ISDA Safe, Efficient Markets

# ISDA Legal Guidelines for Smart Derivatives Contracts: Equity Derivatives

# Contents

## Disclaimer

The purpose of these guidelines is to provide an introduction to equity derivatives for readers who are designing and implementing technology solutions for these products.

In presenting this material, we assume that certain terms in ISDA documentation are capable of being (and may currently be) represented in computer code or processed via a technology platform. For example, payment-related provisions that require one party to pay the other upon the occurrence of a designated event may be suited to codification or automated processing. We also assume that some provisions will not be well-suited or efficient to code and will remain as written in the contract.

The intention of this paper is not to specify or recommend any particular technological application or project. Rather, it is intended to provide an overview of the legal documentation framework used for OTC equity derivatives transactions and to highlight certain issues that may need to be considered by technology developers to appropriately tailor technology solutions for this market.

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

These 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.

Unless indicated otherwise, capitalized terms used in this document and not defined are the defined terms used in the referenced ISDA documentation.

## Introduction

The derivatives industry is increasingly seeking to achieve efficiencies and cost-savings through improvements to processes for settlement and lifecycle event management across many derivatives products, including equities. To achieve this, there is a need to adopt a strategy to standardize, digitize and automate front-to-back processes.

These guidelines will support technology developers, lawyers and other key stakeholders in the development of smart derivatives contracts in the equity derivatives market by:

- Providing an overview of equity derivatives transactions and the different product types;
- Explaining how equity derivatives transactions are documented under both the 2002 and 2011 ISDA Equity Definitions and exploring how smart derivatives contracts might be constructed and delivered within the framework created by the 2011 ISDA Equity Definitions; and
- Recommending steps that the industry should now take to further standardize and digitize equity derivatives documentation and to achieve greater automation of this market.

## Benefits of Automation

In September 2016, ISDA published a whitepaper entitled *The Future of Derivatives Processing and Market Infrastructure*[1]. This paper provided an insight into the challenges facing market participants across all parts of the derivatives industry and proposed a path forward for developing a standardized, efficient, robust and regulatory compliant ecosystem that supports the needs of an array of market users. Among the different infrastructure challenges facing the derivatives industry, the paper identified operational complexity and a lack of automation in front-to-back processes as among the largest impediments to introducing new efficient and cost-effective operational processes.

*The Future of Derivatives Processing and Market Infrastructure* paper notes that, in order for many firms to continue to provide the services desired by their client base and to remain profitable, there is a need to adopt a strategy to standardize, digitize and automate front-to-back processes.

A 2016 report by KPMG[2] found that attempts to cut costs in middle- and back-office operations through “labor arbitrage” (i.e. the offshoring of work to lower cost countries) is neither as efficient nor as sustainable as increased process automation. The report suggested that increased automation could result in a 40-75% reduction in labor costs, as compared with a 15-30%

[1] https://www.isda.org/a/UEKDE/infrastructure-white-paper.pdf
[2] “Rise of the Robots”, KPMG, 2016 (https://home.kpmg/content/dam/kpmg/my/pdf/Rise%20of%20the%20robots.pdf)

reduction under a labor arbitrage model. In addition, automation is more scalable and reduces complexity, thus offering greater opportunities for fundamental business transformation

Other studies suggest similar levels of cost-savings could be achieved through automation. A report[3] published in January 2017 by McKinsey Global Institute found that approximately 50% percent of the overall time of the workforce in finance and insurance is devoted to collecting and processing data, where the potential for automation is high. As a result, the financial and insurance sector has the potential to automate activities taking up 43 percent of its workers' time. A 2017 report by EY[4] suggests that the benefits of introducing greater automation into the finance function could potentially result in a reallocation and reduction of 40-60% of full-time employees ("FTEs") currently engaged in manual reconciliation processes and up to 80% of FTEs involved in data input and output processing functions.

Beyond cost-efficiencies, an increase in automation could also result in performance improvements and increases in revenue. The McKinsey Global Institute report suggests, for example, that "*straight-through processing of financial transactions is usually faster than the manual process it replaces and reduces the number of errors introduced into the process*." A report[5] published by Capgemini in July 2018 identified a number of opportunities for revenue growth through automation, suggesting that with additional investments in intelligent automation solutions and improved benefits from existing automation initiatives, the average revenue from automation in banking and capital markets could be between 4.8% and 6.8%. Key revenue drivers associated with greater automation include faster time to market to launch new products, competitive advantage over peers and higher customer loyalty.

Finally, increased automation can also reduce operational risk. Bain & Company have estimated that major banks lost approximately $38.2 billion from operational risk events arising from execution, delivery and process management between 2011 and 2016.[6,7] Most of these losses stemmed from preventable mistakes made, for example, due to flaws in the way transactions were processed. Increased standardization and automation of these processes could assist in mitigating these risks.

[3] A future that works: Automation, Employment and Productivity", McKinsey Global Institute, January 2017 (https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20future%20that%20works/MGI-A-future-that-works_Full-report.ashx)
[4] "The dawn of a new partnership – A robotics-led finance function", EY, 2017 (https://www.ey.com/Publication/vwLUAssets/ey-faas-finance-function-automation-ch/$FILE/ey-faas-finance-function-automation-ch.pdf)
[5] "Growth in the Machine", Capgemini, July 2018 (https://www.capgemini.com/wp-content/uploads/2018/07/Report_Automation-in-FS.pdf)
[6] https://www.bain.com/insights/how-banks-can-manage-operational-risk/
[7] Note that this figure relates to all operational risk events, not only those relating to derivatives.

## Automation of Equity Derivatives Transactions

The equity derivatives market comprises a large number of different products that range significantly in complexity and structure, from vanilla options to highly customized exotic trades that are structured to suit a client's particular requirements. These trades have been designed to contemplate and address hundreds of separate events and trade mechanics.

It is sometimes assumed that OTC equity derivatives have become as standardized as other OTC products, such as interest rate swaps or credit default swaps. This is not the case. There are no standardized OTC equity derivatives trade types[8] and, consequently, there are no truly standard confirmation templates. Although dealers currently offer many economically similar OTC equity derivatives products, they each do so in different ways. Across dealers, trades are structured differently, and dealers apply different hedging risk policies. Although some of these differences may seem to be minor, any difference in trade features, such as the use of different names for the same trade feature, results in a change to the documentation templates and the operational processes required to support the trade. In fact, most of the differences across templates are significant, reflecting different risk policies across dealers and differences in the equity markets across jurisdictions. The levels of customization within a trade may also be higher where it is entered into between a dealer and an end-user, as compared with trades entered into on a dealer-to-dealer basis, which tend to be less bespoke.

To the extent that certain equity derivatives products have variable structures across the market, it is fair to assume that those variabilities exist for a reason and are not something that can be simply eliminated through a coordinated effort by the industry to promote standardization. This current lack of standardization presents considerable obstacles to the automation of equity derivatives processes.

Nonetheless, the potential benefits that automation can bring to trade processing, risk controls and documentation are substantial. Such automation, however, cannot occur unless developers have standards to develop around.

## Standardization of Equity Derivatives Documentation

Given that there are no standard equity derivative products, how then can the industry move forward with its automation efforts? Among the first steps will be to adopt a different documentation framework. While the open-ended nature of the 2002 ISDA Equity Derivatives Definitions makes it possible to document any bespoke product type or transaction between counterparties, unrestricted by market practice or centralized control structures, this flexibility also makes standardization impossible.

[8] To be clear, the amount of variability in how trades are structured differs by trade type. Some products, such as Variance Swaps, have portions of the contract which, over time (and through dedicated industry effort led by ISDA), have become highly standardized (e.g., the payment formula), while other products such as Equity Swaps remain subject to significant variability across the market. However, even in the case of Variance Swaps, variability exists in the market in respect of certain hedging provisions, which is then reflected in the product's documentation.

While there may not be standardized trade types, it should still be possible to identify those trades that the industry wishes to standardize, focus on the select terms within those trade types that can be standardized, and determine how these terms could be documented in the trade confirmation. This approach can be achieved through use of the documentation framework created by the 2011 ISDA Equity Derivatives Definitions.

Once standardized, a digital representation of these trade types can be created within the ISDA Common Domain Model, allowing for the potential automation of certain lifecycle events and the development of smart derivatives contracts.

# Equity Derivatives Transaction

## Overview

Equity derivatives transactions can reference either an underlying equity stock, a basket of stocks, or an index. These assets are typically referred to as the "underlier." The terms of each trade type[9] generally vary to account for the specifics of the underlying reference asset.

Equity derivatives transactions may be traded over-the-counter (OTC) or they may be exchange-traded (ETD). The key difference between the two is that OTC trades are individually negotiated and, consequently, bespoke. ETD trades, by contrast, are standardized, which allows them to be exchange-traded.

Unlike other asset classes, equity derivatives have benefited from the existence of a robust exchange-traded derivatives market for decades. For this reason, any ETD products that would lend themselves well to standardization have been exchange traded for quite some time. The ETD market, therefore, has benefited from the straight-through-processing (STP) and automation provided by clearing trades through an exchange. By way of contrast, the products that have remained in the OTC space are often too bespoke or too small in size to justify the economic case for moving onto an exchange. It is these OTC transactions, not the ETD market, that present digitization and automation challenges and, therefore, will be the focus of these guidelines.

## Types of Equity Derivatives

The most common types of equity derivatives are swaps and options.

Equity swaps are intended to synthetically replicate the price performance of an exchange-traded security (or an index or basket of such securities). An end-user[10] may choose to replicate either the long or short performance of the underlier. A party who is "long" will benefit from any increase in the price of the security. Conversely, a party who is "short" will benefit from any decrease.

Equity options provide the buyer the right, but not the obligation, to buy or sell an exchange-traded security (or an index or basket of securities) at a pre-agreed price (the 'strike price'). These may be 'physically settled' (delivery of the underlying asset itself) or 'cash settled' (payment to replicate the economics of settlement). The buyer will pay a premium to enter into the equity option. Option transactions may allow for exercise on a single agreed date or at any time during the transaction.

[9] The words "trade type", "transaction type", "product" or "product type" are used interchangeably, referring to many transactions (or potential transactions) all sharing certain characteristics (e.g., a cash-settled equity swap on US underliers with a certain dividend treatment and pricing mechanism would be one transaction type).

[10] These guidelines make a distinction between "dealers" and "end-users", where dealers act as service providers, running a business to facilitate transactions for their end-user clients who wish to access derivatives markets and take on the risk of the trade for speculative purposes. For convenience, we will refer to the party who initiates the trade as the 'end-user' and the other party as the 'dealer'.

In addition to swaps and options, there are other types of equity derivatives transactions (e.g. forwards). Each of these products can be relatively simple or vanilla. Alternatively, they may be more complex or exotic and embed different types of economic features. Many of these products can be structured in ways that allow them to behave like each other. As such, specific products may not fall neatly within any one type of product definition.

It is therefore important for developers to understand that the equity derivatives market comprises a large number of different products, which vary significantly in complexity and structure.

## Trade Terms

Each type of equity derivatives transaction consists of a set of terms that may be either fixed, as a matter of market convention or design, or variable, and thus subject to negotiation between counterparties. Current market practice is for each dealer to determine which terms it will consider fixed or negotiable when preparing its standard form template of the trade. Each dealer strikes a different balance on this point, with the result that fixed terms will vary dealer-to-dealer and market-to-market.

As explained in *ISDA Legal Guidelines for Smart Derivatives Contracts - Introduction*[11], the terms relating to individual transactions are contained in the trade confirmation for that transaction. Importantly, the confirmation is just one component of the overall legal contract. Product-specific provisions and agreements are typically included in the confirmation, but many additional provisions addressing the parties' broader legal relationship are contained in the ISDA Master Agreement[12]. This means that fully understanding the complete terms of a specific transaction is not always straightforward.

The product-specific terms in a confirmation typically fit into one of the following categories:

1) **Payment**. The payout formulas provide the core economics of the trade. These formulas are generally fixed[13] to the trade type (i.e., they are the same across many individual transactions) and not subject to negotiation. Payout formulas can therefore be thought of as the key factor for grouping trades together into types.

   However, while payment formulas are typically fixed, the inputs into these payout mechanics are negotiated (price, quantity, underlier, etc.). Any system designed to calculate trade performance must be able to distinguish between fixed provisions, such as the payment formulas, and those that govern the inputs into the formula. These may vary from party-to-party or be subject to whether certain conditions apply at the time of calculation.

2) **Valuation**. Depending on the type of trade, the dealer will indicate what types of pricing or valuation method it supports. Certain valuation methods, such as determining the volume-weighted average price that a security has traded at throughout the day, may differ dealer-to-dealer or be subject to individual negotiation.

3) **Ordinary events**. Depending on the trade type and underlier, the trade will provide rules to account for the occurrence of expected lifecycle events, such as a dividend or an exchange disruption.

[11] https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf
[12] ISDA Legal Guidelines for Smart Derivatives Contracts: the ISDA Master Agreement (https://www.isda.org/a/23iME/Legal-Guidelines-for-Smart-Derivatives-Contracts-ISDA-Master-Agreement.pdf)
[13] Generally, this is done by industry convention (which can change market to market), as informed by each individual dealer's specific preferences, including risk sensitivity, trading structure, operational systems, etc. The payout formula is functionally the same for all trades of a given product type; however, it may be expressed with slight differences in each dealer's form.

There is a significant amount of market experience relating to these expected events, allowing the parties to rely on market practice to determine the impact on the trade. The business logic for handling these events is generally consistent dealer-to-dealer and is often not negotiated.

### Example: Dividend Payments

Party A and Party B enter into a total return equity swap referencing a share in ABC Inc., which pays a regular dividend, reflecting a return of equity to shareholders.

Consequently, the dividend payment leads to a decrease in the share price of ABC Inc. Unlike an ordinary price movement in the share based on investor sentiment, this price decrease reflects that the value attributable to the dividend (the "Dividend Amount") is no longer included in the share price.

For this reason, if a party is exposed to the total return performance of the share underlier, it would expect to receive this Dividend Amount. Because the Dividend Amount is no longer reflected in the share price, total return equity swaps account for this with a separate dividend payment leg.

From a distance, determining the Dividend Amount may appear to be a simple calculation that could easily be automated. However, edge cases do arise, and to determine whether any additional adjustments should be made, the parties will look to a number of factors, such as jurisdictional market practice, the parties' negotiated preferences, and the relevant trade type.

They may, for example, take into account:

- Whether the record amount of the dividend matches the change in the stock price attributable to the dividend, and whether the issuer ultimately pays this amount.
- Whether the dividend is being paid in non-cash form, such as additional types of equity (including warrants), coupons, or vouchers for products[14].
- Whether there are tax rules unique to dividend payments, which may depend on the jurisdiction of the hedging party (i.e., the party who is hedging the risk under the transaction – discussed below), as opposed to the issuer[15].
- Whether the dividend was unexpected (an "Extraordinary Dividend"), which in some cases results in a completely separate payment or adjustment mechanic (see example below).

[14] In some markets, end-users generally look to receive the economic value of these dividends in cash, but in others, end-users generally look for exposure to this new asset, effectively resulting in the creation of a new trade.
[15] The issue of taxes is an important one that can take into account not only the circumstances surrounding the issuer, but also the tax position of the specific dealer and end-user involved in the trade. Each party, for example, may be subject to different withholding tax rates, preventing the application of a single approach to how the trade accounts for dividends. Also, the precise definition of what can even be considered a tax is also an issue. Tax rates may also change during the life of the trade, potentially requiring further adjustment.

- Whether the dividend, though declared, is ultimately unpaid or subject to a correction or recovery.

4) **Extraordinary events**. Each trade also accounts for events that could, but are not expected to, occur during the transaction and which might affect the transaction in some way. These include:

- **Mergers**: If there is a merger, takeover or transfer of all shares in the underlying entity (i.e., the issuer of an underlying security) to another entity[16];
- **Change in Law**: If it becomes illegal to hold the underlying security or a change in law or regulation means it becomes materially more expensive to continue performing under the transaction;
- **Extraordinary Dividends**: If the issuer of the underlying security announces an extraordinary dividend (see example below);
- **Hedging Disruption**: If the hedging party (discussed below) is unable to maintain its hedging position, or its hedging costs change.

The terms used to adjust trades for these inherently uncertain events often vary among dealers and can be subject to significant scrutiny by both parties because any adjustment may impact the fundamental economic terms of the transaction.

### Example: Extraordinary Dividends

Party A and Party B enter into an OTC equity option referencing shares of XYZ Inc. During the life of the transaction, XYZ Inc. announces that it will pay an extraordinary dividend of $5 per share, resulting in a significant, multi-billion dollar total payout to shareholders.

As noted above, when a dividend is paid, the share price will drop accordingly. This is not, however, as a result of performance, but because the Dividend Amount correspondingly reduces the share price. The issue is whether this share price drop due to the dividend should be reflected in the strike price of the option.

As a matter of market practice, parties often account for the issuer's historical practice in paying dividends when pricing the trade, so many OTC options ignore ordinary dividend payments. Parties sometimes agree at the outset, however, to adjust the economics of the trade if extraordinary dividends occur.

[16] A similar "change in underlier" event is occurring in the interest rates market, where LIBOR is set to be phased out and replaced with different benchmarks. This underlier replacement is a rare event in that space and has been a long-standing industry focus. However, in the equities space this is relatively common, and each contract contemplates allowing the Calculation Agent to adjust the trade to address this event.

In this instance, let us assume Party A and Party B agreed in the confirmation to adjust for extraordinary dividends. Accordingly, the Calculation Agent[17] would adjust the strike price of the equity option to take account of the drop in share price – in contrast to an ordinary dividend, where the strike price would not be modified.

5) **Settlement**. These terms govern how payment or delivery is to be made, and what optionality is permitted. These terms are usually consistent for the specific product type and dependent on market practice. But many dealers have developed their own operational platforms that integrate with a customer's portfolio of transactions, and may have unique methods for handling payments from corporate actions, deferred payments, margining, interest, etc.

6) **Hedging**. Distinct from most other asset classes, equity derivatives account for the dealer's hedging arrangements in the structure of the trade. The economic terms of most equity derivatives trades therefore are typically negotiated to account for events that may impact the hedging activity of the dealer. Depending on the nature of the product, the balance of risks due to a dealer's hedging activity can be allocated any number of ways. Equity derivatives mechanics therefore consider a large number of events that affect the underlier, even if such events are not directly related to the underlier's performance.

   Factors relevant to hedging include:

   - the underlier's liquidity and market jurisdiction;
   - liquidity in futures or listed options referencing the underlier;
   - jurisdictional currency exchange issues;
   - underlier custodial arrangements;
   - financing costs, including securities lending fees;
   - changes in law or regulations; and
   - taxes.

   Whether the parties anticipate that the dealer is hedging with one transaction at the outset, or rebalancing periodically, may also be reflected in the trade's terms.

7) **Other legal terms.** Confirmations may also contain additional provisions to address various legal or regulatory issues. Some examples include representations (e.g., a party stating that it is eligible to trade, or that it has knowledge about trading the relevant product), indemnities for taxes or other costs, or provisions to address new regulations.

The application of technology solutions for trading OTC equity derivatives will need to consider the negotiation and operation of each of these trade terms, how they interact with each other and how they might differ (in some cases, considerably) from product-to-product and from transaction-to-transaction.

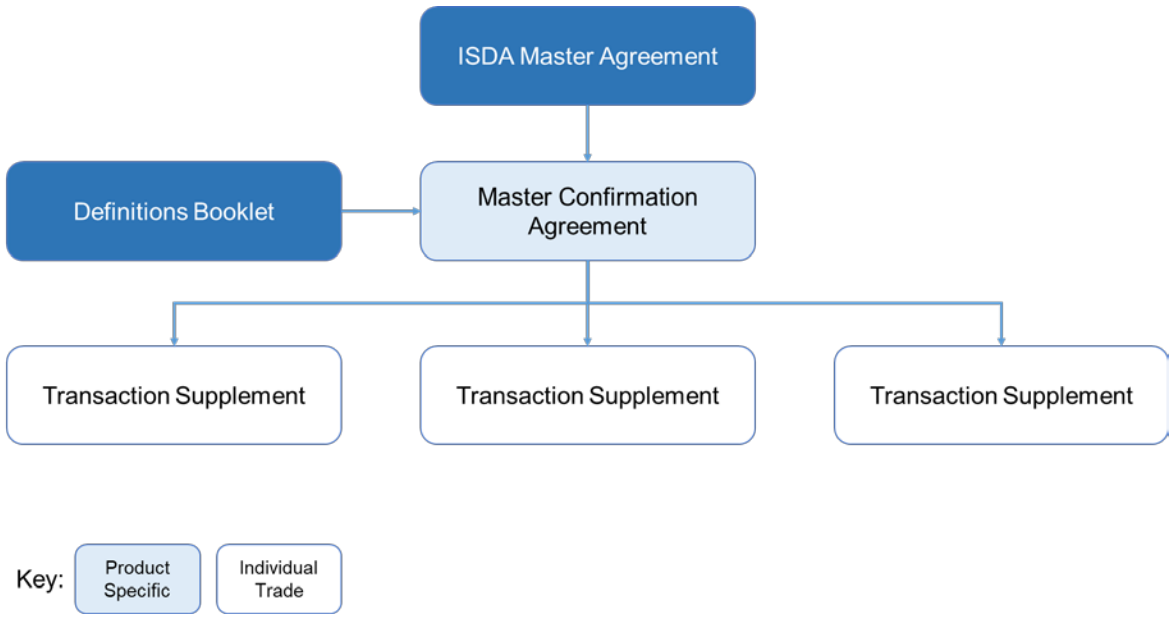
[17] The "Calculation Agent" is the person responsible for performing calculations, collecting pricing inputs, and making lifecycle adjustments to the transaction, as agreed by the parties.

## Transaction Documentation

Equity derivatives documentation, like documentation for other asset classes, incorporates the ISDA Master Agreement (including the Schedule and Credit Support Annex) along with a confirmation for an individual transaction, to form a single contract[18]. The ISDA Master Agreement contains provisions governing the overall derivatives trading relationship between the parties, while product- and transaction-specific provisions are set forth in confirmation agreements entered into under the ISDA Master Agreement.

An individual equity derivatives transaction may be documented using a single, stand-alone confirmation agreement (a "long-form confirmation"). A long-form confirmation contains all the additional legal, operational and economic terms (beyond those incorporated from the ISDA Master Agreement) that apply to a particular trade.

Most trades, however, are documented using confirmation templates, often referred to as Master Confirmation Agreements ("MCAs"). MCAs provide a single set of general legal, operational and economic terms to govern an entire portfolio of trades of a particular type. For individual trade terms that vary with each transaction (typically, trade economics like price, quantity, underlier, etc.), MCAs create a form of "Transaction Supplement", which allows users to agree on these terms at the time of execution for each transaction[19].




[18] See ISDA Legal Guidelines for Smart Derivatives Contracts: Introduction (https://www.isda.org/a/MhgME/Legal-Guidelines-for-Smart-Derivatives-Contracts-Introduction.pdf)

[19] An MCA, together with a Transaction Supplement, contain all the same information as a long form confirmation, but with the advantage that only the economic terms need to be repeated for each transaction, meaning that only a 1-2-page Transaction Supplement needs to be negotiated and reviewed for each trade, instead of a 10+ page long form confirmation.

ISDA has produced a number of MCA templates for equity derivatives transactions, covering a variety of trade types and jurisdictions. In each case, ISDA's templates were produced by an industry working group. However, developers should note that the forms actually used by each dealer, even when based on ISDA's templates, may vary significantly from the ISDA template and from the forms used by other dealers.

MCAs (and long-form confirmations) incorporate provisions from an extensive library of pre-defined terms contained in definitions booklets published by ISDA. These terms are then amended and customized within the MCA to take account of the specific nature of the product and each dealer's own preferences.

For equity derivatives transactions, the relevant ISDA definitions booklets are the 2002 ISDA Equity Derivatives Definitions and the 2011 ISDA Equity Derivatives Definitions. These are explained in more detail in the sections below[20].

[20] In the case of equity swaps (which contain an interest rate financing component), the 2006 ISDA Definitions (https://www.isda.org/book/2006-isda-definitions/) are also likely to be referenced in addition.

## 2002 ISDA Equity Definitions

In 2002, ISDA published the 2002 ISDA Equity Derivatives Definitions (the "2002 Definitions").[21] The 2002 Definitions replaced the 1996 ISDA Equity Derivatives Definitions and were intended to reflect developments in the range of equity products traded and in market practice more generally. The 2002 Definitions provide a framework for documenting privately negotiated equity transactions. They remain widely used today.

### Documenting Transactions

The objective of the 2002 Definitions is not, as one might assume, to provide standard language for all equity derivatives contracts. Rather, it is to provide a bespoke documentation solution to a bespoke market.

The 2002 Definitions were designed to be used as a base set of terms that dealers could incorporate by reference into their confirmations. Each dealer could then amend any relevant parts that it did not want to use, while also introducing any additional provisions not covered by the 2002 Definitions, in order to create their documentation templates. This documentation style may be referred to as the "Base & Amendment" method[22]. Because every equity derivatives trade has a confirmation, and the terms in each confirmation are included precisely to *amend* or *add* terms to the 2002 Definitions, the end result is that there is not one single trade that uses the 2002 Definitions in their published, standard form. Each confirmation is therefore a unique, bespoke contract.

If the parties are amending the 2002 Definitions in each confirmation, why use the definitions at all? The answer is that the 2002 Definitions provide a common starting point. The Base & Amendment method is designed to facilitate the drafting of bespoke contracts by dealers and their review by end-users familiar with the 2002 Definitions[23].

While the Base & Amendment approach is a well-established contract drafting practice among lawyers, allowing those who are familiar with the 2002 Definitions to draft and review confirmations more quickly, the scale and extent to which this fragmentation of contract language occurs in almost every part of the 2002 Definitions documentation framework does pose serious practical problems for automation in the equity derivatives market.

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[21] https://www.isda.org/book/2002-isda-equity-derivatives-definitions/

[22] This type of drafting approach is often used where there is a standard starting point for contracts (e.g., the ISDA Master Agreement is modified by the bilaterally negotiated Schedule). However, this also allows users to diverge from template language and customize the document to reach any acceptable endpoint. ISDA has been working with the industry to develop a Clause Library, as a central repository for commonly used language. The scope of the work has been focused on the ISDA Master Agreement, but a similar process could be applied to equity derivatives or other products.

[23] As noted, the end result, however, is that the 2002 Definitions are never used entirely in their published form.

Technology developers must therefore understand that each confirmation (including any ISDA-published master confirmation templates[24]) is not simply an application of the 2002 Definitions, but rather consists of amendments to the 2002 Definitions for application to a specific trade type. Further, developers must also understand that the bespoke nature of OTC equity derivatives means that the number of possible amendments is potentially infinite. Market participants create their contracts not from a closed menu of standard provisions, but on a contract-by-contract basis, negotiating free-text, bespoke solutions with each counterparty. Because the content of each negotiated confirmation is proprietary and known only to the parties, there is no way to know the full universe of amendments being applied in the market.

## Practical Application

In terms of drafting, many confirmations apply the Base & Amendment approach by providing the relevant amendments in the confirmation without restating how the provision should actually be read after applying these amendments. These amended provisions are, in a way, *synthetic* in that the actual effective contractual language is not then provided in its final form in any written document. Instead, fragmented provisions have to be pieced together to know what the contract actually says. This style of drafting makes it difficult, if not impossible, to use optical character recognition (or OCR) technology to read and digitize these contracts, creating another barrier to automation.

To illustrate a very simple example of a synthetic provision in practice, consider the following terms relating to the definition of "Dividend Amount":

From the 2002 Definitions:

> *"**Dividend Amount**" means, in respect of the relevant Share, the related Dividend Period and the related Dividend Payment Date, the Record Amount, the Ex Amount or the Paid Amount, as specified in the related Confirmation, or any other amount determined as provided in the related Confirmation or included as part of an adjustment pursuant to Section 11.2.*
>
> *"**Ex Amount**" means, in relation to a Dividend Amount, 100% of the gross cash dividend per Share declared by the Issuer to holders of record of a Share where the date that the Shares have commenced trading ex-dividend on the Exchange occurs during the relevant Dividend Period.*

The hypothetical form of confirmation used by a dealer might include the following language, changing both terms significantly. Consider the following examples:

[24] After publishing the 2002 Definitions, ISDA continued to publish dozens of MCA templates for specific product types. These MCA templates use the same Base & Amendment method of amending and adding terms to the 2002 Definitions – which may then be further negotiated bilaterally between counterparties.

*Hypothetical clause 1:*

> *"**Dividend Amount**" means the percentage of the Ex Amount specified in the Transaction Supplement for that Share multiplied by the Number of Shares.*

*Hypothetical clause 2:*

> *The definition of **Ex Amount** in Section 10.1(b) is amended by replacing the word "declared" with the word "paid".*

The first hypothetical clause amends and restates the definition of Dividend Amount, while the second amends the definition of Ex Amount. The final result, when compared against the 2002 Definitions, is as follows:

*Amended clause 1:*

> *"**Dividend Amount**" means~~, in respect of the relevant Share, the related Dividend Period and the related Dividend Payment Date, the Record Amount, the Ex Amount or the Paid Amount, as specified in the related Confirmation, or any other amount determined as provided in the related Confirmation or included as part of an adjustment pursuant to Section 11.02~~ the percentage of the Ex Amount specified in the Transaction Supplement for that Share multiplied by the Number of Shares.*

*Amended clause 2:*

> *"**Ex Amount**" means, in relation to a Dividend Amount, 100% of the gross cash dividend per Share ~~declared~~ paid by the Issuer to holders of record of a Share where the date that the Shares have commenced trading ex-dividend on the Exchange occurs during the relevant Dividend Period.*

Because hypothetical clause 1 amends and restates the entire clause, there is no ambiguity in its construction. The full provision is available to readers of the contract. By contrast, hypothetical clause 2 is a synthetic provision that requires the reader to reconstruct it. To be clear, amended clause 2 is not explicitly restated in its entirety anywhere in the contract. It must be pieced together by the reader.

While the example provided above is relatively simple, there are amendments of various lengths (sometimes pages-long[25]) applied to all manner of provisions in use in the market.

A more complex example relates to the Change in Law provision. This provision is found and amended in most equity derivatives confirmations. The 2002 Definitions provide the following base definition:

[25] For example, the ISDA MCA template for Japanese Index Dividend Swaps has over 3 pages of legal amendments to the 2002 Definitions describing how to calculate the dividend amount.

> ***Original Section 12.9(a)(ii):*** *"Change in Law" means that, on or after the Trade Date of any Transaction (A) due to the adoption of or any change in any applicable law or regulation (including, without limitation, any tax law), or (B) due to the promulgation of or any change in the interpretation by any court, tribunal or regulatory authority with competent jurisdiction of any applicable law or regulation (including any action taken by a taxing authority), a party to such Transaction determines in good faith that (X) it has become illegal to hold, acquire or dispose of Shares relating to such Transaction, or (Y) it will incur a materially increased cost in performing its obligations under such Transaction (including, without limitation, due to any increase in tax liability, decrease in tax benefit or other adverse effect on its tax position);*

and provides for the following consequences if a Change in Law were to occur:

> ***Original Section 12.9(b)(i):*** *If "Change in Law" or "Insolvency Filing" is specified in the related Confirmation to be applicable to a Transaction, then upon the occurrence of such an event either party may elect to terminate the Transaction upon at least two Scheduled Trading Days' notice to the other party specifying the date of such termination (or such lesser notice as may be required to comply with the Change in Law), in which event the Transaction will terminate and the Determining Party will determine the Cancellation Amount payable by one party to the other.*

One template MCA amends Change in Law as follows:

> *Applicable; provided that, (a) Section 12.9(a)(ii)(X) of the Equity Definitions is amended to replace "illegal" with "unable, after commercially reasonable efforts", (b) notwithstanding anything to the contrary in the Equity Definitions, Section 12.9(b)(i) of the Equity Definitions (as it applies to "Change in Law" only) shall only apply in respect of an event that occurs under Section 12.9(a)(ii)(X), (c) if an event occurs under Section 12.9(a)(ii)(Y) (a "Section 12.9(a)(ii)(Y) Event"), Party A, as the Hedging Party, shall apply the consequences specified in Section 12.9(b)(vi), provided that the words "Increased Cost of Hedging" shall be replaced with "Section 12.9(a)(ii)(Y) Event", and (d) Section 12.9(a)(ii) shall not apply if the Calculation Agent determines that (1) the relevant party, acting in a commercially reasonable manner based on prevailing circumstances applicable to it, could have avoided the occurrence of the relevant illegality or increased cost (as applicable); or (2) in respect of a Section 12.9(a)(ii)(Y) Event, the increased cost occurred solely due to the deterioration of the creditworthiness of the relevant party.*

The result is that the effective definition of Change in Law (after applying the amendments to the base language) for users of that form would be:

> ***Amended Section 12.9(a)(ii):*** *"Change in Law" means that, on or after the Trade Date of any Transaction (A) due to the adoption of or any change in any applicable law or regulation (including, without limitation, any tax law), or (B) due to the promulgation of or any change*

*in the interpretation by any court, tribunal or regulatory authority with competent jurisdiction of any applicable law or regulation (including any action taken by a taxing authority), a party to such Transaction determines in good faith that (X) it has become ~~illegal~~ unable, after commercially reasonable efforts to hold, acquire or dispose of Shares relating to such Transaction, or (Y) it will incur a materially increased cost in performing its obligations under such Transaction (including, without limitation, due to any increase in tax liability, decrease in tax benefit or other adverse effect on its tax position). Section 12.9(a)(ii) shall not apply if the Calculation Agent determines that (1) the relevant party, acting in a commercially reasonable manner based on prevailing circumstances applicable to it, could have avoided the occurrence of the relevant illegality or increased cost (as applicable); or (2) in respect of a Section 12.9(a)(ii)(Y) Event, the increased cost occurred solely due to the deterioration of the creditworthiness of the relevant party;*

and the synthetic provision governing the consequences of Change in Law would be:

***Amended Section 12.9(b)(i):*** *If "Change in Law" or "Insolvency Filing" is specified in the related Confirmation to be applicable to a Transaction, then upon the occurrence of such an event either party may elect to terminate the Transaction upon at least two Scheduled Trading Days' notice to the other party specifying the date of such termination (or such lesser notice as may be required to comply with the Change in Law), in which event the Transaction will terminate and the Determining Party will determine the Cancellation Amount payable by one party to the other. Section 12.9(b)(i) (as it applies to "Change in Law" only) shall only apply in respect of an event that occurs under Section 12.9(a)(ii)(X). If an event occurs under Section 12.9(a)(ii)(Y) (a "**Section 12.9(a)(ii)(Y) Event**"), Party A, as the Hedging Party, shall apply the consequences specified in Section 12.9(b)(vi), provided that the words "Increased Cost of Hedging" shall be replaced with "Section 12.9(a)(ii)(Y) Event".*

Note that even this synthetic provision does not spell out the full set of applicable consequences. To understand the consequences of events under clause (Y) of Change in Law, one would also need to deem the following additional synthetic provision (two degrees of separation from the original text, constructed by applying the following amendment to Section 12.9(b)(vi), but only in this circumstance) to now be part of the contract:

***Amended Section 12.9(b)(vi):*** *… upon the occurrence of such an event the Hedging Party will give prompt notice to the Non-Hedging Party that such increased costs have been incurred and that a Price Adjustment will be made to the Transaction. The Non-Hedging Party shall, within two Scheduled Trading Days of receipt of the notice of ~~Increased Cost of Hedging~~ a Section 12.9(a)(ii)(Y) Event and corresponding Price Adjustment, notify the Hedging Party that it elects to (A) agree to amend the relevant Transaction to take into account the Price Adjustment, (B) pay the Hedging Party an amount determined by the Calculation Agent that corresponds to the Price Adjustment or (C) terminate the Transaction as of that second Scheduled Trading Day. If such notice is not given by the end of that second Scheduled Trading Day, then the Hedging Party may give notice that it elects to*

*terminate the Transaction, specifying the date of such termination, which may be the same day that the notice of termination is effective. If either party elects to terminate the Transaction, the Determining Party will determine the Cancellation Amount payable by one party to the other.*

Because these amendments are manually drafted, different formulations of language do not necessarily result in substantively different outcomes. In fact, there are many different formulations of language that ultimately produce the same outcome. Any attempt, then, to use software to read these contracts would need to account for these factors and accurately reconstruct each of these levels of interpretation for the reader. For anyone looking to automate the reading of these confirmations, the Base & Amendment approach to drafting presents a considerable challenge.

## 2011 ISDA Equity Definitions

As mentioned above, the OTC equity derivatives market consists of bespoke transactions, with no standardization of trade types or of documentation. However, while these trades, in their entirety, are bespoke, it is possible nonetheless to identify specific trade components that can be applied uniformly across the market. The industry can develop standards around these components, allowing for the potential automation of these terms.

For any given trade type, this would require the market to identify those terms which are either not subject to change at all (e.g., the payment formula) or which may be subject to change within a limited set of parameters that can be defined in advance ("fixed terms") and then separating those terms from those that are subject to wide variability ("variable terms").

The 2002 Definitions do not draw a distinction between these fixed and variable terms, with the result that variable terms are interspersed throughout the contract, making it impossible to determine which terms are fixed. In 2011, ISDA designed a new documentation model, the 2011 ISDA Equity Derivatives Definitions (the "2011 Definitions"[26]), to allow the industry to trade using contracts that separate fixed terms from variable terms.

It is important to note that, while the framework of the 2011 Definitions has been completed and tested, only one trade type – an index volatility swap – has been documented under the 2011 Definitions[27]. There are no other 2011-based standard forms in use. This is because the industry has continued to apply a completely bespoke approach to the OTC equity derivatives markets. For this approach, the 2002 Definitions, which are designed to support free-form drafting, are the appropriate documentation tool.

## Documenting Transactions

The 2011 Definitions retain the same confirmation structure and presentation as 2002-based confirmations. A major difference between the two is that the 2011 Definitions present trade terms on a trade-by-trade type basis. These are contained in a standalone General Terms Confirmation ("GTC"), centrally published by ISDA. This contrasts with the 2002 ISDA definitions, which provide for a single definitions booklet that is then subsequently modified by a confirmation. The construction facilitates the key difference between the two systems, which is that confirmations using the 2011 Definitions provide for actual standardization (and facilitate automation) by separating terms based on their degree of variability, whereas every term in a 2002-based documentation template is subject to change.

[26] https://www.isda.org/book/2011-isda-equity-derivatives-definitions-and-appendix/

[27] Published in 2015, the Index Volatility Swap Matrix documents under the 2011 Definitions consolidate the terms of the master confirmation agreement forms previously published by ISDA to create a single set of rules that can be applied to both single and multi-exchange index volatility swap trades in open markets in Europe and the Americas. See: https://www.isda.org/book/index-volatility-swap-matrix-documents-under-the-2011-isda-equity-derivatives-definitions/

This results in three distinct sections in 2011-based confirmations:

1) **Terms not subject to negotiation or amendment**.

   Where the market has coalesced around robust, consistent conventions for how to document terms (for example, payment formulas), users agree to those terms as presented in the standard form GTC they have selected to trade. Parties will incorporate the GTC by reference into their confirmations in a manner similar to how they incorporate the 2002 Definitions by reference. Unlike the 2002 Definitions, however, parties will not be able to amend or modify the terms of their incorporated GTC.

   For any given trade type, the market may require ISDA to produce a number of different GTC templates, with changes to account, for example, for regional differences in how that trade type is structured. Once incorporated in their transaction confirmations, the parties agree to the terms contained in their specific referenced GTC, without negotiation or amendment outside of the parameters contemplated by the GTC itself. Market participants seeking to change the structure of any given GTC would either use a different GTC with the fixed terms they are looking for or trade using bespoke documentation under the 2002 Definitions.

2) **Terms subject to negotiation within pre-defined parameters**.

   Where the market has determined that a term should be subject to negotiation but only within certain variables, the GTC will present the parties with a pre-defined menu of options. Terms subject to negotiation are further categorized as being negotiable either:

   - On a relationship-wide basis (meaning a counterparty pair would agree on the election at the outset of the relationship, before they started trading, and it would apply to all their transactions) in a Relationship Supplement ("RS"); or

   - On a trade-by-trade basis (meaning it would be negotiated each time the parties entered into a transaction) in a Transaction Supplement ("TS").

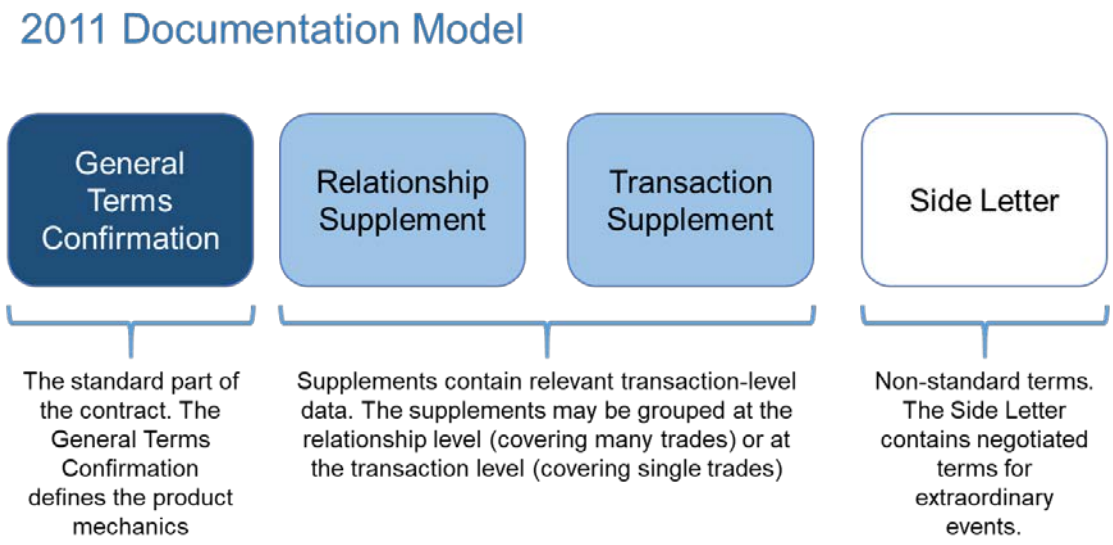
   By way of example, one would expect terms such as the parties' elections for Dividend Amount to be found in the RS, because those terms should apply to every trade under that GTC, while terms such as the notional amount of the trade would be found in the TS, since that is likely to change on a trade-by-trade basis.

3) **Terms subject to free-text negotiation (unlimited)**.

   Where the market has determined that the parties should be free to negotiate terms in respect of a trade, but cannot identify in advance the exact variables for such terms, the GTC will require the parties to negotiate those terms in a separate document: the Confirmation Side Letter ("Side Letter"). While the structure of every GTC will be fixed, the Side Letter will allow

each GTC to provide the parties with the ability to negotiate certain terms on a free-text basis, within the GTC's pre-defined limits.

Currently, many confirmation terms depend on the unique circumstances and risk policies of each of the parties. Often, these terms are the most heavily negotiated and difficult to standardize. These terms, such as dealer-specific risk allocation terms, would be located in the Side Letter. Like the 2002 Definitions, the terms in the Side Letter would *not* be subject to standardization and no one other than the parties would have visibility to the substance of these terms. However, because all of these provisions are confined to one place and their scope is pre-defined in the GTC, developers can rely on the fixed terms applied in the rest of the GTC template to support automation. The Side Letter provides users with the ability to apply infinite outcomes within a finite space. One would expect terms such as Change in Law or Extraordinary Dividend to be found here[28]. The only limitation on the Side Letter is that it must not compromise the integrity of the fixed terms contained in the GTC.




The key to the 2011 model is that it creates two separate zones of documentation: one for fixed terms and another for variable terms. Every trade type will have some fixed terms for that product, with clearly-defined language that is produced and presented to users as standard, while other

[28] Generally speaking, legal interpretive issues make automation difficult. Moreover, these are not, for the most part, the terms the industry is looking to standardize and automate. Negotiated terms such as "avoidance" in Change in Law require discretion and interpretation when judging whether a party could have acted to avoid the occurrence of the event. Building a system to automate these determinations would be impracticable, because of all the factors involved, so all these terms are moved to the Side Letter and negotiated bilaterally. The Side Letter, therefore, clears the way for us as an industry to separate the economic and operational terms we want to automate from the discretionary terms which we need to retain bespoke drafting for. For more discussion around the difficulties in automating terms which require legal interpretation or subjectivity, see Smart Derivatives Contracts: From Concept to Construction (https://www.isda.org/a/cHvEE/Smart-Derivatives-Contracts-From-Concept-to-Construction-Oct-2018.pdf)

terms will be left to negotiation (within the parameters set forth in the GTC) between the counterparties. As the market develops and new trading practices emerge that do not fit into the existing fixed and variable zones contemplated by the available GTCs, this would be addressed by defining new product types and publishing new GTC templates.

## Practical Application

To illustrate a practical application of the 2011 Definitions, ISDA built a sample template confirmation within this framework, called the SES1 (for "Security Equity Swap", with a product ID of 1 to differentiate it from future iterations on this trade type). Like any confirmation using the 2011 Definitions, it has a GTC, RS, TS and Side Letter, and is intended to be incorporated under the ISDA Master Agreement. This documentation package covers the complete contract between the parties.

ISDA modelled SES1 on its Americas Cash-settled Share Swap MCA published in 2009 (the "2009 US MCA") [29]. This is the 2002 equity swap template that is being used in the marketplace with the least amount of modification. Further, the 2009 US MCA has been widely used as a starting point for many dealer forms in the market.

In order to turn the 2009 US MCA into a true standard form, terms identified as not subject to negotiation were set as fixed and placed in the GTC. Then, those terms in the 2009 US MCA marked as being subject to negotiation from a pre-determined menu were allocated to the RS and TS. Finally, the 2009 US MCA itself marked many of the key risk allocation terms with bracketed bullets, indicating that counterparties should negotiate these terms on their own in accordance with their own policies. ISDA placed these terms in the Side Letter, to provide parties with the flexibility to negotiate these terms freely, while isolating them from the more standard sections of the confirmation[30].

The following is an example of how SES1 addresses a single contract provision:

> *"**Dividend Cash Settlement Amount**"*[31] *means, in respect of a Dividend Period and the related Dividend Cash Settlement Date, an amount in the Settlement Currency determined*

[29] https://www.isda.org/book/2009-americas-master-equity-derivatives-confirmation-agreement/

[30] Readers should note that any determinations found in SES1 regarding market practice and trade design are simply reflections of the policy positions taken in the 2009 US MCA. To be clear, SES1 is not meant to serve as, nor is it purported to be, a statement by ISDA as to what the contours of a standard equity swap agreement should be for the industry. Instead, SES1 serves simply as a tool to help the industry see how a future standard equity swap agreement would be implemented.

[31] Instead of "Dividend Amount", the 2011 Definitions use the term "Dividend Cash Settlement Amount." This is because SES1 was calibrated to conform to the terms of the 2009 US MCA, which contemplates that all dividends would be paid out in cash. ISDA contemplates that other trades would use a separate term for "Dividend Physical Settlement Amount" for those markets where physical dividends are contemplated. As a matter of general drafting practice, ISDA is seeking to avoid having a single term, such as "Dividend Amount" possibly refer to a combination of different payment types in order to facilitate transparency. Finally, ISDA contemplates that there will likely be many different iterations of terms like "Dividend Cash Settlement Amount" across many different confirmation templates. ISDA will monitor and track these definitions using the master framework created by the 2011 ISDA Definitions Main Book and Appendix, but this level of metadata, while important to the integrity of the system as a whole, does not need to be in the confirmation.

*by the Calculation Agent for such Dividend Period to which the Dividend Cash Settlement Amount relates, pursuant to the following formula:*

*Dividend Cash Settlement Amount = Record Amount × Number Of Securities*

Record Amount is defined as follows:

*"**Record Amount**" means the gross cash dividend per Security declared by the Issuer to holders of record of a Security on any record date occurring during the relevant Dividend Period. Any "gross cash dividend" shall represent a sum before the withholding or deduction of taxes at the source by or on behalf of any applicable authority having power to tax in respect of such a dividend, and shall exclude any imputation or other credits, refunds or deductions granted by any applicable authority having power to tax in respect of such dividend and any taxes, credits, refunds or benefits imposed, withheld, assessed or levied thereon. In addition, "gross cash dividends" shall exclude Extraordinary Dividends.*

This provision reflects the policy decisions made by the ISDA Working Group that created the 2009 US MCA. SES1 presumes acceptance of those policy decisions made by the working group, and does not permit users to negotiate conflicting provisions, thereby establishing a standard treatment of dividends for this product. It is therefore not possible for users to amend this provision by, for example, providing for dividend payments to be determined based on the ex-amount instead of the Record Amount[32].

Unlike documentation based on the 2002 Definitions, there is no other definitions booklet or other document to reference. SES1 simply states what each term means. Users can then rely on this meaning to determine how to calculate this amount for all trades of this type. There are no synthetic provisions.

With respect to freely negotiable terms, the following illustrates how SES1 addresses Change in Law:

*"**Change In Law**" means as defined in the Confirmation Side Letter.*

This provision is set out in the GTC and provides that parties may negotiate the Change in Law provision using the Confirmation Side Letter. Now that the GTC has directed the parties to the Side Letter, they may negotiate this term freely in that document.

Importantly, just like confirmations using the 2002 Definitions, the content of the negotiated Side Letter will not be visible to anyone but the parties. However, unlike the 2002 Definitions, this lack of visibility should not impede automation of terms in the GTC. The nature of the types of determinations contained in the Side Letter (such as, in this example, what constitutes a Change in Law event) are left to the discretion of the parties and, for developers, identified as a term that will not have a precise business logic defined in the GTC.

[32] If users wanted to use ex-amount, a new confirmation template would have to be created to support this version.

## Comparison with 2002 Definitions

In summary, the 2011 Definitions differ from the 2002 Definitions in a number of important ways:

- **The 2011 Definitions discontinue the Base & Amendment model.** Each GTC is a standalone contract template that does not reference or incorporate any other set of contract terms. As such, there is no need to continue using the Base & Amendment model.
- Confirmations published centrally by ISDA using the 2011 Definitions ("2011 confirmations") are intended to be used as **truly standard confirmation templates** in their published form.
- Unlike confirmations using the 2002 Definitions, **2011 confirmations contain all of the terms relevant to the trade in the agreement itself.** Users will need to read this contract (as they would any other) but will not need to learn how to apply a separate set of base terms in order to do so.
- **The GTC sets forth all the data parameters contained in the contract**, making it possible to identify and extract any relevant quantifiable terms (for example, dates or monetary amounts).
- **The RS sets forth all the data that is subject to negotiation at a relationship-level between any counterparty pair and the parameters of such negotiation.** Confirmations based on the 2002 Definitions do not identify which parts of the confirmation are subject to change counterparty-to-counterparty, making it difficult to identify in advance which provisions developers can expect to see changing from confirmation-to-confirmation. The only way to see what provisions are changing for confirmations based on the 2002 Definitions is to run manual comparisons or blacklines. The RS removes this uncertainty by clearly delineating which provisions are subject to change.
- **Like the 2002 Definitions, the Side Letter allows for parties to negotiate bespoke terms.** Unlike the 2002 Definitions, the Side Letter provides a demarcated space for just those provisions that may be freely and broadly negotiated and limits free negotiation to the Side Letter. Having the Side Letter allows us to account for the fact that complete standardization of OTC equity derivatives trading is impossible to achieve given that these trades address hedging risk as a key factor in their structure. When the underlying markets and risks are themselves variable to this degree, these risks cannot be accounted for in a standard way. The Side Letter gives parties the flexibility to account for these risks in a confined zone. That freedom then allows us to standardize the rest of the trade per the GTC.

## Constructing Smart Derivatives Contracts for Equity Derivatives

Equity derivatives are complex products. Their automation will therefore require solutions that are not necessary or used in other asset classes. ISDA has identified three steps the industry must take to develop and deliver enhanced legal documentation standards and automation of equity derivatives products: standardization, digitization and distribution.

### Standardization

First, the industry must determine the trade types to be standardized and, for each of those trade types, where to draw the line between fixed and variable terms. When doing so, it should consider the following steps for each relevant trade type:

1) Identify non-negotiable terms.

2) Identify negotiable terms that can be limited to a pre-defined set of elections.

3) Determine whether these terms should be negotiated on a relationship-wide basis, or on a transaction-by-transaction basis.

4) Identify terms which should be left open for free-text negotiation by the parties.

For the majority of equity derivatives trades, it should be possible to limit the scope of the Side Letter to those provisions relating to extraordinary events that might occur during the life of the trade[33]. This would mean that, in the ordinary course, it would be possible for the parties to rely only on the fixed terms in the GTC, as informed by any relevant elections in the RS and TS, to determine how to address any lifecycle events relating to the trade. Developers may refer to this scenario as the "happy path" [34], because these trades complete a lifecycle without any adjustments or consequences based on non-fixed terms.

The key, therefore, to automating a market as diverse and complex as equity derivatives is to find the happy path for each product. The industry can address all other scenarios manually per the terms contained in the Side Letter, using the exact same process it does today for the bespoke contracts currently in use. So long as manual events are clearly separated from the happy path for every trade, the industry can find ways to standardize and automate the great majority of trade terms, while still supporting the complex risk exposures and allocations inherent in these trades.

[33] During the design phase of the 2011 Definitions, ISDA reviewed and modeled out in the 2011 framework dozens of trade type structures, from every region of the world, taking into account both actual forms used in the market and its library of over 50 different published MCAs.
[34] In other words, a normal scenario featuring no exceptional conditions, with data conforming to all expected parameters and no errors (as this term is often used in software design and user testing).

In defining this happy path for each trade type, the industry will need to define the set of trade features and lifecycle events that should be considered for inclusion and determine the exact points when a trade could diverge from the automated process and require manual intervention. It will be important to consider, for example, exactly when a disruption, and what type of disruption, may merit manual intervention. Identifying these points of divergence will allow the industry to strike an appropriate balance between standardized and customized trade terms. The distinction between standard contract terms and standard processes must also be acknowledged[35].

Once the industry has made these determinations, ISDA can then provide confirmations, like SES1, which clearly delineate fixed terms in the GTC, identify pre-determined elections to be made in the RS and TS, and allow for bespoke terms to be set forth in the Side Letter. ISDA will then maintain a central database of contract provisions for all such confirmations to ensure consistency across its library of 2011 Definitions-based documents.

## Digitization

As firms seek to operationalize their businesses through automated, data-driven processes, digitization of documentation will allow for greater alignment between the key commercial and operational terms captured and monitored within standardized legal agreements and the processes and data that support these terms. This alignment between process, data and documentation will be supported by the standards created by the ISDA Common Domain Model ("ISDA CDM").

The ISDA CDM is essentially a database of common trade features, designed to record in a single place all of the trade features and processes that form each derivative trade across all asset classes. The ISDA CDM therefore presents a single description of each lifecycle event in one master library. By collecting all of these terms into one place, the ISDA CDM ensures consistency by identifying instances where the same mechanic is used across multiple trade types or asset classes, but is defined in the model only once and can then be used as a standard building block for constructing trades. In many respects, the framework created by the ISDA CDM is similar to that created by the 2011 Definitions.

[35] Note that extraordinary events such as disruptions may require manual processing even if standard language describing these events is developed. By their very nature, these events are unpredictable and the appropriate outcome may depend on the facts and circumstances present at the time, many of which are unknowable on the trade date. For example, it is possible that for many of these events, standard language can be developed that apples universally to many trades. However, this standard language could simply defer the determination to an arbiter by, for example, specifying that the Calculation Agent, acting in a commercially reasonable manner, will make the ultimate determination. In such instances, there may not be industry consensus or guidance on what the specific approach the industry should take to in response to a particular market event. The result would therefore be a range of potential outcomes that could occur throughout the market even where the same standard language is used in every contract. For a general discussion of which terms are suitable for automation and the instances where manual intervention may be desirable in the context of the ISDA Master Agreement, 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

Once users learn how to work with the model for any asset class, they will be able to see how certain trade processes are used across the industry and potentially use that understanding to implement industry-wide technology solutions for a given process.

In the case of equity derivatives, ISDA is identifying for each trade type a standard that can be used to develop the equities portion of the ISDA CDM. In March 2019, ISDA published version 2.0 of the ISDA CDM. As well as providing a full set of representations for interest rate and credit derivatives, the ISDA CDM 2.0 includes an initial representation of equity swaps products.

As mentioned above, ISDA has constructed a sample template confirmation within this framework, called the SES1. By utilizing the SES1 confirmation as the base legal text, participating members of the ISDA CDM equity working group developed digital representations of some basic equity swap events, along with the corresponding data points. As such, the ISDA CDM currently contains events such as (i) equity swap executions, (ii) equity swap resets based on price observations, and (iii) cash transfer payments based on the equity performance calculation. The technology-friendly format of the SES1 confirmation facilitated the effective translation of the legal text into CDM code.

For example, the SES1 defines the terms “Equity Performance” and “Rate of Return” as follows:

> *75. “**Equity Performance”** means, in respect of an Equity Cash Settlement Date, an amount in the Settlement Currency determined by the Calculation Agent as of the Equity Valuation Date to which the Equity Cash Settlement Amount relates, pursuant to the following formula:*
>
> *Equity Performance = (Rate Of Return) X Equity Notional Amount*
>
> *139. “**Rate Of Return**” means, in respect of any Equity Valuation Date, the amount determined pursuant to the following formula:*
>
> *Rate of Return = (Final Price – Initial Price) / Initial Price*

The following code represents the ISDA CDM translation of the above legal text:

**Equity Performance:**

```
func    EquityPerformance:

        inputs:
                contractState ContractState (1..1)
                observation number (1..1)
                date date (1..1)

        output:
                equityPerformance number (1..1)
```

```
alias equityPayout:
        contractState -> contract -> contractualProduct -> economicTerms
        -> payout -> equityPayout only-element

alias periodStartPrice:
        ResolveEquityPeriodStartPrice(equityPayout, date)

alias periodEndPrice:
        observation

alias numberOfSecurities:
        ExtractQuantityByNotation( contractState -> contract ->
        contractualQuantity -> quantityNotation, QuantityNotationEnum ->
        NumberOfSecurities ) -> quantity -> amount

alias rateOfReturn:
        RateOfReturn(periodStartPrice, periodEndPrice)

alias notionalAmount:
        EquityNotionalAmount(numberOfSecurities, periodEndPrice)

assign-output equityPerformance:
        rateOfReturn * notionalAmount
```

**Rate Of Return:**

```
func RateOfReturn:
    inputs:
        initialPrice number (1..1)
        finalPrice number (1..1)

    output:
        rateOfReturn number (1..1)

    assign-output rateOfReturn:
        (finalPrice - initialPrice) / initialPrice
```

These elements can be implemented by technology and infrastructure providers to ensure standard and consistent outputs for all users.

## Distribution

Documentation based on the 2011 Definitions and reflecting the standard set out in the ISDA CDM will allow for standardized trade confirmations that are completely in sync with the ISDA CDM and any technology based upon the ISDA CDM. At that point, the industry can then support automated trade processes with standard documentation.

ISDA's objective is to deliver standardized trade documentation templates to the industry, together with a CDM model for each trade. Further, each individual clause in each of these templates will be made available on an open-source basis, while ISDA will also ensure that each individual clause is unique using the metadata framework of the 2011 Definitions. These resources would both support the industry's trading activity and also open a roadmap for developers to determine what to automate and how.

At this point, having now standardized relevant portions of any 2011 confirmation and identified common industry-wide trade features in the ISDA CDM, any technology built to the specifications of these two resources would be in line with each party's relevant obligations under the trade. The industry should be assured of both (a) standardized results following precisely defined business logic and (b) where manual interventions are required, a clear process for diverging away from automation and implementing the relevant bilaterally negotiated provisions.

## Conclusion and Recommendation

The 2016 KPMG report[36] notes that the largest challenge faced by the industry in delivering these benefits is the siloed nature and the resistance of many business lines, followed by bank procurement processes, complex legacy systems and a lack of standardization. It is clear therefore that in order to achieve many of the benefits mentioned above, there must be an acceptance among market participants that change is necessary.

ISDA is supporting the industry on this journey by developing and delivering increased standardization, which can then serve as the foundation for developing new automated processes with the aim of reducing operational complexity.

These guidelines are primarily focused on the development and implementation of new legal and documentation standards. While the 2002 Definitions provide a legal and contractual framework for bespoke trade types, they present considerable obstacles to standardization. Technology developers seeking to construct a smart derivatives contract using the model established by the 2002 Definitions would need to build a system that could account for every bespoke trade. The fact that no one has access to the full universe of negotiated contract provisions makes it virtually impossible to create a system that could piece together and construct these fragmented provisions into a consolidated legal contract. Even if one had access, many of these provisions require human judgment to determine how the provision itself should even be constructed, and once constructed, interpreted.

Implementing the 2011 Definitions will provide the industry and developers with an automation-friendly structure, while preserving the ability to bilaterally negotiate bespoke features.

However, though the core framework is available for use, the industry has thus far only determined to create one standardized trade based on them. A collective decision, therefore, to move forward with agreeing on standardized terms for additional designated trades is the next critical step. In order to move forward with automation, the industry must determine which trade types it wants to standardize and, for those trades, determine which set of lifecycle events should be automated.

One potential issue this raises is determining the appropriate number of templates. At one end of the spectrum, we would have a template with few fixed terms and broad scope. At the other, would be a large group of templates that provide for more fixed terms but at the cost of increasing the number of templates. Finding the right balance between the two will require broad industry engagement and collaboration among all relevant stakeholders to find a mix of fixed terms which achieves enough standardization to support automation for a meaningful trade population, while preserving enough variability to be attractive to a wide segment of the market.

[36] "Rise of the Robots", KPMG, 2016 (https://home.kpmg/content/dam/kpmg/my/pdf/Rise%20of%20the%20robots.pdf)

We therefore encourage the industry to take the following steps to drive automation forward:

1) Identify the trade types and specific features that both dealers and end-users wish to automate.

2) Determine whether market practice is clear enough to define one or more trade lifecycle processes upon which to focus automation efforts.

3) Determine what would be the appropriate off-ramp manual processes to preserve the market's current approach to extraordinary event risk.

As the industry prepares to make these determinations, ISDA has laid the groundwork to implement the industry's mandates by developing the 2011 Definitions framework and the ISDA CDM.

These resources stand ready to serve as the foundation for automated business logic to support technological advancements, and smart derivatives contracts for the OTC equity derivatives market.

## Contribute

The **ISDA EMIG Documentation Subgroup** has been established to agree new ISDA standard documentation for the purposes of confirming transactions for certain equity derivatives products that are currently documented via bespoke, bilaterally-negotiated paper confirmations.

Members can also participate in ISDA's broader work on technology by joining the following working groups:

- **ISDA Legal Technology Working Group**: Established to promote greater standardization and digitization of ISDA documentation through the ISDA Clause Library Project.
- **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.
- **ISDA CDM Equity Subgroup**: Established to provide an equity focused CDM workstream focused on topical design questions, including specific features to facilitate adoption of the CDM, leveraging both technical and SME knowledge from across the industry.

Members can join these Working Groups through the My Committee Dashboard on the ISDA website: http://www.isda.org/committees.

If you have any questions on any of the issues raised in this paper, please contact ISDALegal@ISDA.org

## Frequently Asked Questions

**1) Why have the 2011 Definitions not been used to date?**

As described above, the 2002 Definitions allow unlimited customization across a fragmented market ecosystem. As such, in light of the absence of any standard equity derivative trade types, the needs of the industry have been sufficiently served by the 2002 Definitions.

Given that the 2002 Definitions simply represent a starting point for bespoke drafting, there would have been no point to developing a replacement for it that would have been designed simply to be a different starting point for eventual revision by the industry when drafting customized forms. Instead, ISDA produced the 2011 Definitions to support standardized contract templates published centrally by ISDA. In the absence of any standardized products in the equity derivatives market, there has been no occasion to apply this framework. As the industry increasingly looks for opportunities to achieve greater efficiencies and cost savings through standardized and digitized documentation, the 2011 Definitions stand ready to provide the framework to produce those forms.

**2) Would there be any basis risk (in terms of documents and contractual terms) between contracts created using 2002 and 2011 templates?**

Yes. As noted, there are no standard equity derivatives products and, as such, no two dealer forms are the same. Consequently, any standardized product template will logically have basis risk compared to any template in use today. The one (unlikely) exception where this may not apply would be if the industry were to adopt one specific dealer's form as a standard, in which case, that form would not present basis risk to that dealer, but present basis risk to every other dealer.

However, while any standard form template in its entirety will present basis risk to any of the unique 2002 Definitions-based agreement in use today, the 2011 Definitions are flexible and can be used to replicate any specific mechanics or terms used in the market. So it's possible that there may not be substantive basis risk in respect of specific trade mechanics and features, assuming that the industry ultimately determines to apply any term used in one's current documentation as a standard in the future. Considering the dividend example above and the various edge cases (non-cash dividends; failure to pay; taxes; etc.), each dealer today applies a different logic in handling these events, and uses its own bespoke drafting, starting from the 2002 Definitions but then modifying the language. These modifications create basis risk among dealers. Similarly, any customer negotiation also introduce basis risk within a single dealer's portfolio. When the industry ultimately determines to apply a standard to these practices, it's likely such standard will line up with the current practice of most of the market at that point, with the result being

that, in respect of that specific mechanic, the portions of the market applying the eventual standard would not need to change their practice.

Any basis risk would depend on what the industry eventually decides to use as the template for a given product type and how that template compares to market practice. The 2011 Definitions are flexible enough to document any existing transaction today – however, to support automation, the consensus of a working group may be to place some limits on the range of negotiation, as a tradeoff in designing a platform meant to drive standardization of product.

**3) Would there be a need to re-paper legacy trades? Would firms need to manage portfolios with two sets of definitions for the same product?**

That would be left to individual users to work out. In some cases, it may be an attractive solution to move an entire book over to a new set of standards for operational convenience all at once. Other parties may wish to maintain separate facilities until the legacy one winds down. We note too that in the equities market, many trades have lifespans that may be measured in months, in which case a transition period may allow users to simply adopt any new standards on a rolling basis while waiting for old trades to roll off. Since the core economics remain the same whether documented under 2002 Definitions or 2011 Definitions, the transition should be manageable, with the main difference between populations being increased transparency and automation for the 2011 Definitions.

**4) What is the cost/benefit analysis of adopting a more standardized approach? How are new technologies going to save money/create efficiencies?**

As outlined in the paper above, the market is already paying significant operational costs in maintaining legacy systems, manually processing lifecycle events and delays in onboarding new clients – and fintech solutions built on the 2011 Definitions framework offer a chance to change that, by building shared processes using a standard CDM representation. Certainly, much of the customization currently in place in the equity derivatives market goes to the essential characteristics of the trade. To the extent, however, that customization is simply a product of organic development and not essential to the trade, it is in the market's interest to drive towards standards. The more standardized approach means greater opportunity for automation, and more efficiencies as individual firms move away from legacy processes to converge on newly developed platforms, promoting lower operating costs overall. The barriers to entry for new customers in the market will be lowered, and greater transparency into the legal terms of existing portfolios will result and allow better risk management. Overall, these new technologies can reduce friction in the market, and benefit both dealers and end-users alike.

## Acknowledgement

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