under this approach would be similar to having real-world assets such as cash and securities (even though different criteria may be applied to determine which jurisdiction's law applies to certain issues). Despite the novelty of such tokens, the principal issue would be whether a court order requiring one party to compensate another could be obtained and, if so, whether it would be enforced. So long as the judgment debtor compensates the judgment creditor in accordance with the court order, the judgment creditor is unlikely to be concerned whether the compensation takes the form of tokens on a distributed ledger, cash or other traditional assets.

If an order is obtained, then a question could arise over the enforceability of a foreign judgment by the court having jurisdiction over the judgment debtor if it is located in another jurisdiction. In determining the answer to this question, there seems to be little conceptual difference between a scenario where parties have used tokens, cash or securities when exchanging collateral assets.

[102] Ireland has neither ratified nor acceded to this convention. It could not do so, given that its terms are incompatible with the PRIMA approach taken in certain EU legislation, including Council Directive 2002/47/EC of June 6, 2002 on financial collateral arrangements (n 97) and Council Directive 98/26/EC of 19 May 1998 on settlement finality in payment and securities systems (n 96) (see further the Report from the Commission to the European Parliament and the Council Evaluation Report on the Financial Collateral Arrangements Directive (2002/47/EC) 20.12.2006/COM(2006) 833 final)

[103] The legal nature and effects against the intermediary and third parties of the rights resulting from a credit of securities to a securities account; the legal nature and effects against the intermediary and third parties of a disposition of securities held with an intermediary; the requirements, if any, for perfection of a disposition of securities held with an intermediary; whether a person's interest in securities held with an intermediary extinguishes or has priority over another person's interest; the duties, if any, of an intermediary to a person other than the account holder that asserts in competition with the account holder or another person an interest in securities held with that intermediary; the requirements, if any, for the realization of an interest in securities held with an intermediary; whether a disposition of securities held with an intermediary extends to entitlements to dividends, income, or other distributions, or to redemption, sale or other proceeds

[104] The FMLC Paper (n 102) at section 7.3, notes that elective situs meets the requirements of being objective and easily ascertainable by the parties themselves. The FMLC also suggested the place where the relevant administrator or operating authority is located, or the law of the place where the system participant that is transferring the token is located, as a back-up, in circumstances where an elective situs "cannot readily or sensibly be implemented", while commenting that an elective situs could be achieved in circumstances where the issuer of the token (in cases where the system constitutes the assets), the system administrator and the participants are regulated, they could be required to agree upon a particular choice of law in the relevant contracts

[105] FMLC Paper (n 102), s 7.4

There may also be means of addressing this issue on the platform itself. For example, each transaction on Corda is validated by a notary to ensure uniqueness in order to address the 'double spend' concern. Given the flexibility that R3 provides on contractual arrangements on Corda business networks, it could be possible to create an agreement between the parties participating in a distributed ledger system that empowers the notary to implement a court order obtained from a court of the contractually agreed jurisdiction on Corda. This would potentially avoid the need for the relevant judgment to be enforced against the judgment debtor before the courts of its home jurisdiction. If such a court order states that a participant is not the proper party to hold tokens, the notary (as a result of the platform agreement) could be empowered (or bound) to deny the transferability of such tokens.

This ensures that such tokens are no longer fungible. Further, the issuer of the tokens, through the applicable contractual arrangements (which, again, would be governed by the law agreed by all participating parties), could be bound to then issue replacement tokens to the proper party that should be the owner of the original tokens.

Assuming the agreement between the parties participating in the distributed ledger system contains express choices regarding the law of the platform and the court where any disputes will be litigated, a judgment creditor faced with an uncooperative judgment debtor would simply serve the court order on the notary to invalidate the tokens of the debtor and require the issuer to issue new tokens to satisfy the order. A distributed ledger system structured in this way would reduce the difficulties that may arise when a judgment creditor tries to enforce a foreign judgment before a court.

This approach could also provide potential solution to difficulties posed by permissionless platforms where the identities of the participating parties and their physical locations are not easily ascertainable. An Irish court will, for reasons of procedural fairness, be hesitant to grant a judgment or injunctive relief against an unknown defendant unless it can be satisfied that the proceedings have been, and any order made will be, brought to the attention of the unknown defendant . Even if a judgment or relief is granted, enforcement will present further practical challenges[106].

[106] A point acknowledged by the UKJT Legal statement on *cryptoassets and smart contracts* (November 2019, at paragraphs 156-157). While expressing no doubt that a smart legal contract between anonymous or pseudonymous parties is capable of giving rise to binding legal obligations under the laws of England and Wales, it notes that "there are inherent risks in contracting with a party whose identity is likely to remain undiscoverable, not least in terms of identifying who can be sued if the contract is breached". A claimant may invoke the jurisdiction to issue proceedings against 'persons unknown'. The Irish courts have addressed this in the context of claims relating to possession of and trespass on land. However, there will be, in respect of such claims, an identifiable location at which relevant unknown defendants can be served with proceedings and injunctive relief and such injunctive relief can be enforced. The potential range of claims arising from DLT presents greater challenges. The Irish courts have not yet had cause to consider, in any written judgment, the challenges presented by DLT or the guidance offered by certain English judicial authorities (including *CMOC Sales & Marketing Limited v Persons Unknown* [2018] EWHC 2230 (Comm) and AA v Persons Unknown & Ors [2019] EWHC 3556 (Comm)). The Irish High Court has recently granted a temporary interim injunction ordering persons unknown not to publish confidential information stolen from a company on the internet or anywhere else and requiring certain named defendants to cease publishing that confidential information. Unfortunately, as the judgment was given on an urgent basis, with only one side represented in court, no written judgment is available (reports of the case are available in the Irish Times at https://www.irishtimes.com/news/crime-and-law/courts/high-court/firm-being-blackmailed-by-hackers-for-6m-obtains-irish-court-injunction-1.4128069) and the Law Society Gazette at https://www.lawsociety.ie/gazette/in-depth/cyberattackers/)

CONCLUSION AND RECOMMENDATIONS

This paper has considered a number of private international law aspects of derivatives contracts governed by the laws of Ireland and involving DLT.

Considering the most straightforward implementations of the DLT-based transaction examples set out in this paper, it is unlikely that either implementation would result in a Irish court disapplying an express choice of law, whether in the ISDA Master Agreement or any agreement between the parties and a platform provider.

This is consistent with the position in England and Wales, Singapore, New York, Ireland, and France[107]. ISDA has published additional papers that consider these issues from the perspective of these jurisdictions[108].

In each of these jurisdictions, there may be additional conflict-of-laws issues arising from a potential lack of legal certainty around the *situs* of tokens that are used to effect payments or exchanges of collateral on a DLT platform. These issues are more likely to arise where a public and permissionless DLT system establishes an entirely disintermediated form of securities holding systems or trading platforms.

These challenges could be overcome by allowing for all parties to agree that all on-ledger transactions or collateral arrangements taking place on a DLT platform are subject to a uniform choice of law. Such common law of the platform could then also be used to determine the situs of any tokens that are native to that DLT system.

Adopting this approach will require national governments, judiciaries, regulators and international standard-setting bodies to work on adapting or developing global legal standards aimed at ensuring the safe, transparent and consistent regulation of DLT-based financial transactions. It will be important, for example, to consider the appropriate mechanism for ensuring the system administrator or provider, the issuer of any tokenized assets and the parties to any transactions effected on the DLT platform continue to be subject to sufficient legal and regulatory oversight.

Achieving greater legal certainty across these areas will provide an important foundation for the development and implementation of innovative new technology within the derivatives industry, creating a more robust, efficient and cost-effective financial markets infrastructure.

[107] ISDA has published forms of ISDA Master Agreement and associated collateral documentation governed by the laws of England and Wales, New York, Ireland, France and Japan

[108] These papers can be accessed here: https://www.isda.org/2019/10/16/isda-smart-contracts/

ABOUT ISDA

Since 1985, ISDA has worked to make the global derivatives markets safer and more efficient. Today, ISDA has more than 925 member institutions from 75 countries. These members comprise a broad range of derivatives market participants, including corporations, investment managers, government and supranational entities, insurance companies, energy and commodities firms, and international and regional banks. In addition to market participants, members also include key components of the derivatives market infrastructure, such as exchanges, intermediaries, clearing houses and repositories, as well as law firms, accounting firms and other service providers. Information about ISDA and its activities is available on the Association's website: www.isda.org. Follow us on Twitter, LinkedIn, Facebook and YouTube.

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To ensure our customers derive the greatest value from their investment, we provide services and support to shorten time-to-market, as well as guidance on implementation, integration and building ecosystems based on a blockchain platform. Learn more at www.r3.com and www.corda.net.