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Introduction

The Dow Jones Industrial Average™ is one of the best-known icons of American culture and among stock market observers around the world. The Dow® along with the Dow Jones Transportation Average™ and the Dow Jones Utility Average™ were the world's first market indicators. Each of these three indices represents a select group of prominent U.S. companies. Together, they make up the Dow Jones Composite Average™—a "blue-chip" microcosm of the U.S. stock market.

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 the Averages Committee so that the index continues to achieve its objective.

Index Family

The Dow Jones Averages Family consists of the following U.S. indices:

- Dow Jones Industrial Average™
- Dow Jones Industrial Average™ (Distributing Index)
- Dow Jones Transportation Average™
- Dow Jones Utility Average™
- Dow Jones Composite Average™
- Dow Jones Industrial Average™ dividend-focused indices
  - Dow Jones High Yield Select 10 Index
  - The Dow 10®
  - The Dow 5™
- Dow Jones Industrial Average™ currency hedged, leveraged, and inverse indices (for details of calculation of these indices, see Appendix)

The Global Dow™, The Asia Dow™ and The Europe Dow™ are also part of the Dow Jones Averages Family. However, as these three indices contain non-U.S. listed securities, please refer to their respective methodology document for further details regarding these indices.
Highlights

Dow Jones Industrial Average™. Introduced in May 1896, the index, also referred to as The Dow®, is a price-weighted measure of 30 U.S. blue-chip companies. The index covers all industries with the exception of transportation and utilities, which are covered by the Dow Jones Transportation Average™ and Dow Jones Utility Average™ respectively. While stock selection is not governed by quantitative rules, a stock typically is added to the index only if the company has an excellent reputation, demonstrates sustained growth and is of interest to a large number of investors. Maintaining adequate sector representation within the indices is also a consideration in the selection process.

Dow Jones Industrial Average™ (Distributing Index). Introduced in April 2012, the index is a version of the Dow Jones Industrial Average™ that is calculated according to a unique distributing methodology.

The distributing methodology couples the performance of a base equity index with a theoretical cash component that is designed to reflect the dividends paid by its constituents in a given six-month period. The index reflects distribution (i.e., a deduction) of the accumulated cash by resetting the theoretical cash component to zero on a semi-annual basis.

Dow Jones Transportation Average™. Considered the oldest U.S. stock index, The Dow Jones Transportation Average™ is the successor to the first U.S. stock index, which was assembled in 1884 by Charles Dow and comprised nine railroads and two non-rails.

In May 1896, the Dow Jones Industrial Average appeared. That same year, Mr. Dow published a list of twenty “active” stocks, eighteen of which were rails — the direct predecessor of the 20-stock transportation average. On October 26, 1896, the two non-rail stocks were replaced with two rail stocks and the Dow Jones Railroad Averages made its formal debut. The name of the index was changed to Transportation Average from Railroad Averages in 1970 to reflect the evolution of the transportation industry and the inclusion of non-rail transportation stocks in the index.

The Dow Jones Transportation Average™ is a 20-stock, price-weighted index that represents the stock performance of large, well-known U.S. companies within the transportation industry. While stock selection is not governed by quantitative rules, a stock typically is added to the index only if the company has an excellent reputation, demonstrates sustained growth and is of interest to a large number of investors.

Dow Jones Utility Average™. Introduced in January 1929, the index is a 15-stock, price-weighted index that represents the stock performance of large, well-known U.S. companies within the utilities industry.

While stock selection is not governed by quantitative rules, a stock typically is added to the index only if the company has an excellent reputation, demonstrates sustained growth and is of interest to a large number of investors.
**Dow Jones Composite Average™.** Introduced in January 1934, the index is a 65-stock, price-weighted index that includes all components of the Dow Jones Industrial Average™, Dow Jones Transportation Average™ and Dow Jones Utility Average™.

**Dow Jones High Yield Select 10 Index.** Introduced in August 2007, the index measures the top ten companies in the Dow Jones Industrial Average™ selected based on indicated annual dividend yield each December. It is equal-dollar-weighted based on component stock closing prices on the last trading session of the year.

**The Dow 10®.** Introduced in December 2001, the index measures the top ten companies in the Dow Jones Industrial Average™ selected based on indicated annual dividend yield each December. It is equal-dollar-weighted based on component stock closing prices on the last trading session of the year.

**The Dow 5™.** Introduced in December 2001, the index measures the five lowest-priced stocks in The Dow 10®, which in turn represents the 10 stocks in the Dow Jones Industrial Average™ with the highest indicated annual dividend yield, as of the end of December. It is equal-dollar-weighted based on component stock closing prices on the last trading session of the year.
Eligibility Criteria

Index Eligibility

The index universe for each index is described in the table below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Index Universe</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dow Jones Industrial Average™</td>
<td>The index universe consists of securities in the S&amp;P 500, excluding stocks classified under Global Industry Classification Standard (GICS) code 2030 (Transportation) and 55 (Utilities).</td>
</tr>
<tr>
<td>• Dow Jones Transportation Average™</td>
<td>The index universe consists of securities in the S&amp;P Total Market Index classified under GICS code 2030.</td>
</tr>
<tr>
<td>• Dow Jones Utility Average™</td>
<td>The index universe consists of securities in the S&amp;P Total Market Index classified under GICS code 55.</td>
</tr>
<tr>
<td>• Dow Jones Composite Average™</td>
<td>The index includes all constituents of the Dow Jones Industrial Average™, Dow Jones Transportation Average™ and Dow Jones Utility Average™.</td>
</tr>
<tr>
<td>• Dow Jones High Yield Select 10 Index</td>
<td></td>
</tr>
<tr>
<td>• The Dow 10®</td>
<td>All constituent stocks of the Dow Jones Industrial Average™ are eligible for the index.</td>
</tr>
<tr>
<td>• The Dow 5™</td>
<td></td>
</tr>
</tbody>
</table>

Constituent Selection

The constituent selection process is described in the table below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Constituent Selection Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dow Jones Industrial Average™</td>
<td>While stock selection is not governed by quantitative rules, a stock typically is added only if the company has an excellent reputation, demonstrates sustained growth and is of interest to a large number of investors. Maintaining adequate sector representation within the index is also a consideration in the selection process for the Dow Jones Industrial Average™. Companies should be incorporated and headquartered in the U.S. In addition, a plurality of revenues should be derived from the U.S.</td>
</tr>
</tbody>
</table>
Index | Constituent Selection Process
--- | ---
- Dow Jones Transportation Average™ | Companies should be incorporated and headquartered in the U.S. In addition, a plurality of revenues should be derived from the U.S. Companies should be classified in the transportation industry group under GICS.
- Dow Jones Utility Average™ | Companies should be incorporated and headquartered in the U.S. In addition, a plurality of revenues should be derived from the U.S. Companies should be classified in the utilities sector under GICS.
- Dow Jones Composite Average™ | The index includes all constituents of the Dow Jones Industrial Average™, Dow Jones Transportation Average™ and Dow Jones Utility Average™.
- Dow Jones High Yield Select 10 Index | Constituent selection is as follows:
- The Dow 10®
- The Dow 5™
1. Each December, the 30 stocks of the Dow Jones Industrial Average™ are ranked by dividend yield, based on indicated annual dividend, in descending order. Dividends are adjusted on a case-by-case basis for corporate actions such as mergers and acquisitions. No special dividends are included.
2. The top ten companies on the list are selected as the constituent stocks for the Dow Jones High Yield Select 10 Index and The Dow 10®.
3. The five lowest priced stocks in The Dow 10® become the constituent stocks of The Dow 5™.
4. The final list of constituents for the forthcoming year is announced three business days prior to the last trading session of December.
5. The new constituent list is effective at the opening of the first trading session of the new year.
Index Construction

Approaches

The table below describes each index’s construction approach.

<table>
<thead>
<tr>
<th>Index</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dow Jones Industrial Average™</td>
<td>The indices are price weighted.</td>
</tr>
<tr>
<td>• Dow Jones Transportation Average™</td>
<td>The index is a version of the Dow Jones Industrial Average™ that is calculated according to a unique distributing methodology.</td>
</tr>
<tr>
<td>• Dow Jones Utility Average™</td>
<td>The distributing methodology couples the performance of a base equity index with a theoretical cash component that is designed to reflect the dividends paid by its constituents in a given six-month period. The index reflects distribution (i.e., a deduction) of the accumulated cash by resetting the theoretical cash component to zero on a semi-annual basis.</td>
</tr>
<tr>
<td>• Dow Jones Composite Average™</td>
<td></td>
</tr>
<tr>
<td>• Dow Jones High Yield Select 10 Index</td>
<td>The index is equal-dollar-weighted based on constituent stock closing prices on the last trading session in December. The index is not reweighted due to price changes during the ensuing year.</td>
</tr>
<tr>
<td>• The Dow 10®</td>
<td></td>
</tr>
<tr>
<td>• The Dow 5™</td>
<td></td>
</tr>
</tbody>
</table>

Index Calculations

The indices are calculated by means of the divisor methodology used in all S&P Dow Jones Indices’ equity indices.

**Dow Jones Industrial Average™, Dow Jones Transportation Average™, Dow Jones Utility Average™, Dow Jones Composite Average™.** When each index was initially created, its values were calculated by simply adding up the constituent stock prices and dividing by the number of constituents. Today, the divisor is adjusted for composition changes, stock splits and other price adjustments (refer to corporate actions table).
**Dow Jones Industrial Average™ (Distributing Index).** The index is calculated daily in U.S. dollars and euros, according to the following formula:

Distributing Index Level = Base Index Level + Theoretical Cash Component

where:

Distributing Index Level = Level of the Dow Jones Industrial Average™ (Distributing Index)

Base Index Level = Level of the Dow Jones Industrial Average™ (price return, EUR and USD)

Theoretical Cash Component = The cumulative net cash dividend yielding Euro Overnight Index Average (EONIA) for the EUR version and Overnight USD London Interbank Offered Rate (LIBOR) for the USD version, divided by the divisor of the Dow Jones Industrial Average™

Interest is accrued on the cash component using EONIA (EUR version) and Overnight LIBOR (USD version).

The cash component resets to zero twice a year, at the market open on the last trading day of June and December. On those reset dates, the level of the Dow Jones Industrial Average™ (Distributing Index) equals the level of the base index.

**Dow Jones High Yield Select 10 Index, The Dow 10® and The Dow 5™.** For each index, the initial divisor is set to have a base index value.

The index value is simply the index market value divided by the index divisor:

\[
\text{Index Value} = \frac{\text{Index Market Value}}{\text{Divisor}}
\]  

(1)

For more information on the index calculation methodology, please refer to S&P Dow Jones Indices’ Index Mathematics Methodology.

In order to maintain index series continuity, it is also necessary to adjust the divisor at each rebalancing.

\[
(\text{Index Value}) \text{ before rebalancing} = (\text{Index Value}) \text{ after rebalancing}
\]  

(2)

Therefore,

\[
(\text{Divisor}) \text{ after rebalancing} = \frac{(\text{Index Market Value}) \text{ after rebalancing}}{(\text{Index Value}) \text{ before rebalancing}}
\]  

(3)
Index Maintenance

Rebalancing

Each index’s rebalancing process is described in the table below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Rebalancing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dow Jones Industrial Average™</td>
<td>Changes to the indices are made on an as-needed basis. There is no annual or semi-annual reconstitution. Rather, changes in response to corporate actions and market developments can be made at any time. Constituent changes are typically announced one to five days before they are scheduled to be implemented. Announcements are available to the public via our web site, <a href="http://www.spdji.com">www.spdji.com</a>, before or at the same time they are available to clients or the affected companies.</td>
</tr>
<tr>
<td>• Dow Jones Transportation Average™</td>
<td>The base index is reviewed on an as-needed basis. The cash component of the index resets to zero twice a year, on the last trading day of June and December.</td>
</tr>
<tr>
<td>• Dow Jones Utility Average™</td>
<td></td>
</tr>
<tr>
<td>• Dow Jones Composite Average™</td>
<td></td>
</tr>
<tr>
<td>• Dow Jones Industrial Average™ (Distributing Index)</td>
<td>The indices are rebalanced after the close of trading on the last business day in December. The new constituents are included in the indices at the opening of the first trading session of January.</td>
</tr>
<tr>
<td>• Dow Jones High Yield Select 10 Index</td>
<td></td>
</tr>
<tr>
<td>• The Dow 10®</td>
<td></td>
</tr>
<tr>
<td>• The Dow 5™</td>
<td></td>
</tr>
</tbody>
</table>

If a constituent stock is removed from the Dow Jones Industrial Average™ during the year, it will remain a constituent of index until the next annual rebalancing.

If a constituent company reduces or suspends its dividend, it will remain in the index until the next annual rebalancing.

If an index constituent is determined to be in extreme financial distress or is in bankruptcy proceedings, it may be removed to protect the integrity of the index.
### Index
- Dow Jones High Yield Select 10 Index
- The Dow 10®
- The Dow 5™

(cont’d)

### Rebalancing
- If any company in the index is involved in a spinoff, the price of the parent company will be adjusted to reflect the value of the spinoff after the close of trading on the day prior to the ex-date. The spinoff will not be included in the index. The value of the spinoff will be “reinvested” in the current constituent stocks based on their weights in the index as of the ex-date of the spinoff. This will result in divisor adjustments to the price and total-return indices.

- If any company in the index is acquired by another company by stock swap or a cash transaction, the acquired company will be removed from the index based on its closing price on its last trading day as a constituent of the Dow Jones Industrial Average™.
  - The non-constituent stock with the highest indicated annual dividend yield will be added to the Dow Jones High Yield Select 10 Index and The Dow 10® at a weight equaling the departing weight of the removed company.
  - The lowest price stock in the revised Dow 10® will be the replacement in The Dow 5™. It will be added at the departing weight of the removed company.

### Corporate Actions

Corporate actions (such as stock splits, stock dividends, spin-offs and rights offerings) are applied after the close of trading on the day prior to the ex-date. Share changes resulting from exchange offers are applied on the ex-date.

<table>
<thead>
<tr>
<th>Corporate Action</th>
<th>Adjustment Made to Index</th>
<th>Divisor Adjustment?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spin-off</td>
<td>The price of the parent company is adjusted according to the terms of the spin off. Any potential impacts on index constituents are evaluated by the Index Committee on a case by case basis.</td>
<td>Yes</td>
</tr>
<tr>
<td>Rights Offering</td>
<td>The price is adjusted according to the terms of the rights offering.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Corporate Action

<table>
<thead>
<tr>
<th>Corporate Action</th>
<th>Adjustment Made to Index</th>
<th>Divisor Adjustment?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock dividend, stock split, reverse stock split</td>
<td>The price is adjusted according to the terms of the stock split.</td>
<td>Yes</td>
</tr>
<tr>
<td>Share Issuance, Share Repurchase, Equity Offering or Warrant Conversion</td>
<td>Index does not use shares or IWF – no impact</td>
<td>No</td>
</tr>
<tr>
<td>Special Dividends</td>
<td>Price of the stock making the special dividend payment is reduced by the per share special dividend amount after the close of trading on the day before the dividend ex-date.</td>
<td>Yes</td>
</tr>
<tr>
<td>Constituent Change</td>
<td>Deletions due to delistings, acquisition or any other corporate event resulting in the deletion of the stock from the index will be replaced on the effective date of the drop.</td>
<td>Yes</td>
</tr>
</tbody>
</table>


### Currency of Calculation

The indices are calculated in U.S. dollars. The Dow Jones Industrial Average™ is also calculated in Japanese yen and the Dow Jones Industrial Average™ (Distributing Index) is also calculated in euros. In addition, the Dow Jones Industrial Average™ is available upon request in Canadian dollars and euros.

### Exchange Rate

WM/Reuters foreign exchange rates are taken daily at 4:00 PM London Time and used in the end-of-day calculation of the Dow Jones Industrial Average™ (Distributing Index). These mid-market fixings are calculated by The WM Company based on Reuters data and appear on Reuters pages WMRA.

The latest telegraphic transfer middle rate (TTM) as of 10:00 AM Japan Standard Time is used in the end-of-day calculation of the Dow Jones Industrial Average™ (JPY version).

### Other Adjustments

In cases where there is no achievable market price for a stock being deleted, it may be removed at a zero or minimal price at the Index Committee’s discretion, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.
## Base Dates and History Availability

Index history availability, base dates and base values are shown in the table below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Launch Date</th>
<th>First Value Date</th>
<th>Base Date</th>
<th>Base Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dow Jones Industrial Average™</td>
<td>05/26/1896</td>
<td>05/26/1896</td>
<td>05/26/1896</td>
<td>40.94</td>
</tr>
<tr>
<td>Dow Jones Industrial Average™ (Distributing Index)</td>
<td>04/26/2012</td>
<td>12/29/2000</td>
<td>12/29/2000</td>
<td>10,786.85 (USD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13,370.57 (EUR)</td>
</tr>
<tr>
<td>Dow Jones Transportation Average™</td>
<td>10/26/1896</td>
<td>10/26/1896</td>
<td>10/26/1896</td>
<td>51.72</td>
</tr>
<tr>
<td>Dow Jones Utility Average™</td>
<td>01/02/1929</td>
<td>01/02/1929</td>
<td>01/02/1929</td>
<td>85.64</td>
</tr>
<tr>
<td>Dow Jones Composite Average™</td>
<td>01/02/1934</td>
<td>01/02/1934</td>
<td>01/02/1934</td>
<td>39.57</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Dow 10®</td>
<td>12/17/2001</td>
<td>12/31/1986</td>
<td>12/31/1986</td>
<td>189.60</td>
</tr>
<tr>
<td>The Dow 5™</td>
<td>12/17/2001</td>
<td>12/31/1986</td>
<td>12/31/1986</td>
<td>189.60</td>
</tr>
<tr>
<td>Dow Jones Industrial Average™ Hedged JPY Leveraged 2X Index</td>
<td>09/27/2013</td>
<td>09/27/2013</td>
<td>12/31/2007</td>
<td>1000</td>
</tr>
<tr>
<td>Dow Jones Industrial Average™ Hedged JPY Inverse Index</td>
<td>09/27/2013</td>
<td>09/27/2013</td>
<td>12/31/2007</td>
<td>1000</td>
</tr>
<tr>
<td>Dow Jones Industrial Average™ JPY Hedged Index</td>
<td>09/27/2013</td>
<td>09/27/2013</td>
<td>12/31/2007</td>
<td>1000</td>
</tr>
</tbody>
</table>

* Price Return; + Total Return
Index Data

Total Return Indices

Total return index series are calculated for the indices as well as the price return series. Ordinary cash dividends are applied on the ex-date in calculating the total return series. “Special dividends” are those dividends that are outside of the normal payment pattern established historically by the issuing corporation. These may be described by the corporation as “special,” “extra,” “year-end,” or “return of capital.” Whether a dividend is funded from operating earnings or from other sources of cash does not affect the determination of whether it is ordinary or special. “Special dividends” are treated as corporate actions with offsetting price and divisor adjustments; the total return index series reflect both ordinary and special dividends.

With the exception of the Dow Jones Industrial Average™ (Distributing Index), total return indices reflect the return to an investor where gross dividends are reinvested.

Dow Jones Industrial Average™ (Distributing Index). The index is calculated according to a unique distributing methodology, using net cash dividends of the base index.

Please refer to the S&P Dow Jones Indices’ Index Mathematics Methodology for more detail on total and net return index calculations.

Index Governance

Index Committee

The indices are maintained by the Averages Committee. The Committee is composed of three representatives of S&P Dow Jones Indices and two representatives of The Wall Street Journal. The Committee meets at least semi-annually. At each meeting, the Committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the indices to the market, companies that are being considered as candidates for addition to an index, and any significant market events. In addition, the Committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts 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.

Index Policy

Announcements

All index constituents are evaluated daily for data needed to calculate index levels and returns. All events affecting the daily index calculation are typically announced 30 days in advance via the Index Corporate Events report (SDE), delivered daily via ftp to all clients. Any unusual treatment of a corporate action or short notice of an event may be communicated via email to clients.

Press releases are posted on our Web site, www.spdji.com, and are released to major news services.

Index methodology is constantly under review for best practices, and any changes are announced well ahead of time via the Web site and email to all clients.


Pro-forma Files

In addition to the corporate events file (.SDE), S&P Dow Jones Indices provides constituent proforma files each time the indices rebalance. The proforma file is typically provided daily five business days in advance of the rebalancing date and contains all constituents and their corresponding weights and index shares effective for the upcoming rebalancing. Since index shares are assigned based on prices one week prior to the rebalancing, the actual weight of each stock at the rebalancing differs from these weights due to market movements.

Please visit www.spdji.com for a complete schedule of rebalancing timelines and pro-forma delivery times.

Holiday Schedule

The indices are calculated when the U.S. equity markets are open.

A complete holiday schedule for the year is available at www.spdji.com.
**Unscheduled Market Closures**

In situations where an exchange is forced to close early due to unforeseen events, such as computer or electric power failures, weather conditions or other events, S&P Dow Jones Indices will calculate the closing price of the indices based on (1) the closing prices published by the exchange, or (2) if no closing price is available, the last regular trade reported for each security before the exchange closed. If an exchange fails to open due to unforeseen circumstances, S&P Dow Jones Indices treats this closure as a standard market holiday. The index will use the prior day’s closing prices and shifts any corporate actions to the following business day. If all exchanges fail to open or in other extreme circumstances, S&P Dow Jones Indices may determine not to publish the index for that day.


**Recalculation Policy**

S&P Dow Jones Indices reserves the right to recalculate an index under certain limited circumstances. S&P Dow Jones Indices may choose to recalculate and republish an index if it is found to be incorrect or inconsistent within two trading days of the publication of the index level in question for one of the following reasons:

1. Incorrect or revised closing price
2. Missed corporate event
3. Late announcement of a corporate event
4. Incorrect application of corporate action or index methodology

Any other restatement or recalculation of an index is only done under extraordinary circumstances to reduce or avoid possible market impact or disruption as solely determined by the Index Committee.


**Real-Time Calculation**

Real-time, intra-day, index calculations are executed during U.S. trading hours for certain indices as described below. Real-time indices are not restated.

<table>
<thead>
<tr>
<th>Index</th>
<th>Calculation Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dow Jones Industrial Average™ (USD version)</td>
<td>Every two seconds</td>
</tr>
<tr>
<td>Dow Jones Transportation Average™</td>
<td>Every two seconds</td>
</tr>
<tr>
<td>Dow Jones Utility Average™</td>
<td>Every two seconds</td>
</tr>
<tr>
<td>Dow Jones Composite Average™</td>
<td>Every five seconds</td>
</tr>
<tr>
<td>Dow Jones High Yield Select 10 Index</td>
<td>Every 15 seconds</td>
</tr>
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</table>

The Dow Jones Industrial Average™ (JPY version), the Dow Jones Industrial Average™ (Distributing Index), The Dow 10® and The Dow 5™ are calculated on an end-of-day basis.
Index Dissemination

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

Tickers

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<tr>
<th>Index (Currency)</th>
<th>Return Type</th>
<th>Bloomberg</th>
<th>Reuters</th>
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<tr>
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<td>Price Return</td>
<td>DJI</td>
<td>.DJJ</td>
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<td></td>
<td>Total Return</td>
<td>DJITR</td>
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FTP

Daily stock level and index data are available via FTP subscription.

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

For further information, please refer to S&P Dow Jones Indices’ Web site at wwwspdji.com.
Appendix – Calculations for Currency Hedged, Leveraged, and Inverse Indices

Currency Hedged Indices

The Dow Jones Industrial Average Hedged JPY Leveraged 2X Index and the Dow Jones Industrial Average Hedged JPY Inverse Index apply standard methods for hedging currency risk and creating inverse exposure to the Dow Jones Industrial Average™.

A currency-hedged index is designed to represent returns for those global index investment strategies that involve hedging currency risk¹, but not the underlying constituent risk.

Investors employing a currency-hedged strategy seek to eliminate the risk of currency fluctuations and are willing to sacrifice potential currency gains. By selling foreign exchange forward contracts, global investors are able to lock in current exchange forward rates and manage their currency risk. Profits (losses) from the forward contracts are offset by losses (profits) in the value of the currency, thereby negating exposure to the currency.

Return Definitions

S&P Dow Jones Indices’ standard currency hedged indices are calculated by hedging beginning-of-period balances using rolling one-month forward contracts. The amount hedged is adjusted on a monthly basis.

Returns are defined as follows:

\[
\text{Currency Return} = \left( \frac{\text{End Spot Rate}}{\text{Beginning Spot Rate}} \right) - 1
\]

\[
\text{Unhedged Return} = (1 + \text{Local Total Return}) \times (1 + \text{Currency Return}) - 1
\]

\[
\text{Currency Return on Unhedged Local Total Return} = (\text{Currency Return}) \times (1 + \text{Local Total Return})
\]

¹ By currency risk, we simply mean the risk attributable to the security trading in a currency different from the investor’s home currency. This definition does not incorporate risks that exchange rate changes can have on an underlying security’s price performance.
Forward Return = 
\[
\left( \frac{\text{Beginning one-month Forward Rate}}{\text{Beginning Spot Rate}} \right) - 1
\]

\(Hedge\ Return = HedgeRatio \times (Forward\ Return - Currency\ Return)\)

\(Hedged\ Index\ Return = \)
\[
\text{Local Total Return} + \text{Currency Return on Unhedged Local Total Return} + \text{Hedge Return}
\]

\(Hedged\ Index\ Level = \)
\[
\text{Beginning Hedged Index Level} \times (1 + Hedged\ Index\ Return)
\]

S&P Dow Jones Indices also offers daily currency hedged indices for clients who require benchmarks with more frequent currency hedging. The daily currency hedged indices differ from the standard currency hedged indices by adjusting the amount of the forward contracts, that mature at the end of month, on a daily basis according to the performance of the underlying index. This further reduces the currency risk from under-hedging or over-hedging resulting from index movement between two monthly rolling periods.

Details of the formulae used in computing S&P Dow Jones Indices’ currency-hedged indices are below.

**The Hedge Ratio**

The hedge ratio is simply the proportion of the portfolio’s currency exposure that is hedged.

- **Standard Currency-Hedged Index.** In a standard currency-hedged index, we simply wish to eliminate the currency risk of the portfolio. Therefore, the hedge ratio used is 100%.

- **No Hedging.** An investor who expects upside potential for the local currency of the index portfolio versus the home currency, or does not wish to eliminate the currency risk of the portfolio, will use an unhedged index. In this case, the hedge ratio is 0, and the index simply becomes the standard index calculated in the investor’s home currency. Such indices are available in major currencies as standard indices for many of S&P Dow Jones’ indices.

In contrast to a 100% currency-hedged standard index, which seeks to eliminate currency risk and has passive equity exposure, over- or under-hedged portfolios seek to take active currency risks to varying degrees based on the portfolio manager’s view of future currency movements.

- **Over Hedging.** An investor who expects significant upside potential for the home currency versus the local currency of the index portfolio might choose to double the currency exposure. In this case, the hedge ratio will be 200%.

- **Under Hedging.** An investor who expects some upside potential for the local currency of the index portfolio versus the home currency, but wishes to eliminate
some of the currency risk, might choose to have half the currency exposure hedged using a 50% hedge ratio.

- **Optimal Hedging.** In order to minimize variability and, therefore, risk in the value of the currency-hedged portfolio, standard variance minimization suggests the following hedge ratio:

  \[
  \text{Hedge Ratio} = \frac{\text{COV(Portfolio Return to Forward Return)}}{\text{VAR(Forward Return)}}
  \]

  S&P Dow Jones Indices calculates indices with hedge ratio different from 100% as custom indices.

**Calculating a Currency-Hedged Index**

Using the returns definitions on prior pages, the Hedged Index Return can be expressed as:

\[
\begin{align*}
\text{Hedged Index Return} & = \text{Local Total Return} + \text{Currency Return} \cdot (1 + \text{Local Total Return}) + \\
& \phantom{=} \text{Hedge Return}
\end{align*}
\]

Rearranging yields:

\[
\begin{align*}
\text{Hedged Index Return} & = (1 + \text{Local Return}) \cdot (1 + \text{Currency Return}) - 1 + \text{Hedge Return}
\end{align*}
\]

Again, using the returns definitions on prior pages with a hedge ratio of 1 (100%), the expression yields:

\[
\begin{align*}
\text{Hedged Index Return} & = \text{Unhedged Index Return} + \text{Hedge Return}
\end{align*}
\]

\[
\begin{align*}
\text{Hedged Index Return} & = \text{Unhedged Index Return} + \text{Forward Return} - \text{Currency Return}
\end{align*}
\]

This equation is more intuitive since when you do a 100% currency hedge of a portfolio, the investor sacrifices the gains (or losses) on currency in return for gains (or losses) in a forward contract.

From the equation above, we can see that the volatility of the hedged index is a function of the volatility of the unhedged index return, the forward return, and the currency return, and their pair-wise correlations. These variables will determine whether the hedged index return series’ volatility is greater than, equal to, or less than the volatility of the unhedged index return series.
Currency Hedging Outcomes

The results of a currency-hedged index strategy versus that of an unhedged strategy vary depending upon the movement of the exchange rate between the local currency and home currency of the investor.

S&P Dow Jones Indices’ standard currency hedging process involves eliminating currency exposure using a hedge ratio of 1 (100%).

1. The currency-hedged index does not necessarily give a return exactly equal to the return of the index available to local market investor. This is because there are two additional returns–currency return on the local total return and hedge return. These two variables usually add to a non-zero value because the monthly rolling of forward contracts does not result in a perfect hedge. Further, the local total return between two readjustment periods remains unhedged. However, hedging does ensure that these two returns remain fairly close.

2. The results of a currency-hedged index strategy versus that of an unhedged strategy varies depending upon the movement of the exchange rate between the local currency and home currency of the investor. For example, a depreciating euro in 1999 resulted in an unhedged S&P 500 return of 40.0% for European investors, while those European investors who hedged their USD exposure experienced a return of 17.3%. Conversely, in 2003 an appreciating euro in 2003 resulted in an unhedged S&P 500 return of 5.1% for European investors, while those European investors who hedged their USD exposure experienced a return of 27.3%.

Index Computation

Monthly Return Series (For Monthly Currency Hedged Indices)

\[ m = \text{the month in the calculation, represented as 0, 1, 2, etc.} \]

\[ SPI_{EHm} = \text{the S&P Dow Jones Indices’ Currency-Hedged Index level at the end of month } m \]

\[ SPI_{EHm-1} = \text{the S&P Dow Jones Indices’ Currency-Hedged Index level at the end of the prior month} \]

\[ SPI_{Em} = \text{the S&P Dow Jones Indices’ Index level, in foreign currency, at the end of month } m \]

\[ SPI_{Em-1} = \text{the S&P Dow Jones Indices’ Index level, in foreign currency, at the end of the prior month} \]

\[ SPI_{ELm-1} = \text{the S&P Dow Jones Indices’ Index level, in local currency, at the end of the prior month, } m-1 \]

\[ HR_m = \text{the hedge return (\%) over month } m \]
\( S_m = \) the spot rate in foreign currency per local currency (FC/LC), at the end of month \( m \)

\( F_m = \) the forward rate in foreign currency per local currency (FC/LC), at the end of month \( m \)

For the end of month \( m = 1 \),

\[
SPI_{EH_1} = SPI_{EH_0} \times \left( \frac{SPI - E_1}{SPI - E_0} + HR_1 \right)
\]

For the end of month \( m \),

\[
SPI_{EH_m} = SPI_{EH_{m-1}} \times \left( \frac{SPI - E_m}{SPI - E_{m-1}} + HR_m \right)
\]

The hedge return for monthly currency hedged indices is:

\[
HR_m = \frac{S_{m-1}}{F_{m-1}} - \frac{S_{m-1}}{S_m}
\]

**Daily Return Series (For Monthly Currency Hedged Indices and Daily Currency Hedged Indices)**

The daily return series are computed by interpolating between the spot price and the forward price.

For each month \( m \), there are \( d = 1, 2, 3 \ldots D \) calendar days.

\( md \) is day \( d \) for month \( m \) and \( m0 \) is the last day of the month \( m-1 \).

\( F_{I_{md}} = \) the interpolated forward rate as of day \( d \) of month \( m \)

\( AF_{md} = \) the adjustment factor for daily hedged indices as of day \( d \) of month \( m \)

\[
F_{I_{md}} = S_{md} + \left( \frac{D - d}{D} \right) \times (F_{md} - S_{md})
\]

\[
AF_{md} = \frac{SPI - EL_{md-1}}{SPI - EL_{m0}}
\]

For the day \( d \) of month \( m \),

\[
SPI_{EH_{md}} = SPI_{EH_{m0}} \times \left( \frac{SPI - E_{md}}{SPI - E_{m0}} + HR_{md} \right)
\]
The hedge return for monthly currency hedged indices is:

\[ HR_{md} = \frac{S_{m0}}{F_{n0}} - \frac{S_{m0}}{F - I_{md}} \]

The hedge return for daily currency hedged indices is calculated as follows:

when day \( d \) is not the last business day of month \( m \),

\[ HR_{md} = \sum_{i=1}^{d} AF_{mi} \left( \frac{S_{m0}}{F - I_{mi-1}} - \frac{S_{m0}}{F - I_{mi}} \right) \]

when day \( d \) is the last business day of month \( m \),

\[ HR_{md} = \sum_{i=1}^{d-1} AF_{mi} \left( \frac{S_{m0}}{F - I_{mi-1}} - \frac{S_{m0}}{F - I_{mi}} \right) + AF_{md} \left( \frac{S_{n0}}{F - I_{md-1}} - \frac{S_{m0}}{S_{md}} \right) \]

**Leveraged Indices**

S&P Dow Jones Indices' leveraged indices are designed to generate a multiple of the return of the underlying index in situations where the investor borrows funds to generate index exposure beyond his/her cash position. The approach is to first calculate the underlying index, then calculate the daily returns for the leveraged index and, finally, to calculate the current value of the leveraged index by incrementing the previous value by the daily return. There is no change to the calculation of the underlying index.

The daily return for the leveraged index consists of two components: (1) the return on the total position in the underlying index less (2) the borrowing costs for the leverage.

The formula for calculating the Leveraged Index is as follows:

\[ LeveragedIndexReturn = K \left( \frac{UnderlyingIndex_{t}}{UnderlyingIndex_{t-1}} - 1 \right) - (K - 1) \left( \frac{BorrowingRate}{360} \right) \times D_{t,t-1} \]

In the equation above, the borrowing rate is applied to the leveraged index value because this represents the funds being borrowed. Given this, the Leveraged Index Value at time \( t \) can be calculated as:

\[ LeveragedIndexValue_{t} = (LeveragedIndexValue_{t-1}) \times (1 + LeveragedIndexReturn) \]

Substituting the Index Return equation into the Index Value equation and expanding the right hand side of the Index Value equation yields:
\[
\text{Leveraged Index Value}_t = \\
\text{Leveraged Index Value}_{t-1} \times \left[ 1 + \left( K \times \left( \frac{\text{Underlying Index}_t}{\text{Underlying Index}_{t-1}} - 1 \right) - (K - 1) \times \left( \frac{\text{Borrowing Rate}}{360} \right) \right) \times D_{t,t-1} \right]
\]

where:

- \( K (K \geq 1) = \) Leverage Ratio
  - \( K = 1, \) no leverage
  - \( K = 2, \) Exposure = 200%
  - \( K = 3, \) Exposure = 300%

\( \text{Borrowing Rate} = \) Overnight LIBOR in the U.S. or EONIA in Europe

\( D_{t,t-1} = \) the number of calendar days between date \( t \) and \( t-1 \)

In the absence of leverage (\( K = 1 \)),

\[
\text{Leveraged Index Value}_t = \text{Leveraged Index Value}_{t-1} \left[ \frac{\text{Underlying Index}_t}{\text{Underlying Index}_{t-1}} - 1 \right]
\]

The leverage position is rebalanced daily. This is consistent with the payoff from futures based replication.

The Dow Jones Industrial Average™ Hedged JPY Leverage 2X Index Total Return (DJIA2LJT) represents a two-time leveraged version of the Dow Jones Industrial Average™ JPY Hedged Index Total Return (DJIHJT). It uses 3-month JPY LIBOR (JY0003M) for the borrowing rate.

Thus, the formula for calculating DJIA2LJT is as follows:

\[
\text{DJIA2LJT}_t = \\
\text{DJIA2LJT}_{t-1} \times \left[ 1 + \left[ 2 \times \left( \frac{\text{DJIHJT}_t}{\text{DJIHJT}_{t-1}} - 1 \right) - (2 - 1) \times \left( \frac{\text{JY0003M}}{360} \right) \right] \times D_{t,t-1} \right]
\]

**Inverse Indices**

S&P Dow Jones Indices’ Inverse indices are designed to provide the inverse performance of the underlying index; this represents a short position in the underlying index. When an investor holds a short position he/she must pay dividends and interest for the borrowed stock. The calculation follows the same general approach as the leveraged index with certain adjustments: First, the return on the underlying index is reversed and is based on the total return of the underlying index so that dividends and price movements are included. Second, while the costs of borrowing the securities are not included, there is an adjustment to reflect the interest earned on both the initial investment and the proceeds from selling short the securities in the underlying index. These assumptions reflect
normal industry practice. (Straightforward adjustments can be made to either to include the costs of borrowing securities or to exclude the interest earned on the shorting proceeds and the initial investment.)

The general formula for the return to the inverse index is:

\[
Inverse Index Return = -K \left( \frac{Underlying Index Total Return_t}{Underlying Index Total Return_{t-1}} - 1 \right) + (K + 1) \left( \frac{Lending Rate}{360} \right) D_{t,t-1}
\]

Where the first right hand side term represents the total return on the underlying index and the second right hand side term represents the interest earned on the initial investment and the shorting proceeds.

Expanding this as done above for the leveraged index yields:

\[
InverseIndexValue_t = InverseIndexValue_{t-1} \left[ 1 - K \left( \frac{UnderlyingIndexTR_t}{UnderlyingIndexTR_{t-1}} - 1 \right) - (K + 1) \left( \frac{LendingRate}{360} \right) D_{t,t-1} \right]
\]

The Dow Jones Industrial Average™ Hedged JPY Inverse Index Total Return (DJIAIJT) represents a one-time inverse version of the Dow Jones Industrial Average™ JPY Hedged Index Total Return (DJIHJT). It uses 3-month JPY LIBOR (JY0003M) for the lending rate.

Thus, the formula for calculating DJIAIJT is as follows:

\[
DJIAIJT_t = DJIAIJT_{t-1} \left[ 1 - \left( \frac{DJIHJT_t}{DJIHJT_{t-1}} - 1 \right) - (1 + 1) \left( \frac{JY0003M}{360} \right) D_{t,t-1} \right]
\]
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