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ISDA®

Contractual Standards for Digital Asset Derivatives

CONTENTS

1. EXECUTIVE SUMMARY

Digital assets have the potential to transform the way in which financial markets operate and how investors interact with the financial system. From a market value of effectively zero a decade ago, the total value of all digital assets is today estimated to be approximately $3 trillion. This growth has been accompanied by a corresponding increase in the number and diversity of market participants.

Digital asset derivatives increase transparency and liquidity in the digital assets market by facilitating price discovery and allowing market participants to hedge risk. However, it is vital the growth of this market is based on firm foundations. The creation of contractual standards will therefore be central to the development of a safe, efficient digital asset derivatives market.

For over 35 years, ISDA has worked with a broad and diverse range of global market participants to establish contractual standards for derivatives across many different asset classes. Accordingly, ISDA is uniquely placed to develop contractual standards for digital asset derivatives. This paper explores the key issues that ISDA will address as part of this work by:

- Identifying novel technology and market-driven events that could disrupt the operation of a digital asset derivatives transaction and providing a framework for dealing with these events;
- Exploring how digital assets (and the derivatives that reference them) can be valued and what happens when a valuation cannot be obtained; and
- Analyzing how digital assets might interact with the existing ISDA documentation architecture, including the ISDA Master Agreement and industry standard collateral documentation.

The paper explains how ISDA will develop digital product templates and definitions and how they can be integrated within the operational and technological infrastructure that is being designed and implemented across the digital asset ecosystem.

2. INTRODUCTION

Digital assets have experienced enormous growth over the past decade to reach almost $3 trillion in market value[1], rivalling the market capitalization of many long-established technology names like Apple, Microsoft and Google, as well as the GDP of some developed nations, such as Italy and Canada.

This rise in value has been accompanied by growth in the number and diversity of market participants. There has been a significant increase in institutional adoption and investment in digital assets in recent years, including efforts by companies such as PayPal[2] and Mastercard[3] to integrate digital assets within their existing payment and market infrastructure.

As has been the case with other markets, derivatives will play a crucial role in the digital asset market, facilitating price discovery, increasing liquidity and allowing market participants to hedge the risks that can arise from both projected and realized price fluctuations.

The launch of Bitcoin and Ether futures by CME Group, which now have daily trading volumes regularly exceeding $1 billion, represents a very significant step forward in this respect, with many digital asset-linked products (eg, Bitcoin exchange-traded funds) referencing the futures price. In recent times, trading volumes in digital asset derivatives have begun to regularly surpass those in spot digital assets[4]. To provide maximum benefit and flexibility to participants in digital asset markets, it will be vital that over-the-counter (OTC) derivatives trading can continue to flourish. To do so, it must be built on firm foundations.

Since the first swap agreement was documented between IBM and the World Bank in 1981, the derivatives market has grown to a gross market value of $12.6 trillion as of mid-2021[5]. Throughout this time, ISDA has worked with a broad and diverse range of market participants to develop global standards for the derivatives markets across asset classes, ranging from interest rate products to emissions trading.

Contractual standards have been a cornerstone in the growth of safe, efficient and liquid global derivatives markets. They allow market participants to transact in confidence using clearly defined provisions for business-as-usual execution and settlement, while also setting out a clear path for the resolution of many different asset- and market-related risk scenarios. Contractual standards also help to minimize unintended basis risk in otherwise similar products and reduce counterparty credit risk (with corresponding reductions in regulatory capital) by providing the contractual ability to net transaction exposures. In this way, contractual standards promote greater liquidity, more efficiency and reduced market and credit risk.

[1] Forbes, Ether and Bitcoin Surge Towards Record Highs As Crypto Market Passes $3 Trillion, November 2021, www.forbes.com/sites/roberthart/2021/11/08/ether-and-bitcoin-surge-towards-record-highs-as-crypto-market-passes-3-trillion/?sh=41d2e788231c

[2] www.paypal.com/uk/webapps/mpp/crypto

[3] www.mastercard.com/news/perspectives/2021/why-mastercard-is-bringing-crypto-onto-our-network/

[4] In June 2021, for example, trading volumes in digital asset derivatives across all trading venues amounted to $3.2 trillion, surpassing those of spot transactions and achieving a 53.8% market share of the total market in digital assets. This represents an almost eight-fold increase in global trading volumes in digital asset derivatives since June 2019. CryptoCompare, Exchange Review, June 2021, www.cryptocompare.com/media/37748193/cryptocompare_exchange_review_2021_06.pdf

[5] Bank for International Settlements, OTC derivatives statistics at end-June 2021, www.bis.org/publ/otc_hy2111.htm

ISDA is therefore uniquely placed to bring together derivatives market participants, members of the cryptoasset community and other stakeholders to help identify and resolve the important issues that will allow the digital asset derivatives market to develop on a sound footing. ISDA has considerable recent experience in bridging this gap and analyzing how novel technologies such as distributed ledger technologies (DLT) and smart contract code[6] can be integrated within ISDA's contractual framework[7]. This paper is an extension of that work.

This paper will:[8]

- Identify the distinguishing features of different types of digital asset, highlighting the key characteristics and features of these assets and their relevance to contractual standards;
- Identify potential disruption events that could occur with respect to digital asset derivatives and provide a framework for defining these events, drawing lessons from the approaches adopted for these events in other asset classes;
- Identify issues relating to how digital assets and the derivatives that reference them can be valued, including in circumstances where a valuation source or methodology is disrupted;
- Explain how contractual standards for digital asset derivatives will interact with the existing ISDA documentation architecture, highlighting potential interpretative issues that might arise with respect to the ISDA Master Agreement when considering some of the novel features of digital asset markets; and
- Highlight potential contractual issues to consider when collateralizing digital asset derivatives, whether using traditional or digital forms of collateral.

Digital assets, particularly when used in conjunction with smart contract code[9], have the potential to transform the way in which financial markets operate and how investors interact within the financial system. From central bank digital currencies (CBDCs) to the tokenization of traditional assets, the adoption and implementation of digital assets within the traditional financial market infrastructure could offer considerable benefits, including real-time settlement, lower transaction and maintenance costs, and greater automation within the front-to-end trade lifecycle.

[6] This refers to code that, once initiated, will execute certain actions upon the satisfaction of certain pre-defined conditions. Smart contract code may or may not give rise to a smart legal contract (ie, a legally binding contract, the performance of which is – at least in part – automated through the use of smart contract code). See ISDA, Smart Contracts and Distributed Ledger – A Legal Perspective, August 2017, www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf

[7] ISDA has produced several Legal Guidelines for Smart Derivatives Contracts papers that aim to explain the core principles of ISDA documentation for technology developers and highlight important legal and documentation issues that should be considered when applying novel technology solutions to derivatives trading and collateral management. These papers are available at www.isda.org/2019/10/16/isda-smart-contracts/

[8] This paper focuses exclusively on issues that are likely to be relevant to the development of contractual standards. There is a broad range of additional issues that will need to be considered as the digital asset derivatives market evolves. These include financial services and technology regulation, prudential treatment, tax, and the laws dealing with financial crime, data privacy and intellectual property. This paper does not directly address any of these issues but does highlight instances where certain of these issues could have an indirect impact on the development of contractual standards

[9] For example, a distributed ledger platform could provide the infrastructure to support an entire trading relationship between two parties by housing assets that are native to the ledger and supporting the automated transfer of such assets for parties to meet payment or delivery obligations and for collateral transfers. See ISDA, Legal Guidelines for Smart Derivatives Contracts: Introduction, January 2019, www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf

As the broader financial industry seeks to take advantage of these opportunities, the development of a robust and liquid derivatives market will be crucial, as will the emergence of the contractual standards underpinning those transactions.

This paper marks the first step in the journey towards a safe, efficient digital asset derivatives market.

This paper does not present an explanation of all relevant issues or considerations in respect of particular transactions, technology applications or contractual relationships and does not constitute legal, accounting, regulatory, financial or other professional advice. As with all market information and guidance that ISDA disseminates, parties are free to choose alternative means of addressing their contract terms. ISDA assumes no responsibility for any use to which any of its documentation or any definition or provision contained therein may be put. This paper is not intended to specify or recommend any particular approach or specific technology application or project. Parties should therefore consult with their legal advisors and any other advisor they deem appropriate prior to entering into a digital asset derivatives transaction.

3. CATEGORIZING DIGITAL ASSETS

The first step to creating contractual standards for digital asset derivatives is to consider the universe of assets that such standards could apply to.

The digital assets market and underlying technology are evolving at a rapid pace. It is therefore challenging to establish a precise definition of what a digital asset is[10]. Indeed, given the pace of change, any such definition is likely to quickly become obsolete. This paper instead identifies and distinguishes certain key characteristics and features exhibited by digital assets and explores their relevance in the context of developing contractual standards.

3.1 Nature and Legal Characterization of the Digital Asset

Currently, the vast majority of digital asset derivatives transactions relate to native digital assets. A native digital asset exists solely as a digital record. While these assets may constitute property in some jurisdictions, a native digital asset does not represent or constitute any legal or proprietary interest in other assets or rights. Bitcoin and Ether are examples of native digital assets and the market in digital asset derivatives is currently heavily concentrated in these two forms of digital asset[11].

Native digital assets can be contrasted with asset-referenced digital assets. These are digital assets that reference an underlying asset or right, either through a legal or operational mechanism. Examples of asset-referenced digital assets include CBDCs and stablecoins. The use of derivatives for certain types of asset-referenced digital assets is expected to develop quickly in the coming years[12].

Most of the analysis in this paper will be applicable to both types of digital asset. However, additional drafting issues may be relevant for asset-referenced digital assets. For example, parties will need to consider what steps to take should an asset-referenced digital asset become untethered from the asset it is referencing.

3.2 Underlying Technology

Much of the recent market activity in digital asset derivatives has involved digital assets based on a blockchain or DLT. However, digital assets may also be based on other technologies. The particular technological features of a digital asset will be relevant to the extent they have a potential impact on the functioning or economics of the transaction. For example, they may give rise to particular disruption events, as discussed in Section 4.

[10] ISDA is participating in other relevant industry or regulatory efforts to develop or adopt a taxonomy for digital assets where such initiatives are likely to be relevant to the derivatives market. For example, ISDA participates as an observer in the International Institute for the Unification of Private Law's (UNIDROIT) Digital Assets and Private Law Project (www.unidroit.org/work-in-progress/digital-assets-and-private-law/) and as an observer in the Global Blockchain Business Council's Global Standards Mapping Initiative (GSMI) 2.0 for derivatives (https://gbbcouncil.org/gsmi/gsmi-2/)

[11] At the time of writing, the only digital asset derivatives products available at CME Group reference either Bitcoin or Ether

[12] Due to their nature, certain types of asset-referenced digital asset are unlikely to be the immediate focus of the derivatives markets. This includes digital assets that are intended to operate as cash equivalents (eg, central bank digital currencies (CBDCs), single currency stablecoins and digital cash (or tokenized) deposits), or digital assets that are unique so there is no liquid market or proxy for hedging purposes (eg, non-fungible tokens). CBDCs could, however, be used as a settlement mechanism for FX derivatives. See ISDA, Legal Guidelines for Smart Derivatives Contracts: Foreign Exchange Derivatives, November 2020, www.isda.org/a/bPYTE/ISDA-Legal-Guidelines-for-Smart-Derivatives-Contracts-FX.pdf

3.3 Market Infrastructure

Markets in certain types of digital asset may operate within infrastructure that is substantially similar to that of traditional financial markets. It is likely existing contractual standards could be usefully applied to these types of assets. Other kinds of digital asset may rely heavily on more novel forms of market infrastructure, the features and operational framework of which may differ from those within traditional financial markets. For example, there may be no centralized authority tracking ownership of assets or a primary trading venue for certain types of digital asset. Novel market features may have significant contractual implications, as discussed in Sections 4 and 5.

3.4 Economic Function

The economic function of a digital asset (for example, whether it is used for the purposes of payment or investment, or to access a service or utility) is unlikely to have any direct impact on the contractual terms of a derivatives transaction. However, the economic function of a digital asset may affect its suitability to be the subject of a derivatives transaction in the first place.

3.5 Regulatory Status

There are certain contractual considerations that flow from the regulatory status of digital assets and the market within which they operate. For example, the unregulated nature of the infrastructure and service providers for certain types of digital assets may create valuation issues or heighten disruption risks. Similarly, the evolving nature of the applicable regulatory framework for certain digital assets may need to be addressed. These issues are discussed in Sections 4-6.

3.6 Property Status

Some digital assets may be capable of being the object of property rights in certain jurisdictions while others may not[13]. Exchange rates, indices and interest rates are examples of reference assets underlying derivatives that do not constitute property[14]. This may need to be reflected in the contractual terms of digital asset derivatives transactions (particularly those that are physically settled) or where digital assets are used as collateral (see Section 7).

[13] For example, the UK Jurisdiction Taskforce (UKJT) issued a legal statement on the status of cryptoassets and smart contracts under the law of England and Wales in November 2019 (available at https://technation.io/about-us/lawtech-panel). The UKJT statement provides a helpful introduction to, and analysis of, various issues relating to cryptoassets (including those considered in this paper)

[14] Although they may constitute intellectual property in some instances

4. DISRUPTION EVENTS

4.1 Why are Disruption Events Important?

In common with other asset classes, digital assets may be subject to one-off or periodic events that could interrupt or disrupt the functioning of a digital asset derivatives transaction.

There is a range of events that could occur. Many, including those relating to the underlying technology, will generally impact the product lifecycle directly. Events affecting the broader digital assets market, ecosystem or regulatory framework could also directly or indirectly impact the terms of a transaction (or many transactions).

These events may have different consequences for a transaction.

- They may impact the valuation of the transaction;
- They may impede or prevent settlement of a transaction or the posting of collateral; or
- They could jeopardize the viability or legality of the overall trading relationship.

Developing contractual standards for digital asset derivatives will require market participants to identify the types of events that could occur with respect to digital asset derivatives and consider what consequences should result from the occurrence of these events.

4.2 Designing Disruption Events for Digital Asset Derivatives

It will be important to ensure that potential disruption events for this market are designed in a manner that supports digitization and automation. Clear definition and parameterization will be crucial to ensure the scope of each event is clear, its negotiation is highly standardized, and the consequences resulting from the event are deterministic and, where appropriate, capable of being deployed within a smart derivatives contract[15].

The article *Events within Smart Derivatives Contracts*[16] establishes a framework for categorizing and structuring events within a smart derivatives contract that is likely to be useful in this regard.

- Observation: Identifying what data should be used and how it can be observed to determine whether a disruption has occurred is critical. In the context of digital assets, certain events (eg, a fork) would arise within the technology platform or ledger that hosts the digital asset and may therefore be relatively easy for the parties to observe. Observing exterior events (such as a market event or changes in law) will be more challenging and will require users to monitor many different traditional data and information sources. For certain types of events, it is possible that alternative data sources or gateways (eg, 'oracles') could be usefully established to route external information and data to the parties and/or smart derivatives contract so they can be observed.

- Determination: Once observed, it is important to accurately define the triggers for determining whether an event or circumstance might constitute a disruption or adjustment event. To support the development of smart derivatives contracts, objective criteria and thresholds should be used where possible to promote standardization and avoid competing subjective interpretations.

[15] Defined by ISDA as the application of smart contract code to ISDA documentation so that certain 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 legal contract. See ISDA, Legal Guidelines for Smart Derivatives Contracts: Introduction (n 9)

[16] See Ciarán McGonagle and Christopher D. Clack, Events within Smart Derivatives Contracts, November 2021, 1(1) IJBL, https://gbbcouncil.org/wp-content/uploads/2021/11/IJBL-1.pdf

- Action: Once it has been determined that a disruption or adjustment has occurred, the contract must clearly set out the action(s) the parties are permitted or required to take in response. Where possible, these actions should be deterministic to enable their automation. There will, however, be certain events where the parties to the transaction may prefer to maintain some discretion over the precise consequences, particularly if those consequences are likely to be material (eg, events of default). Contractual standards must be capable of accommodating either approach, where appropriate.

4.3 Identifying Potential Disruption Events

It appears that many existing digital asset derivatives market participants use different forms of ISDA product definitions as a base for constructing their templates. Some disruption and adjustment events within existing product definitions are broadly analogous to events that could occur to a digital asset. These could include disruptions to the trading venue where the digital asset is traded, an index (of which the digital asset is a component) or a valuation source.

Where appropriate, ISDA will draw on existing contractual principles when developing standards for digital asset derivatives. To support this work, ISDA has produced a supplement to this paper that sets out a granular, technical analysis of different ISDA product definitions and their potential applicability to digital asset derivatives[17].

However, even where analogous events can be extracted from existing ISDA standards, they will often require adaptation to address the specific risks and events that could arise with respect to digital assets. Other events and mechanisms set out within existing product templates and definitions will not be relevant in the context of digital assets. In addition, the novel features of certain types of digital assets may warrant entirely new disruption or adjustment events, depending on the precise nature of the transaction.

To identify the types of disruption or adjustment events that may need to be adapted or developed, it is necessary to first consider the novel features of digital assets and related market structures that may give rise to potential disruptions.

It should be noted that many of these potential disruption events will have some impact on the valuation of the relevant transaction. For example, certain disruption events may result in an inability to use an identified valuation source or interfere with the operation of a specific valuation methodology. Further analysis of valuation-related issues is included in Section 5.

4.3.1 Forks

Digital assets are generally identifiable by reference to a specific technology platform (such as a particular software protocol implemented on a distributed network). Events or occurrences in respect of that underlying technology may have an impact on a derivatives transaction referencing a digital asset, depending on the precise nature of the asset and the structure of the transaction.

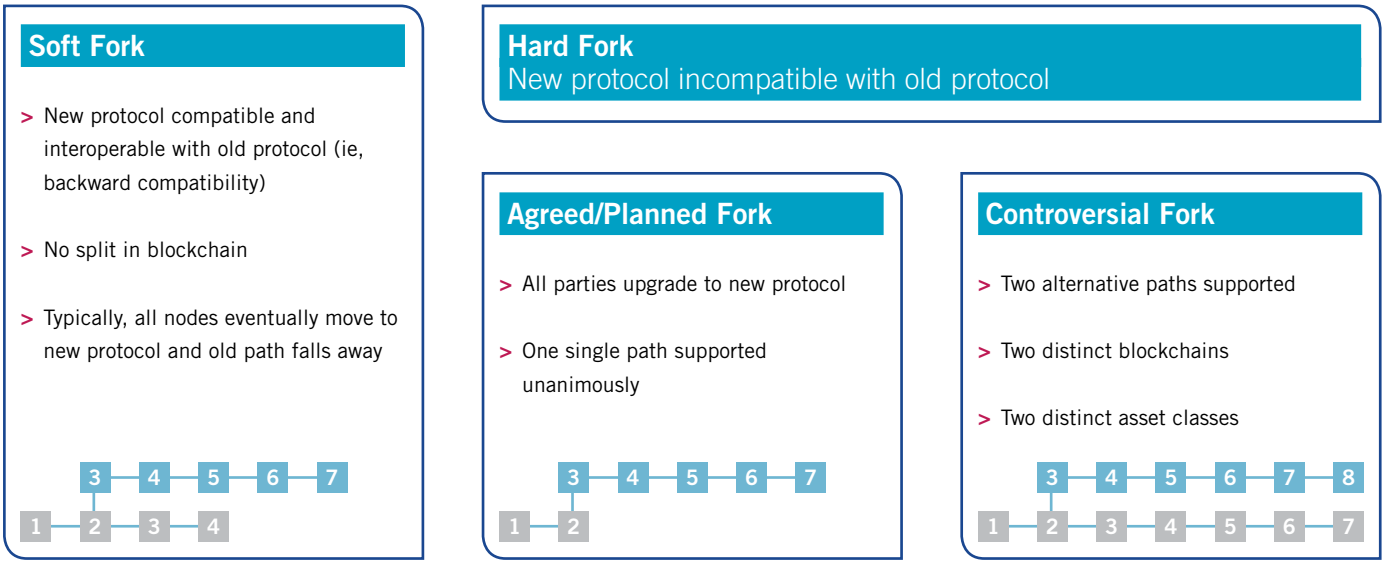
For instance, changes in the underlying technology may fundamentally alter the nature of the digital asset (or its functionality, including interoperability with other systems) for the purposes of any derivatives transaction. Control over the ability to change the underlying technology may reside in the hands of one or many operators or network participants (including validators)[18].

[17] See ISDA, Contractual Standards for Digital Asset Derivatives: Analysis of Existing ISDA Definitional Booklets, December 2021, www.isda.org/2021/12/14/contractual-standards-for-digital-asset-derivatives

[18] A technology stack is typically made up of several layers. It may not be necessary to differentiate between those layers for the purposes of disruption events, provided the relevant disruption event is drafted broadly enough to cover all potential layers

Forks are one example of this type of change and are relevant in the context of blockchain-based digital assets. There are various types of forks that may occur, and they may have different consequences. Some forks occur in connection with a change in protocol, as illustrated in Figure 1. Forks can also arise in other circumstances – for example, when participants conspire to take over the majority of the network's computing power in order to manipulate consensus (ie, a 51% attack).

Figure 1: Types of Fork that May Arise as a Result of a Change in Protocol



4.3.2 Airdrops

The holders of digital assets on a particular network may benefit from an airdrop, which involves the unilateral issuance of a new digital asset to the holders of an associated digital asset.

4.3.3 Cyberattacks and Other Disruptions to the Underlying Technology

Disruptions to the underlying technology may also be triggered by cyberattacks or flaws or bugs in the protocol, among other things. These types of disruptions could, for example, affect the value of the digital asset (which may not be restored later), prevent or delay a transfer into a wallet or disrupt the availability of an observed price. It could also result in an observed price that does not reflect the true market value and is liable to a sudden correcting value movement.

4.3.4 Change in Law or Regulation

There is considerable uncertainty about the regulatory status and treatment of various types of digital asset. In many jurisdictions, there is a lack of clarity over how existing regulatory frameworks apply in the context of certain digital assets, and the legal and regulatory landscape is continuing to evolve. In certain cases, there are novel conflicts-of-laws issues to consider[19]. As a result, digital assets remain particularly vulnerable to changes in law that could potentially impact a derivatives transaction, including restrictions on the ability of derivatives market participants to invest in, or even assume an exposure to, digital assets. Even if this is not prohibited, prudential regulation of exposures may result in increased costs that make the hedging of these transactions uneconomic.

[19] For further analysis on these issues from an English, French, Irish, Japanese, New York and Singaporean law perspective, see ISDA, Private International Aspects of Smart Derivatives Contracts Utilizing Distributed Ledger Technology (Comparative Table), October 2020, www.isda.org/a/zCrTE/Private-International-Law-Aspects-of-Smart-Derivatives-Contracts-utilizing-Distributed-Ledger-Technology-Jurisdiction-Comparison.pdf, and associated whitepapers, available at www.isda.org/2019/10/16/isda-smart-contracts/

Some types of digital assets (particularly native digital assets) are not subject to market abuse or manipulation regulations in certain jurisdictions (although many trading venues seek to impose equivalent or comparable standards through other mechanisms, including contractually). However, actions akin to market abuse can result in extreme value movements in digital assets.

4.3.5 Digital Asset Market Infrastructure

In some cases, infrastructure and service providers in the digital assets market lack the maturity of those in traditional markets and often operate in an unregulated environment. Similar observations could be made for some of the participants in these markets. This can give rise to a number of novel risks, including the reliability or availability of services, resilience and business continuity, the lawfulness of activities that would be unlawful in regulated markets (for example, market abuse), and the potential for activities that are unlawful. As some of the market players perform multiple roles within this landscape (and are not subject to regulatory obligations), there is also a heightened risk of conflicts of interest and harmful effects.

Moreover, it is possible that the holder of a digital asset (whether holding that asset directly or via a custodian) could lose access to the platform or infrastructure through which it holds the digital asset. This could occur as a result of loss or theft of the private key relating to that digital asset. In many cases[20], the private key would not be recoverable, and its loss could result in a permanent inability to deal in the relevant digital asset.

4.3.6 Asset-referenced Digital Assets

Asset-referenced digital assets could become untethered from the underlying asset against which it is purportedly stabilized, particularly if the assets are not inextricably linked through an effective legal mechanism. Likewise, if a digital asset is collateralized by the underlying asset (or, indeed, any other asset), an event may occur that results in the digital asset losing some or all of its backing (for example, because the assets subject to security are lost, the security interest has become ineffective, or the value of the assets has declined versus the purportedly pegged asset). These types of events may trigger an extreme fall in value.

4.4 Applying Disruption Events to Digital Asset Derivatives Transactions

The consequences of an event will vary depending on the nature of the event and the type of transaction or asset to which it applies. This paper highlights certain general principles that market participants should consider when determining the consequences that may result from the occurrence of a particular type of event.

4.4.1 Technology-related events

For events relating to the underlying technology (including forks and airdrops), parties should consider whether the relevant event could be addressed through an economic adjustment to the transaction rather than termination, particularly if the event does not materially impact the parties' respective rights and obligations under the transaction.

[20] For example, where a private key is held in 'cold storage', there will be no online instantiation or record of the private key. If the private key is lost or destroyed, then there will generally be no retrievable back-up. As such, access to the relevant digital asset will be impossible. Conversely, where a key is held in 'hot storage', it is vulnerable to being taken deliberately by a bad actor who immediately uses the private key to transfer the assets to another address, at which point the relevant value will become tied to a new private key known only to the bad actor and the original private key will become worthless

For example, some forks may result in two distinct asset classes with different values. Following such a fork, service providers – such as trading venues, custodians and index providers – may need to choose which path(s) to support. These decisions may influence the values of the respective digital assets, which may need to be considered when determining the nature of any adjustment to the transaction.

Further challenges could occur if an index provider, for benchmarking purposes, chooses a different path to the one that one or both parties consider to be the successor digital asset. In such cases, the parties should consider whether some form of contractual mechanism (such as a fallback) could be used to ensure the transaction continues to accurately reflect their commercial intentions. In some respects, this is analogous to certain events in other asset classes, including a stock split in the equities market.

Similarly, an airdrop could potentially impact a derivatives transaction by causing an increase in the market value of the digital asset native to the benefiting network. The parties may wish to adjust the economic terms of the transaction to allocate the benefit of this increase to the party that has a long position in that digital asset. Questions also arise over whether the value of the derivative after the airdrop should reference both digital assets (ie, the original digital asset and the airdropped digital asset). Again, this might be considered analogous to other events within ISDA documentation, such as an extraordinary dividend within an equity derivatives transaction. ISDA will consider whether such similar events could (in principle) be usefully applied to, or adapted for, digital asset derivatives.

Certain technology-related disruptions will be scheduled in advance, whereas others may be unexpected. It may be appropriate for different contractual consequences to apply based on the degree to which an event could have been anticipated by the parties.

Serious forms of cyber attack or technology-related disruption may be impossible to resolve through economic adjustments to the contract and may require termination of all (or part) of the transaction. Parties should consider and clearly define the precise circumstances under which this might be appropriate or desirable.

4.4.2 Market-related Events

Some of the issues set out in Section 4.3 relate more broadly to the market infrastructure or legal and regulatory environment within which digital assets are created and traded. There is potentially a very large number of these events to consider and, as such, the specific consequences that could result are more challenging to comprehensively define.

Certain events, such as a disruption to core infrastructure or service providers, may have a material impact on a party's ability to physically settle a digital asset derivatives transaction or hedge itself. Parties may wish to consider whether it is possible or desirable to continue with the transaction in these circumstances, or whether an alternative settlement mechanism (for example, a fallback to cash settlement) could be used to preserve the commercial intent of the transaction.

Other events may have broader consequences. For example, parties will need to consider the circumstances in which changes in law and regulation amount to a disruption event and how the event is addressed. Particular care is required to determine the impact of clarifications of existing law in their application to novel technologies (as distinct from clear modifications to existing law).

Careful consideration must also be given to circumstances that would amount to market abuse if they occurred on a regulated market, and whether it is practical to include contractual terms designed to address this issue. In particular, complex questions arise in the event no reliable valuation free of market manipulation can be established for a specific digital asset. Some of these issues may warrant specific consideration in the contractual terms to ensure risks are identified and allocated.

5. VALUATION

5.1 Why is Valuation Relevant?

Valuations of assets are relevant for three primary purposes in derivatives transactions:

- Determining the extent of payment and delivery obligations under the transaction;
- Determining any close-out amount due on early termination; and
- Determining the extent of collateralization obligations.

In each case, valuations can have a fundamental impact on the economics of an arrangement.

- Valuations for payments and deliveries will directly affect the returns attributable to a particular transaction;
- Valuations on close out will affect the cost associated with terminating a trading relationship; and
- Collateral valuations will determine the volume of assets that is required to be tied up in a collateral arrangement, and therefore the opportunity cost of the transaction, as well as the protection a party has to cover its exposures if there is a default.

Valuation is a function of both the valuation source(s) and the valuation methodology. Developing contractual standards for digital asset derivatives will require market participants to consider which valuation source(s) and methodologies will be appropriate for each of these distinct purposes within their transaction(s).

This section identifies specific issues that market participants should consider when determining which valuation source(s) to reference and which valuation methodologies are appropriate.

Once inputs have been determined, valuations are a highly operational mechanism within contracts. They adhere to classic computational logic, allowing some deterministic algorithm to be applied to a standard input with the objective of producing a defined output. As such, there are significant opportunities for greater automation of these processes. This section highlights where these opportunities exist and how they can be achieved.

5.2 Valuation Sources

Determining the appropriate valuation source will be an important consideration for users of digital asset derivatives. Generally speaking, derivatives transactions may use a number of different valuation sources, including screen rates, trading venue data, published index prices and internal modelling.

There are a number of general issues that should be considered when determining the valuation source(s) for a digital asset derivatives transaction. Given the pace of development within digital asset markets, new issues are expected to emerge (such as novel valuation source(s)) that market participants will have to consider. ISDA will work to ensure that contractual standards developed for this market are sufficiently flexible to accommodate future developments in these areas.

5.2.1 Price Observation at Trading Venue(s)

There is generally no primary venue for the trading of a specific digital asset[21], with trading occurring across many (often unregulated) venues. Various issues can arise when valuing a digital asset derivative using prices observed from these sources. For example:

[21] This issue also applies to certain other products, including equities, which can be traded on many venues

- Trading volumes may swiftly move between venues, affecting liquidity and creating a material degree of variability in observed pricing between trading venues;
- Methodologies for publishing data may not be transparent;
- Some trading venues may be vulnerable to market manipulation; and
- Some venues may fail to provide any pricing at all in certain circumstances.

For transactions involving venue-based price observations, it may therefore be prudent to avoid limiting valuation of the digital asset to the price observed at only one particular trading venue and ensure the venues used for price observation purposes are supported by appropriate volumes.

It may also be sensible for digital asset derivatives contracts to cater for the possible exclusion in certain circumstances of some categories of data or valuation sources, including trading venues, for price observation purposes. Equally, additional adjustment events or fallbacks, such as the omission or postponement of an averaging or observation date or time, may be required to address the risks of disruption or permanent discontinuation, or to cater for significant shifts in liquidity.

5.2.2 Settlement Prices

Within some traditional asset markets, there are conventional times during which valuations are established. This is not the case with digital asset markets, which are generally open for trading at all times. Some digital asset trading venues may publish prices at a certain time or across a certain period. However, these times or windows are artificial and not intrinsically tied to any circumstances regarding underlying market activity (such as the availability of trading or trading volume), so there could be significant variations in prices reported on the same day at different venues.

Parties may therefore wish to include provisions to specify how a valuation will be determined in circumstances in which an official closing price (or other comparable value) cannot be used.

The continuous operating nature of digital asset markets may also affect certain other provisions within ISDA documentation. For example, the concept of 'business day' is used for several purposes within the ISDA Master Agreement. The prospect of markets that operate in continuous rather than discrete time periods poses the question of whether this is an appropriate concept for digital asset derivatives transactions. These issues are considered further in Section 6.2.

5.2.3 Index Prices

There is a broad range of index providers in the digital asset space, and published levels of these indices could potentially be used to determine the valuation of digital asset derivatives. However, index price sources for digital assets can raise concerns similar to those in the context of trading venue prices: many derive their benchmarks by aggregating observed prices from a number of trading venues and may not provide transparency on their methodologies.

Typical index succession and index disruption events that can be found in existing definitional booklets (such as the Equity Derivatives Definitions) may address some of the concerns, but these were not drafted to cater for this market and therefore do not address all relevant risks. These provisions will need to be adapted to cater for the digital asset derivatives market.

5.2.4 Decentralized Activities

As the market further evolves, the volume of digital assets transacted through decentralized activities, including decentralized exchanges, continues to increase[22]. This may have an impact on the nature of any valuation source(s) selected for digital asset derivatives transactions that interact with a decentralized platform in some way.

It is conceivable, for example, that a decentralized platform may come to constitute the primary mechanism for transacting in a particular digital asset. Even if that is not the case, parties to digital asset derivatives transactions may wish to establish certain valuations by reference to the price achievable on a decentralized platform. It seems likely this technology will develop further, with corresponding increases in trading volumes and improvements in the reliability of transaction data.

Many of the issues mentioned in Section 5.2.1 will likely apply to decentralized platforms. Depending on the nature and functionality of the technology, there may be additional issues that need to be considered if the data is used to perform valuations within a digital asset derivatives transaction.

5.3 Valuation Methodologies

Valuation methodologies are agreed to determine the value of a derivatives transaction at any given time. These methodologies will vary based on asset type and counterparty preferences. Some typical valuation methodologies are very deterministic (for example, ascertaining a particular value over an observation window by reference to a specific pricing source). Others may provide some degree of discretion to be exercised by a calculation agent or other third party.

Consideration should be given to how standardized, deterministic valuation methodologies could be developed for digital assets. The use of subjectivity or discretion within contracts, particularly when the provision is potentially highly operational (such as a valuation mechanism), will inevitably limit the utility or scalability of automated technology solutions due to the ongoing reliance on human intervention. Drafting such provisions (and any other provisions that have traditionally incorporated some elements of discretion or subjectivity) in a more deterministic way will remove many of the impediments to greater automation and avoid the need for excessive and unnecessary customization and negotiation of each individual transaction[23].

However, valuation methodologies rely heavily on the valuation and pricing mechanisms that feed into them. In the absence of efficient and reliable valuation source(s), it may be necessary for valuation methodologies to permit some degree of discretion by a calculation agent or third party.

The trade-offs between granting broad discretions to a calculation agent (or other third party) to determine a valuation and the benefits of developing standardized digital documentation for this market must therefore be considered. On one hand, broad discretions may lead to potentially high degrees of price variation given the volatility of the underlying asset and the nature of the valuation sources. On the other, the lack of any discretion may at times make it difficult or impossible to determine a valuation for a specific trade, particularly in the absence of efficient and reliable pricing mechanisms.

[22] As of September 2021, $90 billion of collateral was reportedly locked in decentralized finance applications compared with less than $1 billion in 2018, The Economist, Adventures in DeFi-land, September 2021, www.economist.com/briefing/2021/09/18/adventures-in-defi-land

[23] This issue is discussed in ISDA/Linklaters, Smart Contracts and Distributed Ledger – A Legal Perspective, (n 6) 11

In certain instances, it may be desirable to have more formulaic provisions for calculation agent (or other third-party) determination, or at least specify certain guiding parameters or principles that such a party would be able to rely on. These provisions could include express reference to one or more identified price source(s) over a given time window, averaging mechanisms or a determination by the calculation agent by reference to price sources meeting certain additional specified criteria (for example, highest daily volume subject to a moving average). Another potential solution is to allow a deterministic valuation provision supplemented by calculation agent discretion to override it in specified circumstances, which could be based on judgement or quantitative measures.

These issues are not unique to the digital asset derivatives market and have resulted in significant debate between market participants in other asset classes.

5.4 Further Issues

There are a number of other issues specifically linked to the nature of digital assets and their underlying technology that must be considered in the context of valuation. These issues may arise in relation to one or more valuation source and/or a valuation methodology.

5.4.1 Volatility

Historically, many native digital assets and some asset-referenced digital assets have experienced significant volatility in their observed prices[24]. This may be in the form of sustained volatility or a one-off event that triggers an extreme movement (such as a cyber attack or public comments from a government, regulator, politician, court or influential individual). The potential for unreliable pricing data can compound this issue. In addition, digital asset values will be quoted in a base currency, which itself will be subject to value movements over time. As a result of these factors, observed prices can vary significantly at different times of the day.

Parties may wish to address this issue in their contracts – for example, by incorporating a price-smoothing mechanism to account for sharp volatility within a short period of time, specific volatility caps, collars and floors, and/or disruption events.

5.4.2 Transaction Fees

Spot transactions in digital assets generally (depending on the precise nature of the underlying digital asset) require the transfer of a fee in order for the transaction to be implemented on the network. In many cases, the value of that transaction fee can be highly volatile.

Specific consideration should be given to the impact of any such transaction fee within the cashflows of a digital asset derivatives transaction (for example, where a digital asset derivative is hedged using a physical underlying) to allow for the appropriate allocation of risk in relation to the volatility of these transaction fees.

[24] For example, the price of Bitcoin has reportedly fallen by over 10% in a single day on nearly 30 occasions over the past five years, the largest of which was a fall of nearly 40% following a cyber incident at a prominent exchange. See Jon Cunliffe, deputy governor for financial stability at the Bank of England, Is "crypto" a financial stability risk?, SIBOS, October 13, 2021, www.bankofengland.co.uk/speech/2021/october/jon-cunliffe-swifts-sibos-2021

6. INTERACTION WITH THE ISDA MASTER AGREEMENT

6.1 Creating Contractual Standards Within the ISDA Documentation Architecture

A core benefit of the ISDA documentation architecture is that it provides a high degree of contract standardization. This, in turn, creates a solid foundation for the future development of technology solutions aimed at creating efficiencies and cost savings within the derivatives market.

However, this standardized documentation architecture does create a high degree of interdependency between different contracts, meaning it is not possible to fully understand the complete terms of a specific transaction or the overarching contractual relationship between the parties by simply looking at one document[25].

Definitions and templates for derivatives products (including those that will be developed for digital asset derivatives) primarily contain provisions relating to the economic terms of a specific trade and the various product mechanics that could be applied, including those relating to valuations and disruptions.

However, many of the events and mechanisms relating to the broader legal relationship between the parties are contained in the ISDA Master Agreement. These events and mechanisms can significantly impact the operation of product definitions or templates. For example, the occurrence of an event of default under the ISDA Master Agreement can impact the timing, quantum and even the obligation to make a payment or delivery under a transaction subject to that Master Agreement.

As such, it will be crucial to ensure that any contractual standards developed for the digital assets market are capable of being integrated within the broader ISDA documentation architecture, and particularly the ISDA Master Agreement. This interaction will be important when assessing which parts of a digital asset derivatives contract can be automated and how that automation might be achieved[26].

However, some terms of the ISDA Master Agreement[27] may pose potential interpretative issues in the context of digital asset transactions. This section identifies where some of these interpretive issues might arise and what steps parties can take to resolve them.

6.2 Potential Interpretive Issues Within the ISDA Master Agreement

6.2.1 Location of Performance

Several provisions of the ISDA Master Agreement refer to the location of performance of payment or delivery obligations. Similarly, many documents within the ISDA documentation architecture (including the ISDA Master Agreement) refer to the concept of a 'business day' for several purposes.

In most instances, the use of this terminology will pose few issues for digital asset derivatives. Where reference is made to an operation or set of circumstances that arise or take place in relation to the actions of one or more financial institutions, the concept of business days will remain relevant.

[25] Further discussion of the interdependencies within the ISDA documentation architecture and the challenges this presents to developers of smart derivatives contracts are set out in ISDA, Legal Guidelines for Smart Derivatives Contracts: Introduction (n 9)

[26] See Ciarán McGonagle and Christopher D. Clack, Smart Derivatives Contracts: the ISDA Master Agreement and the automation of payments and deliveries, April 2019, arXiv, https://arxiv.org/abs/1904.01461

[27] The document references relate to the 2002 Master Agreement but most of the issues raised are also relevant under the 1992 Master Agreement

However, it may be difficult to interpret the precise location of performance or the meaning of the term 'local business day' in some cases. If digital assets are recorded on public, permissionless blockchains, for example, interpretative issues may arise in determining whether performance takes place in the location in which the application or administration of the relevant private key takes place (which may be the location of the custodian) or one or more other jurisdictions.

6.2.2 Payments and Deliveries

ISDA understands that many of its members and other market participants are unable or unwilling as a matter of internal policy to accept physical settlement of digital assets. While it is expected that the market will remain primarily cash settled in the short term, this could change as the regulatory environment evolves and market participants become more comfortable with physical settlement of digital assets. Physical settlement raises a number of complex issues that do not arise in the context of cash-settled digital asset transactions[28], including potential interpretative issues under the ISDA Master Agreement.

There is a question over whether deliveries of digital assets could or should be treated as 'payments' under the ISDA Master Agreement. Similarly, it is not clear to what extent any digital asset could fall within the term 'currency' or 'funds' (for example, El Salvador has now adopted Bitcoin as legal tender). This determination has important implications for the interpretation or operation of several provisions within the ISDA Master Agreement, including:

- Whether a payment obligation that is required to be made in "freely transferable funds in the manner customary for payments" and in the required currency[29] would be considered discharged following delivery of the relevant digital asset;
- The impact on the payment netting provisions of the ISDA Master Agreement[30];
- Determining whether the provisions relating to contractual currency apply[31];
- The meaning of the term 'account', particularly if the parties are intending to reference an address recorded on a blockchain or wallet interface or another arrangement that does not involve a centralized ledger maintained by an intermediary; and
- The calculation and payment of interest in digital assets.

Although not strictly relating to payments, there may be similar issues to consider if a digital asset is treated as a termination currency under the ISDA Master Agreement. For example, there may be considerable uncertainty over whether a digital asset is freely available[32] and there could be significant room for dispute over the calculation of the termination currency equivalent.

[28] These issues include regulation (including financial crime and anti-money laundering regulations), prudential treatment and tax. Discussion of this is beyond the scope of this paper. However, addressing some of these issues is likely to require adjustments to documentation (eg, the inclusion of specific or enhanced representations)

[29] Clause 2(a)(ii) ISDA Master Agreement 2002 (MA). See also Clause 8(a) MA

[30] The payment netting provisions of the ISDA Master Agreement provide for payments on the same data "in the same currency" in respect of the same transaction to be netted (or in respect of two or more transactions where the parties have elected for multiple transaction payment netting to apply). ISDA intends to publish more detailed analysis on issues relating to netting in 2022

[31] The MA requires payments to be made in the relevant currency specified in the agreement for that payment, but also makes provision for the discharge of an obligation in the contractual currency where receipt is in another currency (provided this results in receipt, on conversion, of the full amount in the contractual currency)

[32] For the purpose of the definition of 'termination currency'

6.3 Addressing these Issues

Parties to digital asset derivatives transactions may wish to include clarificatory provisions within their contracts to address these issues.

An agreed jurisdiction of operation for certain obligations could, for example, be specified in the relevant definitions for digital asset derivatives to avoid issues arising from uncertainty about the specific location of performance. However, questions about the location of performance (and assets) are typically fact-based determinations and it may not be possible in all circumstances to resolve these issues contractually.

It may be more straightforward to avoid some of these issues entirely by specifically treating digital asset transfers as deliveries (rather than payments) under the ISDA Master Agreement and not selecting a digital asset as the termination currency.

7. INTERACTION WITH ISDA CREDIT SUPPORT DOCUMENTATION

7.1 Opportunities for Digital Assets Within Collateral Management

Market participants are increasingly focused on developing and implementing technology solutions within collateral management to deliver greater efficiencies and cost savings. These efforts follow almost a decade of significant changes to collateral management processes and infrastructure, largely driven by new regulatory requirements.

There is an opportunity to harness new technologies like smart contract code and DLT to provide scalable, cost-efficient and more accurate collateral solutions. Digital assets could have an important role to play within a highly digitized and automated collateral management ecosystem.

ISDA's *Legal Guidelines for Smart Derivatives Contracts – Collateral*[33] provides examples of how these technologies could transform existing collateral management performance by:

- Using smart contract code to perform daily calculations of exposure, valuations of posted collateral and eligibility assessments;
- Using DLT to create a shared, golden source of collateral data, eliminating time-consuming reconciliation processes and reducing disputes; and
- Using both smart contract code and DLT-based technology to automate the transfer of collateral assets among parties, including any custodians.

The final example would likely benefit from the use of digital assets by allowing the core collateral management infrastructure and the key operational mechanisms of supporting collateral documentation to be housed entirely within a DLT-based or similar system.

However, various issues need to be considered if digital assets are introduced within the collateral management ecosystem. Questions may also arise when non-digital assets are used to collateralize a digital asset-referencing transaction. This section provides a high-level outline of some of the relevant issues as they relate to documentation.

For further discussion in relation to collateral, including the regulatory issues that should be considered, see ISDA's *Legal Guidelines for Smart Derivatives Contracts - Collateral*.

7.2 Non-digital Assets Used to Collateralize a Digital Asset-referencing Transaction

There are unlikely to be any significant issues when non-digital assets (such as cash) are used to collateralize a digital asset derivatives transaction.

Many of the issues that do arise relate to how calculations and determinations might be made. For example, a valuation agent might make the relevant calculations of 'exposure'. In some cases, the transacting parties may lack the necessary expertise to perform this calculation themselves. They may therefore wish to consider appointing a separate entity, such as a cryptoasset custodian, to act as valuation agent.

[33] ISDA, Legal Guidelines for Smart Derivatives Contracts: Collateral, September 2019, www.isda.org/a/VTkTE/Legal-Guidelines-for-Smart-Derivatives-Contracts-Collateral.pdf

Some interpretive issues may also exist that will need to be clarified. For example, under the terms of certain ISDA collateral documentation, the valuation agent may use "relevant information or data most recently reasonably available for close of business in the relevant market(s)" at the time of valuation to value the exposure. It is unclear how this should be interpreted in the context of a digital asset-referencing transaction, for the reasons discussed in Section 5.

Specific concepts (eg, valuation date location) that apply to transactions not referencing digital assets may apply differently or require adaptation in the context of digital asset-referencing transactions. Parties may also wish to consider including more prescriptive drafting than is currently provided for calculations following a disputed valuation.

7.3 Digital Assets Used as Collateral

Most digital assets, particularly native digital assets, are currently unlikely to be viewed as eligible collateral satisfying mandatory margin requirements under the applicable regulations of major jurisdictions.

Certain money-like instruments (eg, stablecoins that are pegged to and collateralized by fiat currency) have been acknowledged under certain circumstances to present features similar to cash, which is eligible collateral[34]. It is expected that any CBDCs would likely be introduced through specific legislation enabling it to be characterized as cash. Once introduced, CBDCs are therefore very likely to constitute eligible collateral in the relevant jurisdiction. There remains a degree of uncertainty over whether and in what circumstances other asset-referenced digital assets for which the underlying qualifies as eligible collateral (for example, certain security tokens) would themselves qualify as eligible collateral.

The transfer mechanics set out within ISDA's collateral documentation generally apply to cash and securities and may not be well suited to transfers of digital assets. For example, parties may be required to transfer cash, securities or other property as 'distributions', but it is unclear whether this requirement applies to airdrops in the context of digital assets. The application of 'default interest' to digital assets also requires clarification. For instance, in case of a failure to deliver Bitcoin as margin, it is uncertain whether the default rate of interest would run in Bitcoin or its currency equivalent.

The nature of any security interest granted over these digital assets depends on a variety of factors – for example, the location of the asset, the forms of security that can be granted under the applicable law, and other regulatory requirements applying to posted margin such as segregation. Collateral documents may need to be amended in due course to reflect the appropriate forms of security interest granted over digital assets under the relevant law. ISDA intends to produce specific guidance on these issues, focusing on the principal issues that should be considered when providing or receiving collateral in the form of digital assets.

[34] "Where stablecoins are used in systemic payment chains as money-like instruments they should meet standards equivalent to those expected of commercial bank money in relation to stability of value, robustness of legal claim and the ability to redeem at par in fiat." Bank of England, Financial Stability Report, Financial Policy Committee Record and stress testing results – December 2019, www.bankofengland.co.uk/financial-stability-report/2019/december-2019

8. DIGITAL DOCUMENTATION

Since 2017, ISDA has worked to identify opportunities for the use of new technology (such as DLT and smart contract code) with existing products, processes and documentation[35]. In effect, ISDA's work has focused on how the paper-based contracts underpinning these products and processes can be reverse engineered to construct and implement smart derivatives contracts that are capable of delivering efficiency and cost benefits to market participants. While many opportunities have been identified, they are challenging to deliver because of the industry's continued reliance on paper-based documentation and the resulting lack of digitization within financial markets.

In developing contractual standards for the digital asset derivatives market, the industry can take inspiration from the way in which similar standards have been developed for other asset classes. However, there are some fundamental differences between the historic evolution of traditional derivatives markets and the ongoing development of the digital asset derivatives market.

It is important to acknowledge that the existing paper-based documentation framework is a product of its time. Today, paper-based documents are an obstacle to greater digitization and automation within global financial markets, impeding innovation and the optimization of systems, processes and data. As a result, ISDA continues to support the transition from primarily paper-based definitional books and contracts[36]. Consistent with this strategy, it is crucial that product templates, components and definitions for a digital market are natively digital at inception.

The contractual framework for digital asset derivatives must reflect the unique characteristics of this market. It must be flexible and capable of adapting to the rapid evolution of digital assets, the technology underpinning them and the products that reference these assets. It must be structured in a way that facilitates greater automation, promotes interoperability among different technological platforms and integrates seamlessly within existing and emerging market infrastructure for digital assets.

Consistent with the principles and objectives adopted by ISDA in a joint association letter[37] to the Financial Stability Board, the International Organization of Securities Commissions and the Basel Committee on Banking Supervision, ISDA will seek to construct a digital contractual framework that enables greater connectivity between operational processes and data, allowing these processes to be implemented within the operational and technological infrastructure that is being designed and built to manage digital asset derivatives.

This digital framework will also provide a foundation for increased automation through the development and implementation of smart derivatives contracts. The joint ISDA and King & Wood Mallesons whitepaper *Smart Derivatives Contracts: From Concept to Construction*[38] proposes a practical framework for the construction of smart derivatives contracts, setting out specific steps that should be followed to ensure smart derivatives contracts are compatible and consistent with the various technological, commercial, regulatory and legal standards that apply both to derivatives and novel technologies, such as smart contract code, DLT and digital assets.

[35] Papers relating to this work are available at www.isda.org/2019/10/16/isda-smart-contracts/

[36] See ISDA, A Digital Call to Arms, July 2020, www.isda.org/2020/07/30/a-digital-call-to-arms/

[37] See ISDA et al., Joint Association Letter on a Digital Future for Financial Markets, July 2020, www.isda.org/a/MGmTE/Digital-Future-for-Financial-Markets-Letter.pdf

[38] See ISDA, Smart Derivatives Contracts: From Concept to Construction, October 2018, www.isda.org/a/cHvEE/Smart-Derivatives-Contracts-From-Concept-to-Construction-Oct-2018.pdf

This framework can be usefully applied to the development of contractual standards for digital asset derivatives by:

- First identifying the operational aspects of the trade lifecycle (including the various events and mechanisms explored in this paper) and ensuring contractual standards for these aspects take a more formalized, parameterized form;
- Creating in parallel a shared, standardized representation of the data for these events and actions within the ISDA Common Domain Model (CDM)[39], allowing these standards to be implemented in a common, consistent way throughout the industry; and
- Creating functions based on the digital expression of these formalized representations within the CDM to facilitate the automation of the operational mechanics and other features of digital asset derivatives transactions.

As the Smart Derivatives Contracts: From Concept to Construction paper notes, developing smart derivatives contracts within this framework will require knowledge and experience from different disciplines and domains. Expertise in the technology used, the commercial context of its use, the regulation that applies to it and the law that supports its effectiveness will all be crucial in delivering the considerable benefits of smart derivatives contracts to the digital assets market. ISDA is committed to working with all relevant stakeholders to ensure contractual standards for digital asset derivatives meet these objectives.

[39] For more information on the Common Domain Model, see www.isda.org/2019/10/14/isda-common-domain-model/

9. THE PATH TOWARD CONTRACTUAL STANDARDS

Producing ISDA's standards in natively digital format is not enough. The substance and content of the standard product templates and definitions must also be responsive to the needs of all market participants, including the range of firms and novel technological structures active in the digital assets market.

In addition to producing natively digital documentation, participants in the digital assets market expect ISDA's documentation to prioritize accessibility and usability, avoid unnecessary complexity and the need for excessive customization, and include only those features that are necessary for the market to trade specific products safely and efficiently.

In response, ISDA's initial focus will be on developing standard terms for products that exist and are traded in the digital asset derivatives market today. ISDA will work with members of the ISDA Digital Assets Legal Group to establish which products to focus on in 2022.

ISDA will continue to monitor and consider its role in supporting other types of products, including novel products traded on emerging market structures, such as decentralized and hybrid trading venues (see Table A).

Table A: Future Product Development

	2022	2023 Onward[40]
Digital Asset Type	Native digital assets (primarily cryptocurrencies such as Bitcoin and Ether)	More complex native digital assets and asset-referenced assets
Transaction Type	Established transaction structures; cash-settled	Evolving products such as perpetual swaps; physical settlement
Market	Centralized, regulated markets	Decentralized and hybrid markets
Form of Documentation	Transactional templates (ie, long-form confirmations) tailored for common transaction types	Full definitional booklet(s) or library

ISDA will design these product templates in an extensible and composable way, allowing for the contract terms framework to adapt and expand in response to organic market and product growth. This framework will identify and promote the use of common trade features and mechanics across different products, avoiding the need for excessive negotiation and customization of base terms and the proliferation of additional supplements, addendums and definitions.

The templates and definitions developed by ISDA for digital asset derivatives will be made available on the ISDA MyLibrary platform[41]. MyLibrary offers a range of features to users, including the ability to publish golden-source revisions to digital documents each time an update is made and allowing easy side-by-side comparisons of different versions, with changes marked-up in blackline. Documentation can also be navigated via index links to different types of content (including definitions, matrices and templates) and to useful external resources.

[40] This column indicates market developments ISDA currently expects to continue to monitor in considering how to support digital asset derivatives markets

[41] Available at www.isda.org/books/mylibrary

10. CONCLUSION

This paper identifies the key issues that will need to be addressed as part of ISDA's work to develop standards for digital asset derivatives, including disruption events, valuation mechanics and the interaction between the novel technological characteristics of digital assets and the existing ISDA documentation framework. As explained in Section 2, addressing these issues within a standardized framework will provide a solid foundation for the development of a robust, liquid market in digital asset derivatives.

This paper also sets out ISDA's vision for developing natively digital contract terms and delivering them to the market in a way that meets both immediate and longer-term requirements of all market participants. Collaboration among all relevant stakeholders will be crucial to ensure the considerable benefits of standardized definitions, confirmations and contracts are made widely available and accessible.

In developing this paper, ISDA has drawn on the expertise of members of the ISDA Digital Assets Legal Group and, more broadly, the insights of various firms operating in the digital asset market. As this work progresses, ISDA will deepen its relationships with these firms and facilitate greater collaboration among traditional market participants, the crypto community and other relevant stakeholders to produce mutualized solutions that serve all participants and contribute to the development of a safe and efficient digital asset derivatives market.

Members can participate in this work by joining the ISDA Digital Assets Legal Group. ISDA also wants to hear the views of non-members, particularly those that are actively engaged in the digital assets market. Please contact ISDALegal@ISDA.org.

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ABOUT ISDA

Since 1985, ISDA has worked to make the global derivatives markets safer and more efficient. Today, ISDA has over 960 member institutions from 78 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.