

Crypto-asset Risks and Hedging Analysis

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EXECUTIVE SUMMARY

The crypto-assets market grew by three-and-a-half times in 2021 compared to 2020, to almost \$3 trillion as of November 2021. Despite a reduction in recent months, this market is increasingly attracting interest from institutional investors, banks, and policymakers. There is a growing number of new entrants into the crypto-assets market, including hedge funds, banks, insurance companies, sovereign wealth funds, pension funds and endowment funds.

This rapid growth has been accompanied by strong interest in crypto derivatives, as market participants increasingly look for ways to take synthetic exposure to crypto assets or to protect their crypto-asset holdings from adverse market risk. As in any market, derivatives play a vital role in enabling participants to manage risks, deepen liquidity and broaden market access.

The Basel Committee on Banking Supervision (BCBS) has made proposals for the prudential treatment of banks' crypto-asset exposures¹ that, if implemented, would lead to particularly punitive capital requirements for banks holding some types of crypto assets and disincentivize traditional financial intermediaries from playing an active role in crypto markets.

ISDA believes an appropriate, risk-sensitive capital framework for crypto assets is essential, as set out in its response to the BCBS consultation². This would provide a suitable framework to allow banks to meet customer demand while ensuring capital levels are proportionate to the underlying risks.

The BCBS consultation proposed a broad definition of Group 2 assets that includes a diverse range of activities. The industry response proposed Group 2 crypto assets should be divided into two sub-categories to distinguish between crypto assets for which there is a liquid two-way market (referred to as Group 2a) and all other crypto assets (referred to as Group 2b).

In this paper, it is demonstrated that hedging Group 2a crypto assets with their respective futures or exchange-traded funds (ETFs) is effective. Hence the capital treatment should therefore allow for offsetting a given Group 2a crypto asset with its futures or ETFs. The paper also demonstrates that the basis risk profile of Group 2a crypto-asset futures is comparable with that of existing financial assets.

This study categorizes eight³ crypto assets into Group 2a and Group 2b⁴, consistent with the industry response letter, and this also includes their associated futures and ETFs. The data for this study spans the period from January 1, 2018 to March 31, 2022.

To achieve these objectives, the paper:

- Analyzes the correlation of crypto assets with other markets and the basis between Group 2a (Bitcoin and Ethereum) spot and their futures;
- Assesses the hedge effectiveness of crypto-asset exposure hedging with futures and ETFs.

¹ Prudential treatment of crypto-asset exposures, Basel Committee on Banking Supervision, June 10, 2021, www.bis.org/bcbs/publ/d519.htm

² Trade associations' response to Basel Committee consultation on crypto assets, September 21, 2021, www.isda.org/2021/09/21/trade-associationsrespond-to-basel-committee-consultation-on-Cryptoassets

³ Eight crypto assets analyzed: Bitcoin cash, Bitcoin, Ether, Litecoin, BAT, Neo, XRP, Dogecoin

⁴ As outlined in the industry response, Group 2a: Bitcoin cash, Bitcoin, Ether; Group 2b: Litecoin, BAT, Neo, XRP, Dogecoin

Key findings:

- Correlation between Group 2a spot (Bitcoin and Ethereum) and their futures is sufficiently high to support effective hedging. The basis between spot Bitcoin and Ethereum and their respective futures has historically been relatively muted, which would enable effective hedging. The basis is within the same magnitude as the basis between large equity indices and their futures.
- Analysis using the hedge accounting quantitative test under International Accounting Standard 39 (IAS 39) demonstrates that hedging Group 2a spot using their futures and ETFs is highly effective. The IAS 39 hedge accounting quantitative test was used to assess the hedge effectiveness of Bitcoin and Ethereum and their respective futures and ETFs. The result showed an effective hedging relationship between spot Bitcoin and Ethereum and their respective futures and ETFs. This supports the industry position that offsetting a Group 2a spot crypto asset against its futures or ETFs should be allowed.

These findings show an opportunity to establish a crypto-asset hedging framework by using the strong hedging relationship and relatively small basis between Group 2a crypto assets and their futures and ETFs.

The findings set out in this paper will continue to inform ISDA's work with regulators, with the aim of establishing a risk-appropriate capital regime for crypto assets.

ANALYSIS OF CRYPTO-ASSET CORRELATION AND BASIS

The correlation of changes in the price of crypto assets and other financial assets provides an indication of the relationship between crypto assets and traditional assets, and whether any strong relationship could allow market participants to use some traditional assets as proxies to hedge crypto-asset exposures.

Over the past four-and-a-quarter years, the correlation between crypto assets' 10-day and oneday returns and the returns of traditional financial assets has generally been small and revolving around zero (see Table 1). The correlation has been evaluated using the buckets used for the ISDA Standard Initial Margin Model (ISDA SIMM), for which ISDA has extensive instrument and risk factor data. This indicates the absence of a price relationship between crypto assets and traditional assets.

Correlations between BAT, Neo, Ripple XRP, I	crypto assets (Bitcoin, Bitcoin cash, Ether, Litecoin Dogecoin) and other financial assets	Correl 10d returns	Correl 1d returns
EQ Buck1	Large EM Consumer, utilities, health care	9%	5%
EQ Buck2	Large EM Telecommunications, industrials	10%	6%
EQ Buck3	Large EM Basic materials, energy	13%	6%
EQ Buck4	Large EM Financial, technology	8%	5%
EQ Buck5	Large DM Consumer, utilities, health care	16%	8%
EQ Buck6	Large DM Telecommunications, industrials	21%	8%
EQ Buck7	Large DM Basic materials, energy	23%	8%
EQ Buck8	Large DM Financial, technology	21%	11%
EQ Buck9	Small EM All sectors	6%	5%
EQ Buck10	Small DM All sectors	15%	6%
EQ Buck11	Indexes, Funds, ETFs	20%	12%
EQ Buck12	Volatility Indexes	-27%	-9%
CM Buck1	Coal	21%	1%
CM Buck2	Crude	18%	5%
CM Buck3	Light Ends	18%	6%
CM Buck4	Middle Distillates	16%	5%
CM Buck5	Heavy Distillates	18%	5%
CM Buck7	European Natural Gas	1%	0%
CM Buck8	North American Power	6%	1%
CM Buck9	European Power and Carbon	-1%	1%
CM Buck11	Base Metals	16%	7%
CM Buck12	Precious Metals	15%	9%
CM Buck13	Grains and Oilseed	9%	3%
CM Buck14	Softs and Other Agriculturals	16%	5%
CM Buck17	Indexes	14%	6%
FX	All pairs	16%	9%

Table 1: Correlations of 10-day and one-day price moves between crypto assets and other financial assets, January 1, 2018 – March 31, 2022

As illustrated in Figure 1, the correlation between Bitcoin and the S&P 500 became consistently positive in 2021 and 2022, which may correspond to portfolio shifts into crypto assets along with equities. Bitcoin gained wider mainstream appeal in recent years, and its correlation with other macro assets has increased to a point where crypto is now at the centre of recent rotations across asset classes⁵. However, the correlation between Bitcoin and the NASDAQ 100 remained either positive or negative until late 2021.

The correlation between Bitcoin and gold or oil does not exhibit any clear trend. More importantly, the correlation observed between Bitcoin and traditional assets has been noticeably unstable over time, rendering potential proxy hedging strategies between Bitcoin and other asset classes difficult to achieve.



Figure 1: 60-day moving correlations of 10-day returns in the price of Bitcoin and other financial assets

The correlation of changes in the price of different crypto assets and their futures provides an indication of the relationship between crypto assets, as well as with their associated futures contracts. A strong relationship would enable market participants to use crypto-asset futures to hedge their underlying spot crypto-asset exposure.

Over the past four-and-a-quarter years, correlation between one-day returns of Group 2a crypto assets, as well as between Group 2a crypto assets and their futures has been strong, with values of 75% or higher. The correlations between Bitcoin and its futures, and between Ethereum and its futures, are particularly strong at 99%, further suggesting netting should be allowed for the same Group 2a crypto assets, as shown in Table 2.

⁵ In a research report published in January 2022, Goldman Sachs analysts led by Zach Pandl wrote: "Bitcoin is at the center of a recent rotation across asset classes. Bitcoin is positively correlated with inflation risk and a proxy for the frontier tech stock industry, and negatively correlated with real interest rates and the value of the US dollar"

Table 2: Correlations of daily price returns between main crypto assets, January 1, 2018 –March 31, 2022

		Group 2a			
		Bitcoin Spot	Bitcoin Futures	Ethereum Spot	Ethereum Futures
	BTC-USD		99%	81%	75%
p 2a	BTC=F	99%		80%	77%
Broul	ETH-USD	81%	80%		99%
	ETH=F	75%	77%	99%	

Basis between Bitcoin and Bitcoin futures, and between Ethereum and Ethereum futures

The volatility of Bitcoin and Ethereum in recent years has been mirrored by their respective futures contracts. Crypto-asset basis has evolved over time between positive and negative territory. When demand is strong and supply is small, spot prices tend to increase relative to futures prices, resulting in a strengthening of the basis. Conversely, when spot prices trade lower than futures prices, the basis is negative.

A futures price is based on the price of the underlying spot asset plus the cost of carry until delivery, represented by the basis. Generally, crypto futures markets are in contango, meaning that futures prices are higher than spot prices. The basis is mainly determined by the futures implied financing rates, the time left to contract expiry, and expected market volatility.

In March 2020, a significant crypto asset price drop led to the market going into extreme backwardation, where futures traded at a significant discount to spot. The volatility in crypto-asset prices in 2021 has also been associated with some moves in the Bitcoin and Ethereum basis levels against their respective futures.

The shape of the futures curve is important to market participants looking to hedge crypto-asset positions, as it provides an indication of where future prices are expected to go. The basis is used to assess the value of the hedging strategy and a narrow basis will allow market participants to hedge crypto-asset positions with maximum effectiveness.

ISDA's analysis showed that the historical basis between Bitcoin and Bitcoin futures, and between Ethereum and Ethereum futures, has been relatively muted. These moderate basis levels offer effective hedging strategies to market participants.

The basis between Bitcoin, Ethereum and their respective futures is wider than the basis for welltraded equity indices and their futures, but within the same order of magnitude, as illustrated in Table 3.

Asset and futures contract	Maximum absolute basis	Median absolute basis
BTC and CME BTC Futures	10.90%	0.50%
ETH and CME ETH Futures	7.90%	0.70%
S&P 500 and E-mini-S&P 500 Futures	5.80%	0.10%
NASDAQ 100 and NASDAQ 100 E-mini-Futures	6.10%	0.10%
Russell 2000 and E-mini-Russell 2000 Futures	5.50%	0.10%

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lable	3:	Percentage	absolute	basis	comparisons

Figures 2 and 3 show the level of the basis between Bitcoin and its futures, and between Ethereum and its futures, over recent years.





Figure 3: Percentage basis between Ethereum and CME Ethereum futures (Left – US dollar; right – percentage)



ANALYSIS OF CRYPTO-ASSET EXPOSURE HEDGING WITH FUTURES AND ETFS

Hedging spot crypto-asset positions involves entering into trading positions so that a gain or loss in one position (the hedged item or spot crypto position) is offset by changes to the value of the other position (the hedging instrument).

Assessing the effectiveness of a hedging relationship

International accounting standards offer a simple and widely used test to assess the effectiveness of a hedging relationship between a hedged item – in this case, spot Group 2a crypto assets – and the associated hedging instruments (ie, futures and ETFs).

IAS 39 deems a hedge highly effective if two conditions are met:

- 1. The offset is in the range of 80-125%, meaning the slope parameter (Beta) of the regression of the returns of the hedging instrument against the hedged item's returns is within the range of 0.80-1.25;
- 2. The coefficient of determination of the regression (the R-squared parameter) is equal to or greater than 0.80. R-squared is a statistical measure that in this case represents the proportion of the variance of the hedging instrument's returns that is explained by the variance of the hedged item's returns.

In summary, a hedge is considered highly effective under IAS 39 if the following two conditions are met:

 $1.0.80 \le |\hat{\beta}| \le 1.25$

2. $R^2 \ge 0.80$

While the International Accounting Standards Board has recently replaced the IAS 39 quantitative criterion with a principles-based approach⁶, the quantitative hedge effectiveness test remains widely used by financial institutions to determine the effectiveness of a hedging relationship.

Evidence of effective hedging using crypto-asset futures and ETFs to hedge spot crypto-asset exposure

ISDA assessed the hedge effectiveness of a series of well-traded Group 2a crypto-asset futures and ETFs against a position in their respective underlying hedged item, ie, spot Bitcoin or spot Ethereum.

As part of the analysis, a series of hedge effectiveness tests were conducted using Group 2a cryptoasset futures, ETFs and trusts, and the results were compared with those for established equity indices – the S&P 500, the Russell 2000 and the NASDAQ 100. The tests compared five-day, 10-day and 30-day log returns over the testing period for the hedged items and the hedging instruments. The results that satisfied both the Beta and R-squared conditions were deemed effective hedging relationships. These tests are marked as TRUE in Table 4.

⁶ IAS 39 has been replaced by IFRS 9, www.ifrs.org/issued-standards/list-of-standards/lias-39-financial-instruments-recognition-and-measurement

		Is hedging effective? (TRUE/FALSE)		
Hedged Item	Hedging Instrument	5d returns	10d returns	30d returns
Bitcoin	CME BTC Futures	TRUE	TRUE	TRUE
Bitcoin	CME BTC micro Futures	TRUE	TRUE	TRUE
Bitcoin	Eurex future on BTCetc	TRUE	TRUE	TRUE
Ether	CME ETH Futures	TRUE	TRUE	TRUE
Bitcoin	ProShares Bitcoin Strategy ETF (futures based)	TRUE	TRUE	TRUE
Bitcoin	Valkyrie Bitcoin Strategy ETF (futures based)	TRUE	TRUE	TRUE
Bitcoin	VanEck Bitcoin Strategy ETF (futures based)	TRUE	TRUE	TRUE
Bitcoin	BetaPro Inverse Bitcoin ETF (futures based)	TRUE	TRUE	TRUE
Bitcoin	Purpose Bitcoin ETF (physical based)	TRUE	TRUE	TRUE
Bitcoin	EBIT Bitcoin ETF CAD (physical based)	TRUE	TRUE	TRUE
Bitcoin	BTCE GR Equity: BTCetc (physical based)	TRUE	TRUE	TRUE
S&P 500 Index	BMF S&P 500 Index Futures	TRUE	TRUE	TRUE
S&P 500 Index	SPDR S&P 500 ETF TRUST	TRUE	TRUE	TRUE
Russell 2000 Index	CME E-mini Russell 2000 Index Futures	TRUE	TRUE	TRUE
Russell 2000 Index	Vanguard Russell 2000 ETF	TRUE	TRUE	TRUE
NASDAQ 100 Index	Generic 1st NASDAQ 100 E-mini	TRUE	TRUE	TRUE
Bitcoin	Grayscale Bitcoin Trust	FALSE	FALSE	TRUE
Ether	Grayscale Ethereum Trust	FALSE	FALSE	FALSE

Table 4: Hedge effectiveness test results for spot Bitcoin and Ethereum positions and their respective candidate hedging instruments

The hedge effectiveness results set out in this paper have been separately updated by ISDA to include data from April and May 2022, which shows that despite recent crypto-asset market volatility, hedging remains highly effective.

As demonstrated in Table 4, the hedging of spot Bitcoin and Ethereum with their respective futures or ETFs is highly effective. As observed, this is comparable to the hedging relationships between large equity indices such as the S&P 500, the Russell 2000, the NASDAQ 100 and their respective futures and ETFs. However, Bitcoin or Ethereum Grayscale trust funds, which are neither futures nor ETFs, are generally ineffective.

Figure 4 illustrates the effective hedging relationship between the 10-day returns of spot Bitcoin and the 10-day returns of CME Bitcoin futures, with high scores of 0.966 for Beta and 0.98 for R-squared.





Figure 5 illustrates the moderately ineffective hedging relationship between the 10-day returns of spot Bitcoin and the 10-day returns of Grayscale Bitcoin trust, with relatively high scores of 0.93 for Beta and 0.799 for R-squared. R-squared just misses the 0.8 mark for the hedge to be effective.

Grayscale trust funds have been ineffective hedges as they used to trade at a relative premium to underlying spot crypto positions between 2018 and January 2021, as a result of many institutions seeking spot crypto exposure. The premium flipped to a discount in February 2021, which has steadily widened ever since due to several factors such as redemption associated with large crypto price drops and the introduction of competing spot-based crypto ETFs⁷.

⁷ Grayscale is currently working on converting its trusts to spot ETF. If successful, its hedge effectiveness may change, www.coindesk.com/ markets/2022/01/19/grayscale-bitcoin-trust-discount-hits-record-at-265





The paper now analyzes the stability of the hedge effectiveness, in order to determine whether effective hedges tend to be consistently effective over time, and whether ineffective hedges tend to be consistently ineffective over time.

ISDA conducted a hedge effectiveness stability test over two sub-periods of 90 days and 180 days, using five-day and 10-day log returns to ensure the presence of sufficient regression data points in each subperiod for the results to be meaningful. For each hedging scenario, Table 5 shows the proportion of sub-periods where hedging is effective. A high percentage value close to 100% indicates a consistently effective hedging relationship, while a low percentage indicates a consistently ineffective hedging relationship.

Proportion of sub-periods where hedging is effective (%)				
Sub-periods		90-day	180-day	
Hedged Item	Hedging Instrument	5d returns	5d returns	10d returns
Bitcoin	CME BTC Futures	94%	100%	100%
Bitcoin	CME BTC micro Futures	100%	100%	100%
Bitcoin	Eurex future on BTCetc	100%	100%	100%
Ether	CME ETH Futures	100%	100%	100%
Bitcoin	ProShares Bitcoin Strategy ETF (futures based)	100%	100%	100%
Bitcoin	Valkyrie Bitcoin Strategy ETF (futures based)	100%	100%	100%
Bitcoin	VanEck Bitcoin Strategy ETF (futures based)	100%	100%	100%
Bitcoin	BetaPro Inverse Bitcoin ETF (futures based)	100%	100%	100%
Bitcoin	Purpose Bitcoin ETF (physical based)	80%	100%	100%
Bitcoin	EBIT Bitcoin ETF CAD (physical based)	100%	100%	100%
Bitcoin	BTCE GR Equity: BTCetc (physical based)	100%	75%	100%
S&P 500 Index	BMF S&P 500 Index Futures	89%	78%	78%
S&P 500 Index	SPDR S&P 500 ETF TRUST	100%	100%	100%
Russell 2000 Index	CME E-mini Russell 2000 Index Futures	100%	100%	100%
Russell 2000 Index	Vanguard Russell 2000 ETF	100%	100%	100%
NASDAQ 100 Index	Generic 1st NASDAQ 100 E-mini	100%	100%	100%
Bitcoin	Grayscale Bitcoin Trust	42%	60%	80%
Ether	Grayscale Ethereum Trust	25%	33%	17%

Table 5: Stability of the hedge effectiveness test results over sub-periods of 90 and 180 days

It was observed that when hedging spot Bitcoin or Ethereum with their respective futures or ETFs, the hedge was found to be consistently effective. Hedging of spot Bitcoin or Ethereum with respective Grayscale trust funds was consistently ineffective.

Finally, the stability of the hedge effectiveness of Group 2a crypto assets and their respective futures and ETFs was compared with that of equity index futures and ETFs on the three large US equity indices – the S&P 500, Russell 2000, and NASDAQ 100. Results show that while hedges are effective in all cases, the hedge effectiveness parameters Beta and R-squared are significantly closer to one in the case of large US equity indices.

In summary, the hedge effectiveness tests led to the following results:

- 1. Hedging spot Bitcoin or Ethereum with their associated futures or ETFs is highly effective, and the hedging is consistently effective;
- 2. Hedging with Grayscale trust funds is generally ineffective due to the relative premium or discount the trust funds traded at against spot Bitcoin or Ethereum;
- 3. Hedging Bitcoin or Ethereum with the other coin (Ethereum with Bitcoin or Bitcoin with Ethereum), or another coin's futures and/or ETFs, is consistently ineffective.

CONCLUSION

As crypto assets continue to gain attention, market participants are increasingly looking for ways to protect their asset holdings from market risks. Hedging is seen as a useful strategy for market participants looking to maintain their spot crypto-asset holdings or make crypto-asset markets while achieving a market risk neutral exposure.

ISDA's analysis unveils the opportunity to establish a crypto-asset hedging framework by using the effective hedging relationship, strong correlation and relatively small basis between Group 2a crypto assets and their futures and ETFs. The associated capital treatment should therefore allow for offsetting for a given Group 2a crypto asset and its futures and ETFs.

The crypto-assets market is a fast-evolving area, and ISDA is committed to continuing to work with members, policymakers, and crypto market participants to develop a safe and efficient crypto derivatives market, supported by risk-appropriate prudential requirements. The findings set out in this paper support ISDA's work and advocacy positions relating to the crypto derivatives market.

APPENDIX: ANALYSIS SCOPE, DATA SOURCES AND TIME WINDOW

The data used in this paper was sourced from Bloomberg, Yahoo! Finance and Oanda.com, covering the following assets:

- Spot crypto assets: Bitcoin cash, Bitcoin, Ether Litecoin, BAT, Neo, XRP, Dogecoin
- Futures contracts on crypto assets:
 - BTC1 Curncy: CME BTC Futures (BTC)
 - BMR1 Curncy: CME BTC micro-Futures (BTC)
 - DCR1 Curncy: CME ETH Futures (ETH)
- ETFs on crypto assets:
 - BITO US Equity: ProShares Bitcoin Strategy ETF (BTC)
 - BTF US Equity: Valkyrie Bitcoin Strategy ETF (BTC)
 - XBTF US Equity: VanEck Bitcoin Strategy ETF (BTC)
 - BITI CT Equity: BetaPro Inverse Bitcoin ETF (BTC)
 - BTCC/B CT Equity: Purpose Bitcoin ETF (BTC)
 - EBIT CT Equity: Bitcoin ETF CAD (BTC)
 - FBTX=1 GR Equity: Eurex future on BTCetc (BTC)
 - BTCE GR Equity: BTCetc (BTC)
- Trust funds with crypto assets:
 - GBTC US Equity: Grayscale Bitcoin Trust (BTC)
 - ETHE US Equity: Grayscale Ethereum Trust (ETH)
- Equity:
 - 7,317 single names, categorized in ISDA SIMM buckets according to the ISDA SIMM Crowdsourcing Utility⁸
- FX:
 - 28 currencies (ARS, AUD, BRL, CAD, CHF, CLP, COP, DKK, EUR, GBP, HUF, IDR, ILS, INR, JPY, KRW, MXN, MYR, NOK, NZD, PLN, RUB, SEK, SGD, TRY, TWD, ZAR, USD)
- Commodity:

SIMM Commodity Bucket	Instrument
1	NYMEX Coal (API5) FOB Newcastle (Argus/McCloskey) Futures
2	Brent Crude Oil Futures
3	Premium Unleaded Gasoline 10ppm FOB Rotterdam Barges (Platts) Futures
	Singapore Mogas 92 Unleaded (Platts) Futures (SMT)
4	Low Sulphur Gasoil Futures
	Singapore Gasoil Futures (SWS)

⁸ The ISDA SIMM Crowdsourcing Utility is operated and maintained by ICE Benchmark Administration

5	Fuel Oil 180 CST Singapore Futures (SZS)
	Fuel Oil 3.5% FOB Rotterdam Barges Futures (BAR)
7	ICE UK Natural Gas Futures
	ICE Dutch TTF Gas Futures
8	CAISO NP-15 Day-Ahead Peak Fixed Price Futures
	PJM Western Hub Real-Time Peak (800 MWh) Fixed Price Future
	ERCOT West Load Zone Real-Time Peak Fixed Price Future
	NYISO Zone J Day-Ahead Peak Fixed Price Future
9	ICE UK Baseload Power Futures
	ICE European Emission Allowances Futures
11	LME Aluminium Futures
	LME Copper Futures
	LME Lead Futures
	LME Nickel Futures
	LME Tin Futures
	LME Zinc Futures
12	COMEX Gold Futures
	NYMEX Palladium Futures
	NYMEX Platinum Futures
	COMEX Silver Futures
13	ICE Canola Futures
14	ICE Cocoa Futures
	ICE Coffee Futures
	ICE Cotton Futures
	ICE Sugar No 11 Futures
	ICE Frozen Concentrated Orange Juice Futures
17	Bloomberg Agriculture (BCOMAG)
	Bloomberg Commodity Index (BCOM)
	Bloomberg Livestock TR (BCOMLI)
	Bloomberg Natural Gas (BCOMNG)
	Bloomberg WTI Crude Oil (BCOMCL)
	S&P GSCI Dynamic Roll Capped Commodity (SPGCCIP)

Scope: Correlations, basis risk, hedge effectiveness

Time window: From October 1, 2017 or January 1, 2018 to March 31, 2022.

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Crypto-asset Risks and Hedging Analysis

ISDA.

ABOUT ISDA

Since 1985, ISDA has worked to make the global derivatives markets safer and more efficient. Today, ISDA has over 980 member institutions from 78 countries. These members comprise a broad range of derivatives market participants, including corporations, investment managers, government and supranational entities, insurance companies, energy and commodities firms, and international and regional banks. In addition to market participants, members also include key components of the derivatives market infrastructure, such as exchanges, intermediaries, clearing houses and repositories, as well as law firms, accounting firms and other service providers. Information about ISDA and its activities is available on the Association's website: www.isda.org. Follow us on Twitter, LinkedIn, Facebook and YouTube.