

**S&P Dow Jones
Indices**

A Division of **S&P Global**

S&P Futures Indices *Methodology*

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Introduction

Index Objective and Highlights

The S&P Futures Indices measure the performance of the nearest maturing equity, currency, and cryptocurrency futures contract. The indices roll at various frequencies, as defined in *Index Construction*. Each index calculates real-time, with excess return (ER) and total return (TR) versions available.¹

Index Family

Equity Futures Indices

- **S&P 500 Futures Index.** The index measures the performance of the nearest maturing quarterly E-mini S&P 500 futures contract (Symbol: ES) trading on CME.
- **S&P 500 Futures (3 Day Roll) Index.** The index measures the performance of the nearest maturing quarterly E-mini S&P 500 futures contract (Symbol: ES) trading on CME with a three-day roll period.
- **S&P 500 Futures (3 Day Roll) TWAP (3:20-3:30 PM) Index.** The index measures the performance of the S&P 500 Futures (3 Day Roll) Index, using Time-Weighted Average Prices (TWAP) snapped during a window of 3:20-3:30PM.
- **Dow Jones Industrial Average Futures Index.** The index measures the performance of the nearest maturing quarterly E-mini Dow (\$5) futures contract (Symbol: YM) trading on CME.

Currency Futures Indices

- **S&P U.S. Dollar Futures Index.** The index measures the performance of the nearest maturing quarterly U.S. Dollar futures contract (Symbol: DX) trading on ICE.
- **S&P Japanese Yen Futures Index.** The index measures the performance of the nearest maturing quarterly Japanese Yen futures contract (Symbol: JY) trading on CME.
- **S&P Australian Dollar Futures Index.** The index measures the performance of the nearest maturing quarterly Australian Dollar futures contract (Symbol: AD) trading on CME.
- **S&P Euro Futures Index.** The index measures the performance of the nearest maturing quarterly Euro futures contract (Symbol: EC) trading on CME.

Cryptocurrency Futures Indices

- **S&P CME Bitcoin Futures Daily Roll Index.** The index measures the return from a rolling long position in the two nearest maturing Bitcoin futures contracts (Symbol: BTC) trading on CME.
- **S&P CME Bitcoin Futures Index.** The index measures the performance of the nearest maturing monthly Bitcoin futures contract (Symbol: BTC) trading on CME.
- **S&P CME Ether Futures Index.** The index measures the performance of the nearest maturing monthly Ether futures contract (Symbol: HTE) trading on CME.
- **S&P Cryptocurrency MegaCap CME Futures Index.** The index measures the performance of holding long positions in the nearest maturing monthly Bitcoin and Ether futures contracts trading on CME.

¹ Spot indices are available for the Cryptocurrency Futures Indices.

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology	Commodities Indices Policies & Practices
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

Index Construction

Roll Frequency Schedule

Each ER and TR index is constructed from futures contracts and includes a provision for the replacement of the index futures contracts as the contracts approach maturity (also referred to as “rolling” or “the roll”).

Index	Roll Frequency
S&P 500 Futures Index	Quarterly
S&P 500 Futures (3 Day Roll) Index	
Dow Jones Industrial Average Futures Index	
S&P U.S. Dollar Futures Index	
S&P Japanese Yen Futures Index	
S&P Australian Dollar Futures Index	
S&P Euro Futures Index	
S&P CME Bitcoin Futures Daily Roll Index (USD)	Daily
S&P CME Bitcoin Futures Index (USD)	Monthly ²
S&P CME Ether Futures Index (USD)	
S&P Cryptocurrency MegaCap CME Futures Index (USD)	

Equity and Currency Futures indices. Except for the S&P 500 Futures (3-Day Roll) Index, the replacement for these indices occurs over a one-day rolling period every March, June, September, and December, effective after the close of trading five business days preceding the last trading date of the futures contract.

S&P 500 Futures (3 Day Roll) Index. The replacement occurs over a three-day roll period quarterly in March, June, September, and December, effective after the close of the 6th, 7th, and 8th business day³ preceding the last trading date of the futures contract. The indices roll quarterly and distribute the weights equally each day over a three-day roll period.

Date of the Roll Period	Current Roll Out Contract Weight	Roll In Contract Weight
Day 1	2/3	1/3
Day 2	1/3	2/3
Day 3	0	1

Cryptocurrency Futures Indices. Except for the S&P CME Bitcoin Futures Daily Roll Index, the replacement occurs over a five-day roll period every month, effective prior to the open of trading five business days preceding the last trading date of the futures contract. The last trading date of the Bitcoin and Ether futures contracts is the last Friday of the contract month. The indices roll monthly and distribute the weights 20% each day over a five-day roll period.

Date of the Roll Period	Current Roll Out Contract Weight	Roll In Contract Weight
Day 1	0.8	0.2
Day 2	0.6	0.4
Day 3	0.4	0.6
Day 4	0.2	0.8
Day 5	0	1

² Spot indices are available for the cryptocurrency futures indices and roll one day earlier than the ER and TR indices.

³ A business day is defined as a day when the CME is open for trading.

S&P Cryptocurrency MegaCap CME Futures Index. The index is designed to reflect the relative significance of each of the constituent cryptocurrencies to the underlying digital asset market. The market capitalization (or Dollar Weight) of the Bitcoin or Ether futures contract in the index is calculated as the product of the Contract Production Weights (CPWs) multiplied by the respective futures price. At each quarterly re-weighting, the new CPW of each designated constituent cryptocurrency futures contract is set to be the “Effective Coin Supply” of the respective underlying digital asset, determined as of the end of February, May, August, and November. The re-weighting is implemented over the regularly scheduled five-day roll period in March, June, September, and December (Quarterly Rolls).

For more information on Effective Coin Supply, please refer to the Effective Coin Supply and Glossary Sections of the S&P DJI Digital Assets Policies & Practices and Index Mathematics Methodology.

For more information on CPWs, please refer to the S&P GSCI Methodology, available at www.spglobal.com/spdij/.

S&P CME Bitcoin Futures Daily Roll Index. The contracts roll daily and is completed two days prior to the last trading date (t) of the current contract. On day $t-2$ at market close, the index is 0% in the expiring futures contract (Roll Out Contract, that expires two days later) and 100% in the next futures contract (Roll In Contract, which expires the subsequent month). The last trading date is the last Friday of the contract month. The daily roll percentage is determined on the day when the index is fully rolled from the first month contract to the second month contract and stays constant throughout the month regardless of limit disruption events.

Contract Roll Weights Calculation During Roll Period	First Nearby Contract Expiration	Roll Contract Expiration
Day 1	(1-1/N)	1/N
Day 2	(1-2/N)	2/N
Day 3	(1-3/N)	3/N
Day N*	0	1

Cryptocurrency Futures Indices Contract Calendar. The following table identifies the contracts included in the indices.

Trading Facility	Commodity	Ticker ⁽¹⁾	Designated Contract Expirations at Month Begin											
			1	2	3	4	5	6	7	8	9	10	11	12
CME	Bitcoin	BTC	F	G	H	J	K	M	N	Q	U	V	X	Z
CME	Ether	HTE	F	G	H	J	K	M	N	Q	U	V	X	Z

(1) Tickers are Refinitiv RIC Codes.

For more information on Market Disruptions during the Roll Period, please refer to the Market Disruption Events and Holidays During Roll Period Section of the S&P DJI Commodities Policies & Practices Methodology.

Calculation of Excess Return Index

Each ER index calculates from the price change of the underlying futures contract. On any trading date, t , the level of each of the sub-indices is calculated as follows:

$$ERIndex_t = ERIndex_{t-1} * (1 + CDR_{t,t-1})$$

where:

$ERIndex_{t-1}$ = The Excess Return Index level on the preceding business day, defined as any date on which the index is calculated.

$CDR_{t,t-1}$ = The Contract Daily return, defined as:

$$CDR_{t,t-1} = \frac{DCRP_t}{DCRP_{t-1}} - 1$$

where:

$DCRP$ = The Daily Contract Reference Price of the futures contract.⁴

When the index rolls on multiple days, CDR calculates as:

$$CDR_{t,t-1} = \frac{DCRP_t}{DCRP_{t-1}} - 1$$

$$CDR_{t,t-1} = \frac{\sum w_{i,t-1} * DCRP_{i,t}}{\sum w_{i,t-1} * DCRP_{i,t-1}} - 1$$

where:

$DCRP_i$ = The Daily Contract Reference Price of the i^{th} futures contract

w_i = Weight of the i^{th} futures contract

Calculation of Total Return Index

Each TR index calculates as follows:

$$TRIndex_t = TRIndex_{t-1} * IndexTotalReturn_t$$

where:

$TRIndex_{t-1}$ = The Total Return Index level on the preceding business day.

Calculation of Index Total Return

For a funded investment, the total return between dates $t-1$ and t includes the risk-free return for the initial cash outlay is calculated as follows:

$$IndexTotalReturn_t = (1 + CDR_{t,t-1} + CashRate_t)$$

where the $CashRate_t$ can be TBR_t or FFR_t :

TBR_t = The daily-compounding Treasury Bill rate, as determined by the following formula:

$TBR_t =$

$$\left[\frac{1}{1 - \frac{91}{360} * TBAR_{t-1}} \right]^{\frac{Delta_t}{91}} - 1$$

where:

$Delta_t$ = The number of calendar days between the current and previous business days.

$TBAR_{t-1}$ = The most recent weekly high discount rate for 91-day U.S. Treasury bills, effective on the preceding business day.⁵

FFR_t = The simple Fed Funds rate, as determined by the following formula:

$$FFR_t = FedFunds_{t-1} * \frac{ACT(t,t-1)}{N} - 1$$

where:

$ACT(t, t-1)$ = The actual calendar days between day t (exclusive) and day $t-1$ (inclusive)

⁴ The official close, as designated by the relevant exchange, is used.

⁵ Generally, the rates are announced by the U.S. Treasury each Monday. On Mondays that are bank holidays, Friday's rates will apply. The day count convention used is ACT/360.

$N = 360$ (number of days in a year)

The table below lists the total return indices and corresponding cash rate.

Index	Cash Rate
S&P 500 Futures Total Return Index	TBR
S&P 500 Futures (Fed Funds) Total Return Index	FFR
S&P 500 Futures (3 Day Roll) Total Return Index	TBR
Dow Jones Industrial Average Futures Total Return Index	TBR
DJIA Futures Index (Fed Funds) (USD) TR	FFR
S&P U.S. Dollar Futures Total Return Index	TBR
S&P Japanese Yen Futures Total Return Index	TBR
S&P Australian Dollar Futures Total Return Index	TBR
S&P Euro Futures Total Return Index	TBR
S&P CME Bitcoin Futures Daily Roll Index (USD) TR	TBR
S&P CME Bitcoin Futures Index (USD) TR	TBR
S&P CME Ether Futures Index (USD) TR	TBR
S&P Cryptocurrency MegaCap CME Futures Index (USD) TR	TBR

Currency of Calculation and Additional Index Return Series

S&P 500 Futures KRW Hedged (Fed Funds) (3PM KST Rate) Index. The index calculates in Korean won, and hedges using the 3:00 PM Korean standard rate.

S&P 500 Futures (3 Day Roll) TWAP (3:20-3:30 PM) Index. The index calculates the S&P 500 Futures (3 Day Roll) Index Time-Weighted Average Prices (TWAP) snapped during a window of 3:20-3:30PM.

For more information on TWAP calculation, please refer to the Alternative Pricing section in S&P Dow Jones Indices' Index Mathematics Methodology.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to the following: currency, currency hedged, decrement, fair value, inverse, leveraged, and risk control versions. For a list of available indices, please refer to the [S&P DJI Methodology & Regulatory Status Database](#).

For information on the calculation of different types of indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

For the inputs necessary to calculate certain types of indices, including decrement, dynamic hedged, fair value, and risk control indices, please refer to the Parameters documents available at www.spglobal.com/spdji/.

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the indices. The Index Committee may revise index policy covering rules for including currencies, the timing of rebalancing or other matters. S&P Dow Jones Indices' considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

Index Policy

Announcements

Rebalancing announcements, if needed, are made two days prior to the rebalancing date.

For more information, please refer to the Announcements section of S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

Holiday Schedule

The indices are calculated daily, throughout the calendar year. The indices follow the NYSE holiday schedule.

A complete holiday schedule for the year is available at www.spglobal.com/spdji/.

For information on Calculations and Pricing Disruptions, Market Disruption Events and Holidays During Roll Period, Expert Judgment, Data Hierarchy, Unexpected Exchange Closures and Error Corrections, please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

Contact Information

For questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at www.spglobal.com/spdji/, major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

Tickers

The table below lists headline indices covered by this document. All versions of the below indices that may exist are also covered by this document. Please refer to the [S&P DJI Methodology & Regulatory Status Database](#) for a complete list of indices covered by this document.

Index	Bloomberg
S&P 500 Futures Excess Return Index	SPXFP
S&P 500 Futures Total Return Index	SPXFTR
S&P 500 Futures (Fed Funds) Index (USD) TR	SPXFFFUT
S&P 500 Futures Index (3-Day Roll) (USD) ER	SPXF3RE
S&P 500 Futures Index (3-Day Roll) (USD) TR	SPXF3RT
S&P 500 Futures (3-Day Roll) TWAP (3:20-3:30 PM) Index (USD) ER	SPXF3RWE
S&P 500 Futures (3-Day Roll) TWAP (3:20-3:30 PM) Index (USD) TR	SPXF3RWT
Dow Jones Industrial Average Futures Excess Return Index	DJIAFP
Dow Jones Industrial Average Futures Total Return Index	DJIAFTR
S&P U.S. Dollar Futures Excess Return Index	SPUSDP
S&P U.S. Dollar Futures Total Return Index	SPUSDTR
S&P Japanese Yen Futures Excess Return Index	SPJPYFP
S&P Japanese Yen Futures Total Return Index	SPJPYFTR
S&P Australian Dollar Futures Excess Return Index	SPAUDFP
S&P Australian Dollar Futures Total Return Index	SPAUDFTR
S&P Euro Futures Excess Return Index	SPEUFP
S&P Euro Futures Total Return Index	SPEUFTR
S&P 500 Futures KRW Hedged (Fed Funds) (3PM KST Rate) Index	SPXFFKHT
S&P CME Bitcoin Futures Daily Roll Index (USD)	SPBTFDU
S&P CME Bitcoin Futures Daily Roll Index (USD) ER	SPBTFDUE
S&P CME Bitcoin Futures Daily Roll Index (USD) TR	SPBTFDUT

Index Data

Daily index level data is available via subscription.

For product information, please contact S&P Dow Jones Indices, www.spglobal.com/spdji/en/contact-us.

Web site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spglobal.com/spdji/.

Appendix

Digital Assets Inherent Risks

PRICE VOLATILITY

Digital assets have historically experienced significant intraday and long-term price swings.

SPOT MARKETS

The spot markets through which cryptocurrencies trade are new and largely unregulated. Furthermore, many spot markets and over-the-counter market venues, do not provide the public with significant information regarding their ownership structure, management teams, corporate practices, or oversight of customer trading. As a result, the marketplace may lose confidence in, or may experience problems relating to, these venues. Spot markets may impose daily, weekly, monthly, or customer-specific transaction or withdrawal limits or suspend withdrawals entirely, rendering the exchange of bitcoin for fiat currency difficult or impossible. Participation in spot markets requires users to take on credit risk by transferring bitcoin from a personal account to a third party's account.

MARKET ADOPTION

It is possible that digital assets generally or any digital asset in particular will never be broadly adopted by either the retail or commercial marketplace, in which case, one or more digital assets may lose most, if not all, of its value.

GOVERNMENT REGULATION

The regulatory framework of digital assets remains unclear and application of existing regulations and/or future restrictions by international, federal, and state authorities may have a significant impact on the value of digital assets.

SECURITY

There have been significant incidents of digital asset theft and digital assets remain a potential target for hackers. Digital assets that are lost or stolen cannot be replaced, as transactions are irrevocable.

OTHER

Digital assets are susceptible to error and can be affected by forks, discontinuation, and/or suspension in trading.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates (“S&P DJI”) defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company’s public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific

data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

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