ISDA®

LEGAL GUIDELINES FOR SMART DERIVATIVES CONTRACTS: COLLATERAL

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DISCLAIMER

These guidelines discuss legal issues from time to time. These discussions are intended to provide general guidance, not legal advice, and to promote a better understanding of the basic principles that underpin ISDA collateral documentation. In practice, the laws relating to the collateralization of derivatives transactions and the legal documentation that governs it are complex, may change over time due to evolving case law and new regulations, and may vary substantially from jurisdiction to jurisdiction.

In particular, these guidelines use the terms 'collateral' and 'margin' interchangeably to refer to assets (such as securities and cash) transferred from one party to another (or segregated) to secure obligations of the respective parties. The terms 'collateral', 'margin' and 'return' in these guidelines are used in the general sense to cover all methods of collateral transfers, including the creation of a security interest, transferring legal ownership of the asset in full, or posting to an account with a third-party custodian.

The guidelines do not represent an explanation of all relevant issues or considerations in a particular transaction, technology application or contractual relationship. Parties should therefore consult with their legal advisors and any other advisor they deem appropriate prior to using any standard ISDA documentation. ISDA assumes no responsibility for any use to which any of its documentation or any definition or provision contained therein may be put.

INTRODUCTION

Collateral management processes have undergone significant changes in recent years, largely driven by new regulations. More firms are now subject to regulatory margin requirements, creating greater demand for high-quality collateral and requiring more frequent exchange of variation margin (VM) and initial margin (IM). Firms now have to meet jurisdiction-specific haircuts and eligibility requirements, as well as straight-through processing requirements. These regulations and associated requirements have been layered on top of an antiquated infrastructure that is struggling to meet the new demands placed upon it.

It is now time for market participants to take stock and consider opportunities to create a safer and more efficient collateral management infrastructure. In particular, there is an opportunity to harness new technologies like smart contracts and distributed ledger technology (DLT) to provide scalable, cost-efficient and more accurate collateral solutions. In order to achieve this, however, strong foundations first need to be put in place. This includes:

- **Automated feeds:** New front-to-back process frameworks aimed at creating more direct and efficient feeds from collateral management systems to downstream settlement systems and custodians.

- **Standardized reference data:** Common representations of reference data to act as a foundation for regulatory technology (regtech) solutions aimed at minimizing calculation differences and disputes that arise due to differences in reference data.

- **Automated reconciliation:** New data and process standards and greater use of central records/confirmation platforms to automate portfolio validation and reduce manual reconciliations and disputes.

Implementation of new technology will also depend on increased standardization and digitization of legal documentation. As part of this process, it is vital that the current legal and regulatory framework that governs and regulates collateral relationships and processes is not disrupted without due legal consideration of the potential impact.

The purpose of this paper is to explain the core principles of ISDA collateral documentation and raise awareness among technology developers, collateral operations, risk managers and other key stakeholders of important legal and regulatory issues that must be considered when a technology solution is applied to the collateral management process.

This paper therefore provides guidelines to help the development and application of technology in the automation of collateral management. It describes:

- Current challenges that exist in the collateral management process and how they can be resolved through greater automation;

- The importance of increased standardization in creating the foundation for automated technology solutions;

- ISDA's strategy for developing and delivering greater standardization and digitization of ISDA collateral documentation; and

- Existing legal standards as set out in ISDA's collateral documentation and key points for technology developers to consider as they develop and implement new technology solutions within this legal and regulatory framework.

While the intention of this paper is not to specify or recommend any particular approach, or to address any particular technological application or project, these guidelines do suggest steps that should be taken to ensure the design and implementation of new technology solutions are consistent with existing legal and regulatory standards. It also highlights areas where further industry collaboration will be required to identify and resolve existing areas of legal and regulatory uncertainty.

BUILDING THE FOUNDATION FOR SMART DERIVATIVES CONTRACTS

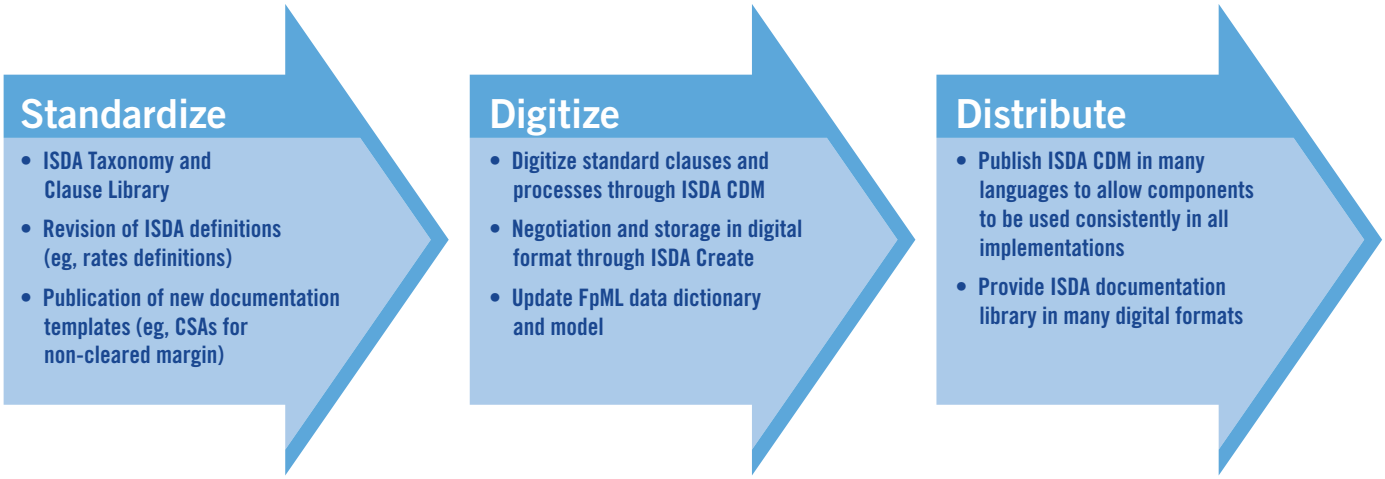
ISDA has been working with its members to identify opportunities for a more efficient collateral management infrastructure and ecosystem through greater standardization, simplification and automation.

In September 2016, ISDA published a whitepaper entitled *The Future of Derivatives Processing and Market Infrastructure*[1], which identified and proposed solutions to the challenges facing market participants across all parts of the derivatives market. In October 2017, ISDA published the *Blueprint for the Optimal Future State of Collateral Processing*[2], which represents the industry's collective vision of an ideal collateral processing framework. The purpose was to design and agree a blueprint that the industry can work towards to meet changing demands and challenges of the collateral process.

The blueprint identifies automation of the front-to-back collateral process as a key component of this future-state collateral process. To achieve this, it suggests a number of areas where industry commitment and focus is required to remove impediments to automation. An example is legal documentation standards – specifically, the development of industry standard terms and templates, contained in a central negotiation and distribution service.

ISDA has engaged with members to identify opportunities for further standardization of ISDA collateral documentation. In doing so, ISDA has identified three key contributors towards developing and delivering enhanced legal documentation standards and facilitating further automation of the collateral management process: standardization, digitization and distribution.

Figure 1



[1] https://www.isda.org/2016/09/15/the-future-of-derivatives-processing-and-market-infrastructure/

[2] https://www.isda.org/2017/10/18/a-blueprint-for-the-optimal-future-state-of-collateral-processing/

Standardization

Standardization takes many forms, covering product definitions, process descriptions, legal documentation, messaging and terminology.

ISDA's focus has been on developing common legal, process and data standards upon which new technologies can be developed and implemented. The implications of increased automation of existing business and operational processes from a technological, legal and operational perspective have also been considered. It is important to note that ISDA's standardization initiatives are not intended to limit the extent to which market participants are able to manage legal, regulatory and operational risk. Rather, standardization is intended to eliminate redundancy and achieve greater efficiency through the reduction of complexity.

The Future of Derivatives Processing and Market Infrastructure whitepaper identifies standardization of documentation[3] as a key contributor to evolving and improving the derivatives ecosystem.

From a legal perspective, ISDA's documentation framework provides robust foundational standards for the development of smart contracts. These documents reflect and are consistent with legal, regulatory and commercial standards for the collateralization of derivatives transactions. Importantly, they would also allow for the technology framework ultimately used for smart derivatives contracts to be consistent with these standards[4].

However, the continuing customization of standard-form documentation and the bespoke wording agreed between contracting parties across their legal agreements creates a number of issues for market participants. In particular, it creates obstacles to further digitization of legal documentation and the implementation of new technology to deliver increased automation of contractual events and obligations.

In response, ISDA is building the ISDA Taxonomy and Clause Library[5]. This initiative will set out standard-form drafting options for the most common clauses and clause variants, creating greater standardization in how firms negotiate and agree terms in their contracts. Use of the clause library will also streamline negotiation and client-onboarding, reduce operational risk and decrease time to market.

The ISDA Taxonomy and Clause Library will be completed for the ISDA Master Agreement by the end of 2019, and will be expanded in early 2020 to capture ISDA collateral documentation.

In parallel, ISDA and Linklaters have developed an online contract negotiation and distribution service called ISDA Create. ISDA Create is an online solution that allows firms to produce, deliver, negotiate and execute documentation completely online[6]. The ISDA Create platform encourages greater standardization through the development of standardized templates, based upon the framework created through the ISDA Taxonomy and Clause Library.

[3] Additionally, the paper notes the importance of standardization of data (eg, through product and trade identifiers) and process (through the development of the ISDA Common Domain Model)

[4] See https://www.isda.org/a/cHvEE/Smart-Derivatives-Contracts-From-Concept-to-Construction-Oct-2018.pdf

[5] ISDA members can listen to a webinar explaining the ISDA clause library here: https://www.isda.org/2018/10/23/isda-clause-library-project-webinar/

[6] ISDA Create currently allows firms to electronically negotiate and execute IM documentation. ISDA Create will be extended to other ISDA documents over time

Digitization

Greater standardization presents opportunities to optimize and automate business processes through the digitization of documentation and its underlying processes.

ISDA is supporting the industry's move toward greater digitization of documentation through its standardization initiatives, such as the ISDA Taxonomy and Clause Library and ISDA Create. Digitization of documentation will allow the key commercial and operational terms captured and monitored within legal agreements to be more closely aligned and consistent with the operational and business processes they support, allowing for increased automation of those processes. ISDA Create will facilitate this by also capturing, processing and storing data from negotiated documents, providing users with a complete digital record of their documentation.

This alignment between process and documentation will be supported through the integration of ISDA Create and other collateral services with the ISDA Common Domain Model (ISDA CDM).

The ISDA CDM establishes a common digital representation of derivatives trade events and actions that will enhance consistency and facilitate interoperability across firms and platforms, providing a foundation upon which new technologies (such as DLT and smart contracts) can be developed and applied.

In March 2019, ISDA published the ISDA CDM 2.0[7]. As well as providing a full set of representations for interest rate and credit derivatives, the ISDA CDM now includes an initial representation of equity swaps products and the ISDA Credit Support Annex for IM. This work will continue to be refined and expanded in 2019 to include the ISDA Credit Support Annex for VM.

Distribution

As the ISDA CDM is expanded to capture collateral documentation, integration among all of ISDA's standardization initiatives will deliver increased alignment between process and documentation. For example, the ISDA CDM can enable collateral eligibility assessments by explicitly specifying the standardized parameters of the underlying data points and the common derivations involved in this assessment process. This would permit the precise modelling of a collateral schedule that allows for the selection of eligible collateral to be posted as margin.

To ensure broad-based industry adoption, the ISDA CDM 2.0 is available under an open license, allowing firms to use the model without charge. By opening access to the entire market, ISDA expects to develop a broader user community for the ISDA CDM and further encourage opportunities for deployment, including across rates clearing and collateral management solutions.

The digitization and expression of standard clauses and processes in ISDA collateral documentation through the ISDA CDM will be published and distributed in many languages to allow these components to be used to drive consistent implementation. This will provide technology developers with an interoperable industry standard, allowing them to focus on creating and implementing technology solutions aimed at achieving greater efficiencies and cost savings in the collateral management process.

[7] https://www.isda.org/2019/03/20/isda-publishes-cdm-2-0-for-deployment-and-opens-access-to-entire-market/

AUTOMATION OF COLLATERAL MANAGEMENT

In October 2018, ISDA and King & Wood Mallesons jointly published a whitepaper entitled *Smart Derivatives Contracts: From Concept to Construction*[8]. This paper proposed a practical framework for the construction of smart derivatives contracts.

As part of this framework, the paper suggests that the first step toward the construction of a smart derivatives contract is the selection of those parts of a derivatives contract for which automation would be both **effective** and **efficient**.

Effective Automation

As explained further in the *ISDA Legal Guidelines for Smart Derivatives Contracts - Introduction*[9], effective automation is likely to be more readily achievable with respect to clauses within a contract that are operational in nature. Operational clauses, which generally embed some form of conditional logic, are readily capable of being expressed as Boolean logic. As a result, they are highly susceptible to being machine automated or analyzed in some way[10].

Many of the clauses found in the ISDA collateral documentation (and the processes they reflect) use conditional logic and lend themselves well to automation, including:

- Valuation of both current exposure and margin requirements and any collateral transferred;
- Assessing the eligibility of the types of collateral to be transferred;
- The exchange and return of collateral; and
- Management of the collateral transferred (for example, substitution or rehypothecation).

Many of these processes are therefore capable of being effectively automated.

Efficient Automation

The efficiency benefits that could be achieved through automation are also clear. ISDA's collateral blueprint identifies a number of observed pain points in the current collateral process. These include:

- Repetitive processes that are inefficient and costly;
- Challenges with resolving disputes in a timely fashion; and
- Slow and ineffective valuations and transfers of collateral assets.

The blueprint also highlights significant replication of process and costs across the industry. Essentially, much of the market is doing the same thing, in the same way, with roughly the same teams and systems.

[8] https://www.isda.org/a/cHvEE/Smart-Derivatives-Contracts-From-Concept-to-Construction-Oct-2018.pdf

[9] https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf

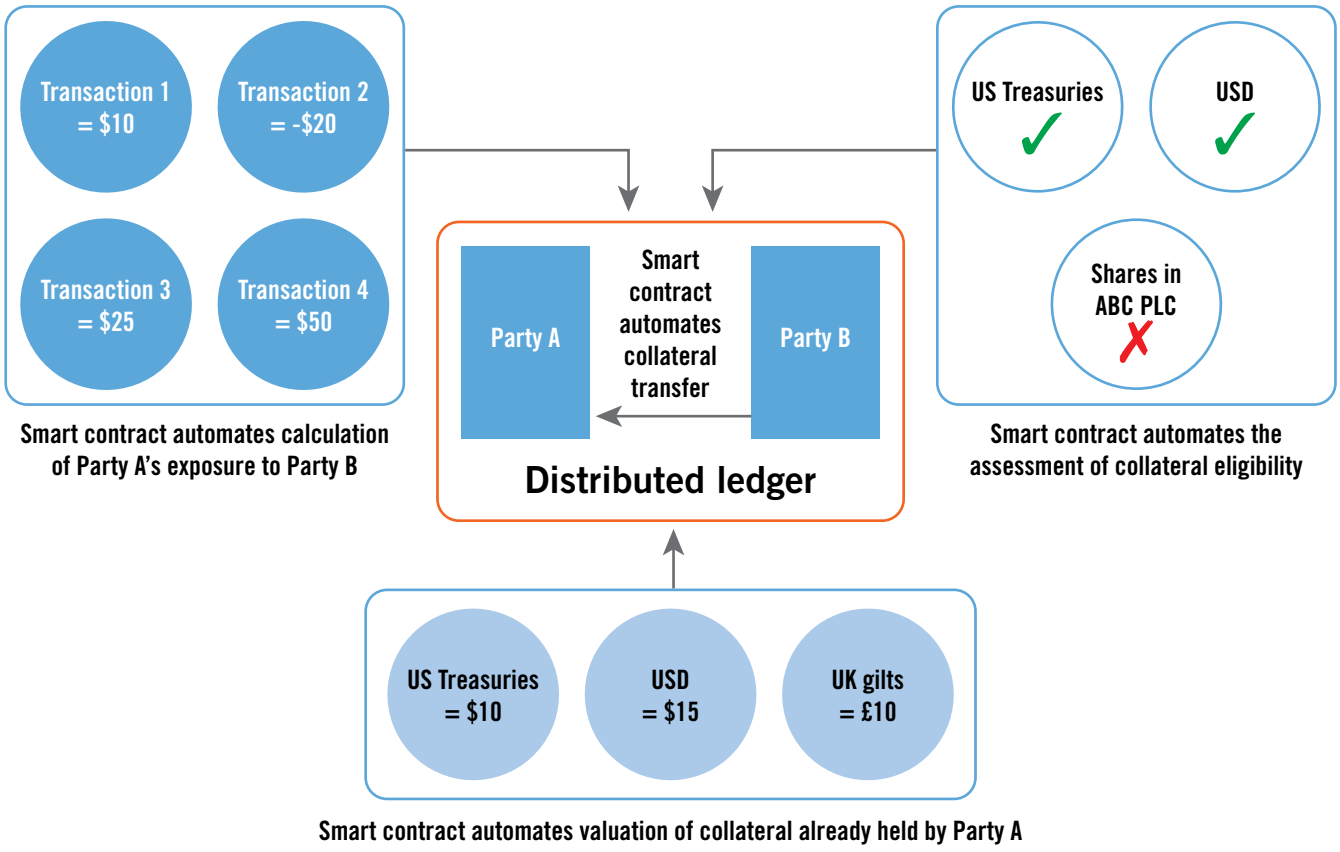
[10] For further discussion of operational and non-operational clauses, see *Smart Contracts and Distributed Ledger – A Legal Perspective* (https://www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf)

Many of these processes would benefit from increased process standardization and shared infrastructure solutions. Doing so would move the industry towards a more efficient, cost-effective and scalable collateral process. It would also present opportunities for greater automation and innovation, and for the application of smart derivatives contracts to ISDA collateral documentation[11].

Consequently, there is likely to be significant potential for the application of smart derivatives contracts in the context of ISDA collateral documentation and the collateral management process.

Figure 2 provides an illustrative example of a smart derivatives contract with a DLT construct, designed to automate some of the processes mentioned above.

Figure 2



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 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 ISDA's collateral documentation. The above example illustrates how, under a heavy chain implementation, the platform could house tokenized collateral assets that are native to the ledger, and could support the transfer of such assets between the parties.

[11] As explained in the *ISDA Legal Guidelines for Smart Derivatives Contracts –Introduction*, a smart derivatives contract is a derivatives contract where 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 (https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf)

Although these guidelines are agnostic about the types of technology and solutions that may ultimately be used, it is important to acknowledge that significant work in this area has already been undertaken.

In addition to ISDA's document standardization and digitization initiatives, infrastructures and technology vendors are emerging with solutions to address the challenges and inefficiencies experienced in the collateral management space. These include:

- **Calculation engines:** These are designed to decrease the margin call and settlement time process, therefore reducing operational risk.
- **Reconciliation tools:** These provide standardized trade representations that reduce manual research and processing, decrease margin-related disputes and improve counterparty risk management.
- **Collateral tokenization/DLT:** DLT-based solutions and the tokenization of collateral could streamline collateral settlement and mobilization and offer improved data transparency for counterparty risk management and collateral optimization.
- **Cloud-based solutions:** Allows market participants to interact externally on a process hosted by external infrastructure, helping to reduce server requirements within individual organizations and deliver immediate cost benefits when it comes to maintaining hardware associated with certain activities (including collateral management).
- **Artificial intelligence (AI):** AI-based tools can be used to optimize decision-making on collateral transfers and substitutions.

While the benefits of using technology to deliver greater efficiency, automation and innovation are clear, existing solutions to some of the basic challenges facing the industry (for example, the use of electronic messaging for business communications) have not yet been fully adopted in some cases. Consequently, there remains a real need for the industry to consider how the market functions and to develop principles to guide the development of an efficient collateral infrastructure through greater standardization and digitization.

TYPES OF COLLATERAL ARRANGEMENT

The different types of collateral arrangement can typically be distinguished by one or both of the following characteristics:

- The risk that one or more parties is aiming to mitigate; and
- The mechanism for transferring collateral (ie, via security arrangement or title transfer).

In a derivatives context, there are two different mechanisms for mitigating risk.

- **VM** is provided to collateralize the mark-to-market value of unsecured and outstanding credit exposures with respect to outstanding transactions.
- **IM** is additional collateral that is provided as a cushion to protect against sudden increases in credit exposure due to changes in the market value of the relevant derivatives transactions, and/or a decline in the value of VM during the time it takes a party to close out these derivatives transactions in the event that the other party defaults. IM may also be referred to as independent amount in certain scenarios, primarily where the exchange of collateral is not required by applicable regulation.

Under ISDA collateral documentation, there are two different legal mechanisms for exchanging collateral.

- **Security arrangement:** The collateral provider grants a security interest over the collateral in favor or for the benefit of the collateral taker. The collateral provider retains an ownership interest in the collateral and is entitled to the release of the collateral from the security interest once it has discharged the relevant collateralized obligations.
- **Title transfer:** The collateral provider transfers its entire interest in the collateral to the collateral taker. The collateral provider retains no legal ownership of the collateral, but instead has a contractual right to receive 'equivalent assets' back from the collateral taker once it has discharged its collateralized obligations. In this context, 'equivalent assets' are those of the same type (from a legal and economic perspective) as the ones transferred.

As a basic principle, collateral should be held and recorded in a manner that is consistent with the underlying legal documentation. As technology solutions are developed, it will be important for developers to understand (and to seek legal advice on) these distinctions, particularly where the solution being used may increase recharacterization risk[12].

Collateralized transactions may result in reduced regulatory capital requirements for banks and other regulated entities. To ensure that a collateral arrangement is recognized as risk-reducing for regulatory capital purposes, the legal enforceability of these financial collateral or margin arrangements is crucial. ISDA has therefore commissioned legal opinions on the enforceability of the ISDA credit support documentation in various jurisdictions[13].

[12] Recharacterization risk is the risk that a title transfer arrangement could be treated instead as an improperly documented and/or improperly perfected grant of a security interest. This may result in a party being unable to enforce its rights to the collateral

[13] https://www.isda.org/opinions-overview/

ISDA COLLATERAL DOCUMENTATION

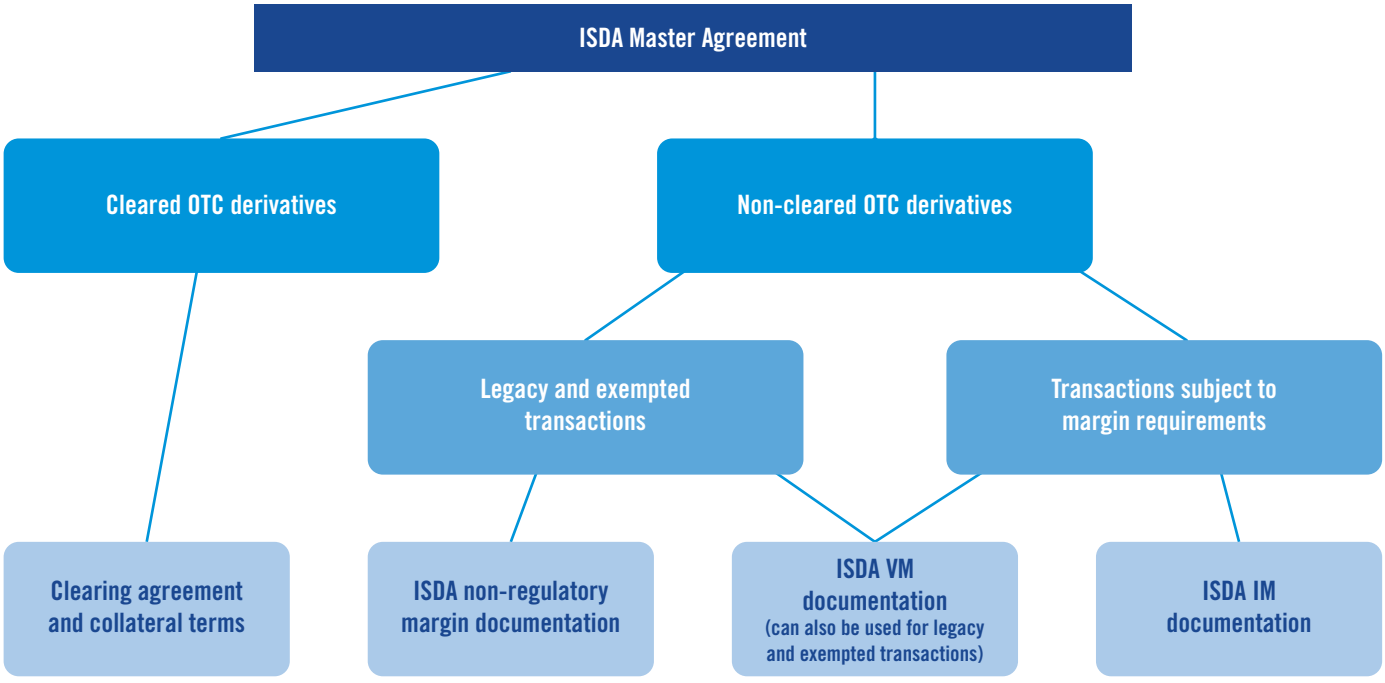
In 1994, ISDA published the 1994 ISDA Credit Support Annex (the **NY CSA**) for use in documenting bilateral security and other credit support arrangements between counterparties for transactions governed by an ISDA Master Agreement under New York law. In 1995, ISDA published two additional standard-form credit support documents for use with ISDA Master Agreements governed by English law: the ISDA Credit Support Annex (the **English CSA**) and the ISDA Credit Support Deed (the **English CSD**)[14,15].

In the intervening years, and in response to regulatory requirements, a number of other documents have been published by ISDA to enable parties to comply with these regulations in various jurisdictions.

In 2019, ISDA also published Irish and French law versions of certain collateral documents for use with Irish and French law governed ISDA Master Agreements.

For the purposes of these guidelines, these documents will be referred to collectively as the 'ISDA collateral documentation'.

Figure 3



Broadly speaking, the ISDA collateral documentation can be broken down into three distinct categories of collateral arrangement.

[14] In 1996, a Japanese law Credit Support Annex for use with Japanese law ISDA Master Agreements was also published

[15] ISDA has also published the 2001 ISDA Margin Provisions, which allow parties to select jurisdiction-specific provisions to apply to their margin arrangements, including New York law, English law and Japanese law, although this document is not commonly used

ISDA Non-regulatory Margin Documentation

Parties may wish to exchange collateral even where there is no obligation under any relevant regulatory regime to do so. This is referred to as 'non-regulatory margin'. This may take the form of VM or IM, which, in this context, is typically referred to as 'independent amount'.

ISDA has published documentation – such as the NY CSA, English CSA and English CSD[16] – that can be used by parties when their trading relationships are not subject to a regulatory obligation to exchange margin.

ISDA VM Documentation

Exchange of collateral is now compulsory for certain market participants under various regulatory regimes[17]. This is referred to as 'regulatory VM'.

A number of documents have been published by ISDA to enable parties to comply with regulatory VM obligations in various jurisdictions, such as: (i) the ISDA 2016 Credit Support Annex for Variation Margin (VM) (English law) (the English VM CSA), which, like the English CSA, is a title transfer arrangement; and (ii) the ISDA 2016 Credit Support Annex for Variation Margin (VM) (New York law) (the New York VM CSA), which, like the NY CSA, is a security arrangement[18].

ISDA IM Documentation

A sub-set of those market participants required to exchange regulatory VM[19] must also exchange IM if the notional amounts of their non-cleared derivatives transactions are above the relevant regulatory thresholds. This is referred to as 'regulatory IM'.

Regulatory IM cannot be held by the collateral taker directly and must be held in a segregated account by a third-party custodian[20]. Each party must appoint a custodian, which will hold the posted collateral for the benefit of the other party should there be a default. Therefore, in order to document a regulatory IM relationship between two parties, it is necessary to agree separate documentation to govern the collateral relationship between the two parties, and the relationship with each party's custodian relating to the relevant segregated account[21]. As further explained in the 'Possession of Collateral' section, the choice of custodian will impact the type and number of ISDA IM documents parties will need to govern their regulatory IM relationship.

ISDA has published a wide range of standard documents to govern the regulatory IM relationships between the two parties to provide flexibility for market participants to choose their preferred custodial arrangements.

[16] ISDA has also published Irish and French law versions of the 1995 ISDA CSA

[17] Multiple regulatory regimes may apply to a single arrangement between two parties. Where this is the case, parties must comply with the strictest requirements of each applicable regime

[18] Other ISDA VM documentation includes: (i) agreements under Irish law, French law and Japanese law; ii) additional English law and New York law agreements for use with counterparties in Japan or Asia ex-Japan; and (iii) agreements where particular collateral is being exchanged, such as Korean won. In addition, parties may elect to amend non-regulatory margin documentation so it complies with relevant regulatory regimes

[19] As with ISDA VM documentation, multiple regulatory regimes may apply to a single arrangement between two parties to the ISDA IM documentation

[20] A third-party custodian is a custodian that is unaffiliated with either the collateral taker or the collateral provider

[21] Typically, an 'account control agreement' for bank custodians

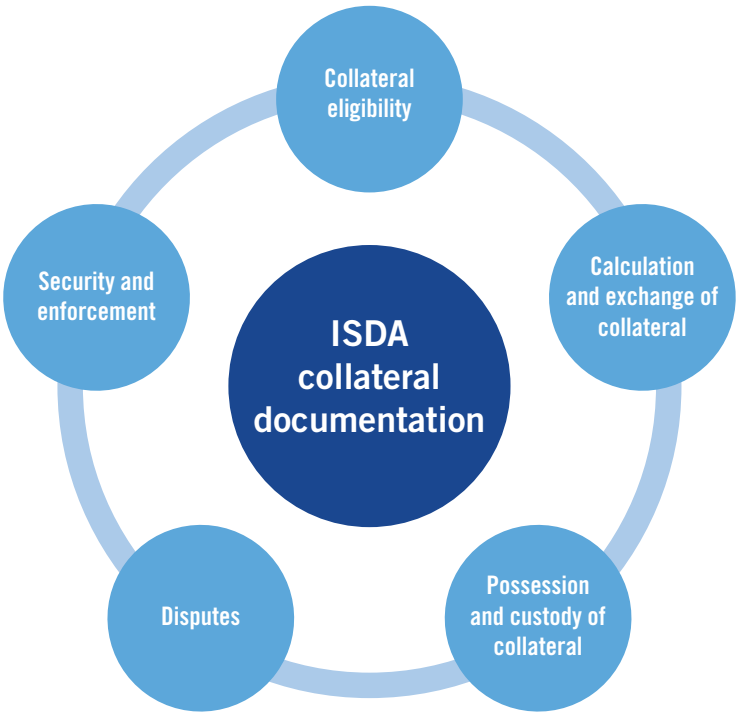
These guidelines are only intended to cover ISDA collateral documentation that is used in the context of non-cleared derivatives transactions that are not subject to mandatory clearing through central counterparties (CCPs)[22]. ISDA has published collateral documentation that can be used in conjunction with clearing documentation to align margin obligations between a clearing member and its client with those existing between a clearing member and CCP. However, analysis of collateral documents for cleared derivatives is not within the scope of these guidelines.

[22] See *ISDA Legal Guidelines for Smart Derivatives Contracts – Introduction* for a high-level discussion of the operation of clearing documentation within the overall ISDA documentation architecture

CORE THEMES

ISDA collateral documentation can be broken down into five core themes.

Figure 4



Collateral Eligibility

At the outset of the arrangement, the ISDA collateral documentation establishes a set of eligibility criteria that stipulates which assets can be transferred to satisfy collateral obligations under the arrangement. The eligibility criteria may be agreed between the parties or prescribed by applicable regulation.

Calculation and Exchange of Collateral

The total amount of collateral transferred is calculated from time to time in accordance with the terms of the relevant ISDA collateral documentation. This may be set according to the applicable regulation. More collateral may need to be transferred as the value of the obligations and/or the value of the collateral fluctuates.

Collateral may also be returned to the collateral provider or released from the collateral arrangement. This may occur if the collateral provider performs its obligations, excess collateral has been transferred, the value of the collateralized obligations changes, or the collateral provider substitutes alternative eligible collateral.

Possession and Custody of Collateral

Depending on the nature of the arrangement, parties may have the right to rehypothecate or dispose of collateral assets for their own purposes. In the case of regulatory IM, collateral is required to be held in a segregated account by a third-party custodian. It is therefore important to consider the role of the custodian and the nature of the custodial arrangement that has been entered into.

Collateral often generates an income in the form of distributions (such as coupons paid on bonds or dividends paid on shares) or interest on cash collateral. Depending on the prevailing interest rate environment and the agreement between the parties, the collateral may also generate a cost payable by the collateral provider in the form of negative interest on cash collateral. The ISDA collateral documentation sets out the mechanism and circumstances by which distributions and interest amounts are transferred or paid to the collateral provider.

Disputes

Disputes can arise with respect to the calculation of the amount of collateral to be transferred or returned and the value of the collateral. The ISDA collateral documentation provides a framework for resolving a dispute that has failed to be resolved between the parties.

Security and Enforcement

In the event of a default of the collateral provider, the collateral taker must have the ability to take possession of the collateral or sell it in order to realize its value. The enforcement mechanisms within the ISDA collateral documentation differ depending on (among other factors) the type of collateral arrangement in question – ie, whether it is a security or title transfer arrangement, and the relevant governing law.

While these themes are common across different types of ISDA collateral documentation, their precise nature may differ depending on the collateral arrangement and the documentation being used, as well as the relevant governing law.

These differences are largely attributable to the extent to which certain market participants are required by regulation to exchange collateral. Consequently, there may be varying considerations for technology developers, depending on the nature of the underlying relationship between the parties.

These guidelines explore these themes in the context of ISDA collateral documentation that is designed to govern the legal relationship underpinning the exchange of collateral between parties where:

- Neither party is subject to a regulatory obligation to exchange collateral; and
- One or both parties are subject to a regulatory obligation to exchange collateral.

Within this latter category, the ISDA collateral documentation used to govern the exchange of regulatory VM and regulatory IM may raise different issues. Consequently, these will be analyzed separately. In particular, the role of custodians in the context of regulatory IM arrangements must be considered.

COLLATERAL ELIGIBILITY

Non-regulatory Margin

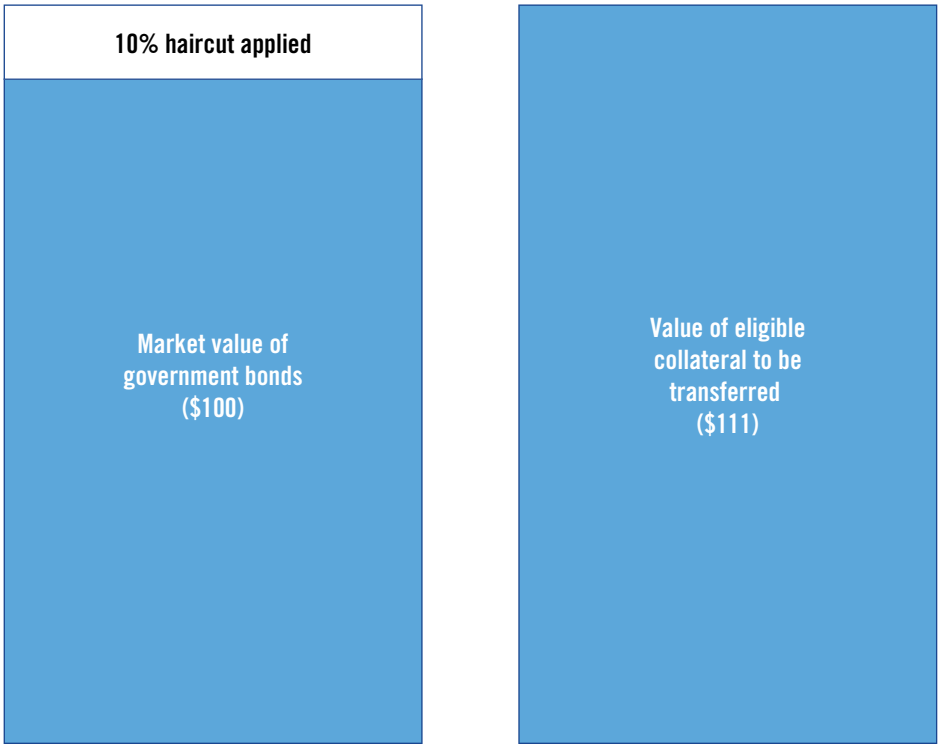
In respect of non-regulatory margin, there are no restrictions on the types of assets that may be transferred. Within the ISDA non-regulatory margin documentation, the parties agree a set of eligibility criteria and only assets meeting the criteria can be transferred or will be treated as having any value as collateral once transferred. The following types of assets are often included as eligible collateral:

- Cash in a specified currency;
- Government bonds;
- Corporate bonds; and
- Equities.

Each category of collateral can be specified as eligible for one or both parties.

As well as specifying what types of collateral can be transferred by each party, each category of collateral may be given a haircut. The application of a haircut (normally expressed as a percentage of value) effectively results in a reduction in the value attributed to the collateral for the purposes of calculating collateral requirements and/or determining whether collateral requirements have been met.

Figure 5



- Party A is required to meet a margin call from Party B of $100.
- Party A intends to meet the margin call by transferring government bonds.
- The parties have agreed that government bonds will be subject to a haircut of 10%.
- Following application of the haircut, government bonds with a market value of $100 will be ascribed a value of $90 for the purposes of determining their value as eligible collateral.
- Party A is therefore required to transfer government bonds with a market value of $111 to Party B (subject to rounding).

The parties may agree that different haircuts will apply in relation to each category of eligible collateral, with a larger haircut being applied to those assets perceived as having greater risk.

Regulatory VM

Each regulatory regime has its own set of collateral types that are eligible to be transferred as collateral for regulatory VM. The collateral types typically include cash[23] (in certain currencies), government bonds, certain other publicly traded securities, certain equities and gold. Under some regulatory regimes, the list of eligible collateral may be subject to further limitations, such as liquidity, credit quality, concentration[24] and/or wrong-way risk[25] assessments.

The parties agree a set of eligibility criteria within the ISDA VM documentation, and only collateral of certain types meeting those criteria can be transferred as eligible collateral. Parties should therefore ensure that the types of collateral that may be transferred comply with the requirements of all relevant regulatory regimes applicable to the parties' trading relationship.

Each regulatory regime prescribes its own haircuts to each eligible collateral type, and may also require the parties to add an additional haircut (ie, an FX haircut) in respect of any eligible asset by reference to the currency of its denomination[26]. As the haircuts and FX haircuts prescribed among the applicable regulatory regimes may differ, parties should ensure all haircuts in their ISDA VM documentation comply with the requirements of all relevant regulatory regimes applicable to the parties' trading relationship.

Regulatory IM

As with regulatory VM, the relevant regulatory regimes prescribe the types of collateral that may be transferred as regulatory IM. The parties will agree which of those types of collateral will be designated as eligible for the purposes of their regulatory IM arrangements.

Under a given regulatory regime, the list of eligible collateral for regulatory VM may differ from the list of eligible collateral for regulatory IM. Different requirements may also apply to a particular eligible collateral type. As with regulatory VM, it is possible that certain collateral is eligible as regulatory IM when transferred but later ceases to be eligible before it is returned. This scenario is dealt with by deeming ineligible regulatory IM to have a value of zero. The collateral provider is entitled to its return and substitution, provided it has satisfied all of its obligations to transfer regulatory IM.

In certain cases, a custodian may agree to perform this verification (see 'Possession and Custody of Collateral' section for a discussion of the different types of custodial arrangement typically on offer). In these cases, the parties will need to agree with the custodian (or other relevant third parties and/or intermediaries) what should constitute eligible collateral, including all applicable regulatory haircuts. Otherwise, the parties will need to agree the list of eligible collateral as part of their ISDA IM documentation.

[23] Some regulatory regimes specify that cash is the only eligible form of collateral between two dealer counterparties

[24] The level of risk arising from direct or indirect exposure to a single counterparty or asset

[25] The risk that occurs when exposure to a counterparty is adversely correlated with the credit quality of that counterparty

[26] In the EU, for example, an FX haircut of 8% applies to all non-cash collateral denominated in a currency other than one agreed in the relevant derivatives contract

Considerations for Technology Developers

Developers should be mindful that parties may have a choice of what collateral to post. When developing a technology solution that is designed to automate the transfer of collateral, developers, lawyers and other key stakeholders should work together to determine whether the benefits of automation outweigh this right to determine which assets to transfer or whether an automated system can be developed that permits a degree of human interaction and discretion.

In certain types of collateral arrangement, parties may negotiate forms of eligible collateral that are less liquid and, as a result, potentially less susceptible to automation. This could include, for example, letters of credit and security interests in property and/or non-publicly traded equity. Technology developers may consider providing optionality for parties to identify other forms of eligible collateral, and for these assets to be dealt with separately from those that might be subject to automated collateral management solutions.

In the context of regulatory compliant collateral arrangements, developers seeking to automate the assessment of collateral eligibility should be mindful that eligible collateral is subject to certain rules on type, liquidity, credit quality, concentration and wrong-way risk[27].

Developers should also be aware that more bespoke non-regulatory margin arrangements might also contain triggers that would result in modifications being made to collateral eligibility criteria upon the occurrence of certain events. For example, the parties might agree that changes would be made to collateral haircuts (and therefore, potential changes in the volume of collateral being transferred) following a deterioration in the creditworthiness of a party (eg, a credit rating downgrade).

Automated processes for the assessment of eligibility will need to capable of performing a dynamic assessment of these characteristics in the collateral, taking account of applicable regulatory requirements and contractual terms agreed between the parties. Smart contracts might be suited for this task. For example, it could be possible to design a smart derivatives contract that pulls information from external data sources to determine which requirements apply when performing this assessment and when those requirements change. It might also be possible for a collateral provider to be given a series of choices that have been pre-calculated, taking the relevant haircuts and any diversification or other requirements into account.

Developers will also need to consider the fact that ISDA collateral documentation contains provisions for the treatment of legally ineligible collateral, which involve valuing it at zero and returning it to the collateral provider (subject to any transfer obligation with eligible collateral having been discharged).

[27] This might also be the case in certain bespoke non-regulatory collateral arrangements where the parties might bilaterally agree that eligible collateral is subject to specific criteria, such as credit quality or minimum/maximum maturity of the relevant securities

CALCULATION AND EXCHANGE OF COLLATERAL

Non-regulatory Margin

The total amount of collateral that is required to be transferred is calculated from time to time in accordance with the terms of the relevant ISDA collateral documentation. Collateral may need to be transferred or returned as the value of the collateralized obligations and/or the value of the collateral transferred fluctuates.

The mechanism for determining the amount of collateral that needs to be transferred varies depending on the nature of the ISDA non-regulatory margin documentation being used (eg, the NY CSA, the English CSD or the English CSA).

In simplistic terms, and using the English CSA as an example, determining the provision of collateral requires a valuation agent (usually one of the contracting parties) to:

1) Determine the net economic exposure of the parties to each other by calculating the mark-to-market value of all derivatives transactions under the relevant ISDA Master Agreement.

2) Add or subtract the net independent amounts[28] agreed between the parties.

   Independent amount is an additional layer of collateral that parties may agree to transfer in addition to VM. As previously stated, independent amount is an over-collateralization to protect against a sudden increase in credit exposure due to changes in the market value of the relevant transactions and/or a decline in the value of collateral transferred during the time it takes a party to close out these trades following a default of the other party.

3) Subtract the relevant threshold. The threshold is the level of uncollateralized exposure each party is prepared to allow the other.

   The total amount calculated in steps (1) – (3) is known as the 'credit support amount'.

4) Subtract the total value of the collateral already transferred from the credit support amount.

   The resulting amount, if positive, is the delivery amount. In order for the delivery amount calculation to work, all amounts need to be converted into the same specified currency agreed between the parties.

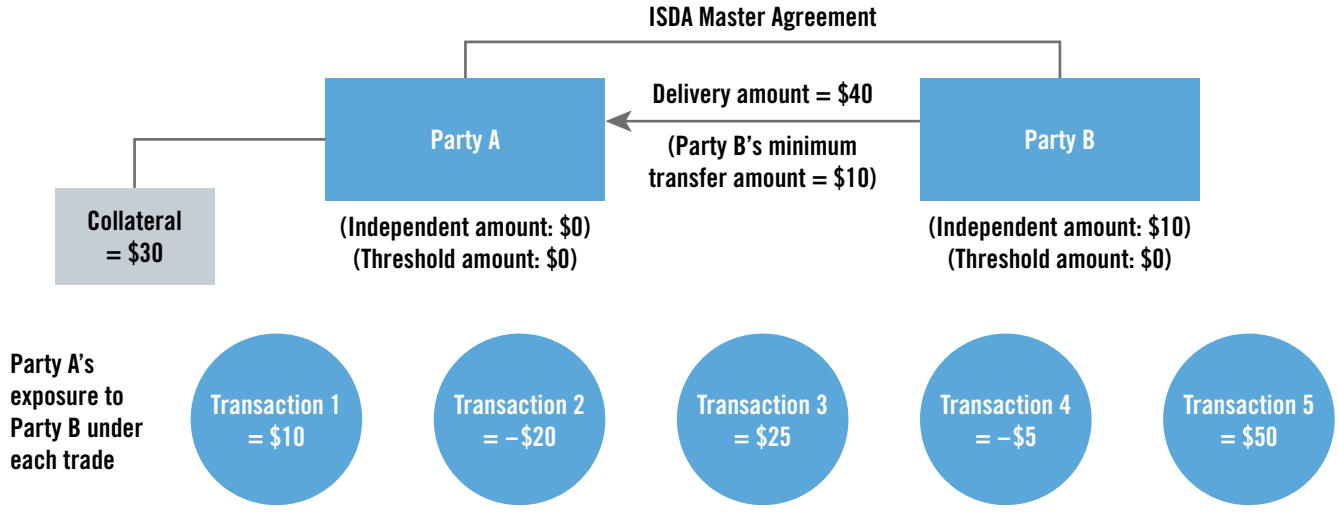
5) Determine whether the delivery amount exceeds a specified minimum transfer amount agreed between the parties. This is to avoid costly transfers of low or insignificant amounts of collateral.

6) Apply any agreed rounding convention to avoid transfers of uneven amounts of collateral[29].

[28] In the context of ISDA non-regulatory margin documentation, IM is typically referred to as 'independent amount'

[29] For example, amounts may be rounded to the nearest 10,000 in the relevant currency

Example 1



(1) Calculating the mark-to-market value of all derivatives transactions under the ISDA Master Agreement between Party A and Party B, it is determined that Party A has a net economic exposure to Party B of $60

(2) Party B has an independent amount of $10. This amount is added to the net economic exposure of Party A to Party B: $60 + $10 = $70

(3) Party B has a threshold amount of zero: $70 + $0 = $70 (the credit support amount)

(4) Party A holds collateral worth $30. This is subtracted from the credit support amount: $70 - $30 = $40 (the delivery amount)

(5) Party B's minimum transfer amount is $10. As $40 is greater than $10, Party B is required to provide a delivery amount of $40 to Party A

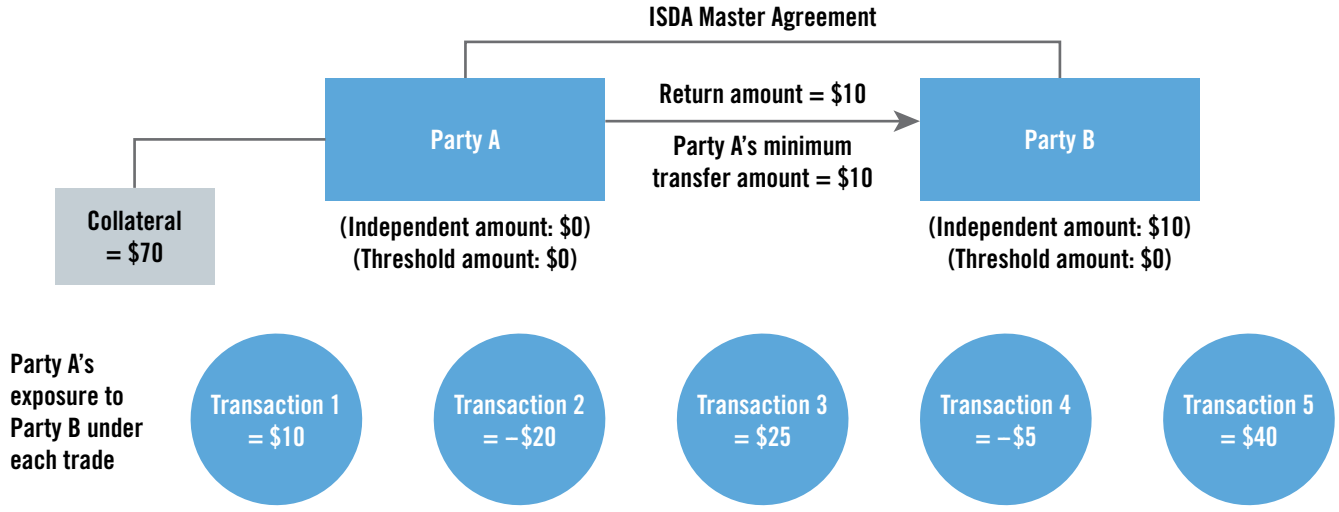
In certain circumstances, collateral may be returned to the collateral provider or released from the collateral arrangement. This may occur if the collateral provider performs its obligations, if excess collateral has been transferred, or if the value of the collateral transferred or the value of the collateralized obligations changes.

The process for determining the amount of collateral that needs to be returned to the collateral provider or released from the collateral arrangement is conceptually the same as that for determining the delivery amount.

Using the above example, if the net sum determined once the total value of collateral has been subtracted from the credit support amount (step 4) is negative (ie, the amount of collateral already transferred exceeds the credit support amount), the resulting amount is the return amount.

Provided the return amount is greater than the minimum transfer amount, then the collateral provider may request the return of an amount of collateral equal to the return amount, subject to any agreed rounding convention.

Example 2



(1) Calculating the mark-to-market value of all derivatives transactions under the ISDA Master Agreement between Party A and Party B, it is determined that Party A has a net economic exposure to Party B of $50

(2) Party B has an independent amount of $10. This amount is added to the net economic exposure of Party A to Party B: $50 + $10 = $60

(3) Party B has a threshold amount of zero: $60 + $0 = $60 (the credit support amount)

(4) Party A holds collateral worth $70. This is subtracted from the credit support amount: $60 - $70 = -$10. As this is a negative sum, a return amount of $10 is due from Party A to Party B

(5) Party A's minimum transfer amount is $10. Party A is therefore required to provide a return amount of $10 to Party B

The ISDA non-regulatory margin documentation also describes the legal mechanism for how transfers of collateral are to be made and when. The process for transferring collateral will differ depending on whether transfers of collateral are made on a title transfer basis or by way of a security arrangement. For example, collateral transferred by way of a security arrangement may require the parties to interact with a third-party custodian.

Regulatory VM

Broadly speaking, the provisions relating to the exchange of collateral within the ISDA VM documentation are similar to those within the ISDA non-regulatory margin documentation. However, the ISDA VM documentation takes into account the various regulatory requirements that may apply to the obligations of either or both parties to exchange regulatory VM.

These regulations specify how frequently regulatory VM must be exchanged between the parties, and place caps on the amount the parties can agree as a minimum transfer amount. It may be the case that not all of the derivatives transactions between parties under an ISDA Master Agreement are subject to regulatory VM requirements[30].

For this reason, the ISDA VM documentation is designed to limit regulatory VM to those derivatives that are subject to the requirements. Separate collateral arrangements may be entered into for those transactions not subject to regulatory VM. This may result in two separate credit support documents existing under the same ISDA Master Agreement (see 'Non-regulatory Margin Documentation' section).

Where parties do have separate collateral arrangements in place, it may be possible to offset same-day transfers of collateral and regulatory VM across multiple collateral arrangements, provided the collateral/regulatory VM in question is fungible and eligible for such offset[31].

The ISDA VM documentation also describes how transfers of collateral are to be made. As with ISDA non-regulatory margin documentation, the process for transferring collateral will differ depending on whether transfers are made on a title transfer basis or by way of a security arrangement.

Regulatory IM

Certain jurisdictions require regulatory IM to be calculated and transferred between counterparties on a daily basis[32]. There is also a permitted threshold provision, which means parties do not need to exchange regulatory IM until an agreed financial level is reached[33].

Regulatory IM must be exchanged by parties on a two-way gross basis – ie, each party must transfer regulatory IM as collateral provider to the other party as collateral taker, and the parties' obligations to transfer cannot be netted.

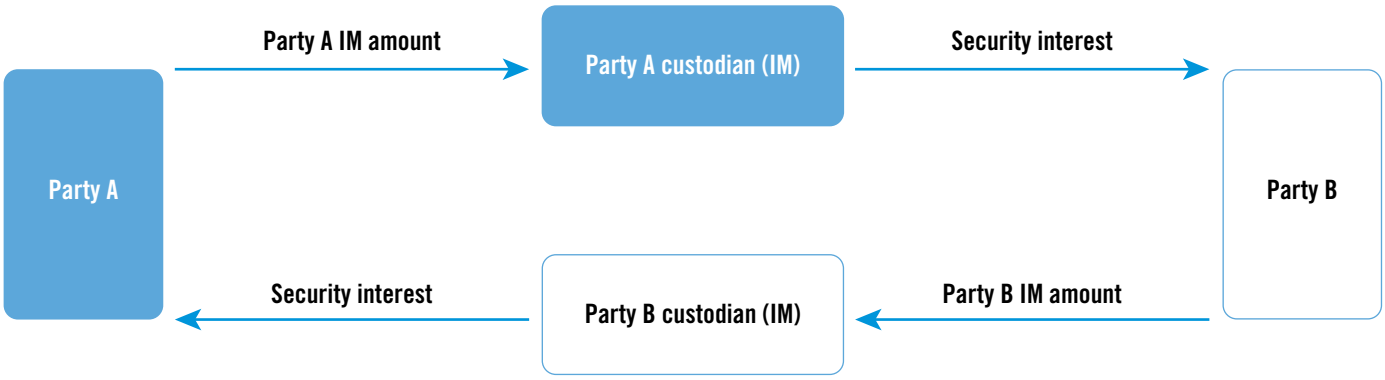
[30] For example, FX spot rate transactions are generally excluded from VM requirements in the US and the EU

[31] Regulatory IM must be segregated and cannot be offset against any other type of margin

[32] Certain other regulatory regimes prescribe the occasions on which regulatory IM must be calculated. However, market participants have in practice broadly agreed to calculate and transfer regulatory IM on a daily basis, regardless of the applicable regulatory requirements. This is due to operational efficiency. As such, the ISDA IM documentation provides for daily calculations and transfers of regulatory IM

[33] However, where there are entities subject to IM regulations that are in the same corporate group, this threshold amount needs to be split across each of those entities

Figure 6



Regulatory regimes generally require the amount of regulatory IM to be determined by either an approved model (eg, the ISDA SIMM™ [34]) or the prescribed table of the applicable regulatory regime. The ISDA IM documentation is designed to allow parties to choose between the two for each applicable regime.

It is possible that more than one regulatory IM regime may apply to a given trading relationship. The ISDA IM documentation is intended to help the parties identify and agree to each of the regulatory regimes that apply to their trading relationship. Where multiple regulatory regimes apply, the *strictest* of the approaches will apply, For example, the delivery amount will be determined based on the highest amount of regulatory IM required and the largest haircut required by each applicable regulatory regime.

Regulatory regimes generally do not require parties to exchange regulatory IM for all types of non-cleared derivatives[35], so it is likely that the exchange of regulatory IM will be required only for a subset of all transactions between two parties under an ISDA Master Agreement. As with the ISDA VM documentation, the ISDA IM documentation only takes in-scope transactions into account when calculating regulatory IM. This may differ between each applicable regulatory regime.

Market participants may also exchange negotiated over-collateralization amounts (non-regulatory independent amount) in addition to regulatory IM. The amount of any non-regulatory independent amount is determined by agreement of the trading parties – ie, there is no prescribed way to calculate non-regulatory independent amount as there is for regulatory IM.

Considerations for Technology Developers

Developers will need to provide a mechanism that allows the parties to control which obligations they are seeking to collateralize. It is common for parties to exclude certain transactions from contributing to the total collateralized exposure, either because there is no regulatory requirement to exchange collateral for those transactions, or the parties otherwise agree that those trades should be excluded. This would need to be reflected in any smart derivatives contract system design.

[34] https://www.isda.org/category/margin/isda-simm/

[35] For example, FX spot, physically settled FX swaps and forwards, and principal payments on cross-currency swaps are excluded from the requirement to exchange IM under most regulatory regimes

In a heavy chain context, if collateral is transferred to a mechanism that automates or encodes the collateral processes (for example, where collateral is transferred to an independent smart contract that cannot be accessed by the collateral provider until the collateralized obligations have been performed), then developers need to consider whether that transfer is intended to occur by way of a security or title transfer.

There may be differences in both: (i) the mechanism under the applicable ISDA collateral documentation for enforcement of security collateral arrangements and title transfer collateral arrangements; and (ii) the requirements under different legal regimes for the creation, perfection and enforcement of security collateral arrangements and title transfer arrangements. Unless the smart contract code includes provisions for the enforcement of a security interest over the relevant collateral in a way that respects both parties' intentions as provided for in the relevant ISDA collateral documentation and the requirements of any applicable law, then it may prove difficult for the collateral taker to assert its rights over the collateral.

A particular issue developers will need to be aware of is the risk of recharacterization, as this will affect the legal means by which the collateral taker can enforce in relation to the collateral. Under a title transfer arrangement, the collateral provider transfers its entire interest in the collateral to the collateral taker. The collateral provider retains no proprietary or ownership rights in the collateral, but instead has a contractual right to a transfer of 'equivalent assets' once it has discharged its collateralized obligations. In this context, 'equivalent assets' means assets that are of the same type (from a legal and economic perspective) as the ones transferred.

In a heavy chain context, parties may also wish to consider which assets or types of asset should be considered 'equivalent'. For example, certain digital or fully dematerialized assets or tokens may represent or track the same underlying economic interest, but may have different features or characteristics. Parties may take the view that these assets are not fungible and, consequently, not equivalent for these purposes. This requires careful analysis in order to avoid any risk of recharacterization. Parties should therefore seek legal advice on the implications of making such determinations[36].

Outside of regulatory IM relationships (where netting is not permitted), developers should be aware that parties may want to have the option to collateralize on a gross basis, rather than seek benefit from netting. This is particularly likely where one of the parties is incorporated in a jurisdiction that does not recognize the legal efficacy of close-out netting (ie, a non-netting jurisdiction)[37].

Developers should be aware that ISDA collateral documentation contains provisions specifying the mechanism for how transfers of collateral, distributions and interest are made. These should be considered when structuring the transfer mechanics under the relevant system.

In the case of regulatory IM, technology providers should be aware that the calculation of the amount of collateral to be transferred is prescribed, and must be carried out in accordance with an approved model or the regulatory prescribed table. They should also be cognizant of the need to consider the interaction of arrangements: (i) between the two counterparties; and (ii) with the relevant custodian.

[36] Legal analysis on digital assets is fast evolving and is likely to vary between jurisdictions. As noted in a recent IMF policy paper (Fintech: The experience so far), a growing number of jurisdictions are classifying crypto-assets according to their characteristics, although these classifications vary across jurisdictions. Even within these classifications, many jurisdictions "recognize that these categories are not mutually exclusive, leaving room for hybrid assets." (https://www.imf.org/~/media/Files/Publications/PP/2019/PPEA2019024.ashx)

[37] Further discussion of close-out netting can be found in the *ISDA Legal Guidelines for Smart Derivatives Contracts: The ISDA Master Agreement*

Where systems are designed for the purposes of automating valuation and calculation procedures, developers should bear in mind that it may not be possible to determine certain valuations (for example, for illiquid assets) without the intervention of a third-party valuation agent. Therefore, opportunities for the automation of valuation and calculation procedures in respect of such assets may be more limited. This may also be the case in the event of a dispute over valuations, and developers should consider the provisions in the ISDA collateral documentation relating to such disputes (see 'Disputes' section).

POSSESSION AND CUSTODY OF COLLATERAL

Non-regulatory Margin

Depending on the nature of the arrangement, parties may have the right to rehypothecate or dispose of collateral assets for their own purposes. Under certain (but not all) ISDA collateral documentation that operates by creating a security interest in respect of transferred collateral, the collateral taker may have a right of rehypothecation[38] over the collateral it holds.

In the case of cash collateral, interest must be paid on cash collateral received at the rate and frequency agreed between the parties. Interest will be payable by the collateral taker. In some scenarios, market conditions may result in the relevant interest rate being negative. In such cases, and if agreed between the parties, any negative interest will be payable by the collateral provider.

In the case of non-cash collateral, where distributions have been made on such collateral (such as coupons paid on bond collateral or dividends on equity collateral), the collateral taker must transfer those distributions (in the case of a security arrangement) or assets equivalent thereto (in the case of a title transfer arrangement) to the collateral provider. This is designed to replicate the amount the collateral provider would have received had it still been holding the non-cash collateral.

Regulatory VM

The provisions within the ISDA VM documentation relating to the possession of collateral are broadly similar to those contained in the ISDA non-regulatory margin documentation.

Regulatory IM

Regulatory IM cannot be held by the collateral taker directly and must be held in a segregated account by a third-party custodian[39]. Each party must appoint a custodian, which will hold the posted collateral for the benefit of the other party should there be a default. Posted regulatory IM cannot be re-used or rehypothecated.

The type and number of IM documents parties will need to enter into to govern their IM relationships will depend on the parties' choice of custodian[40]. Where one party chooses a certain custodian and the other party chooses another, the parties may need separate documentation to govern each entity's obligations as provider of IM.

Custodians can typically be divided by reference to the type of services they offer.

- **Third-party:** Traditional bank custodians that simply custody the assets and act on specific instructions from both parties.

- **Triparty:** These entities offer enhanced services such as verifying the eligibility of collateral, valuing eligible collateral held in the segregated account, ensuring that only excess collateral is returned to the collateral provider, and moving assets between the collateral provider's proprietary custody account and the IM segregated account.

[38] The term 'rehypothecation' is generally used to mean any use (or re-use) of collateral by the collateral taker (including sale or by entering into repurchase transactions)

[39] Regulation in certain jurisdictions may require a third-party custodian to be unaffiliated with either the collateral taker or the collateral provider

[40] The choice of custodian is made by the collateral provider, as it will need to have a general custodial relationship with a custodian in order to use that custodian for IM

The choice of a third-party or triparty bank custodian will typically not impact the type and number of ISDA IM documents parties will need to govern their IM relationship. However, it will affect parties' choices for some of the elections in the ISDA IM documents and, potentially, the development of any technology solution designed to facilitate the transfer of IM.

The location of the custodian may also impact the type and number of ISDA IM documents needed. Collateral takers may prefer the granting and enforcement of security provisions in the ISDA IM documentation to be governed by the law of the location of the segregated account. However, if both parties are posting IM to bank custodians in different jurisdictions, then two different ISDA IM documents, each governed by different laws, may have to be used.

Considerations for Technology Developers

Developers should be aware that, during the period in which collateral has been transferred to the collateral taker and not returned, the collateral taker in certain circumstances must pay interest (in the case of cash) or equivalent distributions (in the event that distributions have been made on any non-cash collateral) to the collateral provider. In certain scenarios, the collateral taker may also have an obligation to pay any taxes that may arise or be imposed with respect to any collateral being held.

In designing systems for the automation of collateral processes, developers may need to consider the mechanism for determining whether any interest or distributions are due or whether any taxes have been imposed, and to arrange for the payment or transfer of the relevant interest, distributions or tax.

Depending on the nature of the security interest, parties may have the right to rehypothecate or dispose of collateral assets. While the collateral is in the control of the collateral taker, the platform will need to address the rights of the collateral taker to rehypothecate the collateral it holds (in the case of a security interest) or to dispose of the collateral as the legal owner (in the case of title transfer). These transfer mechanics – which are distinct from exchanges of collateral – may need to be addressed by the platform.

If the primary aim of the technology solution is to manage collateral, then technology developers will need to provide a mechanism for realizing the value of rehypothecation or disposition outside of the platform to avoid limiting the rights of the collateral taker to rehypothecate and dispose of such collateral (particularly where collateral consists of digitized assets or tokens).

This also highlights the value in achieving interoperability between different platforms. The ISDA CDM intends to facilitate this interoperability by creating a single, standardized data model that is available to all market participants.

There may also be obligations upon the collateral taker to exercise reasonable care to ensure the safe custody of collateral. Technology developers should consider what this means in the context of cyber-security.

With respect to IM arrangements, developers will need to consider the interaction between the two counterparties and the relevant custodian. Given the prescriptive nature of regulatory IM requirements, any technology solution designed to automate aspects of the collateral management process as it relates to IM is likely to prove challenging to develop and implement.

In a light-chain context, many of the operational functions that could be performed by a technology solution are already offered by triparty custodians. Any benefits achieved through automation may therefore be limited.

In a heavy-chain context, and in the case of a fully dematerialized asset, system or platform design can have an impact on the legal *situs* of the asset. This is an issue that will need to be considered when introducing a third-party custodian (which may be located within a different jurisdiction from each of the counterparties) to this framework.

DISPUTES

Non-regulatory Margin

The ISDA non-regulatory margin documentation sets out a process to follow when there are disputes over: (i) the mark-to-market calculation of the transactions and therefore the amount of collateral to be transferred or returned; or (ii) the value of the collateral.

If a party wishes to dispute a calculation relating to the amount of collateral to be transferred or returned, or a valuation of the collateral, it may do so by notifying the other party within a specified time frame. Pending the resolution of any dispute, a party's obligation to transfer any disputed amount of collateral is suspended until the dispute has been resolved and a new demand served. Any undisputed amounts are still required to be transferred.

Once a dispute notice has been served, the parties must consult with each other to try to resolve the dispute. If an agreement is not reached within a specified time frame, the relevant mechanisms for resolving the dispute are set out in the documentation. These mechanisms vary depending on the nature of the dispute.

For example, and as explained in the 'Exchange of Collateral' section, the first step in determining the amount of collateral to be transferred or returned requires the valuation agent to determine the net economic exposure of the parties to each other by calculating the mark-to-market value of all derivatives transactions under the relevant ISDA Master Agreement. Where this amount is in dispute, the resolution mechanism requires quotes to be obtained from third-party dealers in the relevant market.

Once the dispute has been resolved, a further delivery amount or return amount demand may be made.

Regulatory VM

The provisions within the ISDA VM documentation relating to dispute resolution are broadly similar to those contained in the ISDA non-regulatory margin documentation. However, the time frames for resolving any dispute are reduced. As regulatory VM generally needs to be exchanged on a daily basis in order to comply with applicable regulatory regimes, the time frame for transferring undisputed amounts is also reduced.

Regulatory IM

The provisions within the ISDA IM documentation relating to dispute resolution include a consultation process for the parties to resolve any dispute relating to the amount of regulatory IM required. Unlike the dispute resolution mechanics under the ISDA non-regulatory margin and ISDA VM documentation, the ISDA IM documentation does not provide for a resolution process involving third-party quotations due to the bespoke nature and complexity of the regulatory IM calculations.

Under some of the ISDA IM documentation, an additional option is included for disputes relating to the valuation of eligible collateral to allow parties to import the existing dispute resolution procedure from their ISDA VM documentation.

Considerations for Technology Developers

Many of the considerations noted in *Legal Guidelines for Smart Derivatives Contracts: The ISDA Master Agreement*[41] will be equally relevant in the context of the ISDA collateral documentation.

However, it will be particularly important for developers to ensure that disagreements over collateral valuations can be resolved quickly by the parties, especially for regulatory compliant collateral arrangements. It will also be important to ensure that any suspension of transfer obligations (pending resolution of the dispute) is reflected in the system design and, where applicable, allow the transfer of any undisputed amounts.

The ability to resolve disputes within an automated collateral management process (or smart derivatives contracts more generally) might be enhanced if technology developers and users are able to capture and reference the complete, accurate lineage of a collateral valuation back to the underlying data. The framework created by the ISDA CDM could play an important role by ensuring consistency in the way any such functions or calculations are expressed, defined and captured.

[41] https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf

ENFORCEMENT

Non-regulatory Margin

In the event of a default of the collateral provider under the relevant ISDA Master Agreement, it is important that the collateral taker has recourse to the value of the collateral transferred, so it is protected from the collateral provider's failure to perform the collateralized obligations. Upon default, the collateral taker will be entitled to liquidate the collateral to set-off against any amounts unpaid by the collateral provider under the ISDA Master Agreement.

The enforcement mechanism differs depending on the type of collateral arrangement in question – ie, whether it is a security or title transfer arrangement.

- **Title Transfer**[42]**:** Under a title transfer arrangement, the collateral taker achieves full ownership of the collateral at the time it is transferred. If an event of default occurs with respect to the collateral provider, then the value of any collateral that has been transferred to the collateral taker and not returned will be taken into account when determining any early termination amount under the ISDA Master Agreement[43].

- **Security Interest**[44]**:** Under a security arrangement, the collateral provider retains legal ownership of the collateral that has been secured in favor of the collateral taker. Upon an enforcement event (for example, an event of default), the collateral taker will have certain rights with respect to any collateral that has been transferred. Those rights may include the right to sell or take possession of the transferred collateral, and/or apply it (or its proceeds) against any amounts unpaid by the collateral provider under the ISDA Master Agreement.

Regulatory VM

The provisions within the ISDA VM documentation relating to enforcement are broadly similar to those contained in the ISDA non-regulatory margin documentation and will depend on whether the relevant document contemplates regulatory VM being exchanged by way of title transfer or as part of a security arrangement.

Regulatory IM

ISDA IM documentation provides for security interest arrangements and not title transfer. Unlike regulatory VM[45], collateral for regulatory IM must be held in segregated accounts by third-party custodians, so the ISDA IM documentation differs from the ISDA VM documentation with respect to the circumstances in which the parties may be able to access the collateral and exercise their rights and remedies against it.

Subject to elections made in the ISDA IM documentation, the two parties have certain rights if an early termination date has been designated under the ISDA Master Agreement as a result of an event of default or other specified event.

[42] For example, under the English CSA

[43] See *ISDA Legal Guidelines for Smart Derivatives Contracts: The ISDA Master Agreement* for discussion of how close-outs operate under the ISDA Master Agreement (https://www.isda.org/2019/02/19/legal-guidelines-for-smart-derivatives-contracts-the-isda-master-agreement/)

[44] For example, under the NY CSA and English CSD

[45] Although VM is not required to be segregated under the margin rules of regulatory regimes generally, parties may agree to segregate their VM

The collateral taker will generally be able to access the collateral by delivering a notice to the third-party custodian. Depending on the relevant governing law and the type of collateral, the rights and remedies granted to the collateral taker include the right to sell or take possession of the transferred collateral in the segregated account, and apply any cash collateral or the proceeds of sale towards satisfaction of the outstanding obligations of the collateral provider under the ISDA Master Agreement.

Where no early termination amount remains owing to the collateral taker, the collateral provider may be able to access the collateral by delivering a notice instructing the third-party custodian to return the collateral held in the segregated account[46].

Unlike regulatory VM, collateral for regulatory IM is required to be held in a segregated account with a third-party custodian. This means the parties are subject to the performance risk of the third-party custodian. Accordingly, market participants need to consider how this risk should be allocated, and what the contractual consequences will be in the event that the third-party custodian defaults or resigns.

Considerations for Technology Developers

It is important that technology developers understand and are aware of the types of event of default or termination event that might occur under the ISDA Master Agreement, and how the occurrence of any such event (or potential event) may impact their product, platform or solution[47]. In particular, it is important that technology developers understand the documentation architecture and the interaction between the ISDA Master Agreement and the ISDA collateral documentation.

Developers need to be aware that the operation of the enforcement mechanism under a smart contract does not necessarily mean that such operation is legally valid. The fact that the collateral taker has exercised rights of recourse against the collateral assets upon the apparent occurrence of an enforcement event could be challenged under the laws of the relevant jurisdiction. Such a transfer may, for example, be void or voidable under applicable insolvency law, and it may not be possible for the parties to contract out of these restrictions. When building automated enforcement mechanisms, developers need to be mindful of the legal analysis that supports the legal efficacy of such mechanisms.

Specifically, a protective regime for certain 'financial collateral arrangements'[48] exists in the EU. Among other things, this disapplies certain provisions of insolvency law that may otherwise limit automated enforcement of collateral arrangements, or subject them to certain conditions. One of the conditions to the application of this regime is that the relevant (financial) collateral is in the 'possession or under the control' of the collateral taker.

New technologies may give rise to novel ways in which such 'possession' or 'control' of the collateral taker could be established (for example, the issue may turn on how parties decide to custody any relevant 'private key'). Equally, developers should be mindful of the legal analysis that supports a conclusion that there is sufficient 'possession' or 'control'. Certain rights of the collateral provider in relation to the collateral (for example, to substitute or have access to those assets in certain circumstances) may adversely affect that analysis.

[46] Parties will often agree that this right of the collateral provider is subject to a right of the collateral taker to prevent access from being granted in certain circumstances (within a specified window of time)

[47] See Clack, C, McGonagle, C: Smart Derivatives Contracts: the ISDA Master Agreement and the automation of payments and deliveries (2019) https://arxiv.org/pdf/1904.01461.pdf

[48] Directive 2002/47/EC on financial collateral arrangements

While technology may provide novel solutions to certain challenges in establishing protected financial collateral arrangements, it must be used with care to avoid creating other challenges. For this reason, it will be important for technology developers to collaborate closely with and seek advice from their legal advisors at each stage in the development.

CONCLUSION

These guidelines provide an overview of current legal standards within the collateral management process, and how they can be effectively applied to assist technology developers, collateral operations, risk managers and other key stakeholders to develop technology solutions that are consistent with these standards.

It is important to note that the development of smart derivatives contracts in the context of collateral management can give rise to legal and regulatory uncertainty. For example, developers should be aware that their design choices can have an impact on the nature of, and rights to, collateral where digitized or dematerialized collateral assets are recorded or natively hosted on a distributed ledger. This is a crucial issue, underpinning the legal enforceability of the collateral relationship. Understanding the precise nature of the asset and any security or ownership rights attached to it will be important in assessing the efficacy of any system that supports the key operational mechanisms of the collateral management process.

In discussing these issues, these guidelines highlight areas where opportunities exist for improved efficiency and greater automation through the introduction of new technology solutions.

ISDA has been working with its members to develop the legal and contractual foundations for new technology solutions to be applied across the entire derivatives trade lifecycle. This includes facilitating further automation of the collateral management process.

The first step is increased standardization. The development of the ISDA Taxonomy and Clause Library will enable the creation of standard-form drafting options to be used in new contracts, as well as allow more accurate and efficient categorization of clauses in legacy documents. Once this new standardized documentation framework is established, ISDA's collateral documentation can be more readily produced in digitized format. ISDA Create will further promote the digitization of new contracts through the development of standard, digital templates based upon this framework.

This digitized expression of standard-form clauses can then be modelled in the ISDA CDM, resulting in the creation of a common collateral process model comprising standardized events and processes that are aligned with industry standard representations of the underlying contractual provisions.

These components will be published and made available to technology developers in different coding languages. They can then be used to drive consistent implementation of new technologies, providing technology developers with a consistent and interoperable industry standard. This will allow them to focus on creating and implementing technology solutions (including smart derivatives contracts) that can be used to automate collateral management processes.

Through the development of these initiatives, ISDA has laid the groundwork for the development of smart derivatives contracts to be used to deliver greater efficiencies, the reduction of operational risk and cost-savings in the derivatives market. However, due to the multitude of potential fact patterns and the desire among market participants for flexible, modular and interoperable technology platforms and solutions, collaboration among different stakeholders will be crucial to ensure the benefits of automation are made widely available and accessible.

ISDA therefore encourages members to contribute to this work to ensure their views are taken into account and that each of these various projects and initiatives benefit from broad-based market feedback and expert insight.

Members can participate in ISDA's work by joining the following working groups:

- **ISDA Legal Technology Working Group:** Established to promote greater standardization and digitization of ISDA documentation through the ISDA Taxonomy and Clause Library Project (Contact: ISDALegal@isda.org).

- **ISDA Fintech Legal Working Group:** Established to raise and discuss areas of legal and regulatory uncertainty in the application of new technology (such as smart contracts, DLT, digital assets and AI) to derivatives trading (Contact: ISDALegal@isda.org).

- **ISDA CDM Collateral Sub-Group:** Established to focus on topical design questions relevant to implementation of the ISDA CDM within collateral management and infrastructure (Contact: MarketInfrastructureandTechnology@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 more than 900 member institutions from 71 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 @ISDA.