CRSP® MARKET INDEXES

METHODOLOGY GUIDE

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CHAPTER 1: ABOUT CRSP

Since its launch in 1960, the Center for Research in Security Prices (CRSP) has continued to fill an important niche within the financial industry by providing research-quality data. From the introduction of its initial historical research indexes in 1966 to present day, CRSP's dedicated team has continued to develop innovative products that provide a strong foundation for economic forecasting, stock market research, and financial analysis. CRSP's data is used by a variety of entities across the globe including academic institutions, government policy makers, investment managers, banks, brokerage firms, and corporations.

Initially, CRSP was one of twelve research centers that played an integral role in advancing the reputation of the University of Chicago for being one of the leading academic research institutions in the world. Chicago Booth, in particular, is renowned for conducting impactful financial and economic research, and for producing ideas and leaders that have shaped the world of business. Today, CRSP is a non-profit LLC wholly-owned by the University of Chicago and affiliated with the Booth School of Business.

CRSP's experience with historical indexes and its commitment to excellence in the development and maintenance of the most complete, accurate, and easy-to-use securities data inspired an extension of its core products at CRSP's 50th anniversary. In 2010, CRSP introduced the first product in its series of investable US equity market indexes. CRSP Market Indexes (CRSPMI) are relevant to investment practitioners, other financial market participants, and academics. The indexes are used to manage funds, develop investment and trading strategies, benchmark investment performance, and conduct research. As of January 2024, assets under management over $2 trillion were linked to CRSP Market Indexes.

CHAPTER 2: CRSP US TOTAL MARKET INDEX

CRSP Market Indexes strive to blend advancements in academic research with current commercial practice in a fundamentally sound manner under the premise that an index should reflect the way that money managers actually invest. To achieve that goal, CRSP offers market capitalization-based, style (value and growth), sector, and ESG indexes that utilize leading-edge methodology.

CRSP Market Indexes feature the following characteristics, which place an emphasis on minimizing unnecessary turnover while maintaining style purity:

- Objective and transparent rules-based methodology
- Float-adjusted market capitalization weighting
- Investability screens
- Quarterly reconstitution schedule
- Capitalization segment breakpoints based on cumulative market capitalization
- Packeting approach to migration across market capitalization and style segments
- Quarterly index changes utilize a 5-day transition window

INDEX CONSTRUCTION PROCESS

The CRSP US Total Market Index begins with the determination of the eligible and investable universe. The index eligibility and investability screening process includes the application of listing exchange requirements, domicile determination (generally, incorporation and headquarter location), organization, share types, and the application of various investability screens. Total shares outstanding (TSO) and float shares outstanding (FSO) are determined, total company market capitalizations are calculated, and capitalization-based breakpoints are determined to create market cap segment indexes (Mega, Mid, Small, Micro Cap, and various combinations using contiguous segments). Each of these capitalization-based indexes (with the exception of those incorporating Micro Cap) is then further broken down into value and growth classifications to produce the corresponding set of CRSP Value and Growth Indexes. Additionally, the constituents of the CRSP US Total Market Index are subdivided by the industry classification of each member's core business to produce the CRSP Sector Indexes, and the constituents of the CRSP US Large Cap Index are subdivided into the CRSP ISS ESG (and complementary Remainder) indexes.

CREATING THE US EQUITY MARKET UNIVERSE

The CRSP US Total Market Index is designed to represent the entire market of investable US equity securities. It encompasses equity securities including common stocks and real estate investment trusts (REITs) of US companies that are listed on a CRSP exchange of interest — NYSE, NYSE American, NYSE ARCA, NASDAQ, and Cboe BZX. The same eligibility rules apply to all subcomponent (market cap, style, sector, and ESG) indexes.

The following table specifies which exchanges, and organization and share types are eligible/ineligible for inclusion in the CRSP US Market Indexes.

Universe Category	CRSP Market Index Eligible	Eligible for Market Capitalization Assignment
Primary Exchange Listing		
NYSE, NYSE American, NYSE ARCA, NASDAQ, Cboe BZX	Y	Y
OTCBB, Pink Sheets, Unlisted, Other Consolidated US, International	N	Y*
Organization Types		
Corporation, Real Estate Investment Trust (REIT), Berkshire Hathaway A & B	Y	Y
Business Development Company (BDC), Closed-End Investment Company, Exchange Traded Fund (ETF) / Exchange Traded Note (ETN), Limited Liability Company (LLC), Limited Partnership (LP), Royalty Trust, Special Purpose Acquisition Company (SPAC or Blank Check Company), Special Purpose Vehicle (SPV)	N	N
Share Types		
Common Shares	Y	Y
American Depository Receipt (ADR), Preferred and Convertible Preferred Stock, Rights, Warrants, Participating Preferred Stock, Redeemable Shares, Trust Receipts	N	N
Convertible Class B Common Stock	N	Y*
Shares of Beneficial Interest (SBI)	Y (unless a fund)	Y (unless a fund)
Units	N (even if the only trading form of an otherwise eligible share type)	N (even if the only trading form of an otherwise eligible share type)
Non-Restricted Fully Convertible/Exchangeable LLC Partnership Units/Interests	N	Y*

* Only if representing additional common equity of a company already represented as an index-eligible security.

Note: The indexes may temporarily include placeholder securities that represent capitalization received in a corporate action where the holder has right to the payout security but cannot sell it. These cases are described in Chapter 8: Index Maintenance.

VOTING RIGHTS

CRSP will consider for index inclusion companies that IPO with capital structures that include share classes (common stock) with dissimilar voting rights assuming that public disclosures are available related to the company's eligibility and investability. The presence of multiple share classes with skewed voting rights is not currently used to restrict CRSP's eligible and investable universe.

IDENTIFYING US COMPANIES

To determine whether a company is considered a US company, and therefore eligible for indexes, securities are screened based upon the following criteria:

1. **Incorporation and HQ Test: Company headquarters and incorporation are in the United States**

   Companies both incorporated in and with headquarters in the United States are generally eligible, and move on to criteria 3. Companies who have one but not both move on to criteria 2 for consideration. However, special cases may be forwarded for committee review in criteria 5.

2. **HQ Test: Company is headquartered, but not necessarily incorporated, in the U.S., a U.S. Territory (UST), Domicile of Convenience (DOC), or Tax Haven (TH)**

   Companies headquartered in the U.S., a U.S. Territory, Domicile of Convenience or Tax Haven, even if not incorporated in the US, move on to Criteria 3. Others that are a) not headquartered in the U.S., UST, TH or DOC, even if b) incorporated in the US, are generally considered as foreign and are not eligible. However, special cases may be forwarded for committee review in criteria 5.

3. **HQ and EIN Test: Company with an HQ in the U.S., a U.S. Territory (UST), Domicile of Convenience (DOC), or Tax Haven (TH) also has an Employer Identification Number**

   Companies headquartered in the US, UST, DOC or TH, even if not incorporated in the US, that also have an Employer Identification Number (EIN) move on to criteria 4. Companies that do not have an EIN and thus do not withhold taxes on US wages or file US tax returns are generally considered as foreign and are not eligible. However, special cases may be forwarded for committee review in criteria 5.

4. **Holdings by US Public Equity Funds Test: Companies with HQ and EIN in the US, UST, DOC or TH, and also have substantial portion of US funds holding their securities**

   Companies with both an a) EIN and b) an HQ in the US, UST, DOC or TH, are reviewed to determine if more than 5 percent of US Public Equity Funds own a security, as determined by CRSP Survivor-Bias-Free Us Mutual Funds holdings data, the security will be viewed as having strong US manager sentiment and be given an inclusion bias. All securities from criteria 4 are appraised by CRSP's Index Eligibility Committee in criteria 5.

5. **Index Eligibility Committee (IEC) Review:**

   The above rules were developed to identify essentially all issuers of listed US equity securities. In addition, the IEC may also collect any information deemed necessary, which may include information on asset/operation location, tax/regulatory jurisdiction, history, revenue origin, corporate structure/ownership, primary exchange, US assets, revenue, employment, makeup of company executive officers and directors, whether a company has obtained an EIN only for nominal visibility purposes, and any other relevant specifics. The IEC will make the final determination of whether or not a security is included in the CRSP Market Indexes, and will also review securities that experience a fundamental change in their characteristics following initial consideration.

   As one of the many aspects, the IEC considers the accounting rules used by companies as part of its evaluation process and is more likely to consider a company that follows a US GAAP standard for financial reporting to be a US domestic company. If a company does not follow US GAAP but reports in USD there must be a GAAP and currency reconcilement filed as a part of its reports to the SEC to be evaluated by the IEC. The IEC also analyzes company's filing status with SEC, and the company under evaluation issuing the security must satisfy the U.S. Securities Exchange Act's periodic reporting obligations by filing certain forms required for domestic issuers, such as but not limited to: Form 10-K annual reports, Form 10-Q quarterly reports, and Form 8-K current reports on an ongoing basis. IEC is highly unlikely to conclude that a company that files as a Foreign Private Issuer to be a US domestic company.

   Under certain circumstances, the IEC will not automatically exclude companies incorporated in countries such as UK and Canada. If a company's location is unclear after a corporate event, the IEC may elect to give higher weight to continuing its status and reviewing again at the next ranking. In practice, the IEC may also approve some additional jurisdictions deemed valid for business purposes for a particular company.

These criteria will be reapplied prior to each quarterly ranking. Any issuer that has been included in or removed from the CRSP US Total Market Index based on the IEC's determination will retain that status for one year, unless there is a fundamental change in the security's situation. After one year, the security's eligibility status will be reevaluated by the IEC.

PASSIVE FOREIGN INVESTMENT COMPANIES

Passive Foreign Investment Companies (PFICs), as defined by the IRS, are not eligible for inclusion in CRSP US Market Indexes even if they otherwise pass the above rules as a US company.

A company's PFIC designation is determined based on credible independent third-party data sources. If a credible third-party data source is not available, the Index Eligibility Committee will make the final determination.

PFICs excluded from CRSP US Market Indexes are not eligible for inclusion for at least eight rankings after their initial exclusion. To be considered for re-inclusion, a company must have two consecutive annual 10-K filings in which it is not designated as a PFIC.

INVESTABILITY SCREENS

At ranking, once the index-eligible universe is defined and capitalization-based breakpoints are determined, investability screens are applied to create the pro forma indexes, which reflect the anticipated post-reconstitution index constituents. The CRSP Investability Screen Summary table on the next page summarizes these screens and provides threshold criteria that each security must meet.

The investability screens are:

- **Market Capitalization:** The total company market capitalization must be at least $15 million to be added to an index at ranking. If, at ranking, the total company market capitalization for a security in the index has fallen below $10 million, the security will be removed from the index.
- **Float Shares:** A security's FSO, or those shares readily available for trading, must be at least 12.5 percent of the TSO in order for it to be added to an index at ranking. If the FSO of a security in the index falls below 10 percent of TSO at ranking, the security will be removed from the index. For securities qualifying as a fast-track initial public offering (IPO) the minimum float requirement is 10 percent.
- **Trading Volume:** CRSP determines a sparse trading score for each security by calculating the average daily split-adjusted composite/consolidated trading volume over the last 125 trading days divided by the FSO as of the end-of-day five trading days before the ranking day. Trading data used for calculating the average for each security is collected no earlier than its first day of regular way trading on a CRSP exchange of interest. In order for a security to be considered for index inclusion at ranking, this ratio must be at least 0.001. If the ratio of a security that is currently a member of the CRSP Market Indexes falls below 0.0008 for two consecutive rankings, it is removed from the index. For the small number of organizations with multiple share classes, CRSP may consider the trading volume for all the securities that are represented in the company's total market capitalization.
- **Trading Gaps:** To be considered for index inclusion at ranking, a security must not have a sequence of 10 or more consecutive non-trading (zero volume) days since the last ranking. If an index constituent fails the 10-day rule the security will be removed from the index at ranking. Days that a security is suspended by the exchange do not count toward this requirement.
- **Suspended Securities:** If a security has been suspended by its listing exchange for at least 40 days on the ranking day, it will be removed. If a security is suspended from trading on the ranking day, it will not be added to the CRSP Market Indexes. See Chapter 8: Index Maintenance - Managing Untradeable Securities During Transition for more information.
- **Seasoning of New Securities:** New securities are eligible for index inclusion if they fulfill at least one of the two following conditions:
  - The first day of regular way trading on a CRSP exchange of interest was at least 20 trading days before the ranking day.
  - The first day of regular way trading on a CRSP exchange of interest was at least 5 trading days before the ranking day and the company's capitalization is greater than or equal to the lower breakpoint of the CRSP US Small Cap Index.

  Securities created by a corporate action payout are not subject to the seasoning rules. Companies that are identified as "readmitted" to an exchange of interest (e.g. transfers from OTC after previously delisting from NYSE) use the original first day of regular way trading before delisting for purposes of this check. Companies that were not previously tracked (e.g. transfers from OTC with no previous exchange of interest history) use the first day of trading after listing on an exchange of interest.

  In terms of seasoning, if a company changes from an ineligible to an eligible organization type only as an internal reorganization (e.g. a conversion from an LLC or LP into a C-Corp) CRSP will consider the company's entire primary exchange trading history including the trading days before the organization type change.

If a company changes from an ineligible to an eligible organization type as a part of a conversion involving another entity, such as a de-SPAC transaction, then the resulting entity will be treated as a new company. The conversion/merger date will be the first trade date of the new entity for seasoning purposes. In these cases, the first day of trading of the new company must be twenty days before the ranking regardless of the size of the new entity.

CRSP INVESTABILITY SCREEN SUMMARY

Investability Screen	Add	Drop
Market Capitalization	$15 million or greater	Less than $10 million
Float Shares	12.5% or more of shares outstanding, 10% or more for a fast-track IPO	Less than 10% of shares outstanding
Trading Volume	0.001 or greater sparse trading score	Less than a 0.0008 sparse trading score for two consecutive rankings
Trading Gaps (sequence of 10 or more days with zero volume)	None since the last ranking	At least one since the last ranking
Suspended Securities	Not currently suspended	Suspended at least 40 days
Seasoning of New Securities	20 days trading or greater, or 5 days or greater if satisfying the fast-track IPO rules	n/a

DROP THRESHOLDS

If a security is removed from the CRSP Market Indexes for failing one of the investability screens (deemed uninvestable) it must pass the below "drop" thresholds for four consecutive rankings before it is considered for reinclusion. Once a security has passed the drop threshold requirements for four consecutive rankings (it does not need to be the last four rankings) it must also pass the "add" thresholds described below.

- Market capitalization ≥ $10 million
- Float ≥ 10 percent
- Sparse trading score ≥ .0008
- Consecutive days of zero volume < 10
- Suspended for < 40 trading days

ADD THRESHOLDS

An uninvestable security that has subsequently passed all of the investability drop screens for four consecutive rankings (now considered for reinclusion) must also pass the more restrictive add thresholds before it can be readmitted (added back) to the CRSP Market Indexes.

- Market capitalization ≥ $15 million
- Float ≥ 12.5 percent
- Sparse trading score ≥ .001
- Consecutive days of zero volume < 10
- Not currently suspended

For example:

1. Security A is removed at the December 2020 rebalance for having a float percentage of less than 10 percent (FSO/TSO < 10 percent).
2. Security A passes all drop thresholds for four consecutive rankings.
3. At the December 2021 rebalance the security may be readmitted to the CRSP Market Indexes if, in addition to passing the drop thresholds for four consecutive rankings, it passes all of the more restrictive add thresholds.

If a security is removed from an index due to delisting from a CRSP exchange of interest and it is later readmitted to that or another exchange of interest, the security cannot be added back to an index earlier than the fourth ranking after it was removed, unless the entity is reconstituted or restructured and treated as an IPO or some form of merger before reentry.

The Market Capitalization and FSO requirement investability screens are also applied between rankings when adding or reevaluating securities after certain corporate actions such as spin-offs or mergers.

UNIVERSE SHARES AND INDEX HOLDINGS

TOTAL AND FLOAT SHARES OUTSTANDING

The CRSP Market Indexes are free float adjusted capitalization-based indexes. FSO represents the TSO less any restricted shares, which are defined as those held by insiders or stagnant shareholders – including, but not limited to: board members, directors and executives; government holdings, employee share plans, and corporations not actively managing money. CRSP defines a security's float factor as the ratio of FSO to TSO, expressed as a percentage. While float-adjusted market capitalization is used to determine a security's weight within an index, the TSO is used to rank companies by size at ranking.

The shares figures used at ranking are the last known values as of the close five trading days prior to ranking, unless shares are impacted by a corporate action during this five-day period. Holdings are not updated between rankings unless a company undergoes a corporate action. If a non-neutral corporate action occurs, the holdings are calculated using the post-corporate action TSO and float factor. If a neutral corporate action that affects shares occurs, then holdings are adjusted by applying the rate indicated in the corporate action.

If shares or float do not clearly fit the stated rules above, due to limitations of reporting or unusual company situations, the Index Operating Committee will make the final decision regarding the shares data used for the ranking or after a corporate event. If there is insufficient data to substantiate a change from the originally known data, then the committee may choose to use share numbers that reduce the anticipated index turnover. Any shares data reviewed by the committee may be reviewed again before the next ranking.

FLOAT SHARES DETERMINATION AFTER EVENTS

If a block of shares issued in an event is owned by a class of investors that originated outside of CRSPs previously tracked companies, CRSP will seek to confirm the ownership status of these shareholders before adding their holdings to FSO.

- After an IPO, or other event with a defined lockup period, holdings designated as "locked" are not added to FSO until at least the end of the lockup period. In general, share estimates will be made using the registration statement at the time of the event. These share numbers will be used for 180 calendar days unless there is a non-cap-neutral corporate event where the holders' free float status is known.
- If a company was brought to market via a Direct Listing and the lockup period has expired, unclassified shareholders are considered non-float through the next ranking unless there is direct evidence that those shares were sold to non-stagnant shareholders.
- As it relates to de-SPAC transactions, only the float shares held by the former blank check company's shareholders will be classified as FSO in the new corporation. In general, share estimates will be made using the maximum redemption scenario known at the time of the merger. These share numbers will be used for 180 calendar days after the conversion unless there is a non-cap-neutral corporate event where the holders' free float status is known.
- If shares are issued in a corporate action, and the float shares of the acquired company is known, then the new shares issued to the target company's shareholders will retain the float share characteristics known on the day before the effective day of the event. Shares may not be updated until the first filing regarding ownership or TSO after the lockup period expires.
- CRSP does not typically include the exercise of the greenshoe (over-allotment) option in its initial calculation of float shares.

EFFECTIVE FLOAT FACTOR

At ranking, CRSP generates an effective float factor (EFF) for all index constituents, defined as a security's float factor rounded to the nearest 5 percent. An EFF will remain in place from the first transition day until the following ranking unless the security is affected by a non-neutral corporate action between rankings, such as a merger, spin-off, or secondary offering. CRSP calculates an EFF when applying non-neutral corporate events between rankings and when new adding securities to indexes as a result of the fast-track IPO process.

INDEX HOLDINGS

Once EFFs are calculated for all securities, index holdings are calculated by multiplying the security's TSO by its EFF as well as index-specific multipliers. These multipliers exist to indicate shared allocation within size and style index families, and limits used to satisfy the US Internal Revenue Service's concentration constraints. Size index family construction is described in Chapter 3: CRSP US Market Cap Indexes. Style index family construction is described in Chapter 4: CRSP US Value and Growth Indexes. Concentration limits are described in Chapter 9: IRS RIC 25/50 Concentration Rules.

Like the EFF, index holdings are calculated on the ranking day and remain in place until the following ranking, unless affected by a corporate action between rankings. From index holdings, a security's weight in an index is calculated as (security's index holdings * security's price)/total index market capitalization. While a security's EFF and index holdings will not change on a daily basis, its weight within an index will be affected by fluctuations in its price and fluctuations in the capitalization of the other securities in the index.

CHAPTER 3: CRSP US MARKET CAP INDEXES

ASSIGNING COMPANIES TO CAPITALIZATION-BASED INDEXES

CRSP assigns companies eligible for the US Total Market Index to size-specific capitalization-based indexes using the company's total market capitalization calculated using TSO. Unlike count-based indexes, the CRSP Market Indexes do not have a limit on the number of index constituents. This feature allows the CRSP Market Indexes to better reflect the market's evolution, as the number of listed companies and market concentration levels can change substantially over time.

At ranking, companies are sorted from largest to smallest based on each company's total market capitalization. Market capitalization is determined by summing all classes of a company's cap-eligible equity using each security's TSO multiplied by its respective price on a random price day (see Chapter 8: Index Maintenance - Quarterly Maintenance section for more details on the Ranking and Reconstitution process). The market capitalizations of all index-eligible securities of a given company are then summed together to determine the company's total market capitalization. Once all index-eligible companies are sorted, each company is then assigned a cumulative market capitalization score, which is equal to the cumulative capitalization of all higher capitalization companies plus half of the capitalization of the company that is being ranked, expressed as a percentage of the market capitalization of all eligible companies. In other words, the score is based on the midpoint of a company's market capitalization in order to ensure it is assigned to the index in which the majority of its market capitalization lies.

Breakpoint targets are then set at 70 percent, 85 percent, and 98 percent of the cumulative market cap of the index-eligible universe. See Capitalization-Based Indexes, Breakpoints and Bands for more information.

At each ranking, the market capitalization of the largest company and the smallest company in each capitalization-based index is noted. These sizes determine the ranges for assignment of new additions or of securities impacted by corporate actions. A company is considered valid for an index if its capitalization is less than or equal to that of the largest company in the index and greater than that of the largest company in the adjacent lower capitalization index.

Companies lying at or near the boundary of market capitalization breakpoints are viewed as being in a transitional area between adjacent capitalization indexes. In order to prevent the premature movement of these "borderline" companies to a new index, CRSP establishes different percentage "bands'' around each breakpoint. Movement of companies in or near these bands is restricted and can result in securities being partially held in adjacent indexes. This approach balances the desire to maximize style purity while minimizing index turnover.

CRSP base-level size indexes are Mega, Mid, Small, and Micro. All companies in the Total Market Index will be allocated fully within these four indexes. In addition, CRSP maintains five composite indexes that combine base level indexes:

Composite Index	Underlying Base Index			
Large	Mega	Mid		
Core	Mega	Mid	Small	
Total Market Ex-Mega		Mid	Small	Micro
Small/Mid		Mid	Small	
Small/Micro			Small	Micro

BANDING AND MIGRATION WITH PACKETING

In order to prevent the premature movement of companies located near the established breakpoints, CRSP considers different percentage "bands" around each breakpoint. Band percentages can be seen in the Capitalization-Based Indexes, Breakpoints and Band Diagram. Movement between indexes is cushioned by introducing the concept of "packeting." CRSP defines a packet as 50 percent of the index's total holdings of a company. Movement occurs when a company passes completely through to the other side of a shared band between indexes into the core of the adjacent index.

The packeting level for each security in an index constituent list is maintained as a Size Multiplier. This multiplier shows the allocation of this security within this Market Cap index, or an index derived from this Market Cap Index, relative to its allocation in the Total Market Index. It is set to 1 if fully allocated.

Once a company crosses the threshold into the adjacent core, one packet (50 percent) is moved. If a company remains in the adjacent core at the next ranking, then the second packet (remaining 50 percent) is moved into the adjacent index.

At ranking, if a company with a 100 percent allocation in an index moves beyond the core of the adjacent index, then the company is moved entirely to the new capitalization-based index. Similarly, if a company with a 50 percent allocation in an index moves beyond the core of the adjacent index, then that allocation is moved entirely (100 percent) to the new capitalization-based index.

If the company moves back into the shared band then no further packets are moved (the holdings are kept in the same proportion). No movement is exercised if the company ranks within the band. In other words, a security may remain in a transitional band area indefinitely.

New index constituents (e.g. an IPO), are added fully to the appropriate capitalization-based index based strictly on the breakpoints determined at the most recent quarterly ranking (bands are ignored).

Migration rules related to packeted constituents (e.g. 50% Small/50% Mid), are applied to each packet individually, and then combined. See Capitalization-Based Migration Examples for more information.

CAPITALIZATION-BASED INDEXES, BREAKPOINTS AND BANDS

CRSP defines the following capitalization-based indexes and their associated bands, which are shown as a chart on the next page:

CRSP US Core Cap Index:

- Index range: 0% < $X_{i,t}$ ≤ 98%
- Band range: 96% < $X_{i,t}$ ≤ 99.5%; breakpoint: $X_{i,t}$ = 98%
- Adjacent core: 99.5% < $X_{i,t}$ ≤ 100% (micro core)
- Always fully allocated: 0% < $X_{i,t}$ ≤ 89%

CRSP US Mega Cap Index:

- Index range: 0% < $X_{i,t}$ ≤ 70%
- Band range: 64% < $X_{i,t}$ ≤ 76%; breakpoint : $X_{i,t}$ = 70%
- Mega Only: 0% < $X_{i,t}$ ≤ 50%;
- Adjacent core: 76% < $X_{i,t}$ ≤ 81% (mid core)

CRSP US Large Cap Index:

- Index range: 0% < $X_{i,t}$ ≤ 85%
- Band range: 81% < $X_{i,t}$ ≤ 89%; breakpoint: $X_{i,t}$ = 85%
- Adjacent core: 89% < $X_{i,t}$ ≤ 96% (small core)
- Always fully allocated: 0% < $X_{i,t}$ ≤ 76%

CRSP US Mid Cap Index:

- Index range: 70% < $X_{i,t}$ ≤ 85%
- Band ranges:
  - 64% < $X_{i,t}$ ≤ 76%; breakpoint: $X_{i,t}$ = 70%
  - 81% < $X_{i,t}$ ≤ 89%; breakpoint: $X_{i,t}$ = 85%
- Adjacent cores:
  - 50% < $X_{i,t}$ ≤ 64% and (mega core)
  - 89% < $X_{i,t}$ ≤ 96% (small core)

CRSP US Small/Mid Cap Index:

- Index range: 70% < $X_{i,t}$ ≤ 98%
- Band ranges:
  - 64% < $X_{i,t}$ ≤ 76%; breakpoint: $X_{i,t}$ = 70%
  - 96% < $X_{i,t}$ ≤ 99.5%; breakpoint: $X_{i,t}$ = 98%
- Adjacent cores:
  - 50% < $X_{i,t}$ ≤ 64% and (mega core)
  - 99.5% < $X_{i,t}$ ≤ 100.0% (micro core)

CRSP US Total Market ex-Mega Cap Index:

- Index range: 70% < $X_{i,t}$ ≤ 100%
- Band range: 64% < $X_{i,t}$ ≤ 76%; breakpoint: Xi,t = 70%
- Adjacent core: 50% < $X_{i,t}$ ≤ 64% (mega core)
- Always fully allocated: 81% < $X_{i,t}$ ≤ 100%

CRSP US Small Cap Index:

- Index range: 85% < $X_{i,t}$ ≤ 98%
- Band ranges:
  - 81% < $X_{i,t}$ ≤ 89%; breakpoint: $X_{i,t}$ = 85%
  - 96% < $X_{i,t}$ ≤ 99.5%; breakpoint: $X_{i,t}$ = 98%
- Adjacent cores:
  - 76% < $X_{i,t}$ ≤ 81% and (mid core)
  - 99.5% < $X_{i,t}$ ≤ 100.0% (micro core)

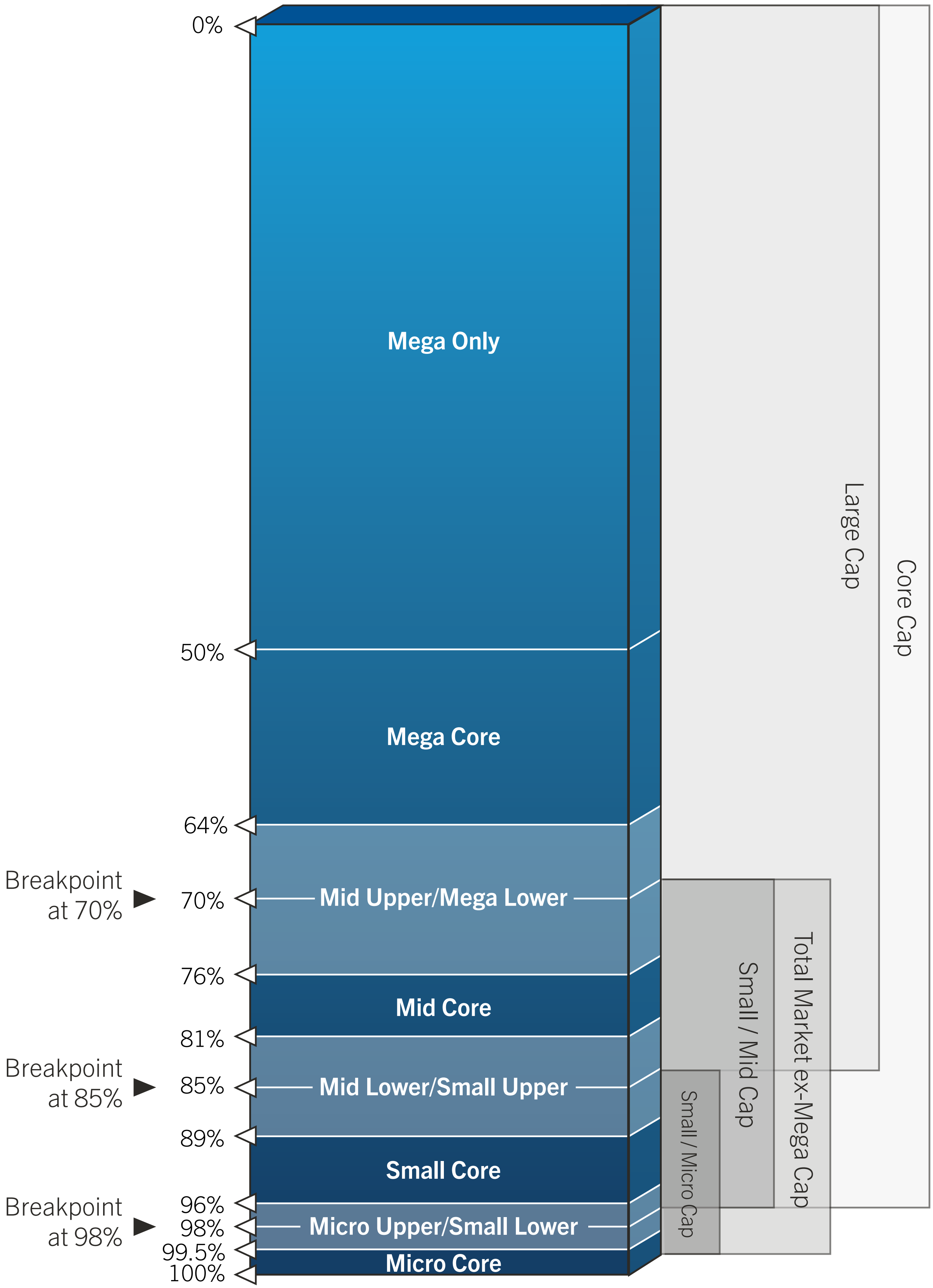
CRSP US Small/Micro Cap Index:

- Index range: 85% < $X_{i,t}$ ≤ 100%
- Band range: 81% < $X_{i,t}$ ≤ 89%; breakpoint: $X_{i,t}$ = 85%
- Adjacent core: 76% < $X_{i,t}$ ≤ 81% (mid core)

CRSP US Micro Cap Index:

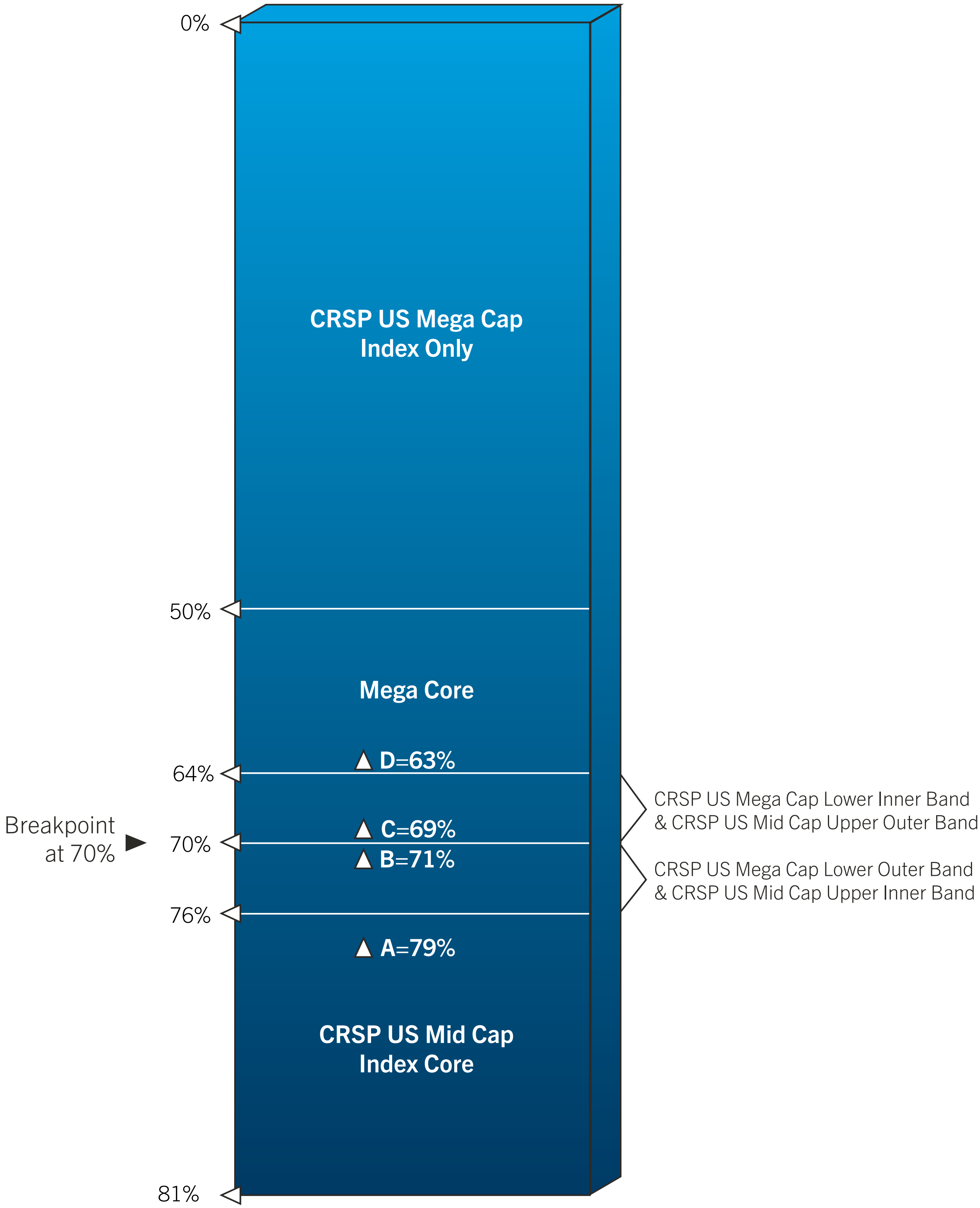
- Index range: 98%< $X_{i,t}$ ≤ 100%
- Band range: 96%< $X_{i,t}$ ≤ 99.5%; breakpoint: X = 98%
- Adjacent core 89%< $X_{i,t}$ ≤ 96% (small core)

CAPITALIZATION-BASED BREAKPOINTS AND BANDS DIAGRAM



CAPITALIZATION-BASED MIGRATION EXAMPLES

In the interest of making the CRSP cap-based methodology clear, examples are provided that refer to the diagram below. The diagram makes use of two adjacent indexes: Mega Cap and Mid Cap. The breakpoint is set at 70 percent of cumulative market cap and the band range is from 64 percent to 76 percent. Examples assume a quarterly ranking/reconstitution. In this example, the CRSP US Large Cap Index is ignored for simplicity.



EXAMPLE 1: COMPANY MOVES FROM B IN Q1 TO C IN Q2, TO D IN Q3, AND STAYS AT D IN Q4.

Q1 State: Company is ranked at 71 percent (point B)

It is on the CRSP US Mid Cap Index side of the breakpoint and was not previously in the adjacent CRSP US Mega Cap Index. Therefore, the company is allocated 100 percent to the US Mid Cap Index.

Q2 State: Company is ranked at 69 percent (point C)

Since the company remains in the band, no movement occurs. Therefore, it is still allocated 100 percent to the US Mid Cap Index.

Q3 State: Company is ranked at 63 percent (point D)

The company has crossed the 64 percent threshold into the US Mega Cap Index core. Therefore, one 50 percent packet is moved from US Mid Cap to US Mega Cap. Therefore it is now allocated 50 percent to US Mid Cap and 50 percent to US Mega Cap.

Q4 State: Company is still ranked at 63 percent (point D)

Since the company has remained in the US Mega Cap core for two consecutive quarters, its second 50 percent packet is moved from US Mid Cap to US Mega Cap, resulting in a new 100 percent allocation to the US Mega Cap Index.

EXAMPLE 2: COMPANY MOVES FROM D IN Q1 TO A IN Q2, STAYS AT A IN Q3, THEN MOVES TO B IN Q4, TO D IN Q5, AND TO A IN Q6.

Q1 State: Company is ranked at 63 percent (point D)

The company originally starts in the US Mega Cap core and is allocated 100 percent to the US Mega Cap Index.

Q2 State: Company is ranked at 79 percent (point A)

The company crosses the breakpoint and is now located beyond the band adjacent to the US Mid Cap core. Therefore, one 50 percent packet is moved. As a result, 50 percent of the company is allocated to the US Mega Cap Index and 50 percent is allocated to the US Mid Cap Index.

Q3 State: Company remains at 79 percent (point A)

Since the company remains in the US Mid Cap core, its second 50 percent packet is moved, resulting in a new 100 percent allocation to the US Mid Cap Index.

Q4 State: Company is ranked at 71 percent (point B)

Because the company's score is still in the band adjacent to the US Mid Cap core, it maintains its 100 percent allocation in the US Mid Cap Index.

Q5 State: Company is ranked at 63 percent (point D)

The company crosses beyond the breakpoint and 64 percent threshold of the adjacent band into the US Mega Cap core. Consequently, one 50 percent packet is moved and allocated to the US Mega Cap Index; the other 50 percent packet remains allocated to the US Mid Cap Index.

Q6 State: Company is ranked at 79 percent (point A)

At 79 percent, the company has moved back across the threshold of US Mid Cap core. It did not remain in the US Mega Cap core for two consecutive quarters; therefore, the 50 percent packet that was moved to the US Mega Cap Index during the previous quarter is reallocated to US Mid Cap resulting in a 100 percent allocation to the US Mid Cap Index.

EXAMPLE 3: COMPANY MOVES FROM D IN Q1 TO C IN Q2, TO A IN Q3, TO B IN Q4 AND TO C IN Q5.

Q1 State: Company is ranked at 63 percent (point D)

Since the company is located in the US Mega Cap core, it has a 100 percent allocation to that index.

Q2 State: Company is ranked at 69 percent (point C)

The company moves into the band adjacent to the US Mega Cap core but, since it is has not crossed the threshold to the adjacent index core, no movement occurs and the company maintains its 100 percent allocation to US Mega Cap Index.

Q3 State: Company is ranked at 79 percent (point A)

The company has crossed the breakpoint and has moved beyond the band into the core of the US Mid Cap Index. Therefore, one 50 percent packet is moved out of US Mega Cap and into US Mid Cap. As a result, 50 percent of the company is allocated to US Mega Cap and 50 percent is allocated to US Mid Cap.

Q4 State: Company is ranked at 71 percent (point B)

Because the company remains within the band, no movement occurs and the company's allocation remains split (50/50) between the US Mid and US Mega Cap indexes.

Q5 State: Company is ranked at 69 percent (point C)

Though the company is now located on the US Mega Cap side of the band, since it has not moved beyond the band threshold, it will maintain the allocation from the previous quarter.

EXAMPLE 4: MOVEMENT OF A COMPANY ALREADY ALLOCATED IN MULTIPLE INDEXES

A company currently allocated 50% Mid Cap and 50% Small Cap is reevaluated and is placed on the Mega Cap side of the Mid/Mega band.

The 50% Mid Cap does not move because it is in the band.

The 50% Small Cap allocation cannot remain in Small Cap because the movement past the adjacent core (the other side of Mid Core), so that allocation is assigned to its new location, which is Mega Cap.

Combining the new components results in 50% Mega Cap and 50% Mid Cap.

SECTOR RESTRICTED MARKET CAP INDEXES

Indexes may be created that originate from a Market Cap index that either include or exclude companies assigned to one or more of the sectors defined in the ICE Entity Sector benchmark. For example, the CRSP US Small Cap ex-Real Estate Index encompasses all securities present in the CRSP US Small Cap Index, except those belonging to the Real Estate and REIT sectors. See Chapter 5: CRSP US Sector Indexes for additional information related to the ICE Entity Sector benchmark.

CHAPTER 4: CRSP US VALUE AND GROWTH INDEXES

CRSP offers 12 Value and Growth Indexes across the market capitalization spectrum. Every company in a capitalization-based Index will be fully allocated to a CRSP US Style Index of that size. Micro Cap companies are not eligible for inclusion in the CRSP US Value and Growth Indexes.

CONSTRUCTING THE CRSP US VALUE AND GROWTH INDEXES

The construction of the CRSP Value and Growth Indexes is tied to the construction of the market capitalization-based indexes. Value and growth style determination involves completing the following three additional steps for each market-cap segment at each quarterly ranking:

1. Calculate the value and growth style factors for each company within a market-cap segment.
2. Combine multiple style factors into a single composite factor (the score that is used to place the company), separately for value and growth. This will be the score used to assign a security to either a value or a growth index.
3. Rank scores and assign companies to their appropriate value and growth indexes.

DEFINING VALUE AND GROWTH INDEXES

When classifying companies to their appropriate value or growth indexes, CRSP employs a multi-factor model that uses five value and six growth factors. CRSP is the first index provider to use the Current Investment-to-Assets Ratio (INV) and the Return on Assets Ratio (ROA) as style model inputs/factors.

VALUE FACTORS USED IN THE MULTI-FACTOR MODEL

1. Book-to-Price Ratio (BP)
2. Future Earnings-to-Price Ratio (FEP)
3. Historical Earnings-to-Price Ratio (HEP)
4. Dividend-to-Price Ratio (DP)
5. Sales-to-Price Ratio (SP)

GROWTH FACTORS USED IN THE MULTI-FACTOR MODEL

1. Future Long-term Growth in Earnings Per Share (FLGE)
2. Future Short-term Growth in Earnings Per Share (FSGE)
3. Three-year Historical Growth in Earnings Per Share (HGE)
4. Three-year Historical Growth in Sales Per Share (HGS)
5. Current Investment-to-Assets Ratio (INV)
6. Return on Assets (ROA)

For detailed definitions and formulas of each factor, see Value and Growth Factor Definitions and Formulas.

CALCULATING COMPOSITE VALUE AND GROWTH SCORES

1. For each company, determine values for the various style factors.
2. Winsorize the data for each style factor at the 5th and 95th percentiles.
3. Calculate each style factor's cross-sectional mean and cross-sectional standard deviation.
4. Scale each style factor for each company by finding the factor's z-score using the following formula:

$$\text{z score} = \frac{\text{company factor - cross sectional mean for factor}}{\text{cross sectional standard deviation for the factor}}$$

The z-score factors are denoted by the presence of a "z" before the factor acronym (e.g. zBP).

5. Compute the single Composite Style Score (CSS) for each company by weighting the z-scores of the underlying factors according to the following methods:

   Calculating Value Composite Style Score:
   When determining the value CSS, CRSP's model first combines the future and historical earnings-to-price ratios (FEP and HEP) into a single earnings-to-price factor (EP), which is then combined with the book-to-price ratio (BP) to create a primary value super factor (V1). The sales-to-price ratio (SP) and dividend-to-price ratio (DP) are then combined to create a secondary value super factor (V2). Merging the two value super factors together creates a single composite value score (V), as defined below:

$$V = (2/3 \times V1) + (1/3 \times V2), \text{ where:}$$

$$V1 = (2/3 \times zEP) + (1/3 \times zBP), \text{ where } zEP = (2/3 \times zFEP) + (1/3 \times zHEP)$$

$$V2 = (2/3 \times zSP) + (1/3 \times zDP)$$

   Calculating Growth Composite Style Score:
   When determining the growth CSS, CRSP calculates a future growth super-factor (FG) based on analysts' estimates of future long-term growth in earnings (FLGE) and future short-term growth in earnings (FSGE), as well as INV and ROA. Additionally, a historical growth super-factor (HG) is calculated based upon three-year historical growth in earnings (HGE) and three-year historical growth in sales (HGS).

   Once determined, these two growth super-factors are combined to create a single composite growth score (G) as defined below:

$$G = (2/3 \times FG) + (1/3 \times HG), \text{ where:}$$

$$FG = (1/3 \times zFLGE) + (1/3 \times zFSGE) + (1/6 \times zINV) + (1/6 \times zROA)$$

$$HG = (2/3 \times zHGS) + (1/3 \times zHGE)$$

CREATING STYLE-BASED INDEXES USING THE RANK APPROACH

CRSP assigns each composite score a rank value (RV for value and RG for growth) that represents a certain percentage of the cumulative market cap with lower scores. The RG value is inverted and the scores are averaged with the RV value to arrive at an Average Rank (AR) score for each company. A company with a high AR, or mean score above 0.5, is categorized as value, while a company with a low AR, or mean score below 0.5, is categorized as growth.

There is little agreement on the exact definitions of value and growth or when exactly companies migrate between value and growth, therefore CRSP applies its rules for packeting and migration to its Value and Growth Indexes as well. As with the market capitalization-based indexes, band thresholds are set to reduce the migration of securities with marginal ranking scores.

DERIVATION OF THE AVERAGE RANK (AR) SCORE:

1. Rank companies separately by both their value composite style scores (CSS = V) and growth composite style scores (CSS = G).
2. Assign a rank composite style score (RCSS) to each company, calculated as follows:

   In general, RCSS = M1/M2, where:

   - For value (CSS = V), M1 is the total market capitalization of all companies that are constituents of a specific capitalization-based index with a CSS lower than the particular company's CSS, plus half of its own market cap (RCSS = RV).
   - For growth (CSS = G), M1 is the total market capitalization of all companies with a CSS higher than the particular

company's CSS, plus half of its own market cap (RCSS = RG).

- M2 is the total market capitalization of all companies within the companies' cap-based universe.

Thus, each company's RCSS corresponds to the market-cap adjusted percentile of its CSS within its cap-based universe. This value falls between 0 and 1. Therefore, for rank value (RV), the security with the highest value will have a score equal to 1 while the security with the lowest value will have a score equal to 0. The reverse is true for rank growth (RG) – the security with the highest growth will have a score equal to 0 and the security with the lowest growth will have a score equal to 1.

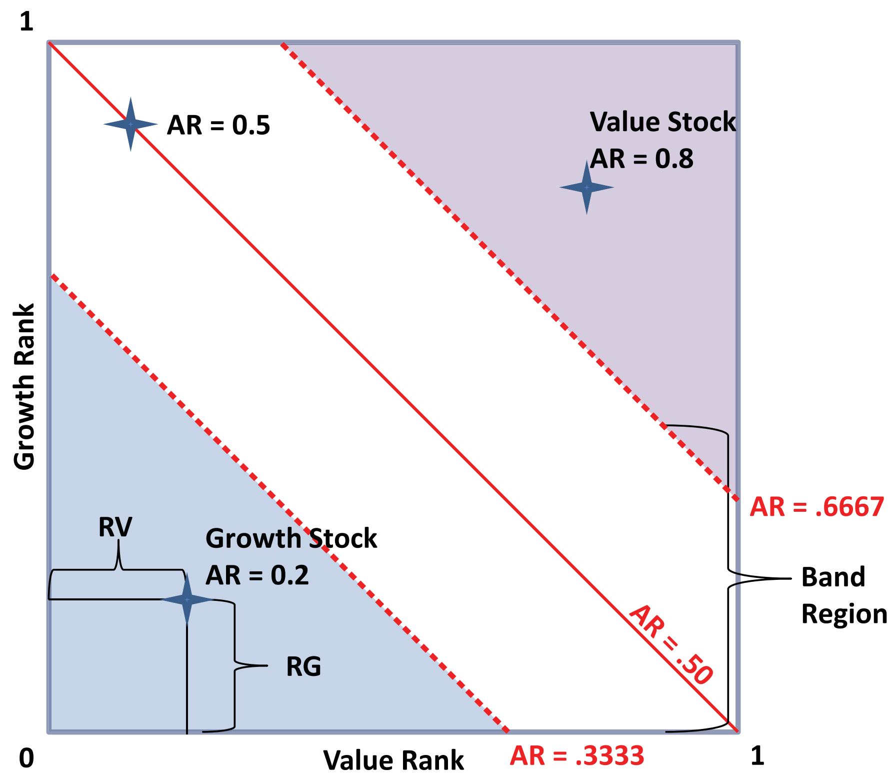
3. Compute AR for each company according to the formula below. Average rank scores range from 0 to 1 with higher numbers indicating higher "value" attributes and lower numbers indicating higher "growth" attributes.

$$AR = \frac{RV + RG}{2}$$

4. Assign newly added companies to value or growth categories according to their AR scores:
   - Companies with an AR > 0.5 are classified as 100 percent value
   - Companies with an AR ≤ 0.5 are classified as 100 percent growth

Note that complementary Value and Growth Indexes are not designed to represent 50% (each) of the parent market cap parent index at time of reconstitution.

To visualize this procedure, the following figure plots RV and RG scores for a hypothetical company. Average rank scores greater than 0.5 represent points above the main diagonal while AR scores less than 0.5 represent points below the main diagonal. For an overview of the entire scoring process, see the Value and Growth Factors Diagram.



INSUFFICIENT STYLE INPUT DATA

If a composite factor is generated with an underlying factor missing, the weight for the missing data point is distributed proportionally across the remaining factors. A minimum number of non-missing input factors are needed before the composite factor itself is considered missing. There must be at least two value and two growth factors available to generate a style AR score.

All companies present in a size index must be fully represented in style indexes corresponding to that size. For example, if a company is packeted at 50 percent in the CRSP US Small Cap Index, then the 50 percent in the CRSP US Small Cap Index must be allocated between the CRSP US Small Cap Value Index and the CRSP US Small Cap Growth Index. If no AR score is available, then an additional step is applied to fulfill this rule.

STYLE ASSIGNMENT WHEN NO SCORE IS AVAILABLE

If a company is currently assigned to style indexes and a new AR score is unavailable, then its style is carried forward using the following rules:

1. If the company remains in the same size index, then the allocation between value and growth within that market-cap segment does not change. For example, if before a ranking, a company is allocated fully to Mid Value, and the ranking keeps the company in the Mid Cap index but there is no new AR score available, then the company remains fully in Mid Value.
2. If the company is entering a new size index, then the style allocation can be carried forward from the style assignment in other size indexes. Generally, only non-composite capitalization indexes Small, Mid, and Mega are used for this purpose. If only one style is found, then that style is used. If both Value and Growth assignments are found, then the company is assigned half its available holdings in each style. For example, if before a ranking, a company is in Mega Cap Value and Mid Cap Growth and it moves to Small Cap with no new AR score available, it is assigned half to Small Cap Value and half to Small Cap Growth.

If a company is not currently assigned to a style index and a new AR score is unavailable, then the company is assigned half to Value and half to Growth. If this is done the company assignment is noted as set by default. The next time this company is evaluated and an AR score is available, the packeting rules will disregard the 50 percent assignment as an initial state and treat the company as if it were new.

VALUE AND GROWTH QUARTERLY MAINTENANCE

The CRSP US Value and Growth Indexes are fully reviewed on a quarterly basis, following the same schedule and process as all CRSP Market Indexes. For the ranking schedule, see Chapter 8: Index Maintenance - Quarterly Maintenance and Chapter 2: CRSP US Total Market Index for more information on the reviews and process undertaken at each ranking.

MIGRATION WITH PACKETING

As with the capitalization-based indexes, CRSP applies its packeting and migration procedures to the CRSP Value and Growth Indexes. CRSP centers the style band around an AR score of 0.5 and sets the threshold bandwidth at an AR of .3333. This means that companies with an AR between .3333 and .6667 are considered to be inside of the band. Once a company crosses through the band between its current style and the adjacent style core, 50 percent of its holdings are moved. If the company stays beyond the threshold in the following ranking period, the remaining 50 percent will be moved. Therefore, a company may be partially held in both a value and a growth index. It is also possible for the same company to be classified differently in different market capitalization—based indexes depending on the characteristics it displays in each segment. In other words, a company may be classified as value in one capitalization-based index and as growth in another capitalization-based index, depending on its AR score within each market capitalization segment.

The packeting level for each security in a Value or Growth index constituent list is maintained as a Style Multiplier. This multiplier shows the allocation of a security within a Style index or an index derived from a Style index, relative to its allocation in its underlying Market Cap index. It is set to 1 if fully allocated to this Style.

The Size Multiplier of the underlying Market Cap indexes is inherited from that index and is also an input, but not changed itself by the Value and Growth index construction.

VALUE AND GROWTH DAILY MAINTENANCE

IPO METHODOLOGY FOR VALUE AND GROWTH INDEXES

When a newly listed company is added to a capitalization-based index, it is assigned to a corresponding style index. To assign the company to a value and/or growth index, CRSP uses fundamental and estimates data from CRSP's data sources. A minimum of two growth factors are required to generate a growth score and a minimum of two value factors are required to generate a value score. If complete data is not available from CRSP's third-party data sources, CRSP will first use a set of modified calculations that accept annual rather than quarterly data. If third-party data is not available, CRSP will review prospectuses to determine the values necessary to generate value and growth scores.

If a company's capitalization is lower than the Large Cap lower breakpoint (85 percent), or a style cannot be determined for each size index, holdings will be set to 50 percent value and 50 percent growth. As soon as an AR score can be calculated at a ranking, the company will move to the appropriate Value or Growth Index. Banding and migration rules are not applied to newly listed companies.

CORPORATE ACTION METHODOLOGY FOR VALUE AND GROWTH INDEXES

After the completion of a merger, spin-off, or similar corporate action, the resultant surviving companies may be reevaluated independently and moved, if necessary, to new size indexes. At this time, they are also reevaluated and added to the value and/or growth indexes corresponding to their respective size assignments. Likewise, if they are no longer a constituent of a size index after reevaluation they will be removed from any style index corresponding to that size index.

For style index assignment in reevaluations, CRSP generally carries forward the style of one of the corporate action participants. If there are multiple source companies for a resulting company, one is chosen. The carry-forward rules found in the following paragraph are applied.

The company used as the carry-forward initial state is selected with these rules:

- If a survivor of a merger, then its source is itself.
- If a spin-off child, its source is its parent.
- If a split-off child, its source is itself.
- If a partial merger, merger of equals, or other case with more than one source of holdings in a resulting company, the source is the largest contributor to the company's holdings in the CRSP US Total Market Index from the event.
  If during a ranking period, the company is selected using the above rules based on the holdings in the pro forma index, not the primary index.

Similar to the fast-track IPO process, if there is sufficient information available, CRSP may independently evaluate style factors and apply migration rules based a newly derived AR score and the existing entities' current style placement.

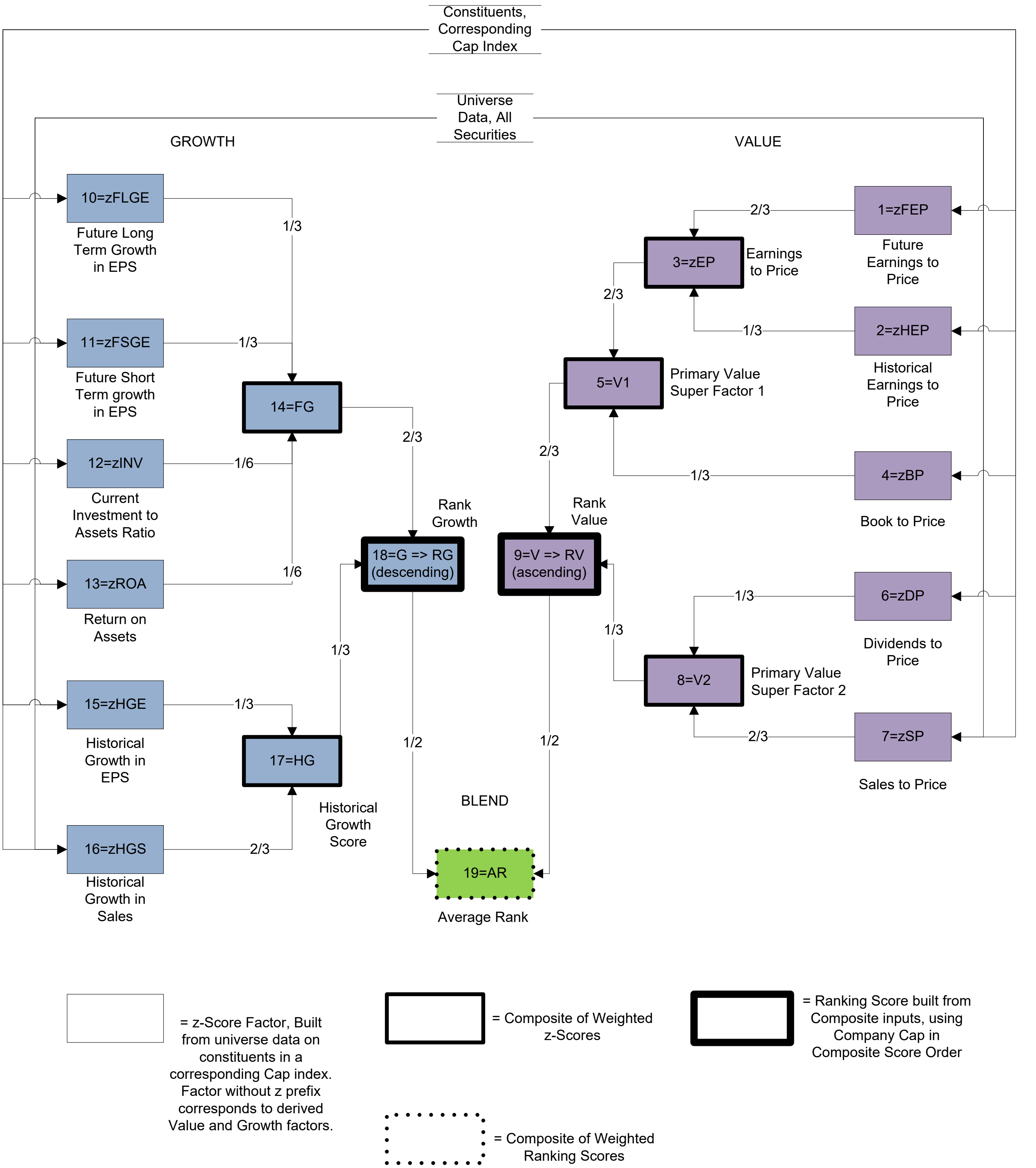
VALUE FACTORS

Factor	Definition	Description
BP	Book to Price	Ratio of company accounting book value over the company's total market capitalization. Book value is adjusted for deferred taxes, investment tax credits, and preferred stock. If book value is negative the value is set to zero. Company's market cap is the total capitalization of index eligible securities issued by the company. If recent quarterly data is unavailable, use the available data within the most recent 4 quarters. If data is still missing, then the value is defined as missing.
FEP	Future Earnings per Price	Ratio of time-weighted future earnings per share estimates for 1 and 2 years over price per share.
HEP	Historical Earnings per Price	Ratio of actual earnings per share for the past 4 quarters over the price per share.
DP	Dividends to Price	Ratio of trailing 12-months dividends, excluding stock dividends, over the company's total market capitalization. Company's market cap is computed same as for BP factor.
SP	Sales to Price	Ratio of company's sales for the last 4 quarters over the company's total market capitalization. Company's market cap is computed same as for BP factor.

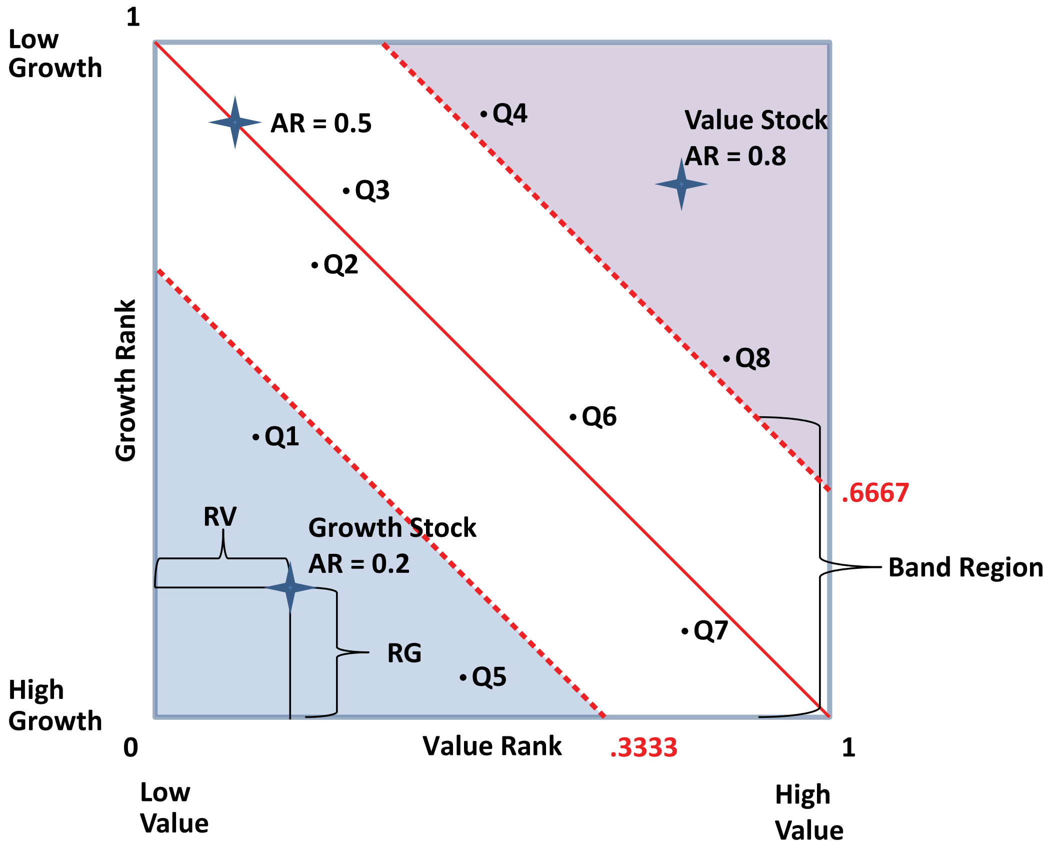
GROWTH FACTORS

Factor	Definition	Description
FLGE	Future Long Term Growth in EPS	The consensus estimate of the company's long-term growth in EPS.
FSGE	Future Short Term Growth in EPS	Ratio of the time-weighted future earnings per share estimates for 1 and 2 years over historical earnings per share for the past 4 quarters. The value is defined as missing if denominator or numerator are negative, or denominator is 0.
HGE	Historical Growth in EPS	Ratio of historical earnings per share for the most recent 4 quarters over the company's earnings per share for the 4 quarters ended 3 years prior. The value is defined as missing if denominator or numerator are negative, or denominator is 0.
HGS	Historical Growth in Sales	Ratio of the difference in sales for the most recent 4 quarters and sales for the 4 quarters ended 3 years prior over sales for the 4 quarters ended 3 years prior. The value is defined as missing if sales for the recent 4 quarters are negative or if the sales for the 4 quarters ended 3 years prior are 0 or negative.
INV	Current Investment to Assets Ratio	Ratio of the sum of the change in plant, property, and equipment from 4 quarters ago plus the change in inventory from 4 quarters ago over total company assets 4 quarters ago. If inventory and assets are not available in the latest quarter, use the earliest value reported within the past 4 and then 8 quarters. If still no data, then the value is defined as missing.
ROA	Return on Assets	Ratio of net income for the past 4 quarters over total assets 4 quarters ago.

VALUE AND GROWTH FACTORS DIAGRAM



VALUE AND GROWTH STYLE MIGRATION EXAMPLES



For the value and growth style indexes, CRSP set the breakpoint to an AR score of 50 percent and the band width to .3333. Therefore, the band range runs from an AR of .3333 to an AR of .6667.

Q1 State: Company's AR is 23 percent (point Q1).

Initially, the company's AR score is 23 percent and it is, therefore, allocated 100 percent to the growth index for its market segment.

Note: CRSP allocates a company first to the corresponding capitalization-based index. Then, based on its AR score, the security will be assigned to the corresponding value or growth index. Thus, the 100 percent allocation to the growth index corresponds to the total market capitalization that the company was allocated to in this capitalization category. For example, when a company starts with half of its total market cap allocated to the CRSP US Mid Cap Index (e.g., migrating between the Mid Cap Index and the Small Cap Index), with an AR score of 23 percent, CRSP would allocate all of its available market cap in the US Mid Cap index (i.e. 50 percent of its total market cap) to the US Mid Cap Growth Index.

Q2 State: Company's AR is 45 percent (point Q2)

The company's AR score moves up to 45 percent but, since it is still within the band, it remains allocated 100 percent to the growth index.

Q3 State: Company's AR is 55 percent (point Q3)

The company's AR score moves up again to 55 percent. Even though this value is above the 50 percent breakpoint, the company has not passed through the upper threshold of 66.67 percent so it will remain in growth.

Q4 State: Company's AR is 68 percent (point Q4)

Now, the company's AR score is 68 percent which is greater than the upper threshold of 66.67 percent. CRSP will migrate one 50 percent packet to the value index within the company's market capitalization segment, resulting in a 50 percent allocation to value and 50 percent allocation to growth.

Q5 State: Company's AR is 30 percent (point Q5)

In this quarter, the company's AR score drops down to 30 percent. Since that number is below the lower threshold of 33.33 percent, CRSP will migrate the 50 percent packet moved to value in the previous quarter back to the company's original growth index. The company is once again allocated 100 percent to growth.

Q6 State: Company's AR is 56 percent (point Q6)

The company's AR score rises to 56 percent but, since this is below the upper threshold, it remains 100 percent allocated to growth.

Q7 State: Company's AR is 46 percent (point Q7)

The company's AR score decreases to 46 percent but since this is above the lower threshold, it will remain 100 percent allocated to growth.

Q8 State: Company's AR is 70 percent (point Q8)

In this quarter, the company's AR score finally moves enough to break through the upper threshold. Therefore, 50 percent will be allocated to growth and 50 percent to value.

CHAPTER 5: CRSP US SECTOR INDEXES

CRSP developed a series of Sector Indexes with the intention of highlighting specific industry characteristics of all the companies that are constituents of the CRSP US Total Market Index. In order to achieve this objective, CRSP utilizes the ICE Uniform Entity Sector Benchmark (UES®) to categorize companies into their respective industry sector indexes.

For more information on this benchmark, please refer to the documentation at:
https://www.ice.com/publicdocs/ICE_Uniform_Entity_Sector_Methodology.pdf.

There are 11 sectors defined by the ICE UES Entity Sector level that represent companies eligible for CRSP US Sector Indexes:

ICE Entity Sector	Industry
01	Consumer Discretionary
02	Consumer Staples
03	Energy
04	Financials
05	Healthcare
06	Industrials
07	Materials
08	Media & Communications
09	Real Estate & REITs
10	Technology
11	Utilities

INDUSTRY LEVEL SECTOR INDEXES

All securities included in the CRSP US Total Market Index with a UES ICE Entity Sector code defined in the table above are assigned to the CRSP US Sector Industry Index based on that code.

Securities with a UES ICE Entity Sector of Sovereign, Quasi-Government, or Trust may be assigned to the CRSP US Total Market Index or other indexes if otherwise eligible, and may be assigned another Entity Sector by the CRSP Index Operating Committee, but otherwise will not be assigned to a CRSP US Sector Index and will not contribute to any sector breakdowns.

SECTOR QUARTERLY MAINTENANCE

RANKING AND RECONSTITUTION

The CRSP US Sector Indexes undergo a quarterly review, aligning with the same schedule and methodology as all CRSP Market Indexes. For further insight into the review and the procedures carried out during each ranking, refer to Chapter 8: Index Maintenance - Quarterly Maintenance and Chapter 2: CRSP US Total Market Index. Changes to a company's industry classification that occur within a quarter, unrelated to corporate events such as mergers or spinoffs, are incorporated during the quarterly ranking. CRSP does not employ the concept of packeting in its Sector Indexes. In the case of a company being reclassified from one industry sector to another, the transition involves a complete move to the newly designated sector, rather than transferring in smaller increments.

SECTOR DAILY MAINTENANCE

If a company is reevaluated as part of a corporate action, then it may move entirely to a new sector. If new sector information is not available at the time a company is reevaluated, it will continue in its previously known sector (e.g., spinoff parent's sector or merger survivor's sector).

CHAPTER 6: CRSP ISS US ESG INDEXES

There are six ESG indexes based on the ISS ESG Performance Score available, within three sub-families. CRSP developed these indexes using ratings from ISS's Environmental, Social, and Governance (ESG) scores for companies included in the CRSP US Large Cap Index.

CRSP ISS ESG indexes use the ISS ESG Performance Score, which is a market-wide metric based on the ISS ESG Corporate Rating, a sector-specific forward-looking ESG assessment of an individual company.

The ISS ESG Corporate Rating has a twelve-point scale from A+ (the company shows excellent performance) to D- (the company shows poor performance or fails to demonstrate any commitment to appropriately address the topic). The ESG Performance Score is derived from the ESG Corporate Rating using a standardized best-in-class threshold that is valid across all sectors and is used for cross-sector comparison and index construction. The ESG Performance Score is the numerical representation of the alphabetic ratings (A+ to D-) on a scale of 0 to 100, with 50 representing the Prime Threshold. This means that all companies with values equal to or greater than 50 are Prime, while companies with values less than 50 are Non-Prime.

This ISS ESG Prime Indicator is only granted to industry leaders by sector that exceed certain industry thresholds in their Corporate Rating by fulfilling demanding expectations. ISS considers Prime Companies to be well-positioned to, on the one hand, adequately manage key ESG risks associated with their specific business model, and, on the other hand, capitalize on opportunities offered by transformations towards sustainable development. For more information on ISS ESG Ratings, please refer to the documentation at https://www.issgovernance.com/esg/ratings/

CONSTRUCTING THE CRSP ISS ESG INDEXES

The CRSP ISS ESG Indexes are designed using the CRSP Large Cap Index coupled with the ISS ESG Performance Score. There are three models used, each described above as a different CRSP ISS ESG sub-family. Allocation in the underlying CRSP Large Cap index is preserved and further subdivided within each CRSP ISS ESG sub-family using the applicable model.

CRSP ISS ESG PRIME SUB-FAMILY

A company in the underlying index with an ISS ESG Performance Score equal to or higher than 50 has its Prime Indicator set and is allocated in full to the CRSP ISS ESG Prime Index, while a company with an ISS ESG Performance Score lower than 50 does not have its Prime Indicator set and will be allocated in full to the CRSP ISS ESG Non-Prime Index.

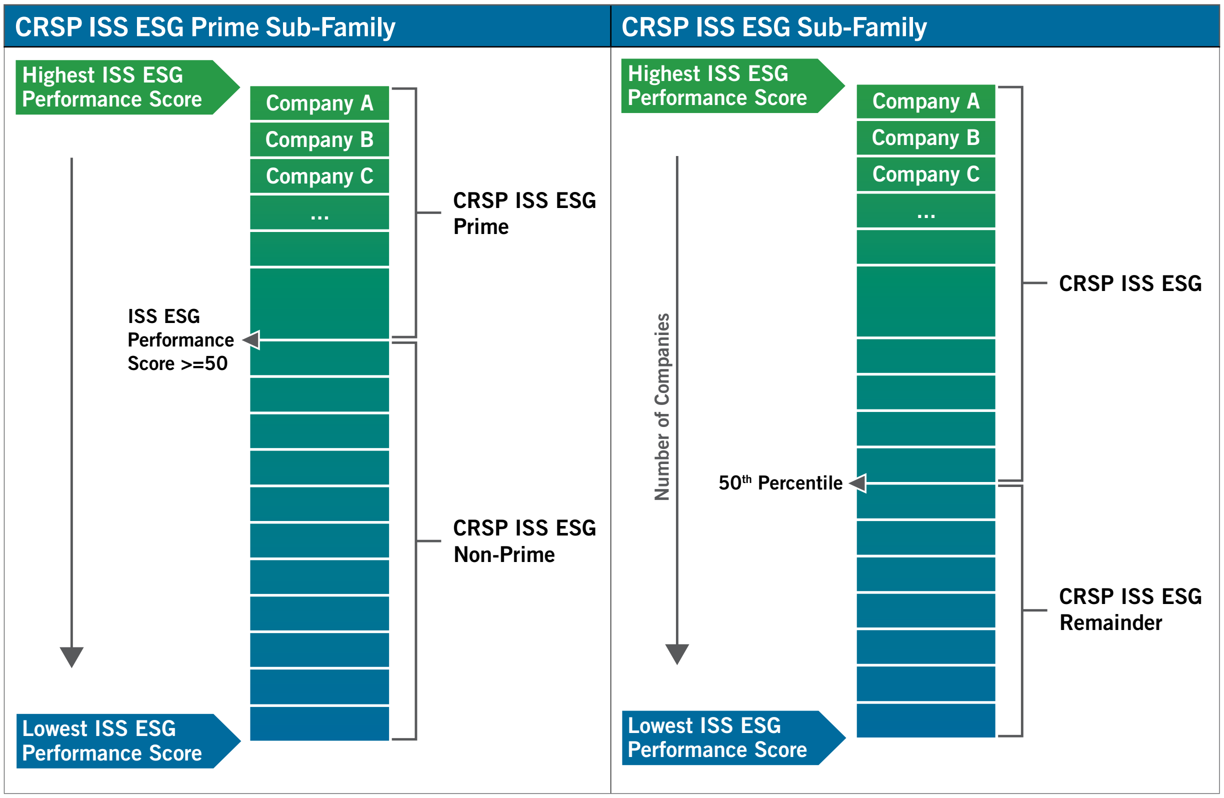
CRSP ISS ESG SUB-FAMILY

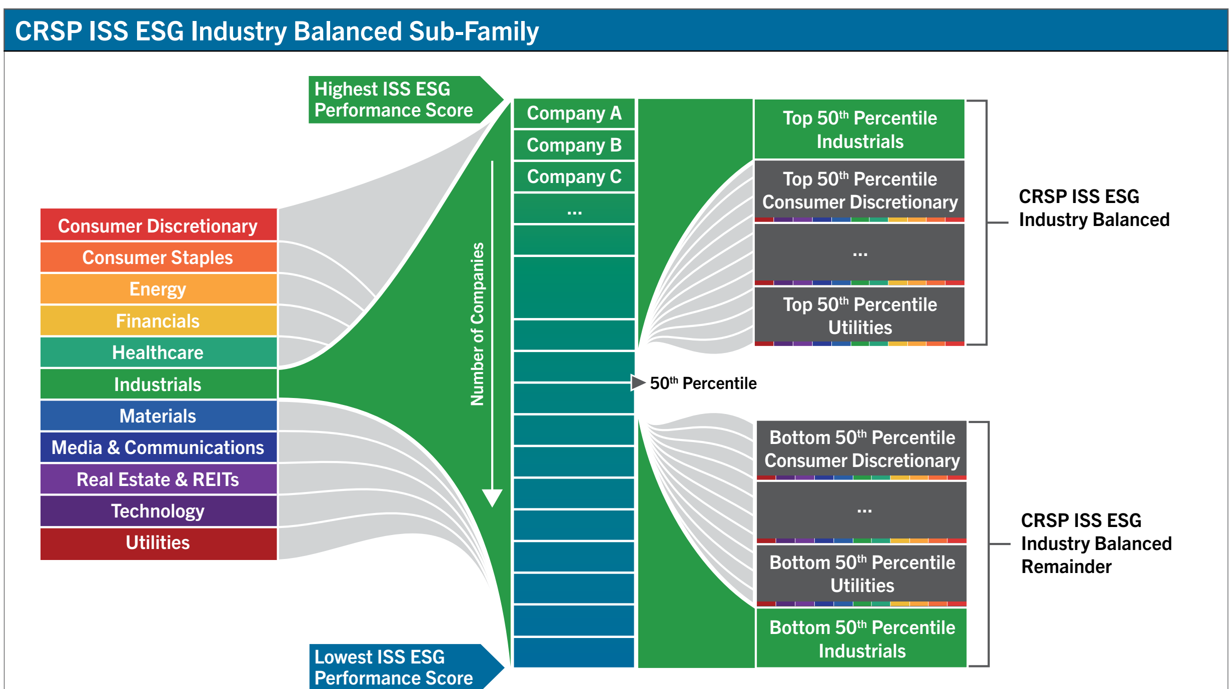
A company with an ISS ESG Performance Score at or above the 50th percentile based on count will be allocated in full to the CRSP ISS ESG Index, while those below the 50th percentile based on count will be allocated in full to the CRSP ISS ESG Remainder Index.

CRSP ISS ESG INDUSTRY BALANCED SUB-FAMILY

Each company within the underlying index is assigned a sector as determined by the ICE Uniform Entity Sector Benchmark (UES®), further described in Chapter 5: CRSP US Sector Indexes. Those companies with an ISS ESG Performance Score at or above the 50th percentile based on count within their sector will be allocated in full to the CRSP ISS ESG Industry Balanced Index, and those below the 50th percentile based on count within their sector will be allocated in full to the CRSP ISS ESG Industry Balanced Remainder Index.

ESG FAMILY COMPARISON





The above example illustrates the application of the CRSP ISS ESG Industry Balanced methodology to the Healthcare sector. To generate CRSP ISS ESG Industry Balanced indexes, the process is applied to each sector within the CRSP US Large Cap.

COMPANY LEVEL DATA

All ISS ESG performance scores are assigned at a company level. Therefore, all eligible securities of the same company will be placed in the same ESG index within the family. When a percentile is calculated for placement, the company is counted only once regardless of the number of eligible securities.

MISSING SCORES

Those companies with no score available at the ranking will be considered a zero ISS ESG performance score, included in the ranking, and assigned to the Non-Prime or Remainder index of that family.

ESG QUARTERLY MAINTENANCE

The CRSP ISS ESG Indexes are reviewed quarterly following the same schedule and process as all CRSP Market Indexes. See Chapter 2: CRSP US Total Market Index and Chapter 8: Index Maintenance - Quarterly Maintenance for the ranking schedule, the construction of CRSP Cap indexes, and more information on the reviews and processes undertaken at each ranking.

The CRSP ISS ESG Indexes are extensions of the CRSP Large Cap Index, and in each ESG sub-family, the CRSP Large Cap Index allocations are fully divided between the qualifying and remainder indexes of that sub-family. The ESG allocations incorporate the most recent ISS ESG Performance Score at the time of the ranking.

CRSP ISS ESG rules do not use any packeting within the ESG assignments, although they may inherit packeting from the underlying cap index. All eligible securities of a company are assigned fully to either the ESG index or its Remainder index. Other aspects of ranking, including transition, are done as in other indexes.

ESG DAILY MAINTENANCE

CRSP ISS ESG indexes follow corporate action processing of other indexes in most cases. When a reevaluation is needed after a corporate action, a security that remains in the underlying index may move to a different ESG index based on the post-event ISS ESG Performance Score. If a post-event score is not available in a timely manner, the score can be inherited from the last known score of one of the participants in the corporate action based on the corporate action type. If no prior score is available to inherit, the security will be treated as having a zero score.

In indexes where a percentile is used at ranking to assign to ESG indexes, the highest score assigned to the Remainder index at each boundary is tracked and maintained as a breakpoint until the next ranking. When comparing a post-event score to determine inclusion, the new score must be greater than the appropriate breakpoint to be placed in the ESG qualifying index of that sub-family. If not greater than the breakpoint, then the security is placed in the Remainder index of that sub-family.

If there is no ISS ESG Performance Score for the security after the corporate action, the following default rules are used:

- IPOs
  - If there is no ISS ESG Performance Score when the company would be added to CRSP capitalization indexes, a score of 0 is assigned, and the company is added to the Remainder indexes.
- Mergers
  - Determine the source of the ISS ESG Performance Score:
  - CRSP determines a survivor of a merger which then becomes the source for ISS Performance Score
  - If a partial merger, merger of equals, or other case with more than one source of holdings in a resulting company, the source is the largest contributor to the company's holdings in the CRSP US Total Market Index from the event.
  - Use ISS ESG Performance Score of the source determined in the first step.
  - If the source has no ISS ESG Performance Score, then a score of 0 is assigned
- Spin-offs/Split-offs
  - Spin-Off: If a spin-off child, its source is its parent. If the source has no ISS ESG Performance Score, then a score of 0 is assigned, and the company is added to the Remainder indexes.
  - Split-Off: If a split-off child, its source is itself. If the source has no ISS ESG Performance Score, then a score of 0 is assigned, and the company is added to the Remainder indexes.

In CRSP ISS ESG Industry Balanced Sub-Family indexes, the sector assignment based on Uniform Entity Sector follows the rules in Sector indexes. A Uniform Entity Sector must be available before a reevaluation completes or an IPO is added, but the Uniform Entity Sector is continued, or inherited from a parent in a spin-off, if no new assignment has been made.

CHAPTER 7: INDEXES REPORTED IN FOREIGN CURRENCIES

CRSP reports the performance of selected index series in foreign currencies. In all cases, the constituents of these indexes are the same as an underlying index, but the result is on the basis of the new currency.

There are two methods of measuring the value of an index against a foreign currency.

- A Hedged index is an investable method where a forward contract is used to hedge against fluctuations in an exchange rate.
- A Non-Hedged index is a direct snapshot based on a daily foreign exchange rate.

The Hedged and Non-Hedged indexes supported are shown in the following table.

Index ID	Index Series Name	Index Symbol	Index CUSIP	Index FIGI	Currency (ISO)	Type	Underlying Index Constituents	Underlying Index Series	Rate Time
1001625	CRSP US Total Market Index (CAD-hedged) (TR)	CRSPTCHT	12630Y108	BBG003PZ7F52	CAD	Hedged	CRSP US Total Market Index	CRSP US Total Market Index Tax-Adjusted (TR)	London Close
	CRSP US Total Market Index (CAD-hedged) (PR)	CRSPTCH1	12628G200	BBG003PZ7F34				CRSP US Total Market Index (PR)	
1001617	CRSP US Total Market Index (AUD-hedged) (TR)	CRSPTAHT	12633D200	BBG009J9GN20	AUD	Hedged	CRSP US Total Market Index	CRSP US Total Market Index (TR)	London Close
	CRSP US Total Market Index (AUD-hedged) (PR)	CRSPTAH1	12633D101	BBG009J9GN11				CRSP US Total Market Index (PR)	
1001626	CRSP US Total Market Total Return Index CAD (TR)	CRSPTMCT	12632P204	BBG004MFW5W1	CAD	Non-Hedged	CRSP US Total Market Index	CRSP US Total Market Index Tax-Adjusted (TR)	New York Close
	CRSP US Total Market Index CAD (PR)	CRSPTMC1	12632M201	BBG004MFW5V2				CRSP US Total Market Index (PR)	
1001618	CRSP US Total Market Total Return Index AUD (TR)	CRSPTMAT	12633D408	BBG009J9GN48	AUD	Non-Hedged	CRSP US Total Market Index	CRSP US Total Market Index (TR)	London Close
	CRSP US Total Market Index AUD (PR)	CRSPTMA1	12633D309	BBG009J9GN39				CRSP US Total Market Index (PR)	

NON-HEDGED INDEXES

CRSP Non-Hedged indexes provide benchmarks of the U.S. equity market in terms of foreign currencies. CRSP calculates the index by directly converting the index level each day using the appropriate exchange rate between the U.S. dollar and the target currency. The reported index level and the index return are in terms of the target currency.

CRSP uses the WM/Reuters spot rate reported at the appropriate time for the intended users of the index. If the WM/Reuters spot rate for the appropriate time is missing, CRSP may use an alternative data source. If there is no acceptable spot rate for the day, then CRSP will use the previous business day's spot rate. The spot rate used is as quoted in foreign exchange markets, but converted if needed to the form of from-USD to-target currency. The midpoint of the bid-ask spread is used.

INDEX LEVEL FORMULA

CRSP calculates the index in foreign currencies on a daily basis. The level of the index is calculated by multiplying the index by the exchange rate between the US dollar and the foreign currency.

The daily index level is calculated as:

Equation 1

$$\mathbf{TindC_t = S_t Tind_t}$$

Where

$TindC_t$	the level of the underlying index series in the foreign currency at date **t**
S_t	the spot rate on date **t**, in terms of from-USD to-target currency
$Tind_t$	the Index level of the underlying index series at date **t**

Index Return

Daily index returns can be calculated from the index levels,

$$r_{TindC,t} = (TindC_t / TindC_{t-1}) - 1$$

Where

$r_{TindC,t}$	the return of the index in the foreign currency at date **t**
$TindC_t$	the level of the index in a foreign currency at date **t**
$TindC_{t-1}$	the level of the index in a foreign currency on the previous business day

Examples

Index calculation example

The following example illustrates how CRSP calculates the level and daily return for the CRSP US Total Market Index in Canadian Dollars. Only the relevant data are shown in the table below, and numbers are not shown to full precision.

	Spot Rate	US Total Market Index ,Tind($)	US Total Market Index CAD, Tind (C$)
2/6/2013	0.99675	1174.665	1170.847
2/7/2013	0.99785	1172.823	1170.301

On February 6 and 7, 2013, CRSP US Total Market Index levels are 1174.665 and 1172.823 respectively. And the 4 p.m. ET spot rates for the same dates are C$ 0.99675/$ and C$ 0.99785/$ correspondingly. Thus, the US Total Market Index in Canadian dollars are:

$$1174.665 \times 0.99675 = 1170.847 \text{ for Feb. 06, 2013}$$

and

$$1172.823 \times 0.99785 = 1170.301 \text{ for Feb. 07, 2013}$$

And the daily return for Feb. 07, 2013 is

$$r_{Feb\ 07,2013} = (1170.301 / 1170.847) - 1 = -0.047\%$$

HEDGED INDEXES

CRSP provides hedged indexes for foreign investors who only want exposure to the U.S. equity market by hedging the foreign exchange risk between a US dollar and a foreign currency.

The construction of the hedged indexes closely mimics the hedging process in practice. WM/Reuters is CRSP's primary source for spot and forward rates. The hedged amount, or the size for the forward contract, is defined as the end-of-day hedged index level at the second-to-last business day of the previous month. The forward rate for the contract is the 4 p.m. UK closing rate at the last business day of the previous month. The amount hedged is kept constant for the month. If the WM/Reuters spot rate and/or the forward rate are missing, CRSP may use an alternative data source. If there is no acceptable spot rate and/or forward rate for the day, then CRSP will use rates from the previous business day. All rates used are as quoted in foreign exchange markets, but converted if needed in all formulas to the form of from-USD to-target currency. The midpoint of the bid-ask spread is used.

The value of the index is driven by two parts: the amount tracking the underlying index and the value of the forward contract. This is described in detail in the section below. The reported level of the index and the index return are in terms of the foreign currencies.

HEDGED INDEX FORMULA

Index Level

CRSP calculates the levels of the hedged indexes on a daily basis. The levels of the hedged indexes reflects the component that tracks the underlying index and the value of the forward contract, the hedging part.

Within any month **M**, the daily Hedged index level is calculated as:

Equation 1

$$Y_t = S_t P_0 Tind_t + \breve{X}_0 \, [F_{0,T} - S_t - (F_{t,1\text{-month}} - S_t) \times (RemD / TD)]$$

Where:

Y_t	the Hedged Index level in terms of the foreign currency at date **t**
S_t	the spot rate on date **t**, 4 p.m. UK closing spot rate
P_0	the Hedged Level Multiplier for the month; constant for month **M**
$Tind_t$	The index level at date **t**
$\breve{X}_0$	the hedged amount, the end-of-day hedged index level at the second-to-last business day of month **M-1**, in terms of U.S. dollars
$F_{0,T}$	the 4 p.m. UK closing one-month forward rate at the last business day of month **M-1**
$F_{t,1\text{-month}}$	the 4 p.m. UK closing one-month forward rate on date **t**
RemD	the remaining counted days till the last business day of the month (excluding day **t**)
TD	the total number of counted days within the month[1]

As shown in Equation 1, $S_t P_0 Tind_t$ tracks the performance of the underlying index and $\breve{X}_0 \, [F_{0,T} - S_t - (F_{t,1\text{-month}} - S_t \times (RemD / TD)]$ is the value of the forward contract at date **t**. The term, $S_t + (F_{t,1\text{-month}}) - S_t) \times (RemD / TD)$, marks to market the value of foreign currencies on the last business day of month **M.**

Index Return

Daily index returns can be easily calculated from the index levels,

$$r_{Y,t} = (Y_t / Y_{t-1}) - 1$$

Where:

$r_{Y,t}$	the Hedged Index daily return at date **t**
Y_{t-1}	the Hedged Index level in terms of the foreign currency at date **t-1**

INDEX MAINTENANCE

CRSP maintains the hedged indexes to closely reflect fund managers' hedging activities. CRSP resets the Hedged Level Multiplier (P_0) and the Hedged Amount ($\breve{X}_0$) on a monthly basis, consistent with the fact that fund managers roll the forward contract monthly. For each month, the Hedged Level Multiplier (P_0) is determined by the ratio between the end-of-day Hedged Index level in U.S. dollars and the index level on the last business day of the previous month. The Hedged Amount ($\breve{X}_0$) is determined by end-of-day hedged index level, in U.S. dollars, on the second-to-last business day of the previous month.

EXAMPLES

Index Calculation Example

The following example illustrates how the CRSP Canadian Hedged Index level and daily return is calculated. Only the relevant data are shown in the table below, and numbers are not shown to full precision. The same approach is used to calculate the CRSP Australian Hedged Index level and daily return.

	Spot Rate	Forward Rate 1 Month	Underlying US Total Market Index Tind($)	TD	RemD	CRSPTCHT (C$)
1/30/2013	1.00290					1161.166
1/31/2013	0.99885	0.99945	1163.154			1159.429
2/6/2013						1171.030
2/7/2013	0.99785	0.99846	1172.823	28	21	

For February 2013, CRSP reset the HLM ($\mathbf{P_0}$) and Hedged Amount ($\breve{\mathbf{X}}_0$) based on relevant information at the end of January 2013. At the close on January 31, 2013, the underlying U.S. Total Market Index level (**$**) is 1163.154, the Canadian Hedged Index level is 1159.429, and the spot rate is C$ 0.99885/$. Thus, the HLM for February 2013 is

$$\mathbf{P_0 = 1159.429 / (0.99885 \times 1163.154) = 0.9979}$$

The Hedged amount,

$$\breve{\mathbf{X}}_0 = \mathbf{1161.166 / 1.0029 = 1157.808}$$

is the Canadian Hedged Index level on Jan. 30, 2013, in terms of US dollars.

Since the last day of the month, February 28, 2013 is a business day, there are 21 days left on the hedging forward contract from Feb. 07, 2013. Thus, RemD = 21.

Based on Equation 1, the Canadian Hedged Index level on Feb. 07, 2013 is

$$\mathbf{Y_{Feb.07,2013} = 0.99785 \times 0.9979 \times 1172.823 + 1157.808 \times [0.99945 - 0.99785 - (0.99846 - 0.99785)\,(21 / 28)\,] = 1169.167}$$

And the daily return on Feb. 07, 2013 is

$$\mathbf{r_{Feb.07,2013} = 1169.167 / 1171.030 - 1 = -0.159\%}$$

HEDGED AMOUNT AND FORWARD RATE EXAMPLES

In order for the Hedged Indexes to be "investable", the hedged amount $\breve{\mathbf{X}}_0$ is calculated based on the end-of-day level of the hedged index on the second-to-last business day before the beginning of the current month. And $\mathbf{F_{0,T}}$ is taken as the 4 p.m. UK closing (11:00 am ET) forward rate one business day before the beginning of the month.

Several examples illustrate this process:

EXAMPLE 1:

October 01, 2011 is a Saturday. The forward contract will be rolled on Friday, September 30, 2011. $\breve{\mathbf{X}}_0$ will be calculated based on the end-of-day hedged index level on September 29, 2011. And $\mathbf{F_{0,T}}$ is taken as the 4 p.m. UK closing (11 a.m. ET) 1-month forward rate on Friday, September 30, 2011.

EXAMPLE 2:

July 01, 2012 is a Sunday. Since June 30, 2012 is a Saturday, the forward contract will be rolled on Friday, June 29, 2012. $\breve{\mathbf{X}}_0$ will be calculated based on the end-of-day hedged index level on June 28, 2012. And $\mathbf{F_{0,T}}$ is taken as the 4 p.m. UK closing (11 a.m. ET) 1-month forward rate on Friday, June 29, 2012.

EXAMPLE 3:

May 01, 2012 is a Tuesday. The forward contract will be rolled on Monday, April 30, 2012. Since April 28 and 29 are Saturday and Sunday, $\breve{\mathbf{X}}_0$ will be calculated based on the end-of-day hedged index level on Friday, April 27, 2012. And $\mathbf{F}_{0,T}$ is taken as the 4 p.m. UK closing (11 a.m. ET) 1-month forward rate on Monday, April 30, 2012.

TAX-ADJUSTED INDEXES

An underlying index for a total return series may be tax-adjusted to represent the tax withholding on dividends imposed on foreign investors of securities held in the underlying index. All dividends paid are reduced by 15% when the index returns are calculated.

Index ID	Index Series Name	Index Symbol	Underlying Index Constituents	Rule to Estimate Withholdings	Withholding Rate
1001331	CRSP US Total Market Tax Adjusted Index (TR)	CRSPTTT	CRSP US Total Market Index	Reduce all cash dividends by the withholding rate	15%

TAX ADJUSTED CRSP US TOTAL MARKET HEDGED TO CAD INDEX (TAX ADJUSTED CANADIAN HEDGED INDEX)

There are two components in a Tax Adjusted Canadian Hedged US index. The first follows the underlying US index withholding the Canadian tax rate on a daily basis and the second is the forward contract for the hedging purpose.

The part following the underlying US index is at level $\mathbf{X}_{t-1}$ and $\mathbf{X}_t$ in dates **t-1** and **t** (the corresponding daily return $\mathbf{X}_t = \mathbf{X}_{t-1}\,[1 + r_t - (r_t - r_a)\, r_{twh}]$, all in terms of US \$. And $\mathbf{r}_t$ is the CRSP US Total Market daily total return at day **t**, $\mathbf{r}_a$ is the CRSP US Total Market price return at day **t** and $\mathbf{r}_{twh}$ is the Canadian withholding tax rate, The forward contract is for selling the notional amount of $\breve{\mathbf{X}}_0$ US \$. The level of the Canadian Hedged US Index at day **t** can be expressed as:

$$S_t X_{t-1}\,[1 + r_t - (r_t - r_a)\, r_{twh}] + \breve{X}_0\,(F_{0,T} - \breve{F}_{t,T})$$

Where:

$\mathbf{S}_t$ the spot rate at day **t**,

$\mathbf{F}_{0,T}$ the day 0 forward rate maturity at date **T**, and

$\mathbf{F}_{t,T}$ the day **t** forward rate at maturity at date **T**.[2]

$\breve{\mathbf{F}}_{t,T}$ is estimated by interpolating the one month forward rate on day **t**.

$$\breve{F}_{t,T} = S_{t,} + (F_{t,1\text{-month}} - S_{t,}) \times RemD / TD$$

Where:

$\mathbf{F}_{t,1\text{-month}}$ the day **t** one-month forward rate,

RemD the remaining counted days till the last business day of the month (excluding day **t**),

TD the total number of counted days within the month.[3]

Y and $\mathbf{r}_Y$ represent the level and daily return of the Tax Adjusted Canadian Hedged US Index in terms of Canadian \$. The related calculation is summarized in the following table:

Table 1: The Tax Adjusted Canadian Hedged US Index

Index	Unhedged part following US Index (US \$)		Canadian Hedged US Index (Canadian \$)	
Time	t-1	t	t-1	t
Level	X_{t-1}	X_t	Y_{t-1}	$Y_t = S_t X_t + \breve{X}_0(F_{0,T} - \breve{F}_{t,T})$
Index Daily Return	r_{t-1}	r_t	$r_{Y,t-1}$	$r_{Y,t} = (Y_t / Y_{t-1}) - 1$

These indexes are not reported as standalone indexes, but only as underlying indexes to selected foreign currency indexes.

Since fund managers rolling the forward contract by the end of the month, $\breve{X}_0$ is taken as the end-of-day level of the hedged index two business days before the beginning of this month. And $F_{0,T}$ is taken as the 11:00 a.m. ET forward rate one business day before the beginning of the this month.

Several examples illustrate this process:

Example 1:

October 01, 2011 is a Saturday. The forward contract will be rolled on Friday, September 30, 2011. $\breve{X}_0$ will be the end-of-day hedged index level on September 29, 2011. And $F_{0,T}$ is taken as the 11 am ET 1-month forward rate on Friday, September 30, 2011.

Example 2:

July 01, 2012 is a Sunday. Since June 30, 2012 is a Saturday, the forward contract will be rolled on Friday, June 29, 2012. $\breve{X}_0$ will be the end-of-day hedged index level on June 28, 2012. And $F_{0,T}$ is taken as the 11 a.m. ET 1-month forward rate on Friday, June 29, 2012.

Example 3:

May 01, 2012 is a Tuesday. The forward contract will be rolled on Monday, April 30, 2012. Since April 28 and 29 are Saturday and Sunday, $\breve{X}_0$ will be the end-of-day hedged index level on Friday, April 27, 2012. And $F_{o,T}$ is taken as the 11 a.m. ET 1-month forward rate on Monday, April 30, 2012.

CHAPTER 8: INDEX MAINTENANCE

QUARTERLY MAINTENANCE

RANKING AND RECONSTITUTION

CRSP Market Indexes are reviewed on a quarterly basis. The review process consists of reevaluating each security's eligibility, investability, and capitalization. In addition, index construction rules for each index family are applied. Chapter 2: CRSP US Total Market Index describes the CRSP US Total Market and capitalization-based index construction process, Chapter 3: CRSP US Market Cap Indexes details the market capitalization-based index construction rules, Chapter 4: CRSP US Value and Growth Indexes details the style based index construction rules, Chapter 5: CRSP US Sector Indexes details the sector index construction rules, and Chapter 6: CRSP ISS US ESG Indexes details the ESG construction rules.

The review process is completed on the ranking day, after the close of the first Friday of March, June, September, and December. The ranking day initiates the ranking period, or pro forma period. Updated constituents and holdings for each primary index are reported in a separate associated pro forma index.

TRANSITIONAL RECONSTITUTION

Transitional Reconstitution represents a departure from the standard practice of making all of the rebalance changes on a single day. This process better aligns the CRSP Market Indexes with the investment community's best practices. The conversion from current index membership and holdings to their updated pro forma targets is completed over a five-day transition period. The transition period is generally effective after the close of the second Wednesday after the ranking day.

During the five-day transition period, CRSP will move 20 percent of the change in holdings from the current index to the target pro forma index each day. More precisely, the goal of each transition day is to move the difference in holdings between the current index and the target pro forma index, divided by the number of remaining days in the transition period. On the final transition day, the remaining holdings are moved regardless of the past rates during the transition.

By the end of the ranking period, on the final transition day (in most cases effective after close of the first Tuesday after the third Friday of the month of ranking) the indexes are fully reconstituted (converted to the targets maintained in their pro forma indexes) and the pro forma indexes cease to exist.

Both pro forma and primary indexes are maintained on a daily basis. In some cases, there are adjustments to the rules for handling specific corporate action types during the pro forma period. These cases are noted on the following pages and in the appropriate daily maintenance chapters.

CRSP may adjust the holdings of individual pro forma constituents. Pro forma holdings adjustments are generally applied during the first week following the ranking day. The Index Operating Committee will make the final decision as it relates to adjustments made at each ranking.

Appendix E: Transitional Reconstitution Calendar defines the various segments of the pro forma period. In the case of an unscheduled market closure or a holiday that conflicts with an important segment of the ranking period, the pro forma adjustment period may be shortened, but the transition period will remain five days.

MANAGING UNTRADEABLE SECURITIES DURING TRANSITION

An untradeable security will not transition during the Transitional Reconstitution Period. This includes a security that is suspended or delisted but held awaiting a value. If an untradeable security later becomes tradeable during the transition period it will move evenly over the remaining transition days to its targeted pro forma allocation.

- If a security was marked for removal at ranking due to a suspension of at least 40 days it will not transition before it is removed.
    - If the security resumes active trading before the last transition day, it is removed after the close of the last transition day at its last known price.
    - If the security is still suspended on the last transition day, it is removed after close on that day at a price of zero.

- If a security was not marked for removal at ranking, but is suspended through the last transition day, it will continue at its current holdings at reconstitution, and the target from the pro forma is temporarily discarded. If it starts trading again before the next ranking or the next non-cap-neutral corporate action, it will migrate as if it had snapped to the original pro forma allocation before applying the event.
- A security that is halted on the close is treated the same as if it was suspended the entire trading day. This includes any case known before end of day where a listing exchange fails to hold a closing auction .
- See Special Dividends (Stock/Cash Elections) for the behavior of Pending Payment Securities during transition.

IRS CODE 25/50 COMPLIANCE AT RANKING

At each ranking, CRSP checks for compliance using the Ranking Test Limits. If required, security weights are adjusted in the initial pro forma indexes to meet the Ranking Optimization Targets, even if the Compliance Test Limits are not violated.

If the weights in the pro forma index violate the Compliance Test Limits at any time during the pro forma period (i.e., after ranking day but before the final transition day), the pro forma index is rebalanced so as to meet the Ranking Optimization Targets.

If the pro forma indexes are rebalanced during a transition period, the primary index will continue transitioning to the new target beginning the day after the index is rebalanced. For example, if the pro forma is rebalanced on Thursday for Friday, then the transition will start moving to the new target beginning on Friday for Monday. If a security in the primary or newly rebalanced pro forma index is constrained, then a new CLM is computed by taking the ratio of the post transition holdings of the constrained index to the post-transition holdings of its parent (unconstrained) index.

Prices used to determine a company's compliance weight at ranking are the start of day prices known after the close of the ranking day. Prices used to validate the daily t+1 compliance of the pro forma indexes are the start-of-day prices known on t. For example, Monday's start-of-day prices are used to verify the compliance of index holdings effective before open Tuesday.

DETERMINING PRICE ON RANDOM PRICE DAY

CRSP uses the closing prices of all eligible securities on the "random price day" to determine the company's total market capitalization used at ranking. The random price day is selected algorithmically from the seven completed trading days immediately prior to the ranking using the following criteria:

- The two trading days with the highest aggregate absolute price moves and the two trading days with the lowest aggregate trading volume are excluded. The CRSP US Total Market Index is used as the point of reference
- The random price day is selected from the remaining (non-excluded) trading days

Prices are adjusted for all corporate actions to place companies on the same basis as the ranking day. A security not yet trading (pending listing) on the random price day is valued using its closing price on its first day of trading.

CORPORATE ACTIONS DURING PRO FORMA PERIOD

If a non-capitalization-neutral corporate action that affects holdings occurs during the pro forma period, CRSP seeks to evaluate and move the resultant entity only once. If the corporate action triggers a reevaluation during this time, the affected company will be migrated from its location in the primary indexes, not the pro forma index. If there is a true-up or reevaluation done when processing a corporate action, even if the event does not normally result in migration, the security will snap to its targeted Pro Forma location as part of the event. For example, if a company is anticipated to be added to the CRSP primary indexes at the quarterly rebalance and a secondary offering of the company's securities prices during the pro forma period, then the primary indexes and the pro forma indexes will be updated to reflect the total number of shares outstanding after the closing of the offering.

When reevaluating Mergers or Mergers of Equals during the Pro Forma period there is no minimum size requirement before migration is allowed.

Secondary Offerings during the Pro Forma Period

If the offer is valued at least $1B, CRSP will apply the secondary offering to both pro forma and primary indexes, before and during the Transition Period, regardless of the ratio of offering shares to holdings. If not, the following rules apply based on the ratio of offering shares to holdings in the US Total Market Index pro forma and primary indexes.

Before the Transition Period

1. If the offering number of shares is greater than or equal to 5 percent of the security's holdings in the US Total Market Index pro forma and primary holdings, CRSP will apply the secondary offering to both pro forma and primary indexes.
2. If the offering number of shares is greater than or equal to 5 percent of the security's holdings in the US Total Market Index pro forma index holdings and less than 5 percent of primary holdings, CRSP will apply the secondary offering to the pro forma index only.
3. If the offering number of shares is greater than or equal to 5 percent of the security's holdings in the US Total Market Index primary index holdings and less than 5 percent of pro forma holdings, CRSP will apply the secondary offering to both pro forma and primary indexes.
4. If the offering number of shares is less than 5 percent of the security's holdings in the US Total Market Index pro forma and primary holdings, CRSP will not apply the secondary offering.

During the Transition Period

If the offering number of shares is greater than or equal to 5 percent of the security's holdings in the US Total Market Index pro forma index holdings and less than 5 percent of primary holdings CRSP will apply the secondary offering to both pro forma and primary indexes (cases 1, 3, and 4 remain the same as above).

Reverse Mergers during the Pro Forma Period

If the new company's size is greater than or equal to the CRSP US Small Cap breakpoint as of the last ranking, then no transition or reconstitution will be implemented until the reevaluation of the new entity is complete.

Special Cases:

- If the new company is reevaluated by the final transition day, then it will migrate from the packeting location in the primary index.
- If the new company is reevaluated after the final transition day, then it will migrate from the packeting location that was targeted in the pro forma index. In other words, the reevaluation/rebalance for the new company will be postponed until after the final transition day.

DAILY MAINTENANCE

Changes in the CRSP Market Indexes occur on a daily basis as a result of numerous factors, including price movements, corporate actions, and security additions and deletions. In order to accurately track and reflect these daily changes, CRSP uses the following price methodology.

START-OF-DAY PRICE

A security's start-of-day price is defined as the previous day's end-of-day price adjusted for all splits and non-ordinary distributions, such as special dividends, returns of capital, and spin-offs. See Corporate Actions and Appendix A: Index Formulas - Price Adjustment Table for more information describing the derivation of a security's start-of-day price.

END-OF-DAY PRICE

Closing prices are assigned in the following order of precedence to securities traded on a CRSP exchange of interest:

1. The closing price reported by the primary listing exchange. If no volume on the primary exchange, or if the security is trading when issued and the volume reported by the primary listing exchange is less than 100 shares, move to step 2.
2. The last trade price from consolidated price feeds. If no volume on the primary or consolidated tape, move to step 3.
3. The last traded date end-of-day price carried forward. Bid-ask averages are not used to fill in trading gaps. In addition, no adjustments are made to reflect the current level of the market or market segments.
4. CRSP will calculate an end-of-day price adjustment amount from the terms of the corporate action in cases where a security could not be valued accurately at the start of a day.

FINAL CLOSING VALUE FOR DELISTED SECURITIES

A security that delists from an exchange of interest but is still held in indexes (e.g., late primary exchange delist notification, trading halted or suspended on the day prior to the effective date of the delist) carries forward its last known exchange closing price until it can be valued and removed from indexes.

If trading volume is first identified on a secondary exchange by 2:30 p.m. ET on one of nine trading days after the security has been delisted from its primary exchange delist (day one is the effective date of the delisting) it will be removed effective after close of that trading day. If volume is first identified on a secondary exchange after 2:30 p.m. ET on one of the eight trading days after the primary exchange delist, the security will be removed effective after close of the following trading day. If neither of the above cases occurs, the security will be removed effective after the close of the 10th trading day.

In the above cases, securities are valued (marked) using the following order of precedence:

1. The latest closing price reported on a secondary exchange. If no volume on the secondary exchange, move to step 2.
2. If available, the closing bid on a secondary exchange on the tenth day after the primary exchange delist. If no closing bid on the 10th day is reported to CRSP, move to step 3.
3. The security is marked at a price of zero.

PRICE ADJUSTMENTS AS A RESULT OF CORPORATE ACTIONS

If an index constituent is exchanged for cash, shares, or other property as part of a merger, acquisition, or liquidation, the security's value is determined using the following order of precedence:

1. The total value of all distributions (cash and/or stock) received in exchange for the security through the current day.
2. The start-of-day price carried forward. A price can be carried forward no more than 10 trading days after its last day listed on a CRSP exchange of interest.
3. Partial liquidation payments after delisting are applied as they are announced, up through the end of the 10th day after delisting. If no final payment is announced by the tenth day, the security is generally removed at a price of zero.
4. Contingent Value Rights (CVRs) received in a merger or other corporate action are generally given no value in indexes.

See Appendix A: Index Formulas - Price Adjustment Table for more information.

CORPORATE ACTIONS

CRSP adheres to the principles of replicability, consistency, maintaining style purity, and minimizing turnover when implementing corporate actions, with the objective of reflecting changes in the US equity market in a timely and accurate manner. When a corporate action takes place such that the surviving entities' index eligibility cannot be determined with the available information, CRSP will evaluate the security's eligibility at the next regularly scheduled quarterly ranking.

SHARE CHANGES REPORTED IN CORPORATE FILINGS

Changes to TSO or FSO that are not directly attributable to a single corporate event on a specific day (e.g., reported in corporate filings) generally do not immediately affect index holdings. However, the next regularly scheduled quarterly ranking or non-neutral corporate action uses the last confirmed TSO and FSO regardless of source.

MERGERS

A merger is a corporate action in which two or more companies are combined into one, creating a new entity. Shares of the non-surviving entity are exchanged for shares of the surviving entity, cash, or both. In most cases, the surviving entity will be evaluated for index inclusion immediately, and the non-survivor will be removed from the index.

IMPLEMENTATION OF MERGERS

The non-surviving participant(s) of a merger is generally removed from the index after the market close on the day before the effective date. However, if necessary, the non-survivor may remain in an index until the surviving entity can be accurately valued. Assuming both participants are index eligible and investable, a stock merger will result in a change of the surviving company's index holdings applied after the close of the trading day before the effective date (i.e., the first day of trading of the combined entity).

CRSP will reevaluate mergers and allow movement intra-quarter if the resultant (combined) entity's market capitalization is at least as large as the lower breakpoint of the CRSP US Small Cap Index as of the last ranking. If CRSP can confirm the merger is complete and is able to acquire the information necessary to determine the company's market capitalization and placement in all index families by 2:30 p.m. ET on the trading day before the merger's effective date, CRSP will reevaluate the surviving entity. Any changes made will be effective after the close of the trading day before the effective date. Banding and migration rules will apply, with migration originating from the index location of the company with the largest pre-merger market capitalization. If the resulting company does not meet the size requirements for immediate reevaluation, it will remain in its current index and will be reviewed at the next quarterly ranking. In general, no changes will be made at the time of the corporate action if the acquired entity is not index eligible and investable.

CONSTITUENT PURCHASE OF AN INELIGIBLE OR UNINVESTABLE COMPANY

In most cases, if an index constituent issues additional shares to purchase a company that is not a member of the CRSP US Total Market Index due to its failure to meet index eligibility or investability requirements, CRSP will reevaluate and true-up holdings of the combined entity at the next regularly scheduled quarterly ranking or upon the application of the next non-capitalization-neutral corporate event (e.g., secondary offering). In other words, the holdings of the acquirer will not be adjusted on the effective date of the merger.

CONSTITUENT ACQUISITION BY AN INELIGIBLE OR UNINVESTABLE COMPANY

In most cases, if an index constituent is acquired in a stock merger by a company that is not a member of the CRSP US Total Market Index at (e.g., due to its failure to meet CRSP's index eligibility or investability thresholds at a previous ranking) but meets those requirements after the event is completed, CRSP will add the new entity to indexes at the time of the event. The event will be applied using the index rules for received stock and reevaluation as described in the Merger Resulting in a Newly Listed Security section.

LATE ANNOUNCEMENT OF COMPLETED MERGERS

If the completion of a merger is confirmed after 2:30 p.m. ET on the trading day before the effective date, then the non-surviving entity (target) may appear in an index on the effective date. Its end-of-day value will be set to the sum of the value of the newly issued shares received plus any cash amount distributed. The target will be removed on the following trading day (the day after the effective date). Late mergers will be reevaluated if the resultant company meets the same criteria as an on-time merger.

MERGER RESULTING IN A NEWLY LISTED SECURITY

If two (or more) companies combine to form a single new company, (a merger of equals, or other cases where the shareholders of the acquired companies represent all index eligible shares of the new security), the new entity's reevaluation can be effective as early as after the close of the first day of regular way trading of the newly listed shares. There is no minimum size requirement before migration is allowed when reevaluating a Merger of Equals.

If the merger is confirmed before 2:30 p.m. ET on the day before the effective date (or confirmed after 2:30 p.m. ET on the day before the effective date and the merger consideration is stock only) then the new company can be added to the indexes after the close of the day before the effective date as received stock.

A synthetic start of day price for the new security is calculated by subtracting the cash proceeds (if any) from the acquired security's previous closing price divided by the shares payout ratio.

If there is more than one acquired security, the security with the highest security capitalization contribution relative to the newly listed company is used in the above calculation.

The new company will be reevaluated using the synthetic company capitalization known at the time of the announcement. For example, if the merger announcement is disseminated on-time (before 2:30 p.m. ET) the company's capitalization will be computed using the prices known at the start of the day before the effective date. If the merger announcement is delayed (after 2:30 p.m. ET) the company's capitalization will be computed using the prices known on the following trading day.

REEVALUATION AFTER A DISTRIBUTION FROM MULTIPLE PARENT COMPANIES

A primary contributor is assigned for purposes of reevaluation after a corporate event if more than one company contributes to the post-event holdings of the new entity. The company that contributes the highest number of post-event holdings (CRSP US Total Market Index) to the new entity is considered the primary contributor. A company is considered a contributor if it was a constituent of the CRSP US Total Market Index prior to the event. Migration rules apply as if the new security originated from the primary contributor's indexes.

During the pro forma period, holdings in the CRSP US Total Market Pro forma Index are used to determine the primary contributor.

MERGER AND CONCURRENT SPIN-OFF

If a corporate action involves both merger and spin-off characteristics, CRSPs spin-off rules take precedence. All affected companies are reevaluated after the close of the first day that all participant securities are trading regular way. As opposed to the small capitalization merger reevaluation methodology, there is no size threshold that restricts companies from moving from one index to another.

In most cases, the target company will not trade on the effective date of the merger/ spinoff. The target's pre-event index capitalization is held constant for a day. This is implemented by either continuing the company's existing holdings and valuing as described in the Late Announcement of Completed Mergers section, or if possible, converting the target's existing holdings to an active (currently trading) security at the rate denoted in the corporate action.

If a corporate action involves both reverse merger and spin-off characteristics, the reevaluation is implemented no earlier than effective after the close of the fifth trading day of regular way trading of the new company.

MERGER WITH ELECTION

In cases where the target shareholder's stock or cash entitlement is capped, CRSP will apply a prorated stock/cash payout, taking into account the known merger terms. If the proportion of cash relative to stock cannot be determined prior to the effective date, the merger will be implemented when the final payout ratio is announced.

REVERSE MERGERS

A merger in which the surviving entity originates from outside of CRSP's security universe is treated as a reverse merger. This includes, but is not limited to, cases where the acquiring company is either private, foreign, or does not trade on a CRSP exchange of interest.

Ineligible companies are removed from indexes after the close of trading the day before the effective date of the merger. Otherwise, the target's index holdings will be replaced by an equivalent value of the survivor using the acquisition terms.

CRSP will reevaluate reverse mergers if the resultant company's market capitalization, as of the close of the first day of regular way trading of the new entity, is at least as large as the lower breakpoint of the CRSP US Small Cap Index as of the last ranking.

If the resultant entity's capitalization is significant enough to warrant moving indexes, CRSP will (effective after the close of the fifth day of regular way trading of the new entity) move the new company to the appropriate index in each index family.

Companies that do not qualify for reevaluation will be kept in their current indexes with holdings that reflect the entitlement known as of the effective date of the merger.

ACTIONS WITH INELIGIBLE SURVIVORS

If all surviving companies of an on-time (confirmed by CRSP before 2:30 pm ET on the day before the ex-date) merger, spinoff, or other type of reorganization are anticipated to be ineligible or un-investable post-event, CRSP will attempt to reevaluate all participants prior the effective date of the event. All post-event ineligible or un-investable securities of the same company (various classes) will be reevaluated and removed from indexes at the same time. In terms of CRSPs investability rules, eligible survivors for this purpose must have a minimum security float percentage of 10%.

EXCHANGES AND CONVERSIONS

An exchange or conversion is a mandatory swap of one security for another security of the same company (e.g., preferred stock converted to common or one class of security being exchanged for another class).

The holdings of the received security are increased by the holdings of the exchanged or converted security multiplied by the conversion rate in each of the exchanged or converted security's indexes. The received security will continue at these holdings until the next ranking or non-cap neutral corporate action, regardless of its new size.

If the converted or exchanged security was not a constituent of the US Total Market Index, no changes will be made to indexes even if the received security is a constituent. If the converted or exchanged security no longer trades on an exchange of interest, it will be removed from all indexes at the time of the exchange.

If the converted or exchanged security is in the US Total Market Index, but the payout security is not an eligible share type, the payout security will be removed from indexes as soon as possible. If a partially converted or exchanged security is continuing, then the ineligible received security will be removed after the close on the ex-date. If the partially converted or exchanged security is delisting from exchanges of interest the received security will not be added to indexes.

TENDER OFFERS

A tender offer is an external public offer made directly to a company's shareholders to buy their stock at a specified price, usually at a premium over the prevailing market price. Generally, the objective of a tender offer is to acquire the target company.

As a guideline, CRSP will consider the tender offer successful if the security being acquired is trading within 10 basis points of the tender price at the time of tender expiration, and either:

1. Ninety-five percent of the company's shares have been tendered, or
2. The initial tender offer has expired and the acquirer seeks to complete the acquisition via a short-form merger.

If a tender offer is successful, it will affect the indexes in the same way as a merger. No action is taken if the tender offer is unsuccessful.

If a security is removed from an index but the tender offer is subsequently declared unsuccessful, the constituent will not be reinstated immediately. Instead, the company will be reconsidered for index inclusion at the next regularly scheduled quarterly ranking.

PARTIAL LIQUIDATIONS

In general, a security that is under a plan of liquidation, but is still listed on an exchange of interest, will be removed from indexes after the close of the trading day before the ex-date of a partial liquidating payment if either of the following is true:

1. The estimated market capitalization of the remaining security is less than $10 million, or
2. The partial payment includes nontransferable property estimated to be at least 90 percent of the value of the current pre-event market price of the liquidating security.

If a security is removed from the indexes because either of these criteria is met, it will not be reconsidered for index inclusion until the fourth ranking after its removal.

CANCELED MERGER

If a security is removed from an index but the merger is subsequently terminated, the constituent will not be reinstated immediately, and the acquirer's post-event holdings will not reverse immediately. Instead, the target company will be reconsidered for index inclusion at the next regularly scheduled quarterly ranking and the acquirer's holdings will remain at the updated amount until the next ranking or non-neutral corporate action. If a security is removed from an index but the tender offer is subsequently terminated, the constituent will not be reinstated immediately. Instead, the company will be reconsidered for index inclusion at the next regularly scheduled quarterly ranking.

ADDS AND DELISTS

INITIAL PUBLIC OFFERINGS

A new security resulting from an IPO is considered for inclusion after trading regular-way for five days on a CRSP exchange of interest. If the company's total market capitalization is at least as large as the breakpoint of the CRSP US Small Cap Index, then it is eligible to be added to the appropriate indexes after the close of the fifth day of trading as a "fast- track IPO". The company's total company market capitalization is calculated using the closing price and shares outstanding known on the first day of trading.

The company's securities must also pass the eligibility and investability screens (however, for fast track IPOs, the minimum FSO requirement is 10 percent, rather than 12.5 percent), as stated in Chapter 2: CRSP US Total Market Index - Creating the Index-Eligible US Equity Market Universe.

Securities that do not qualify for fast-track inclusion will be reviewed for inclusion at the next regularly scheduled quarterly ranking.

DIRECT LISTINGS

CRSP will consider for index inclusion companies that IPO via direct listings assuming that public disclosures are available related to the company's eligibility and investability (e.g. share type,organization type, FSO, TSO, location, market capitalization etc.). Given sufficient information, CRSP will not limit its eligible and investable universe based on the initial offering type.

DE-SPAC TRANSACTIONS

New corporations (C-corps) created via de-SPAC transactions (e.g., a Blank Check Company (SPAC) merges with a private company) will be considered for index inclusion at the next regularly scheduled quarterly ranking.

TRANSFERS FROM THE OVER-THE-COUNTER MARKET

In the absence of a significant liquidity event, transfers from the over-the-counter market (OTCQX, OTCQB, and OTC Pink marketplaces) to an exchange of interest will be considered for index inclusion at the next regularly scheduled quarterly ranking.

DELISTINGS

A security that delists from an exchange of interest is removed from all indexes. Delistings may or may not be related to a specific corporate event.

UNRELATED TO CORPORATE ACTIONS

A company that fails to meet an exchange's listing requirements (or delists voluntarily) will be removed from indexes. If the exchange's delisting notice is confirmed by 2:30 p.m. ET on the day before the effective date of the removal (and the security is trading) the constituent will be dropped after close of that day. If not, the security will continue in indexes until it can be valued. See Final Closing Value for Delisted Securities for more information.

MERGERS AND ACQUISITIONS

A security that delists from an exchange of interest due to a merger is removed from all indexes effective after the close of its last day of trading, assuming the event and the associated exchange delisting notice is confirmed before 2:30 p.m. ET on the trading day before the merger's effective date. If the event is confirmed after 2:30 p.m. ET on the trading day before the effective date, the security is kept in its indexes and is removed on the following trading day.

BANKRUPTCY ANNOUNCEMENTS

In the event that a company files for bankruptcy, CRSP will continue to hold its securities in their respective indexes as long as the securities remain listed on a CRSP exchange of interest. The securities' investability and eligibility will be reviewed at the next regularly scheduled quarterly ranking.

However, in most cases, companies that file for bankruptcy do not meet the exchange's listing requirements. If the company fails to meet the exchange's listing requirements, the company will be removed from all indexes after the close of its last day of trading. If the delisting notice is confirmed after 2:30 p.m. ET when the affected security is still trading, or it is suspended on the day before the effective date of the delist, the constituent will remain in all indexes until a final valuation can be assigned. See Final Closing Value for Delisted Securities for more information.

SUSPENDED SECURITIES

A suspended security is not open for trading for a full day due to an action by its listing exchange, typically for a rules violation or an extended halt due to trading conditions. Generally no index action is taken at the time when the security is first suspended, but if the suspension continues for multiple days, the security may be subject to investability rules at the following ranking. See Chapter 2: CRSP US Total Market Index - Investability Screens for the impact to indexes at that time.

REGULATORY ACTIONS

If a regulator or trustee takes control of a company's operations, and its securities are suspended or delisted by its listing exchange for at least two days after this action, and there is no announced plan for further trading or exchange of the company's securities, those securities may be removed from all indexes as soon as practicable, at a final price of 0. The removal announcement will be made before 2:30 p.m. ET on the day before the securities are removed.

LIQUIDATIONS

When a company adopts a plan of liquidation and announces its intention to delist from an exchange of interest, the security will be removed from all indexes after the close of its last day of trading. If the delisting notice is confirmed after 2:30 p.m. ET on the last day of trading, the security will be kept in all indexes until a final value can be assigned. See Final Closing Value for Delisted Securities for more information.

These rules may be adjusted if an official final or partial liquidation payment is announced and known before the security is removed. If the final payment amount is disseminated within the period commencing with the first day the security is delisted and ending ten trading days later, the security will be removed from indexes at the announced value as soon as practicable. If partial payment amount(s) are announced on or before day ten, then the security will be removed at the sum of the announced partial payments rather than zero.

CAPITAL RAISING EVENTS

RIGHTS OFFERINGS (DISTRIBUTIONS)

A rights distribution is an event in which shareholders are given the option to purchase, within a certain period of time (subscription period), a specified number of additional shares from the issuing company at a specific price (subscription or strike price). The subscription price is typically set at a discount relative to the price of the underlying security.

RELATIONSHIP BETWEEN THE SUBSCRIPTION PRICE AND THE UNDERLYING SECURITY (EXERCISE DECISION)

If the subscription price of the right is less than the closing price of the underlying security on the trading day before the ex-date of the distribution, the rights are "in-the-money" and are generally assumed to be fully exercised. Accordingly, if the right is in-the-money, the shares of the underlying security are increased after the close of the ex-date as if all of the issued rights are exercised. If the security is an index constituent, its holdings are trued-up based on its new total float and shares outstanding.

If the subscription price of the right is greater than or equal to the closing price of the underlying security on the trading day before the ex-date, the rights are “out-of-the-money” and the company’s index holdings are not adjusted.

On the ex-date, the right and the underlying security are represented in the index as a package (common stock plus right). However, only the underlying security is reported as an index constituent. At the constituent level the combined start-of-day capitalization of the security and its associated right is reported.

In general, after the close of the ex-date the right is considered exercised or sold (i.e., not considered a constituent of any CRSP Market Index).

PRICE ADJUSTMENT TO REFLECT THE VALUE OF THE DISTRIBUTION

At the end of the ex-date, the value of the entitlement to the right(s) is added to the issuing company’s security(s) as a “payment value” (end-of-day price adjustment). The payment value is set to the maximum of the right’s “fair market value” (intrinsic value/in-the-money amount) relative to the right’s “market value”. In other words, the value added to the underlying security at the end of the ex-date is the fair market value of the right(s) or the market value of the right(s), whichever is greater.

The “market value” of the distribution (assuming the right is trading regular way by the close of the ex-date) equals:

$$\textbf{Market Value} = \textbf{Rr} \times \textbf{Pr}$$

Rr = Rights Ratio (number of rights received per share)

Pr = End of Day Price of the Right on the ex-date

The fair market value of the right(s) is computed using the most recent closing price of the underlying security as follows:

$$\textbf{Fair Market Value} = (\textbf{Rr} \times \textbf{Sr} \times \textbf{Max (0,Up - Sp)}) / (\textbf{1} + \textbf{Rr} \times \textbf{Sr})$$

Rr = Rights Ratio (number of rights received per share)

Sr = Subscription Ratio (number of shares received per right exercised)

Up = Underlying Security’s Price

Sp = Subscription Price (price paid per share upon exercise)

Rights received in an offering that grant the holder the option to buy securities that are not members of the US Total Market Index (not index eligible or investable, e.g., bonds, preferred stock, foreign equities, unlisted securities) are implemented in the following manner:

The end-of-day (ex-date) price of the issuing company’s securities are adjusted only if the value of the right(s) can be determined on or before the close of the ex-date. If the value of the entitlement can be determined after the ex-date, a special dividend representing the value of the dividend may be applied. The holdings of the issuing company generally remain unchanged.

RIGHTS SPECIAL CASES

If a rights offering is limited in terms of the total number of shares available for purchase, and the subscription period starts after the ex-date for a portion of those available shares, the holdings in indexes will not be adjusted. Any share increase related to the event will be considered at the next quarterly ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

If there is a limit in the shares available for purchase, the subscription ratio is adjusted to reflect the number of shares offered.

In general, if the subscription period starts after the ex-date, the holdings in indexes will not be adjusted.

WARRANT OFFERINGS (DISTRIBUTIONS)

A warrant offering is an event in which shareholders are given the option to purchase, within a certain period of time, a specified number of additional shares from the issuing company at a specific price. Warrants are similar to rights; however, they are typically issued out-of-the-money and have a longer time to expiry relative to rights.

Warrants are valued in the same manner as rights. However, warrants are generally assumed to be sold rather than exercised. Therefore, as opposed to in-the-money rights, index holdings are not increased effective after the close of the ex-date.

SECONDARY OFFERINGS (FOLLOW-ON OFFERINGS)

A follow-on offering involves the selling of new (primary) or existing (secondary) shares after the company's IPO. CRSP makes the following distinction between two types of follow-on offerings:

Primary equity offerings (primary shares) involve the issuance of additional "new" shares of a security. The company will receive the proceeds from the sale. CRSP increases both the TSO and the FSO by the number of additional shares issued, using the most recently available TSO and FSO figures. The EFF and index holdings are then recalculated using these new figures.

Secondary equity offerings (secondary shares) involve the sale of already issued "old" shares. The company will not receive the proceeds from the sale of securities by the selling stockholders. The FSO will be increased by the number of shares sold, using the most recently available share figures, however, since the company did not issue additional shares, the TSO typically remains unchanged. The EFF and index holdings are then recalculated using these new figures.

IMPLEMENTATION:

Five Percent Threshold and Timing

Changes in index holdings resulting from primary or secondary equity offerings that represent 5 percent or more of a security's holdings in the CRSP US Total Market Index, or an offer valued at least $1B, are implemented effective after the close of the first day after the issue prices or the following trading day. The above timing assumes that an announcement of the issues' pricing is known before 2:30 ET on the trading day after the pricing of the offering. Otherwise, the event is implemented at the next regularly scheduled ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

Primary or secondary equity offerings that represent less than 5 percent of a security's holdings in the CRSP US Total Market Index, and have an offer valued at less than $1B, are implemented at the next quarterly ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

Concurrent primary (proceeds distributed to the company) and secondary (proceeds distributed to the selling shareholders) offering shares are summed as it relates to the 5 percent threshold. For example, if 1M primary shares and 2M secondary shares are concurrently offered and the pre-offering index holdings are 50M, then the 5 percent implementation threshold is satisfied (1+2)/50 = 6%.

Exclusions

In general, CRSP will not update index holdings intra-quarter to reflect the pricing of a private placement, registered direct, confidentially marketed public offering (CMPO), at-the-market, forward sale agreement, or an unregistered block. However, the change in the number of shares will be considered at the next ranking or upon the application of a subsequent non-capitalization-neutral corporate event.

CAPITAL DISTRIBUTION EVENTS

SPIN-OFFS

In a spin-off, the parent company "spins off" its subsidiary/division by distributing all of that subsidiary's stock to the parent's stockholders. Shares of the new organization, the child, are allocated to equity holders of the parent organization at a ratio established by the parent. After the transaction, both parent and child are separate, independent companies.

IMPLEMENTATION OF SPIN-OFFS

Placement for the participants in a spin-off in all index families is determined based on data on the latest of:

- The close of the first day of when-issued trading, or
- The ranking day before the ex-date and after the first day of when-issued trading, or
- The effective date of any non-neutral corporate action applied to the parent (e.g., secondary offering) which occurs after the first day of when-issued trading but before the ex-date of the spin off.

Prices and the TSO known on one of the above dates will be used to determine the market capitalization used on the reevaluation date. Placement in non-capitalization index families will follow the rules of that family, generally using the best available information at the time the cap is determined, with the spun off company inheriting the score or placement of the parent if insufficient information is known at that time.

A received security in a spin-off is added to the indexes of its parent effective after the market close the day before the ex-date of the spin-off. Holdings are calculated by multiplying the parent's holdings by the spin-off ratio. The addition of the received security preserves the company's previous end-of-day index capitalization.

The parent and received company are reevaluated effective after the close on the ex-date based on their own merits. Companies may move to new indexes, or be dropped altogether.

At reevaluation, effective after the close of the ex-date, both the parent and received company are migrated independently from the parent's index based on each company's capitalization. In most cases, each company's capitalization is established using the shares and closing prices known at the end of the first day of when issued trading. Banding and migration rules are applied, using the breakpoint ranges for each band set at the last ranking. Similar to ranking, all index-eligible securities of a company are combined to determine the company's capitalization. Ineligible securities, or securities that fail the investability rules for float (10 percent) or company capitalization ($10 million), will be removed from the CRSP Market Indexes.

The following formulas are used to determine the parent's post spin-off start-of-day price and TSO:

Parent's Start of Day Price (ex-date)

$$PSOD = \left(\frac{P_v}{EventSplitFactor} \right) - (R_v \times S_r + R_{vi} \times S_{ri} \ldots\ldots)$$

PSOD = Parent's Start of Day Price

P_v = Parent's Close Price

R_v = Closing price of the child on the day before the ex-date (typically a when-issued price)

S_r = Spin off Ratio (in post-split terms)

R_{vi} , S_{ri} = Price and Spin-off Ratio of any additional spun off companies

Parent's Start of Day TSO (ex-date)

$$TSOP = TSO_v \times EventSplitFactor$$

TSOP = Parent's Start of Day TSO

TSO_v = Total Shares Outstanding (on the valuation day)

Received Shares (ex-date)

$$R_s = TSOP \times S_r$$

R_s = Received Shares

TSOP = Parent's TSO

Sr = Spin-off Ratio (in post-split terms)

SPIN-OFFS WITHOUT WHEN-ISSUED TRADING PRIOR TO THE EX-DATE

If a security received in a spin-off does not trade on a when-issued basis before the ex-date, then both the parent and received stock cannot be accurately valued at the start-of-day of the ex-date. In this case, the child is still included in the parent's index(es) as received stock even if it is not yet trading. Initially the parent will show no adjustment for the distribution and the child will be reported with a zero start of day price; that is all index capitalization will be included in the parent. At the end of the ex-date, both parent and child starting prices and weights will be retroactively redistributed, attributing movement in price of the parent to the distributed value of the child. The price found for the child will carry forward until the child trades. CRSP uses the following formulas to calculate start-of-day prices for the parent and detached securities:

Parent's Start-of-Day Price (on the ex-date)

$$\text{New Parent Start of Day Price} = \text{Parent End of Day Price}$$

Child Security's Start-of-Day Price

$$CsSOD = \frac{Max((OpSOD - PEOD),0.01)}{SpR}$$

CsSOD = Child Security Start-of-Day Price

OpSOD = Original Parent Start-of-Day Price

PEOD = Parent End-of-Day Price

SpR = Spin off Ratio

The following example illustrates what happens when the parent company (Security A) spins off a new company (Security B). Security B had no trades on or before day T and is trading regular way (RW) on the ex-date (T+1).

Security	SOD (T+1) initial	SOD (T+1) Revised at EOD (T+1)	EOD (T+1)	SOD (T+2)
Parent – Security A	$40	= EOD (T+1) = $30	$30	$30 (and reevaluated for new index)
Child – Security B	$0, in A's index	= $40-$30 = $10 from A	$12 trading RW	$12 (and reevaluated for new index)

CRSP will not reevaluate companies until there is an opportunity to trade both parent and child securities on a regular way basis. If the child does not trade regular-way by the close of the ex-date then both companies will be reevaluated effective after the close of the second day of regular way trading. At least one day's notice will be provided for any reevaluation results.

If there are multiple parent companies distributing one security, or one parent distributing multiple securities, then all the entities involved will be reevaluated at the same time. Various classes of a company's index eligible securities will be reevaluated as a package. In other words, post reevaluation, securities of the same company will move to (or remain in) the same indexes regardless of whether or not they were involved in the corporate action at hand. If an index ineligible security is distributed as one component of a spin-off and has not traded but can be assigned a derived fair market value, then it can be used to adjust the parent's price and a regular way trade is not needed for reevaluation.

SPIN-OFF SPECIAL CASES (SPLIT-OFFS AND PARTIAL MERGERS)

If a company distributes shares of a security already trading, in a split-off or partial merger, the event is treated as a spin-off. On the ex-date the holdings received in the parent's index are calculated as in a "standard" spin-off (spin-off terms*parent's holdings). At reevaluation (the trading day after the ex-date), the split-off company will migrate from the cap based index with the largest holdings. Note that contrary to the standard migration process, for split-offs CRSP will determine the starting point of migration based on the largest index capitalization (Price of Split-off Entity*Holdings) rather than company capitalization (Price of Split-off Entity*Total Shares Outstanding). For example, Company ABC is currently a constituent of the CRSP US Micro Cap Index with holdings of one million shares. Small Cap Company XYZ splits-off two million shares of ABC. In this case, ABC will migrate from the CRSP US Small Cap Index rather than the CRSP US Micro Cap Index.

CRSP may treat the proceeds of distributed ineligible securities as special dividends. For example, if a security is distributed as part of a spinoff and the spun off entity is not expected to trade on an exchange of interest; CRSP will treat the value of the distributed security as a special dividend when its value can be determined.

A spinoff child of a foreign, ineligible company is not added to indexes when it starts trading. The new company will be considered for inclusion at the next quarterly ranking.

EXCHANGE OFFERS

A partial merger or split-off event may be structured as an exchange offer. Shareholders of one company have the option to exchange their current holdings for securities of another company. These securities represent additional capitalization in the case of a partial merger, and additional float shares in the case of a split-off. Price adjustments are not applied to the participant securities.

Constituents may be eligible for reevaluation if changes in either of the company's float shares (shares exchanged via the offer) represent 5% or more of its holdings in the CRSP US Total Market Index. If either company is at least as large as the lower breakpoint of the CRSP US Small Cap index, then the participants may also migrate to other indexes. Otherwise, companies will true-up within the same capitalization based indexes. Reevaluations are generally implemented effective after the close of the first day the preliminary results are available, regardless of whether updated shares are trading regular way or when-distributed.

If insufficient notice is provided and/or information is not available, or the float changes are below the 5% threshold specified above, the event will be implemented at the next regularly scheduled ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

SPLIT-OFF AFTER CARVE OUT

If a new security is listed on an exchange of interest as an IPO in a Carve Out from another security in indexes, and it is not initially added to indexes under Fast-Track IPO rules only because its Float Factor is below 10%, it may be added to indexes during the reevaluation of a split-off event where the parent company distributes enough shares to raise the float factor to at least 12.5%.

CASH PAYMENTS

CASH DIVIDENDS

Cash dividends are a proportionate distribution of corporate profits made in the form of a payment to shareholders. Dividends are paid periodically (typically quarterly) over the course of a year. CRSP does not apply a start-of-day price adjustment to the distributing company's securities.

The following unique situations related to cash dividends are recognized:

- A dividend paid in a foreign currency is converted to US dollars using the spot foreign exchange rate available on or before the ex-date.
- A cash dividend with an ex-date on the same day as a stock split is reported in post-split terms.
- A dividend with a payout amount that is only conditionally approved before the ex-date is not applied.

In most cases, dividend payments are reported gross of any income or withholding taxes. As it relates to the tax-adjusted indexes, dividend payments are reported net of withholding taxes.

RETURN OF CAPITAL DISTRIBUTIONS

Cash received as a return of capital is treated as a non-ordinary distribution. The security's start-of-day price is adjusted by the amount of the payment effective after the close of the trading day before the ex-date.

SPECIAL CASH DIVIDENDS

Cash received as a special dividend is treated as a non-ordinary distribution. The security's start-of-day price is adjusted by the amount of the dividend effective after the close on the trading day before the ex-date.

SPECIAL DIVIDENDS (STOCK/CASH ELECTIONS)

A special dividend that allows the shareholder to elect to receive cash and/or stock with the proration determined after the ex-date is handled as follows:

- Cash and stock results are based on the composite result of all shareholders, not the election of one shareholder. Therefore, cash amounts and rates are determined before the proration results are reported. The shares added to indexes are based on the price (typically a VWAP) announced before the payable date.
- The average cash payout is made based on the limits imposed on the distribution, assuming that all shareholders choose the maximum cash election. The known cash entitlement is applied to indexes immediately.
- The remaining value is distributed as a Pending Payment Security.
  - This security will be added as received stock in the indexes of the distributing security at the same holdings, multipliers, and effective float factor as the distributing security.
  - The security is tracked in the security universe with the same TSO and FSO as the distributing security on the ex-date. It is used to represent additional company capitalization for purposes of ranking or reevaluation while it is active, but it is not otherwise investable.
  - The Pending Payment Security price is initially set to the total amount of the distribution minus the cash payout, on a per share basis.
  - On the ex-date, the distributing security will have a start of day distribution value (price adjustment) equal to the cash plus the value of the Pending Payment Security. This distribution value will be used to adjust the start of day price of the distributing security on the ex-date.
  - Once there is an announcement of the price (typically a VWAP) used to determine the shares to be issued, the value of the Pending Payment Security will be set based on those terms. This is equal to the (dividend total amount - cash payout amount) / price per share for exchange * price of distributing security, on a per share basis. If there is no public information readily available related to the price used, CRSP will wait up to five days and then make best efforts to estimate the price.
  - If the price per share for exchange is not announced by 2:30 p.m. ET on the payable date, the payable date is effectively delayed until the first day after the price is announced.
  - On the payable date, the Pending Payment Security will be converted into its equity/stock components.
    - Shares of the distributing security will be increased after close on the payable date. The additional TSO is calculated as (dividend total amount - cash limit amount) / price per share for exchange. The additional FSO is calculated as the additional TSO * Float Factor.
    - In indexes, the distributing security is trued-up after close on the payable date, based on the updated TSO and FSO. There is no movement to another index, except where specified under rules for corporate actions during the Pro Forma Period.
    - The Pending Payment Security is removed from indexes after close of the payable date at the updated value based on the actual number of shares distributed.
  - While active, the Pending Payment Security is considered untradeable. Its holdings or location do not change even during transition. If required (a ranking or another corporate event) the distributing security can move, and its shares can change.
  - If the distributing security is removed from an exchange of interest before the payments are made, the impact to the Pending Payment Security is reviewed. If the Pending Payment Security can be resolved, it is valued and removed immediately, if not, it will be removed and valued at its expected payable date with no index impact to the distributing security.

Generally, a Pending Payment Security that represents the right to shares of an underlying security of an index-eligible company is also index-eligible for purposes of calculating company cap at a ranking, but is not investable or tradeable itself, so its lifecycle is governed by the rules of the corporate event that generated it.

Pending Payment Securities are labeled in index reports with the following conventions:

- CUSIP – inherit the first six characters from the payout security, and then append 90X. If this CUSIP already exists, increment 90 to 91, etc. until generating a new CUSIP.
- Ticker – inherited from the payout security, with .PP appended.
- Company Name – inherited from the payout security, with " – PENDING PAYMENT" appended
- PERMNO® – a unique six-digit number for each instance.

SHARE REPURCHASES (STOCK BUYBACKS)

DUTCH AUCTIONS

Changes in a security's float resulting from Dutch auctions that represent 5 percent or more of the security's holdings in the CRSP US Total Market Index, or the number of shares repurchased are valued at least $1B, will generally be implemented on one of the five trading days following the tender offer results announcement.

If insufficient notice is provided and/or the information is not available, the event will be implemented at the next regularly scheduled ranking or upon the application of a non-capitalization-neutral intra-quarter corporate action.

Changes in a security's float resulting from Dutch auctions that represent less than 5 percent of the security's holdings in the CRSP US Total Market Index, and the number of shares repurchased are valued below $1B, will be implemented at the next quarterly ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

When a Dutch tender offer is implemented, index holdings are trued-up to the new post-offer shares of the security.

LIMITED FIXED SELF-TENDER OFFERS

Changes in a security's float resulting from limited fixed self-tender offers that represent 5 percent or more of the security's holdings in the CRSP US Total Market Index, or the number of shares repurchased are valued at least $1B, will generally be implemented on one of the five trading days following the tender offer results announcement. If insufficient notice is provided and/or information is not available, the event will be implemented at the next regularly scheduled ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

Changes in a security's float resulting from limited fixed self-tender offers that represent less than 5 percent of the security's holdings in the CRSP US Total Market Index, and the number of shares repurchased are valued below $1B, will be implemented at the next quarterly ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

LIMITED EXTERNAL TENDER OFFERS

A drop in the target company's float shares stemming from a consummated limited external tender offer will generally be implemented on one of the five trading days following the tender offers' results announcement if the change in float represents 5 percent or more of the security's holdings in the CRSP US Total Market Index, or if the offer is valued over $1B. If insufficient notice is provided and/or information is not available, the event will be implemented at the next regularly scheduled ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action. Changes in a security's float resulting from limited external tender offers that represent less than 5 percent of the security's holdings in the CRSP US Total Market Index, and the offer is valued at less than $1B, will be implemented at the next quarterly ranking or upon the application of an intra-quarter non-capitalization-neutral corporate action.

BUYBACKS ON THE OPEN MARKET

A buyback on the open market is generally applied at the next ranking after the results are officially announced.

NEUTRAL CAPITAL STRUCTURE EVENTS

STOCK DIVIDENDS

A stock dividend is a distribution of additional shares of stock to existing stockholders. On the ex-date, total and float shares outstanding of the issuing security are increased by the stock dividend rate and index holdings are adjusted accordingly. In other words, a stock dividend is an increase in a company's total shares outstanding accompanied by a corresponding decrease in its price per share. Stock dividends have no net impact on the company's market capitalization.

STOCK DIVIDENDS OF ANOTHER SECURITY (ISSUE SPLIT)

If a company creates a new share class by distributing shares from an existing common equity class in a cap-neutral event, the new share class will be added to the distributing security's indexes at the rate of the distribution.

If the new security does not have when issued trading prior to the ex-date of the event, the newly listed line will be assigned a price based on the terms of the distribution. In most cases, the initial start of day price of the new issue will be the same as the closing price of the distributing security on the day before the effective date less the value of the distribution.

The company will be reevaluated after close of the ex-date and may change holdings and/or move to new indexes based on CRSP's banding and migration rules.

FORWARD AND REVERSE STOCK SPLITS

A forward stock split is an increase in a company's total shares outstanding accompanied by a corresponding decrease in its price per share. A reverse stock split is a decrease in a company's total shares accompanied by a corresponding increase in its price per share. On the ex-date, index holdings are increased or decreased by a split factor. Since the change in shares and stock price are proportional and offsetting, they have no net impact on a company's market capitalization and thus both forward and reverse stock splits as well as stock dividends are considered capitalization neutral corporate events.

SPECIAL CONSIDERATIONS FOR HALTED SECURITIES

If there is a security that is halted at the close of a trading day, and the halt is known before the day's final release, and that security is involved in an approved corporate action with a non-neutral index action reported for after close on that day, then any index actions tied to that corporate action will be postponed until the next trading day.

For purposes of this action, any time a scheduled closing auction for the security on its listing exchange is canceled on a trading day, that security is considered halted for that day. Prices used for the purpose of index valuation, or next day weighting, follow normal pricing rules.

Postponing an event is tied to the specific action:

- If the event is a reevaluation, the reevaluation is postponed, and the current state is maintained, either by continuing a delisted security or by continuing it as Received Stock.
- If the event is a Fast-Track IPO, the addition is postponed until the next open trading day.
- If the security is delisted due to a cash merger or an exchange action, the action is treated as a late notification, carrying forward the delisted security in the indexes until it can be valued.
- The application of Secondary Offerings or Partial Tender Offers, will be moved to the next open trading day.

SPECIAL CONSIDERATIONS FOR CONSTRAINED INDEXES

The processing of corporate actions and exchange listing changes are researched and applied consistently across all CRSP Market Indexes. When corporate events affect the constituents of a constrained index CRSP attempts to preserve the existing CLM. See Chapter 9: IRS RIC 25/50 Concentration Rules for background on constrained indexes and CLM. In some cases, a newly added security must be fitted into an existing constrained index.

- Secondary offering or share repurchase — the CLM is preserved and the newly trued up holdings are set to maintain the existing ratio of constrained to unconstrained holdings.
- Splits and reverse splits — the split rate is applied to existing holdings and the CLM is preserved.
- Received stock — if the shares are distributed from one parent security (source), such as in a spin-off, then the CLM is inherited from the source. If the shares originate from multiple sources, such as in a merger of equals or a spin-off with two parents, then the CLM is recomputed to preserve the ratio of constrained to unconstrained holdings.

$$\mathbf{CLM} = \Sigma_i\ (\mathbf{holdings}_i * \mathbf{rate}_i) / \Sigma_i\ (\mathbf{holdings}_i / \mathbf{CLM}_i * \mathbf{rate}_i)\ \textbf{for each input security i}$$

- Securities added to constrained indexes — a fast-track IPO, spin-off, or merger that creates a company in a different index relative to any of its parents will trigger a review of compliance.
  - Large Cap – If the index company cap of any of the new securities is greater than or equal to the breakpoint of the Large Cap index as of the last ranking, or if the index is a pro forma index, then the index is reoptimized to the Ranking Optimization Targets.
  - Small Cap – If all of the new securities have an index company cap less than the breakpoint of the US Large Cap Index as of the last ranking, and if the index is a primary index, then the new securities are fitted into the existing index. Fitting sets the CLM for a security to achieve a target weight, without impacting the holdings of the other constituents.
    - If the primary or pro forma index is already unconstrained, the new securities are added at their full weight.
    - If the primary index is constrained, and the pro forma is active, then the pro forma is reoptimized to Ranking Optimization Targets, and the new securities are fitted into the primary index based on their weights in the pro forma.
    - If the pro forma is inactive, then the new securities are fitted into the primary index based on the weights they would be assigned if the primary index was reoptimized to the Ranking Optimization Targets.
- Other reevaluated or trued-up securities – if resultant securities of a merger, spin-off, or similar action continue in the same constrained index, the CLM is preserved and applied to the new unconstrained holdings. If the security was added or updated via received stock, then the CLM applied at the time of the action will continue. If there is a reevaluation with no received stock required, then the CLM is calculated the same as if there was received stock.

COMPLIANCE DAYS

The IRS rules state that regulated investment companies are required to be compliant at their fiscal quarter-end. CRSP has set its compliance dates to the last trading day of March, June, September, and December. Compliance checks are completed by 2:30 p.m. ET on the trading day before the compliance day and are based on the trading day's start-of-day prices adjusted for the compliance day basis and projected compliance day index holdings. Checks are made against the Compliance Test Limits.

If an index is out of compliance, a modified holdings adjustment process is used. This process attempts to minimize turnover by using the Compliance Optimization Targets.

OPTIMIZATION FREEZES

Concentration tests, and an optimization or fitting, will be completed based on the events known two days prior the effective date of the optimization. Holdings changes projected on the day before the optimization are based on the concentration limit multipliers (CLMs) established on t - 2. However, if a significant holdings change (e.g., a large inflow or outflow of index capitalization) is announced on the day before the optimization is effective, the CLM freeze can be moved to 2:30 p.m. ET on the day before the optimization (i.e. t-1).

CHAPTER 9: IRS RIC 25/50 CONCENTRATION RULES

The Internal Revenue Service has established rules for a fund to qualify as a Regulated Investment Company (RIC). In other words, the IRS rules impose limits on the holdings of RICs. These rules state that at the end of each quarter of a RIC's tax year,

- No more than 25 percent of the value of the RIC's assets may be invested in a single issuer
- The sum of the weights of all issuers representing more than 5 percent of the fund's total assets should not exceed 50 percent

When necessary, a CRSP Market Index is constrained to allow a fund tracking the index to comply with the IRS' rules, by adjusting the weights of its constituents, with the following goals:

- Meet the diversification requirements
- Minimize the expected tracking error between the constrained index and an implied parent index with no constraints imposed
- Use buffers around the limits so that the typical movement of weights due to price movement and corporate actions do not initiate recurrent index rebalancing and the associated turnover
- Preserve the investability of the index by avoiding the assignment of index weights that represent an excessive stake in any one issuer

There are two types of operations on an index, a check for compliance and an optimization if the check fails. Each of these operations may have different limits based on the situation, described in the following terms:

1. Single Company Limit – the maximum weight that may be represented by a single issuer (e.g. 25%)
2. Large Company Limit – the maximum weight that may be represented by all issuers considered Large (e.g. 50%)
3. Large Company Threshold – the maximum weight of issuers not included in the Large Company Limit (e.g. 5%)

Optimization also allows control over the following variables:

1. Maximum Weight Ratio – the maximum ratio allowed of an issuer's constrained index weight relative to its unconstrained index weight (e.g. 10x)
2. Ideal Weight Target – either the unconstrained state or the current state. The current state utilizes the existing index constraints when optimizing.

A "least squares" approach is used to minimize expected tracking error between the alternate index and the ideal "unconstrained" index, while minimizing constituent deviations from the ideal weight target and obtaining compliance with the rule.

The first step in using a least squares approach is to calculate the constrained weights through a non-linear optimization that minimizes the squared difference between each company's ideal weight ($\overline{w}_i$), or the weight based on the security's holdings before the concentration constraint is applied, and its constrained weight (w_i).

$$\textbf{Minimum Least Squares} = \min \sum_{i=1}^{N} (\overline{w}_i - w_i)^2,$$

Where N is the number of companies in the index, subject to the following constraints:

The summation of all company weights within an index must equal a value of one:

$$\sum_{i=1}^{N} w_i = 1$$

The weight for a specific company must fall between zero and the Single Company Limit (25%):

$$\text{for all } i,\ 0 \le w_i \le \text{Single Company Limit}$$

The Maximum Weight Ratio for any company must be satisfied (10x):

$$\text{for all } i,\ \frac{w_i}{\overline{w}_i} \le \text{Maximum Weight Ratio}$$

The total weight of companies above the Large Company Threshold should not exceed the Large Company Limit (50%):

where w_i > Large Company Threshhold, $\Sigma w_i \leq$ Large Company Limit

The second step is to calculate the concentration limit multiplier (CLM) that is used to adjust index holdings at the security level. The CLM is defined as the ratio of shares in the constrained index to the shares in its unconstrained ideal index.

The CLM used for a company at reconstitution to meet compliance remains in effect until the next ranking period, unless there is a corporate action or index event that triggers a full index rebalance as detailed under the Quarterly Maintenance and Daily Maintenance sections. CRSP tests compliance on the ranking and compliance days. In addition, the pro forma indexes are verified for compliance daily during the pro forma period.

Standard combinations of the concentration parameters are used for known situations. These are denoted in the following tables:

These parameters are in effect for all indexes except Sector indexes:

Situation	(1) Single Company Limit	(2) Large Company Limit	(3) Large Company Threshold	(4) Maximum Weight Ratio	(5) Ideal Weight Target
Ranking Test	22.5%	45%	4.5%		
Ranking Optimization	22.5%	45%	4.5%	10x	Unconstrained
Ranking Test Contingency1*	23.25%	46.5%	4.5%		
Ranking Optimization Contingency1*	23.25%	46.5%	4.5%	10x	Unconstrained
Compliance Test	25%	50%	5%		
Compliance Optimization	24.5%	49%	4.75%	10x	Current

These parameters are in effect for Sector indexes:

Situation	(1) Single Company Limit	(2) Large Company Limit	(3) Large Company Threshold	(4) Maximum Weight Ratio	(5) Ideal Weight Target
Ranking Test	22.5%	45%	4.9%		
Ranking Optimization	22.5%	45%	4.9%	10x	Unconstrained
Ranking Test Contingency1*	23.25%	46.5%	4.9%		
Ranking Optimization Contingency1*	23.25%	46.5%	4.9%	10x	Unconstrained
Compliance Test	25%	50%	5%		
Compliance Optimization	24.5%	49%	4.95%	10x	Current

* - If it is not mathematically solvable to optimize an index due to the low number of companies and the wide range of input weights, a smaller buffer is used. If still unsolvable, a solution will be found by reducing the buffers further or by increasing the Maximum Weight Ratio. If it is still not possible to find a viable solution, the Index Management Committee will review whether the index should be modified or discontinued. See Chapter 10: Index Policies - Index Termination for more information.

CHAPTER 10: INDEX POLICIES

INDEX GOVERNANCE

CRSP is committed to the oversight and transparency of its index governance structure. In order to provide the effective review of its processes and procedures, CRSP employees, Chicago Booth faculty advisors, and representatives from the financial services industry serve on its governance committees. Committees will apply expert judgment in different roles to manage the index methodology and resolve any operational issues.

CRSP Market Indexes Governance Committees	
Index Advisory Council	Provides guidance with respect to the construction, methodology, and maintenance of the indexes. The council is consulted for input and advice to ensure the relevance of the CRSP Market Indexes, and to ensure that the indexes meet the needs of CRSP's clients.
CRSP Advisory Board	Provides technical advice on strategy, data, and index issues
Index Management Committee	Reviews and approves material changes to the index methodology, as well as all stages of the index determination process, to ensure that the integrity of all CRSP Market Indexes is maintained
Index Eligibility Committee	Evaluates securities whose eligibility is indeterminate after applying rules both at ranking and following the application of corporate actions
Index Operating Committee	Conducts ad hoc reviews of complex corporate actions and immediate operational issues

CRSP's Governance Committees may exercise discretion to deviate from or amend the published methodology and/or operational processes to mitigate various risks or possible market disruption. In such cases, CRSP, LLC will communicate such information simultaneously to all subscribers.

See Index Governance Committees - Terms of Reference for more details related to the different committees and their roles.

METHODOLOGY MANAGEMENT

CRSP actively reviews and maintains the methodology for all indexes. This includes the following types of adjustments

- Clarifications – a Clarification is a further explanation of an existing rule and how it is applied in a given situation, if that situation is not covered explicitly in the current methodology, or client questions indicate that the current definition is unclear or incomplete.
- Material Changes – a Material Change is a change to index construction, maintenance, or calculation rules that result in a different index action or outcome for the same situation with the same inputs.

Each year, or as determined by the Index Management Committee, the following steps are performed to review Index Methodology:

- A formal review of methodology is completed. This concerns the continued ability of indexes to satisfy their stated goals, based on the suitability of current rules to the current data environment.
- A review is done on Issues raised which question the current methodology and its application to the indexes, or its ability to handle new market conditions, new types of corporate events, or new reporting requirements. Each issue is categorized by a general methodology type.
    - Index Construction rules (Eligibility, Investability, Allocation, and Weighting)
    - Index Maintenance rules (Investable responses to corporate events)
    - Index Calculation rules (Confirmation that the system applies rules correctly, including statistics, placement, and calculations, with suitable methods to identify and mitigate exceptions).
- For each issue, a determination will be made whether the issue requires a clarification or review for possible material changes.
    - Any material changes identified above must be approved by the Index Management Committee. The Index Advisory Council must also approve a change to index construction rules.

- The Index Advisory Council may request a Consultation with stakeholders if the issue under consideration is of particular impact.
  - A consultation is formed as a communication to subscribers with background information and one or more proposals of new rule language.
  - Subscribers are asked to respond within a given time period stated in the communication.
  - Subscriber responses are not published outside of CRSP and no comments are made to those making the responses. They are collected and presented to the Index Advisory Council before a final decision is made on the original rule.
- All approved changes are scheduled and announced to stakeholders according to CRSP Market Indexes communication policies.

- The CRSP Market Indexes Methodology Guide will be updated to represent any accepted changes. The changes will be communicated according the CRSP Market Indexes announcement policies. An updated version of the guide, with significant changes highlighted in an Appendix, will be published before any new changes go into effect. The CRSP Market Indexes Methodology Guide will be updated at least once a year, and if no material changes that will be noted in the Appendix of the new guide.

Notifications of changes to Index Methodology will be sent to subscribers by email using a CRSP Market Indexes Notification email. See Chapter 10: Index Policies - Announcements for more information.

DATA SUFFICIENCY, DATA INPUT HIERARCHY, AND THE USE OF EXPERT JUDGMENT

To ensure the data used to construct the CRSP Market Indexes is accurate and reliable CRSP uses data from various regulated public marketplaces (e.g. NYSE, NYSE American, NYSE ARCA, NASDAQ, and Cboe Global Markets) sourced from numerous data vendors. Non-primary exchange data may be used when primary exchange data is not available. Prices and rates are based on indexes or values that have been established by the competitive forces of supply and demand. Corporate action terms are sourced from the company's primary listing exchange, company presentations, press releases, corporate filings, and/or a number of data vendors.

Expert judgment refers to the exercise of discretion by CRSP with respect to the use of the data utilized to derive our indexes. Expert judgment includes extrapolating information from prior or related transactions and adjusting values for factors that might influence the quality of data such as market events. To ensure that CRSP minimally exercises the use of expert judgment, in most cases, only data from the sources indicated above are utilized.

In the case where there is a discrepancy between our data vendors and a primary exchange notification, filing, or company press release, the exchange notification, filing, or company press release generally takes precedence. If further review is required, the decision (and the rationale for said decision) will be properly documented via the appropriate application (e.g. data reconciliation software, trouble ticket, or proprietary index application).

In the case where operational issues occur due to an unusual event or a software limitation, the Index Operating Committee (IOC) will review and decide the appropriate course of action. The IOC's decision and the rationale for the decision will be documented in the appropriate application (e.g. data reconciliation software, trouble ticket, or proprietary index application).

ANNOUNCEMENTS

CRSP will communicate announcements, and when necessary exceptions to our general policies and processes, to all index subscribers simultaneously, in addition to announcing concurrently to the public as appropriate.

- Methodology Changes
  - A summary of any material changes to the CRSP Market Indexes Methodology is reported to clients as a CRSP Market Indexes Notification via email at least 60 days before implementation.

- A clarification of high interest to subscribers may be issued outside of a methodology change to all subscribers via email.
- The updated Index Methodology Guide is published before implementation of the changes. Another notice is sent at the time the new guide is published.
- A consultation on the methodology will be communicated to subscribers via email. The notification will include the last day responses will be considered. Any changes to methodology due to a consultation will be included as part of the normal methodology notification process.

- Ranking Results
  - CRSP will release a list of new pro forma index constituents by FTP at a time scheduled as part of the previously announced ranking schedule.
  - All pro forma subscribers will receive pro forma files at the same time.
  - Any changes to pro forma indexes as part of the pro forma review process will be disseminated with the same methods as for daily constituent changes.
- Technical Notices
  - A summary of the index actions expected for major events, including spin-offs, split-offs, partial mergers, other complex mergers, and Large Cap fast-track IPOs may be disseminated. This is a supplement to the Index Changes reporting in files and on the CRSPMI Secure Website, and only provided when the event result is not already visible through normal Index Change reporting.
  - These are made available via the CRPSMI secure website when the results are confirmed. They may be updated if new information becomes available that changes the original anticipated result.
- Ranking Schedule and Adjustments
  - Ranking results are made available to index subscribers via the CRSPMI Secure Website at 7:00 a.m. ET (6:00 a.m. CT) on the first trading day following the ranking day (the first trading day after the first Friday of March, June, September, and December).
  - Pro forma files are made available to index subscribers via FTP at 7:00 p.m. ET (6:00 p.m. CT) on the Sunday following the ranking day (the first Sunday after the first Friday of March, June, September, and December).
  - Notice will generally be given two months prior to making a change to the ranking schedule.
  - The ranking schedule for the next year will be published on the public website and in the Methodology Guide before the current year completes.
  - Any changes made after an upcoming schedule is first published will be reported as a CRSP Market Indexes Notification. These will be released at least 60 days before the change is effective, unless the schedule change is due to external factors not known beforehand. In this case, the change will be reported within one business day of the decision.
- Important Technical System Information for subscribers
  - Major deployment of new software or IT systems.
  - Unexpected downtime of CRSPMI Secure Website or FTP.
- Daily Release Delays
  - A CRSP Market Indexes Notification email and a CRSPMI Secure Website alert will be made available if CRSP determines that end of day files will not be available within two hours of the scheduled release time.
  - A CRSPMI Secure Website alert will be made available if CRSP determines that any index changes release will not be available within 15 minutes of its scheduled release time.

- Data Review and Restatement
  - If a published result is questioned by a client or an internal process, communications may involve the following:
    - Report of Review
      - CRSPMI Secure Website alert
      - CRSP Market Indexes Notification Email sent to all clients
    - Report of Findings and Plan of Correction if needed
    - Report of Completion if restatement is available
      - Email sent to clients as soon as possible once data is available

INDEX TERMINATION

If an Index termination is proposed due to market structure change, product definition change, or any other condition, which makes the Index no longer representative of its intended Interest, the Index Management Committee must review the proposal and approve the termination. See Index Governance Committees - Terms of Reference.

- Best efforts will be made to find a suitable alternative Index before an index is terminated, if appropriate.
- The Index Management Committee will define the criteria to guide the selection of an alternative Index and consider the practicality of maintaining parallel Indexes, unless the termination was due to the unavailability of requisite data. A likely solution where there is no longer investment Interest in the Index would be to continue to calculate the Index on a daily research basis, but to discontinue real-time calculation and dissemination.
- The Index Advisory Council will be consulted, as appropriate, for guidance in the selection of an alternative Index and the actions around the termination.
- Any persons or entities who manage financial instruments or is benchmarked to the CRSP Market Indexes will be notified, via email, of the Index termination at least (90) days prior to the proposed termination date wherever possible.

UNEXPECTED SITUATIONS

If there is an unexpected external situation, CRSP will attempt to maximize the investability, minimize the index impact, and provide as much continuity as possible for the indexes. In any of the following cases, a CRSP Market Indexes Notification will be delivered to subscribers by email and as a CRSPMI Secure Website alert as soon as the situation is known and a response is planned, and each time new information becomes available.

EXCHANGE CLOSURES

- Full Day Closures
  - If all CRSP exchanges of interest close due to unforeseen circumstances, CRSP will not produce index results for that day. Instead, the index levels will continue from the last complete day of trading.
  - If the closing is known at least one day in advance, corporate actions originally declared effective after the close of the "closed" day would be made effective after the close of the day that markets reopen. Index holdings will be carried forward from the end of the day prior to the closed date. Scheduled index notifications will be announced on the trading day before the closing.
  - All corporate actions declared effective on a closed day or the first day after reopening that impact the CRSP security universe will be re-dated to the day after trading resumes. Changes to index holdings will take place after the close of the day trading resumes. If there is an unexpected market closure during the transition period, the transition period will be extended accordingly.

- Unplanned Early Closures
  - If all CRSP exchanges of interest close for the day before their scheduled time due to circuit breaker limits or other exceptional circumstances after valid trading for the day has started, then CRSP will report index levels for the day based on the trades reported up to the time the exchanges closed. If there is limited notice so that normal end of day trading processes are not followed, then CRSP will postpone until the next open trading day, any index actions that were scheduled to be effective after the close of the early closure day.
- Abbreviated Trading Schedules
  - If all CRSP exchanges of interest announce an abbreviated trading schedule before the normal scheduled market open for a day, CRSP will attempt to follow standard rules for processing corporate actions and reporting results. The same number of releases and the same files will be created, but the timing of each may be revised to fit the situation. CRSP will announce any updated times of releases as soon as possible.
- Individual Exchange Closures
  - If one or more, but not all, CRSP Exchanges of interest close for a day, close early, or run on an abbreviated trading schedule, CRSP will follow normal schedules, but may adjust pricing rules for securities listed on the "closed" exchange(s). If there are consolidated trading prices available significantly after the primary listing prices are closed/frozen, then consolidated trading prices will be used to compute CRSP's closing index levels and returns.

DATA OR PRODUCTION ISSUES

- Data review and Restatement
  - CRSP makes every effort to maintain its high standards of data quality and strives to be transparent and consistent when addressing errors or inaccuracies in the information disseminated to its clients. Errors or inaccuracies may occur for a variety of reasons, including but not limited to: incorrect or late data, misinterpreted corporate actions, or market distortions.
  - If an error is found in a CRSP Market Index that causes an incorrect index level, constituent list, or file, CRSP will follow the guidelines described in Appendix F: CRSP Market Indexes Restatement Policy.
- External data delays or errors
  - If prices are unavailable or known to be incorrect due to an exchange issue, CRSP will wait for correct data if possible, based on communications from the exchange. The Index Operating Committee will determine whether those communications indicate a long-term issue that requires a fallback to an exchange closure rule. Notifications will be sent by email to the subscriber email list, and posted on the CRSPMI Secure Website, as information and estimates are known.
- Internal production issues
  - CRSP has multiple levels of redundancy in the index systems, software, and data. However, if index releases are delayed due to an internal system or software issue, a CRSP Market Indexes Notification alert describing the issue and impact is sent by email to a subscriber email list, and posted as an alert. Updated notifications will be sent as new estimates are known, or progress is made, towards a resumption of normal processing.
- Disruption or failure in critical infrastructure
  - CRSP has escalation protocols and business continuity procedures in place to minimize disruptions to critical business functions, in the event of a business interruption, and disaster recovery plans to ensure equipment needed for critical business functions can be restored to normal or near-normal operations as quickly as possible. If CRSP is unable to run the CRSP Market Indexes operation, a third party will take over the production of the CRSP Market Indexes, until CRSP is able to resume normal operations.

CHAPTER 11: GLOSSARY OF TERMS & DEFINITIONS

Terms	Definition
Bands	Capitalization Bands: Percentage thresholds straddling each capitalization-based breakpoint. Style Bands: Percentage thresholds straddling the value/growth breakpoint. Bands are considered when reevaluating a company's index placement in terms of a company's capitalization or style.
Base Index	An index within an Index Sub-Family that is not subdivided further. A Base Index does not overlap allocation of securities with another Base Index of the same Index Sub-Family. Index allocation includes any packeting if allocation can be shared in the Index Sub-Family. For example, Mid Cap and Small Cap indexes are Base Indexes, even though a security can be shared with 50% allocation in each. If they allowed 100% allocation in each they cannot both be Base Indexes.
Capitalization-Based Indexes	Indexes developed to represent capitalization-based (size-specific) characteristics of companies.
Capitalization-Neutral Corporate Action	A corporate action that does not change the capital structure of the company is considered capitalization-neutral. Examples include stock dividends and stock splits.
Cash Dividend	An event in which shareholders receive cash for each share held (payments are typically scheduled at regular intervals).
Compliance Check	Determines whether an index satisfies the IRS's 25/50 portfolio diversification/concentration rules.
Compliance Days	The last trading day of March, June, September, and December. Dates where an index must comply with the IRS's (25/50) portfolio diversification/concentration rules.
Compliance Rebalance	An action that resets the holdings of index constituents using CRSP's concentration optimization rules. All of the securities in the index may be adjusted. Also known as a compliance re-optimization.
Composite Index	An index within an Index Sub-Family that has constituents that are an aggregate of the constituents of two or more Base Indexes. The allocation of a security in the Composite index is the sum of the allocations, including any packets, of the security in the Base Index components.
Concentration Fitting	An action that applies a concentration adjustment to new securities added to a constrained index. In a fitting, the target weights of the new securities are found as if the entire index was rebalanced, but holdings of already existing securities are not affected.
Concentration Multiplier (CLM)	Shows the ratio between the holdings of this security within this index and what the holdings would be if the index was unconstrained by IRS RIC 25/50 concentration rules. It is set to 1 if the index is not constrained or the security is not constrained within the index.
Consolidation	A corporate action where a company combines multiple share classes of stock into one class. A consolidation behaves like a merger but is neutral at the company capitalization level.
Conversion	A corporate action where a company exchanges one of its securities for another type of security.
Constrained Index	An index where the holdings of one or more constituents are adjusted to satisfy IRS's portfolio diversification/concentration rules. At least one security in the index has a concentration limit multiplier (CLM) not equal to one.
Corporate Action	An event initiated by a company that impacts its shareholders. Examples include cash dividends, distributions, mergers, spin-offs, stock buybacks, and stock splits.
CRSP Exchange of Interest	NYSE, NYSE American, NYSE ARCA, NASDAQ, and Cboe BZX.
De-SPAC	A merger between a Blank Check Company (SPAC) and a private operating company resulting in the creation of a new corporation (C-corp).
Effective Float Factor (EFF)	A security's float factor (FSO/TSO) rounded to the nearest 5 percent at the last ranking or the last time a corporate action caused an index holdings review.
Effective TSO	A security's TSO at the last ranking or the last time a corporate action initiated an index holdings review. A neutral corporate action applies the rate to the previous Effective TSO while other actions use the TSO known at the time of the action.

Terms	Definition
Employee Identification Number (EIN)	A unique nine-digit number assigned by the IRS to business entities operating in the United States. An Employer Identification Number (EIN) is also known as a Federal Tax Identification Number, and is used to identify business entities.
End-of-Day Price	The price used for a security by an index for end-of-day calculations. The End-of-Day Price applies CRSP's price methodology to derive a value based on the available data.
Enhanced ICB	A revision to the Industrial Classification Benchmark (ICB) standard introduced in 2020.
ESG	Methods to score and categorize companies using a combination of Environmental, Social, and Governance criteria.
Exchange/Conversion	A mandatory swapping of one security for another type/class of security of the same company. For example, when preferred stock is converted to common stock or one class of security is exchanged for another class.
Ex-Distributed Trading	A period of conditional trading with deferred settlement, when a security is traded without post-event rights before an event is effective. During this time of conditional trading the parent security is trading regular way in its pre-event state.
Fast-Track IPO	A newly listed company that passes specific company capitalization and investability thresholds, added to an index prior to ranking.
Final Transition Day/ Reconstitution Day	The last day of the pro forma period. The ranking process is complete and the indexes are converted to the projected holdings established on the ranking day.
Float Factor	The ratio of float shares outstanding (FSO) to total shares outstanding (TSO), expressed as a percentage.
Float Shares Outstanding (FSO)	The number of shares of a security outstanding that are freely available for trading by the public.
Forward Stock Split	An increase in a company's total shares outstanding (TSO) accompanied by a corresponding decrease in its price per share.
Free Float	A metric that describes the number of shares of a security available to the investing public for trading. It is quantified as a number of shares as Float Shares Outstanding (FSO) or Float for index purposes.
Halted Security	A security that is not open for trading at some point during the trading day due to an action by its listing exchange. For purposes of index methodology, only the subset of cases where the security traded at some time after market open but was halted at market close are of interest. Any security where a scheduled closing auction is not held by its listing exchange is considered halted on that day.
Holdings	The number of shares of a security held in an Index. Holdings are calculated according to weighting rules for the index and incorporate all inputs and multipliers into a single value that can be used to derive the weight of the security within the index.
ICE Entity Sector	The top tier of the Uniform Entity Sector classification schema. It is a two-letter code that describes the industry sectors.
ICE Uniform Entity Sector (UES®)	A five-tiered classification system that allocates companies to the industry sector whose definition closely describes the nature of its business.
Index Capitalization	A security's capitalization within an index, equal to the security's index holdings multiplied by its price.
Index Company Capitalization	A company's capitalization within an index, equal to the sum of the Index Capitalization of all of the company's securities in an index.
Index Family	A group of common indexes. This can be a set of indexes that use similar scoring methods to subdivide other indexes into new constituents, a set of indexes that use similar methods to weight constituents, or a set of indexes that use similar methods to measure performance.
Index Sub-Family	A set of indexes that fully divide the constituents of an underlying index into segments based on a common scoring or categorization method. These may include composite segments built by combining one or more indivisible segments, for example Large Cap = Mega Cap + Mid Cap.
Industry Balanced	A method of constructing an index by first dividing candidates by sector, then partitioning each sector into defined groups through common scoring methods, and then recombining the common groups found within each sector into a single index.
Industry Classification Benchmark (ICB)	A classification system that allocates companies to the industry sector whose definition closely describes the nature of its business. The classification is derived from the source of the company's revenue or the source of the majority of its revenue.

Terms	Definition
Investability	Characteristics of a security in terms of liquidity, defined by CRSP's investability rules.
ISS ESG Corporate Rating	An industry specific forward-looking ESG assessment of an individual company in an industry. See https://www.issgovernance.com/esg/ratings/ for ISS definitions.
ISS ESG Prime Indicator	A flag set by ISS for a company based on whether its ISS ESG Performance Score is at least 50. If a company meets the minimum threshold it is designated as Prime, and if not it is designated as Non-Prime. See https://www.issgovernance.com/esg/ratings/ for ISS definitions.
ISS ESG Performance Score	An ESG metric assigned by ISS based on its ISS ESG Corporate Rating, allowing direct comparisons of companies in different industries. ISS Performance Score is a numeric value between 0 and 100. See https://www.issgovernance.com/esg/ratings/ for ISS definitions.
Issue Split	A corporate action where a company creates a new share class by distributing shares from existing share class(s). Issue splits are neutral at the company capitalization level. An Issue Split can also be described as a Stock Dividend of a new security.
Lockup Period	Typically 180 calendar days, starting on an IPOs pricing day or a De-SPAC merger's closing date, where certain investors have agreed not to sell their ownership stake in the newly listed company.
Market Capitalization	The total market value of a company's capitalization-eligible share classes.
Market Impact	The extent to which the buying or selling of a security moves its price.
Master Index	An index that is subdivided into multiple other indexes by applying further construction factors and rules on its constituents. Master Indexes can be nested, so that an index created as a subdivision of a Master index can itself be subdivided. In this case the largest superset of the security universe using the same eligibility and data summary rules is the Master Index and other levels are considered Seed Indexes. For example, the CRSP US Total Market Index is a Master Index, and the CRSP US Small Cap Index is the Seed Index to the CRSP US Small Cap Value Growth Index Sub-Family.
Merger/Acquisition	An event in which two or more companies are combined into one.
Merger of Equals	A corporate event that occurs when two companies of about the same size merge. In general, shareholders of both companies surrender their holdings for shares of the new company.
Migration	A security's movement between indexes of an index family after reevaluation or ranking, applying CRSP's packeting and migration rules for the family.
Multipliers	Multipliers quantify the allocation of securities shared among members of an index family, such as size (BHM) and style (SSM). Multipliers also show the ratio of holdings in indexes constrained to satisfy the IRS's portfolio diversification rules to their initial unconstrained holdings (CLM).
Non-Capitalization Neutral Corporate Action	A corporate action that changes the capital structure of the company. Examples include mergers, spin-offs, and secondary offerings.
Nontransferable	A security, property or right that cannot be traded/bought/sold, only converted, redeemed, or exercised per the rules set by the issuing company.
Opening Settlement Value (OSV)	An opening level for an index, calculated by using the opening value of each component on each trading day, regardless of when each component opens, instead of its closing value.
Packet	The minimum change in allocation allowed by migration rules for the index. In general, 50 percent of a company's index holdings.
Packeting	The process of gradually migrating companies to or from specific indexes.
Partial Merger	A corporate action where a company spins off assets (typically a specific business segment) and immediately merges those assets with another company. New shares of the child company are issued by the parent company resulting in a reduction in the parent company's capitalization. Partial Mergers are typically implemented as a mandatory or voluntary exchange. If voluntary, the transaction is structured as an Exchange Offer. Shareholders of the parent company have the right, but not the obligation to tender their shares for shares of the child company.
Passive Foreign Investment Company (PFIC)	In general, a foreign corporation is considered to be a PFIC for any taxable year if at least 75% of its gross income is passive income or at least 50% of the value of its assets (based on an average of the quarterly values of the assets during a taxable year) is attributable to assets that produce or are held for the production of passive income.

Terms	Definition
Pending Payment Security	A placeholder for payouts of a corporate action that cannot be determined on the day when the rights to the action are known. The payouts are grouped into a package that is treated as a standalone security that can be an index constituent that exists until all payout components are known. There are no trading instruments, as any prices are derived from rules based on the original action type and data of underlying securities as defined by those rules. Pending Payment securities can be created of different types based on specific corporate action types.
PERMNO®	PERMNO® is a proprietary reference key for all securities data maintained by CRSP. PERMNOs are permanent, unique identifiers for all US-listed equities, consistent over the life of each security.
Price/Market Impact	The correlation between the execution of an order to buy or sell a security and the subsequent price move.
Primary Index	The current (standard) index as opposed to the pro forma index.
Pro forma Adjustment Period	Generally, the first week of the pro forma period during which CRSP reviews inquiries related to the newly created pro forma indexes.
Pro forma Period	The period of time between the ranking and reconstitution dates, currently 12 trading days.
Pro forma Index	The projected composition of the post-transition (rebalanced) CRSP Market Indexes established on each quarterly ranking date. On the final transition day, the pro forma index becomes the primary index for the upcoming quarter.
Qualifying Index	An index containing companies that meet specified criteria established within an index sub-family.
Ranking	The quarterly review of CRSPs index constituents. CRSP's ranking dates are effective after the close of the first Friday of March, June, September, and December.
Rebalance	Another term used to describe the reconstitution process.
Received Stock	Received Stock is a neutral distribution of stock of another security. New holdings of the distributed security are added to the indexes of the distributing security using the rate of the distribution multiplied by the initial holdings of the distributing security. The added holdings either add the security to the index or add to existing holdings of a security already in an index. All spin-offs make use of received stock, on the ex-date. Mergers may require received stock when the distributed security trades before a subsequent reevaluation is done.
Received Stock Multiplier (RSM)	Shows the ratio between the holdings and what they would be if the security was trued up using the Effective TSO and multipliers. It is set to 1 unless there is a corporate action or index action that operates on index holdings without a true up or reevaluation, such as stock received in a security payout or movement due to transitional reconstitution.
Reconstitution Day	Another term used to describe the final transition day.
Reevaluation	The intra-quarter application of CRSP's index methodology. Examples include index eligibility, investability, and market capitalization rules. Companies are typically reevaluated after a significant corporate event such as a spin-off or merger.
Regular-way Trading	A type of trade that is settled through the regular settlement cycle (two days after the trade date (T+2)).
Remainder Index	An index containing companies that do not meet criteria established within an index sub-family.
Reverse Merger	A merger in which the surviving entity (typically a foreign or private company) originates from outside of CRSP's security universe.
Reverse Stock Split	A decrease in a company's total shares outstanding (TSO) accompanied by a corresponding increase in its price per share.
Rights Distribution	An event in which current shareholders are offered the option to buy, within a certain period of time, a specified number of additional shares from the company at a specific price, typically below the current market price.
Rights Ratio	The entitlement representing the number of rights received per share held of the underlying security.
Secondary Exchange	Stock exchanges excluding NYSE, NYSE American, NYSE ARCA, NASDAQ, and Cboe BZX. Examples include Pink Sheets, foreign exchanges, or small, regional exchanges.
Secondary Offering	An event where a company or stagnant shareholder sells shares to the public after the company's initial public offering.
Sector Indexes	Indexes developed to represent industry sector-specific characteristics of companies. For example, the financial or oil & gas industry.

Terms	Definition
Shares Freeze Date	The date that a company's reported shares are struck for ranking. The shares of a new security that starts after the Shares Freeze Date are struck on its first trade date. Reported shares may be adjusted if there is a corporate action effective after the shares are initially struck. The Shares Freeze Date is generally set five trading days before the Friday of ranking.
Size Multiplier (BHM)	Allocation within a Market Cap index, or an index inherited from a Market Cap index. Set to 1 if not defined for an index.
Spin-off	The creation of an independent company through the distribution of new shares of an existing business or division/subsidiary.
Split Factor	The ratio of the number of new shares received relative to old shares held, typically associated with a stock split or stock dividend.
Split-off	A split-off is initiated when a company distributes shares it holds of another company. The post event parent's capitalization is reduced. The child's capitalization typically remains unchanged. The corporate action can be implemented as a mandatory or voluntary event. If the action is voluntary, the transaction is structured as an exchange offer. Shareholders of the parent company have the right but not the obligation to tender their shares in exchange for the shares of the child company.
Start-of-Day Price	The previous day end-of-day (closing) price of a security adjusted for all splits and non-ordinary distributions, such as special dividends, rights distributions, or spin-offs.
Stock/Cash Election	A special dividend that allows the shareholder to elect to receive cash and/or stock with the proration struck after the ex-date.
Stock Dividend	A distribution of additional shares of stock to existing stockholders. Otherwise known as a forward stock split.
Style Indexes	Indexes developed to represent the value or growth characteristics of companies, as defined by CRSP's multifactor style model.
Style Multiplier (SSM)	Allocation within a Style index. Set to 1 if not defined for an index.
Subscription Ratio	The number of shares of the underlying security that can be purchased per right held.
Suspended Security	A security that is not open for trading for an entire trading day due to an action by its listing exchange.
Tender Offer	An external or internal offer made directly to a firm's shareholders to buy their stock at a specified price. Offers are typically made at a premium relative to the current market price.
Total Shares Outstanding (TSO)	All of the shares of a specific class of a company's equity securities that are issued and outstanding.
Transition Day	One of the five trading days during the transition period when holdings are partially moved from the primary (standard) index to the target pro forma index.
Transitional Reconstitution	The incremental process of moving holdings from the primary index to the pro forma index during the five-day transition period.
When-distributed Trading	A period of conditional trading with deferred settlement, on shares of a security affected by an offer awaiting the final allotment of shares to stakeholders. Prior to the effective date of the distribution, there will typically be two markets a "regular-way" and a "when-distributed" market.
True-up	An update of index holdings utilizing the latest share information. When a company's holdings are "trued-up" the effective float factor (EFF) is recalculated by dividing the FSO by the TSO rounded to the nearest 5 percent. Holdings are then set to the TSO multiplied by the updated EFF and other relevant index multipliers.
Unconstrained Index	An index that is either not enforcing IRS RIC 25/50 rules, or no adjustment is needed to satisfy those rules.
Unconstrained Weight	The weight that would be assigned to a security in an index if there were no IRS RIC 25/50 rules enforced.
Unit Split	A corporate action where securities previously trading as a package (unit) begin trading independently. A unit split typically occurs when one of the unit's component securities are called or expire.
Untradeable Security	A security that cannot be traded on a trading day where its listing exchange is open, either because it is suspended by its listing exchange, it is halted by its listing exchange at the end of the trading day, or it is delisted from its prior listing exchange and not yet valued. A Pending Payment security or other synthetic index constituent placeholder is also considered untradeable on all days it is active.
When-issued Trading	A period of conditional trading of a new security with deferred settlement. When-issued securities typically trade regular way on the effective date of the corporate event.
Winsorize	A method of limiting extreme values in statistical data to reduce the effect of possibly spurious outliers.

APPENDIX A: INDEX FORMULAS

INDEX LEVEL

Index Level is the value of an investment relative to its value at one fixed point in time. Index Levels allow for the convenient comparison of the relative performance of the different portfolios or asset classes. For the CRSP Market Indexes initial levels were set to 1,000. See Appendix B: CRSPMI Quick Reference Summary for a list of inception dates for all of the CRSP Market Indexes.

INDEX LEVELS – PRICE ONLY

$$\text{Index Level}_t = \frac{\text{Index Market Value}_t}{\text{Divisor}_t}$$

INDEX LEVELS INCLUDING DIVIDENDS (TOTAL RETURNS INDEX)

$$\text{Index Level TR}_t = \text{Index Level TR}_{t-1}\left(\frac{\text{Index Level}_t + \text{Dividend Points}_t}{\text{Index Level}_{t-1}}\right)$$

where

$$\text{Dividend Points}_t = \frac{\text{Dividend Amount}_t}{\text{Divisor}_t}$$

DIVISOR

$$\text{Divisor}_{initial} = \frac{\text{Index Market Value at Inception}}{1{,}000}$$

$$\text{Divisor}_t = \text{Divisor}_{t-1}\left(\frac{\text{SOD Index Market Value}_t}{\text{EOD Index Market Value}_{t-1}}\right)$$

INDEX RETURNS

INDEX RETURNS – PRICE ONLY

$$\text{Index Return}_t = \left(\frac{\text{Index Level}_t}{\text{Index Level}_{t-1}}\right) - 1$$

INDEX RETURNS INCLUDING DIVIDENDS (TOTAL RETURN)

$$\text{Index Return TR}_t = \left(\frac{\text{Index Level TR}_t}{\text{Index Level TR}_{t-1}}\right) - 1$$

INDEX HOLDINGS

Holdings, or Index Shares, are used to weight constituents within an index. Holdings are derived from allocation multipliers, weights, and other adjustments defined for each index.

$$\text{Holdings} = \frac{\text{Effective TSO} * \text{Effective Float Factor}}{100 * \text{Size Multiplier} * \text{Style Multiplier} * \text{Concentration Multiplier} * \text{Received Stock Multiplier}}$$

Where:

- Effective TSO – a security's TSO at the last ranking or the last time a corporate action initiated an index holdings review. A neutral corporate action applies the rate to the previous Effective TSO while other actions use the TSO known at the time of the action.
- Effective Float Factor – a security's float factor (FSO/TSO) rounded to the nearest 5 percent at the last ranking or the last time a corporate action caused an index holdings review, reported as a percentage.
- Size Multiplier – allocation within a Market Cap index, or an index inherited from a Market Cap index. Set to 1 if not defined for an index.
- Style Multiplier – allocation within a Style index. Set to 1 if not defined for an index.
- Concentration Multiplier – Shows the ratio between the holdings of this security within this index and what the holdings would be if the index was unconstrained by IRS RIC 25/50 concentration rules. It is set to 1 if the index is not constrained or the security is not constrained within the index.
- Received Stock Multiplier – Shows the ratio between the holdings and what they would be if the security was trued up using the Effective TSO and multipliers. It is set to 1 unless there is a corporate action or index action that operates on index holdings without a true up or reevaluation, such as stock received in a security payout or movement due to transitional reconstitution.

Effective TSO * Effective Float Factor / 100 is rounded to the nearest integer before applying multipliers. The final value is rounded to two decimal places.

INDEX MARKET CAP AND WEIGHT

Index Market Cap for each constituent = Holdings * Start of Day Price, rounded to two decimal places.

Index Weight for each constituent is equal to its Index Market Cap divided by the sum of Index Market Caps for all constituents.

SECURITY RETURNS

The return on a security is equal to the change in the total value of the initial investment over a period of time divided by the amount of the initial investment. A total return takes into account all distributions to shareholders and the reinvestment of cash dividends. Dividends are assumed to be reinvested at the end of the day on the ex-date. A price return, on the other hand, excludes ordinary cash dividends from the return calculation.

Security total returns are calculated according to the following equation:

$$r(t) = \left(\frac{p(t) + n(t) + d(t)}{p(t')} \right) - 1$$

Where:

r(t) = return based on purchase at t' and sale at t

p(t) = end-of-day price

d(t) = dividend amount for t (Total Return only)

n(t) = value of non-ordinary payments not available for start-of-day adjustment

p(t') = start-of-day price on day t

SECURITY START-OF-DAY PRICE

Start-of-day prices are derived by applying all known distribution values and split factors to the previous end-of-day price according to the formula below:

$$p(t') = \left(\frac{p(t-1)}{f(t)}\right) - v(t)$$

Where:

$p(t')$ = start-of-day price on day t

$p(t-1)$ = end-of-day price (closing) on previous trading day

$f(t)$ = split factor applicable on day t

$v(t)$ = value of non-ordinary (split adjusted) payments available for start-of-day adjustment (e.g. special dividends)

If a new security is created by a Merger, Conversion, or similar corporate action, its start-of-day price on the effective date of the corporate action is derived from the price of the securities that the investor held before the event. For each held security that was exchanged for the new security, the derived start-of-day price is calculated as:

New Security derived Start-of-Day Price = (Held Security Start-of-Day Price – Any Cash Distributed) / Ratio of Shares of New Security per each share of Held Security

If more than one held security applies for the new security, the price is set using the result for the held security with the highest security capitalization contribution, calculated as the total shares outstanding multiplied by the quantity of the start-of-day price minus any cash distributed.

TURNOVER

Turnover is a measurement of the overnight activity needed to maintain a weighted holdings match to an index, based on a fixed investment amount. The weight of a security is the ratio of the market value held to the total market value of the index. CRSP calculates daily index turnover number. Annual turnover is calculated as the summation of daily turnover:

$$\textbf{CRSP Market Index Daily Turnover}_t = \frac{\sum_{i=1}^{N} |w_{i,t} - w_{i,t-1}|}{2}$$

where $w_{i,t}$ is the start of day weight for security i in the index and $w_{i,t-1}$ is the end of day weight for security i on day t-1. And N is the number of securities in the index.

Thus,

$$\textbf{CRSP Market Index Annual Turnover} = \sum_{t=1}^{T} \textbf{CRSP Market Index Daily turnover}_t$$

where T is the total number of trading days in the calendar year.

Since there is no money inflow/outflow, for indexes, the total sales will always equal the total purchases. Thus, the total weight change due to sales will always equal to the total weight change due to purchases.

OPENING SETTLEMENT VALUES

Opening Settlement Value index series are maintained for selected indexes. Instead of the end of day price used in the base indexes, the Opening Settlement Value (OSV) series uses the opening price of each constituent.

The opening price of each index constituent used in the calculation is determined as follows:

1. Use the Official Opening price from the listing exchange.
2. If there are no trades, use the security Start-of-Day Price. See Appendix B for its calculation.

The Index Open Market Value of index i made up s securities is:

$$\text{IOMV(i)} = \sum \text{(open price(s) * index shares(s,i))}$$

Where open price is defined as above.

The OSV of each Price return index i is calculated as:

$$\text{OSV(i)} = \left(\frac{\text{IOMV(i)}}{\text{Index Divisor (i)}} \right)$$

The calculation of OSV for Total Return indexes (OSVTR) is a function of the dividend points as well as the start-of-day index levels of the total return index and its underlying base index. The calculation for OSV of total return index i with the base index ib is as follows:

$$\text{OSVTR(i)} = \text{SOD Index Level (i)} \left(\frac{\text{OSV(ib)} + \text{Dividend Points(i)}}{\text{SOD Index level (ib)}} \right)$$

ADDITIONAL INDEX CALCULATIONS

CRSP calculates additional daily index statistics, which may be obtained upon request. A partial listing of additional statistics is provided below:

Daily Index Statistic	Description
Total return	The return on an index, including all distributions.
Capital appreciation return	The return on an index, excluding ordinary dividends.
Income return	The return on ordinary dividends in an index.
Total return index level	The value of an index, including all distributions, relative to its value at inception.
Income return index level	The total return index level minus the capital appreciation return index level.
Count of securities in the index	The total number of securities in an index on the selected trading date. Securities are counted as one regardless of their packeting allocation.
End-of-day market value	The End-of-day total index capitalization of all index constituents (in thousands of dollars).
Start-of-day market value	The Start-of-day total index capitalization of all index constituents (in thousands of dollars).
Concentration ratio – one	Weight of the largest company in the portfolio at the start-of-day.
Concentration ratio – ten	Sum of the weights of the largest ten companies in the portfolio at the start-of-day.
Concentration ratio – large	Sum of the weights of the companies in the portfolio with a weight over 5% at the start-of-day.
Herfindahl-Hirschman Index	The sum of the squares of the market share percentages of all the individual components in an index computed using beginning of period market caps.
Aggregate Dollar Trading Volume	∑(end of day price × daily number of traded shares for all securities in an index)

PRICE ADJUSTMENT TABLE

Action:	Description:	Price adjustment:
Special Dividend	A non-recurring distribution of a company's assets, usually in the form of cash to shareholders.	Adjusted price = previous day closing price - special dividend cash amount.
Stock Dividend	A dividend payment made in the form of additional shares rather than cash	Adjusted price = previous day closing price / (1+stock div ratio)
Stock Split	The increase in a company's number of outstanding shares of stock with an equally offsetting reduction in its price. This event has no impact on the company's market capitalization.	Adjusted price = previous day closing price / split ratio
Reverse Stock split	The decrease in a company's number of outstanding shares of stock with an equal and offsetting increase in its price. This event has no impact on the company's market capitalization.	Adjusted price = previous day closing price / split ratio
Spin-off (when-issued trading available before the ex-date)	The creation of an independent company through the sale or distribution of new shares of an existing business/division of a parent company. A spinoff is a type of divestiture.	Parent company's adjusted SOD price on the ex-date = parent company's closing price on the day before the ex-date – spun off company's closing WI price on the day before the ex-date * spin-off ratio
Rights Offering	Rights issuance to the existing shareholders of a company allowing them to buy a number of additional shares at a given price (usually a discount) within a fixed period of time.	If the rights trade when-issued on the day before the ex-date, the price of the right on that day will be used to adjust the parent's price. If the rights do not trade and the rights are in-the-money, the fair market value formula is used to adjust the parent's price.
Stock Distribution	One security (A) distributes shares of another existing security (B).	Adjusted price (A) = previous day closing price (A) - closing price of (B) * distribution ratio

APPENDIX B: CRSP MARKET INDEXES QUICK REFERENCE SUMMARY

CRSP MARKET CAP, VALUE AND GROWTH INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg FIGI
Total Market	CRSP US Total Market Index (TR)	CRSPTMT	12628H109	12/31/2012	4/1/2011	BBG003PZ7F43
	CRSP US Total Market Index (PR)	CRSPTM1	12628G101	4/1/2011	4/1/2011	BBG001DQ7123
Total Market AUD Hedged	CRSP US Total Market Index (AUD-hedged) (TR)	CRSPTAHT	12633D200	7/1/2015	–	BBG009J9GN20
	CRSP US Total Market Index (AUD-hedged) (PR)	CRSPTAH1	12633D101	7/1/2015	–	BBG009J9GN11
Total Market AUD Non-Hedged	CRSP US Total Market Total Return Index AUD (TR)	CRSPTMAT	12633D408	7/1/2015	–	BBG009J9GN48
	CRSP US Total Market Total Return Index AUD (PR)	CRSPTMA1	12633D309	7/1/2015	–	BBG009J9GN39
Total Market CAD Hedged	CRSP US Total Market Index (CAD-hedged) (TR)	CRSPTCHT	12630Y108	12/31/2012	–	BBG003PZ7F52
	CRSP US Total Market Index(CAD-hedged) (PR)	CRSPTCH1	12628G200	12/31/2012	–	BBG003PZ7F34
Total Market CAD Non-Hedged	CRSP US Total Market Total Return Index CAD (TR)	CRSPTMCT	12632P204	4/15/2013	–	BBG004MFW5W1
	CRSP US Total Market Index CAD (PR)	CRSPTMC1	12632M201	4/15/2013	–	BBG004MFW5V2
Mega Cap	CRSP US Mega Cap Index (TR)	CRSPMET	12631H104	12/31/2012	4/1/2011	BBG003PZ7F61
	CRSP US Mega Cap Index (PR)	CRSPME1	12627R108	8/15/2011	4/1/2011	BBG001YCYN69
Mega Cap Value	CRSP US Mega Cap Value Index (TR)	CRSPMEVT	12631L105	12/31/2012	9/10/2012	BBG003PZ7F89
	CRSP US Mega Cap Value Index (PR)	CRSPMEV1	12630T109	10/1/2012	9/10/2012	BBG003PZ7DJ2
Mega Cap Growth	CRSP US Mega Cap Growth Index (TR)	CRSPMEGT	12631K107	12/31/2012	9/10/2012	BBG003PZ7F70
	CRSP US Mega Cap Growth Index (PR)	CRSPMEG1	12630R103	10/1/2012	9/10/2012	BBG003PZ7DH4
Large Cap (Mega + Mid)	CRSP US Large Cap Index (TR)	CRSPLCT	12631M103	12/31/2012	4/1/2011	BBG003PZ7F98
	CRSP US Large Cap Index (PR)	CRSPLC1	12627P102	8/15/2011	4/1/2011	BBG001YCYN50
Large Cap Value	CRSP US Large Cap Value Index (TR)	CRSPLCVT	12631R102	12/31/2012	9/10/2012	BBG003PZ7FC4
	CRSP US Large Cap Value Index (PR)	CRSPLCV1	12630X100	10/1/2012	9/10/2012	BBG003PZ7DL9
Large Cap Growth	CRSP US Large Cap Growth Index (TR)	CRSPLCGT	12631P106	12/31/2012	9/10/2012	BBG003PZ7FB5
	CRSP US Large Cap Growth Index (PR)	CRSPLCG1	12630W102	10/1/2012	9/10/2012	BBG003PZ7DK0
Core Cap (Mega + Mid + Small)	CRSP US Core Cap Index (TR)	CRSPXMT	12666H102	12/4/2023	4/1/2011+	BBG01K02DMV2
	CRSP US Core Cap Index (PR)	CRSPXM1	12666H201	12/4/2023	4/1/2011+	BBG01K02DMW1
Core Cap Value	CRSP US Core Cap Value Index (TR)	CRSPXMVT	12671T109	12/4/2023	9/10/2012‡	BBG01K02DN13
	CRSP US Core Cap Value Index (PR)	CRSPXMV1	12671T208	12/4/2023	9/10/2012‡	BBG01K02DN22
Core Cap Growth	CRSP US Core Cap Growth Index (TR)	CRSPXMGT	12671U106	12/4/2023	9/10/2012‡	BBG01K02DN31
	CRSP US Core Cap Growth Index (PR)	CRSPXMG1	12671U205	12/4/2023	9/10/2012‡	BBG01K02DN40
Mid Cap	CRSP US Mid Cap Index (TR)	CRSPMIT	12631T108	12/31/2012	4/1/2011	BBG003PZ7FD3
	CRSP US Mid Cap Index (PR)	CRSPMI1	12627W107	8/15/2011	4/1/2011	BBG001YCYN87
Mid Cap Value	CRSP US Mid Cap Value Index (TR)	CRSPMIVT	12629L109	12/31/2012	9/10/2012	BBG003PZ7FG0
	CRSP US Mid Cap Value Index (PR)	CRSPMIV1	12631C105	10/1/2012	9/10/2012	BBG003PZ7DN7
Mid Cap Growth	CRSP US Mid Cap Growth Index (TR)	CRSPMIGT	12628N106	12/31/2012	9/10/2012	BBG003PZ7FF1
	CRSP US Mid Cap Growth Index (PR)	CRSPMIG1	12631A109	10/1/2012	9/10/2012	BBG003PZ7DM8
Small + Mid Cap	CRSP US Small / Mid Cap Index (TR)	CRSPSMT	12591C103	3/10/2014	3/31/2011*	BBG0069LWSJ3
	CRSP US Small / Mid Cap Index (PR)	CRSPSM1	12632T107	3/10/2014	3/31/2011*	BBG0069LWSH5
Small + Mid Cap Value	CRSP US Small / Mid Cap Value Index (TR)	CRSPSMVT	12591L103	3/10/2014	9/10/2012*	BBG0069LWSG6
	CRSP US Small / Mid Cap Value Index (PR)	CRSPSMV1	12591E109	3/10/2014	9/10/2012*	BBG0069LWSD9
Small + Mid Cap Growth	CRSP US Small / Mid Cap Growth Index (TR)	CRSPSMGT	12591P104	3/10/2014	9/10/2012*	BBG0069LWSF7
	CRSP US Small / Mid Cap Growth Index (PR)	CRSPSMG1	12591M101	3/10/2014	9/10/2012*	BBG0069LWSC0
Total Market ex-Mega Cap (Mid + Small + Micro)	CRSP US Total Market ex-Mega Cap Index (TR)	CRSPXET	12666J108	12/4/2023	4/1/2011+	BBG01K02DMX0
	CRSP US Total Market ex-Mega Cap Index (PR)	CRSPXE1	12666J207	12/4/2023	4/1/2011+	BBG01K02DMY9

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg FIGI
Small Cap	CRSP US Small Cap Index (TR)	CRSPSCT	12630N102	12/31/2012	4/1/2011	BBG003PZ7FH9
	CRSP US Small Cap Index (PR)	CRSPSC1	12628A104	8/15/2011	4/1/2011	BBG001YCYNB3
Small Cap Value	CRSP US Small Cap Value Index (TR)	CRSPSCVT	12631N101	12/31/2012	9/10/2012	BBG003PZ7FK5
	CRSP US Small Cap Value Index (PR)	CRSPSCV1	12631F108	10/1/2012	9/10/2012	BBG003PZ7DQ4
Small Cap Growth	CRSP US Small Cap Growth Index (TR)	CRSPSCGT	12630V104	12/31/2012	9/10/2012	BBG003PZ7FJ7
	CRSP US Small Cap Growth Index (PR)	CRSPSCG1	12631E101	10/1/2012	9/10/2012	BBG003PZ7DP5
Small/Micro Cap	CRSP US Small/Micro Cap Index (TR)	CRSPMST	12671M104	12/4/2023	4/1/2011+	BBG01K02DMZ8
	CRSP US Small/Micro Cap Index (PR)	CRSPMS1	12671M203	12/4/2023	4/1/2011+	BBG01K02DN04
Micro Cap Index	CRSP US Micro Cap Index (TR)	CRSPMCT	12631V103	12/31/2012	4/1/2011	BBG003PZ7FL4
	CRSP US Micro Cap Index (PR)	CRSPMC1	12627T104	8/15/2011	4/1/2011	BBG001YCYN78
Small Cap ex-Real Estate	CRSP US Small Cap ex-Real Estate Index (TR)	CRSPSXT	12632L104	12/31/2012	2/1/2012	BBG003PZ7FZ9
	CRSP US Small Cap ex-Real Estate Index (PR)	CRSPSX1	12631G106	10/1/2012	9/10/2012	BBG003PZ7F25

+ Core, Total Market ex-Mega, and Small/Micro Cap indexes are initialized on December 4, 2023, based as if they began at 1000 on the start of day on April 1, 2011, and their constituents each day were the composite of their underlying Mega, Mid, Small, and Micro Cap indexes.

‡ Core Cap Value and Growth index levels are initialized on December 4, 2023, based as if they began at 1000 at the start of day on September 10, 2012, and their constituents each day are estimated based on their underlying indexes. For purposes of assigning Value or Growth to a company in Core Cap each day for this calculation, the assignment uses the sum of the corresponding Large Cap and Small Cap Value or Growth style allocations.

* Small Cap + Mid Cap indexes are initialized on 2/7/2014 based on the composite history of their underlying Small and Mid indexes since their inception.

CRSP SECTOR INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg FIGI
Consumer Discretionary	CRSP US Consumer Discretionary Index (TR)	CRSPCDT	12631X109	12/31/2012	2/1/2012	BBG00VC1QCP3
	CRSP US Consumer Discretionary Index (PR)	CRSPCD1	12630J101	7/16/2012	2/1/2012	BBG00VC1Q658
Consumer Staples	CRSP US Consumer Staples Index (TR)	CRSPCST	12631W101	12/31/2012	2/1/2012	BBG003PZ7FN2
	CRSP US Consumer Staples Index (PR)	CRSPCS1	12630G107	7/16/2012	2/1/2012	BBG003PZ7DS2
Energy	CRSP US Energy Index (TR)	CRSPENT	12631Y107	12/31/2012	2/1/2012	BBG003PZ7FP0
	CRSP US Energy Index (PR)	CRSPEN1	12630A100	7/16/2012	2/1/2012	BBG003PZ7DT1
Financials	CRSP US Financials Index (TR)	CRSPFNT	12632A108	12/31/2012	2/1/2012	BBG003PZ7FQ9
	CRSP US Financials Index (PR)	CRSPFN1	12630M104	7/16/2012	2/1/2012	BBG003PZ7DV8
Healthcare	CRSP US Healthcare Index (TR)	CRSPHCT	12632C104	12/31/2012	2/1/2012	BBG003PZ7FR8
	CRSP US Healthcare Index (PR)	CRSPHC1	12630H105	7/16/2012	2/1/2012	BBG003PZ7DW7
Industrials	CRSP US Industrials Index (TR)	CRSPIDT	12632E100	12/31/2012	2/1/2012	BBG003PZ7FS7
	CRSP US Industrials Index (PR)	CRSPID1	12630F109	7/16/2012	2/1/2012	BBG003PZ7DX6
Materials	CRSP US Materials Index (TR)	CRSPMTT	12632G105	12/31/2012	2/1/2012	BBG003PZ7FV3
	CRSP US Materials Index (PR)	CRSPMT1	12630E102	7/16/2012	2/1/2012	BBG003PZ7DZ4
Media & Communications	CRSP US Media & Communications Index (TR)	CRSPTET	12632H103	12/31/2012	2/1/2012	BBG003PZ7FW2
	CRSP US Media & Communications Index (PR)	CRSPTE1	12630K108	7/16/2012	2/1/2012	BBG003PZ7F07
Real Estate & REITs	CRSP US Real Estate & REITs Index (TR)	CRSPRET	12632K106	12/31/2012	4/1/2011	BBG003PZ7FY0
	CRSP US Real Estate & REITs Index (PR)	CRSPRE1	12627X105	8/15/2011	4/1/2011	BBG001YCYN96
Technology	CRSP US Technology Index (TR)	CRSPITT	12632F107	12/31/2012	2/1/2012	BBG003PZ7FT6
	CRSP US Technology Index (PR)	CRSPIT1	12630P107	7/16/2012	2/1/2012	BBG003PZ7DY5
Utilities	CRSP US Utilities Index (TR)	CRSPUTT	12632J109	12/31/2012	2/1/2012	BBG003PZ7FX1
	CRSP US Utilities Index (PR)	CRSPUT1	12630L106	7/16/2012	2/1/2012	BBG003PZ7F16

CRSP ISS ESG INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg FIGI
CRSP ISS ESG Prime	CRSP ISS US Large Cap ESG Prime Index (TR)	CLESGPT	12657Y205	9/7/2021	9/7/2021	BBG012CHZKD6
	CRSP ISS US Large Cap ESG Prime Index (PR)	CLESGP	12657Y106	9/7/2021	9/7/2021	BBG012CHZK64
CRSP ISS ESG Non-Prime	CRSP ISS US Large Cap ESG Non-Prime Index (TR)	CLESGNPT	12658A206	9/7/2021	9/7/2021	BBG012CHZKF4
	CRSP ISS US Large Cap ESG Non-Prime Index (PR)	CLESGNP	12658A107	9/7/2021	9/7/2021	BBG012CHZK73
CRSP ISS ESG	CRSP ISS US Large Cap ESG Index (TR)	CLESGT	12658D200	9/7/2021	9/7/2021	BBG012CHZKG3
	CRSP ISS US Large Cap ESG Index (PR)	CLESG	12658D101	9/7/2021	9/7/2021	BBG012CHZK82
CRSP ISS ESG Remainder	CRSP ISS US Large Cap ESG Remainder Index (TR)	CLESGRT	12658E208	9/7/2021	9/7/2021	BBG012CHZKH2
	CRSP ISS US Large Cap ESG Remainder Index (PR)	CLESGR	12658E109	9/7/2021	9/7/2021	BBG012CHZK91
CRSP ISS ESG Industry Balanced	CRSP ISS US Large Cap ESG Industry Balanced Index (TR)	CLESGBT	12658F205	9/7/2021	9/7/2021	BBG012CHZKJ0
	CRSP ISS US Large Cap ESG Industry Balanced Index (PR)	CLESGB	12658F106	9/7/2021	9/7/2021	BBG012CHZKB8
CRSP ISS ESG Industry Balanced Remainder	CRSP ISS US Large Cap ESG Industry Balanced Remainder Index (TR)	CLESGBRT	12658K204	9/7/2021	9/7/2021	BBG012CHZKK8
	CRSP ISS US Large Cap ESG Industry Balanced Remainder Index (PR)	CLESGBR	12658K105	9/7/2021	9/7/2021	BBG012CHZKC7

OSV INDEXES - CRSP MARKET CAP, VALUE AND GROWTH INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Bloomberg FIGI
Total Market OSV	CRSP US Total Market OSV Index (TR)	CRSPTMS	12628H208		BBG01NRTDH67
	CRSP US Total Market OSV Index (PR)	CRSPTMV	12632M300	5/24/2021	BBG0106YDTL6
Mega Cap OSV	CRSP US Mega Cap OSV Index (TR)	CRSPMES	12631H203		BBG01NRTDH76
	CRSP US Mega Cap OSV Index (PR)	CRSPMEV	12627R207	5/24/2021	BBG0106YDTF3
Mega Cap Value OSV	CRSP US Mega Cap Value OSV Index (TR)	CRSPMEVS	12631L204		BBG01NRTDHD9
	CRSP US Mega Cap Value OSV Index (PR)	CRSPMEVV	12630T208	5/24/2021	BBG0106YDTJ9
Mega Cap Growth OSV	CRSP US Mega Cap Growth OSV Index (TR)	CRSPMEGS	12631K206		BBG01NRTDHF7
	CRSP US Mega Cap Growth OSV Index (PR)	CRSPMEGV	12630R202	5/24/2021	BBG0106YDT90
Large Cap OSV (Mega + Mid)	CRSP US Large Cap OSV Index (TR)	CRSPLCS	12631M202		BBG01NRTDHB1
	CRSP US Large Cap OSV Index (PR)	CRSPLCV	12627P201	5/24/2021	BBG0106YDTP2
Large Cap Value OSV	CRSP US Large Cap Value OSV Index (TR)	CRSPLCVS	12631R201		BBG01NRTDHL0
	CRSP US Large Cap Value OSV Index (PR)	CRSPLCVV	12630X209	5/24/2021	BBG0106YDT63
Large Cap Growth OSV	CRSP US Large Cap Growth OSV Index (TR)	CRSPLCGS	12631P205		BBG01NRTDHM9
	CRSP US Large Cap Growth OSV Index (PR)	CRSPLCGV	12630W201	5/24/2021	BBG0106YDTD5
Core Cap OSV (Mega + Mid + Small)	CRSP US Core Cap OSV Index (TR)	CRSPXMS	12666H409		BBG01NRTDGF9
	CRSP US Core Cap OSV Index (PR)	CRSPXMV	12666H300	4/2/2024	BBG01M9NHVF7
Core Cap Value OSV	CRSP US Core Cap Value OSV Index (TR)	CRSPXMVS	12671T406		BBG01NRTDGH7
	CRSP US Core Cap Value OSV Index (PR)	CRSPXMVV	12671T307	4/2/2024	BBG01M9NHVH5
Core Cap Growth OSV	CRSP US Core Cap Growth OSV Index (TR)	CRSPXMGS	12671U403		BBG01NRTDGG8
	CRSP US Core Cap Growth OSV Index (PR)	CRSPXMGV	12671U304	4/2/2024	BBG01M9NHVG6
Mid Cap OSV	CRSP US Mid Cap OSV Index (TR)	CRSPMIS	12631T207		BBG01NRTDH85
	CRSP US Mid Cap OSV Index (PR)	CRSPMIV	12627W206	5/24/2021	BBG0106YDT81
Mid Cap Value OSV	CRSP US Mid Cap Value OSV Index (TR)	CRSPMIVS	12629L208		BBG01NRTDHG6
	CRSP US Mid Cap Value OSV Index (PR)	CRSPMIVV	12631C204	5/24/2021	BBG0106YDTB7
Mid Cap Growth OSV	CRSP US Mid Cap Growth OSV Index (TR)	CRSPMIGS	12628N205		BBG01NRTDHH5
	CRSP US Mid Cap Growth OSV Index (PR)	CRSPMIGV	12631A208	5/24/2021	BBG0106YDT45
Small + Mid Cap OSV	CRSP US Small / Mid Cap OSV Index (TR)	CRSPSMS	12591C202		BBG01NRTDHC0
	CRSP US Small / Mid Cap OSV Index (PR)	CRSPSMV	12632T206	5/24/2021	BBG0106YDTM5
Small + Mid Cap Value OSV	CRSP US Small / Mid Cap Value OSV Index (TR)	CRSPSMVS	12591L202		BBG01NRTDHN8
	CRSP US Small / Mid Cap Value OSV Index (PR)	CRSPSMVV	12591E208	5/24/2021	BBG0106YDTC6
Small + Mid Cap Growth OSV	CRSP US Small / Mid Cap Growth OSV Index (TR)	CRSPSMGS	12591P203		BBG0106YDTM5
	CRSP US Small / Mid Cap Growth OSV Index (PR)	CRSPSMGV	12591M200	5/24/2021	BBG01NRTDHP6
Total Market ex-Mega Cap OSV (Mid + Small + Micro)	CRSP US Total Market ex-Mega Cap OSV Index (TR)	CRSPXES	12666J405		BBG01NRTDGK3
	CRSP US Total Market ex-Mega Cap OSV Index (PR)	CRSPXEV	12666J306	4/2/2024	BBG01M9NHVK1
Small Cap OSV	CRSP US Small Cap OSV Index (TR)	CRSPSCS	12630N201		BBG01NRTDH94
	CRSP US Small Cap OSV Index (PR)	CRSPSCV	12628A203	5/24/2021	BBG0106YDTH1
Small Cap Value OSV	CRSP US Small Cap Value OSV Index (TR)	CRSPSCVS	12631N200		BBG01NRTDHJ3
	CRSP US Small Cap Value OSV Index (PR)	CRSPSCVV	12631F207	5/24/2021	BBG0106YDT72
Small Cap Growth OSV	CRSP US Small Cap Growth OSV Index (TR)	CRSPSCGS	12630V203		BBG01NRTDHK1
	CRSP US Small Cap Growth OSV Index (PR)	CRSPSCGV	12631E200	5/24/2021	BBG0106YDT54
Small/Micro Cap OSV	CRSP US Small/Micro Cap OSV Index (TR)	CRSPMSS	12671M401		BBG01NRTDHC0
	CRSP US Small/Micro Cap OSV Index (PR)	CRSPMSV	12671M302	4/2/2024	BBG01M9NHVN8
Micro Cap Index OSV	CRSP US Micro Cap OSV Index (TR)	CRSPMCS	12631V202		BBG01NRTDGL2
	CRSP US Micro Cap OSV Index (PR)	CRSPMCV	12627T203	4/2/2024	BBG01M9NHVL0
Small Cap ex-Real Estate OSV	CRSP US Small Cap ex-Real Estate OSV Index (TR)	CRSPSXS	12632L203		BBG01NRTDGJ5
	CRSP US Small Cap ex-Real Estate OSV Index (PR)	CRSPSXV	12631G205	4/2/2024	BBG01M9NHVJ3

OSV INDEXES - CRSP SECTOR INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Bloomberg FIGI
Consumer Discretionary OSV	CRSP US Consumer Discretionary OSV Index (TR)	CRSPCDS	12631X208		BBG01NRTDGN0
	CRSP US Consumer Discretionary OSV Index (PR)	CRSPCDV	12630J200	4/2/2024	BBG01M9NHVQ5
Consumer Staples OSV	CRSP US Consumer Staples OSV Index (TR)	CRSPCSS	12631W200		BBG01NRTDGP8
	CRSP US Consumer Staples OSV Index (PR)	CRSPCSV	12630G206	4/2/2024	BBG01M9NHVS3
Energy OSV	CRSP US Energy OSV Index (TR)	CRSPENS	12631Y206		BBG01NRTDGQ7
	CRSP US Energy OSV Index (PR)	CRSPENV	12630A209	4/2/2024	BBG01M9NHVV9
Financials OSV	CRSP US Financials OSV Index (TR)	CRSPFNS	12632A207		BBG01NRTDGR6
	CRSP US Financials OSV Index (PR)	CRSPFNV	12630M203	4/2/2024	BBG01M9NHVY6
Healthcare OSV	CRSP US Healthcare OSV Index (TR)	CRSPHCS	12632C203		BBG01NRTDGS5
	CRSP US Healthcare OSV Index (PR)	CRSPHCV	12630H204	4/2/2024	BBG01M9NHW01
Industrials OSV	CRSP US Industrials OSV Index (TR)	CRSPIDS	12632E209		BBG01NRTDGT4
	CRSP US Industrials OSV Index (PR)	CRSPIDV	12630F208	4/2/2024	BBG01M9NHW47
Materials OSV	CRSP US Materials OSV Index (TR)	CRSPMTS	12632G204		BBG01NRTDGV1
	CRSP US Materials OSV Index (PR)	CRSPMTV	12630E201	4/2/2024	BBG01M9NHW65
Media & Communications OSV	CRSP US Media & Communications OSV Index (TR)	CRSPTES	12632H202		BBG01NRTDGW0
	CRSP US Media & Communications OSV Index (PR)	CRSPTEV	12630K207	4/2/2024	BBG01M9NHW83
Real Estate & REITs OSV	CRSP US Real Estate & REITs OSV Index (TR)	CRSPRES	12632K205		BBG01NRTDGX9
	CRSP US Real Estate & REITs OSV Index (PR)	CRSPREV	12627X204	4/2/2024	BBG01M9NHWB9
Technology OSV	CRSP US Technology OSV Index (TR)	CRSPITS	12632F206		BBG01NRTDGY8
	CRSP US Technology OSV Index (PR)	CRSPITV	12630P206	4/2/2024	BBG01M9NHWD7
Utilities OSV	CRSP US Utilities OSV Index (TR)	CRSPUTS	12632J208		BBG01NRTDGZ7
	CRSP US Utilities OSV Index (PR)	CRSPUTV	12630L205	4/2/2024	BBG01M9NHWG4

OSV INDEXES - CRSP ISS ESG INDEXES

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Bloomberg FIGI
CRSP ISS ESG Prime OSV	CRSP ISS US Large Cap ESG Prime OSV Index (TR)	CLESGPS	12657Y403		BBG01NRTDH03
	CRSP ISS US Large Cap ESG Prime OSV Index (PR)	CLESGPV	12657Y304	4/2/2024	BBG01M9NHWJ1
CRSP ISS ESG Non-Prime OSV	CRSP ISS US Large Cap ESG Non-Prime OSV Index (TR)	CLESGNPS	12658A404		BBG01NRTDH12
	CRSP ISS US Large Cap ESG Non-Prime OSV Index (PR)	CLESGNPV	12658A305	4/2/2024	BBG01M9NHWK9
CRSP ISS ESG OSV	CRSP ISS US Large Cap ESG OSV Index (TR)	CLESGS	12658D408		BBG01NRTDH21
	CRSP ISS US Large Cap ESG OSV Index (PR)	CLESGV	12658D309	4/2/2024	BBG01M9NHWL8
CRSP ISS ESG Remainder OSV	CRSP ISS US Large Cap ESG Remainder OSV Index (TR)	CLESGRS	12658E406		BBG01NRTDH30
	CRSP ISS US Large Cap ESG Remainder OSV Index (PR)	CLESGRV	12658E307	4/2/2024	BBG01M9NHWM7
CRSP ISS ESG Industry Balanced OSV	CRSP ISS US Large Cap ESG Industry Balanced OSV Index (TR)	CLESGBS	12658F403		BBG01NRTDH49
	CRSP ISS US Large Cap ESG Industry Balanced OSV Index (PR)	CLESGBV	12658F304	4/2/2024	BBG01M9NHWN6
CRSP ISS ESG Industry Balanced Remainder OSV	CRSP ISS US Large Cap ESG Industry Balanced Remainder OSV Index (TR)	CLESGBRS	12658K402		BBG01NRTDH58
	CRSP ISS US Large Cap ESG Industry Balanced Remainder OSV Index (PR)	CLESGBRV	12658K303	4/2/2024	BBG01M9NHWP4

BACKTEST HISTORY

CRSP's methodology was originally backtested for a 10-year period between January 2, 2001, and March 30, 2011. To align the launch of value and growth indexes, a subsequent backtest was run using June 29, 2001, as the start date. Additionally, CRSP's sector index methodology was initially backtested for a six-year period from January 3, 2005, to March 31, 2011, and CRSP's ESG index methodology was initially backtested from December 8, 2014, to June 30, 2021.

APPENDIX C: US TERRITORIES, DOMICILES OF CONVENIENCE, AND TAX HAVENS

ISO Code	US Territories
AS	American Samoa
GU	Guam
MH	Marshall Islands
MP	Northern Mariana Islands
PW	Palau
PR	Puerto Rico
VI	US Virgin Islands

ISO Code	Domiciles of Convenience
AW	Aruba
AI	Anguilla
AN	Netherlands Antilles
AG	Antigua
BS	Bahamas
BM	Bermuda
BB	Barbados
KY	Cayman Islands
DM	Dominica
DO	Dominican Republic
GG	Guernsey
GI	Gibraltar
HT	Haiti
IM	Isle of Man
JM	Jamaica
JE	Jersey
KN	St. Kitts and Nevis
LR	Liberia
LC	St. Lucia
LU	Luxembourg
MF	St. Martin
MS	Montserrat
PA	Panama
TC	Turks and Caicos Islands
TT	Trinidad and Tobago
VC	St. Vincent the Grenadines
VG	British Virgin Islands

ISO Code	Tax Havens
CH	Switzerland
IE	Ireland
NL	Netherlands

Note: Other locations may be considered case-by-case for business reasons.

APPENDIX D: HOURS, HOLIDAYS, AND EARLY CLOSURES

HOURS:

The CRSP Market Indexes Operations department is open from 8:00 a.m. to 7:00 p.m. ET.

HOLIDAYS:

CRSP observes the following exchange holidays:

	2025	2026
New Year's Day	Wednesday, January 1	Thursday, January 1
Martin Luther King, Jr. Day	Monday, January 20	Monday, January 19
Presidents' Day	Monday, February 17	Monday, February 16
Good Friday	Friday, April 18	Friday, April 3
Memorial Day	Monday, May 26	Monday, May 25
Juneteenth	Thursday, June 19	Friday, June 19
Independence Day	Friday, July 4	Friday, July 3*
Labor Day	Monday, September 1	Monday, September 7
Thanksgiving Day**	Thursday, November 27	Thursday, November 26
Christmas	Thursday, December 25	Friday, December 25

*CRSP will observe the holiday on this date due to the holiday occurring on a weekend.

**CRSP will close at 1:00 p.m. ET the day after this holiday

EARLY CLOSURES:

CRSP will close early on the days stated above; in accordance with early equity, market closes. On days of early close, CRSP's final release will be completed at 11:30 a.m. ET.

On half trading days (typically the day before Christmas and Independence Day, and the day after Thanksgiving), CRSP's final release will be completed by 11:30 a.m. ET.

APPENDIX E: TRANSITIONAL RECONSTITUTION CALENDAR

2025 TRANSITIONAL RECONSTITUTION CALENDAR

March Quarter 2025:	
Ranking Date:	After end of day Friday, March 7
Pro Forma Indexes Available via FTP:	Sunday evening, March 9
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, March 10
Transitional Reconstitution Dates:	After end of day Wednesday, March 19 – After end of day Tuesday, March 25
June Quarter 2025:	
Ranking Date:	After end of day Friday, June 6
Pro Forma Indexes Available via FTP:	Sunday evening, June 8
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, June 9
Transitional Reconstitution Dates:	After end of day Tuesday, June 17 – After end of day Tuesday, June 24
September Quarter 2025:	
Ranking Date:	After end of day Friday, September 5
Pro Forma Indexes Available via FTP:	Sunday evening, September 7
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, September 8
Transitional Reconstitution Dates:	After end of day Wednesday, September 17 – After end of day Tuesday, September 23
December Quarter 2025:	
Ranking Date:	After end of day Friday, December 5
Pro Forma Indexes Available via FTP:	Sunday evening, December 7
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, December 8
Transitional Reconstitution Dates:	After end of day Monday, December 15 – After end of day Friday, December 19

2026 TRANSITIONAL RECONSTITUTION CALENDAR

March Quarter 2026:	
Ranking Date:	After end of day Friday, March 6
Pro Forma Indexes Available via FTP:	Sunday evening, March 8
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, March 9
Transitional Reconstitution Dates:	After end of day Wednesday, March 18 – After end of day Tuesday, March 24
June Quarter 2026:	
Ranking Date:	After end of day Friday, June 5
Pro Forma Indexes Available via FTP:	Sunday evening, June 7
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, June 8
Transitional Reconstitution Dates:	After end of day Tuesday, June 16 – After end of day Tuesday, June 23
September Quarter 2026:	
Ranking Date:	After end of day Friday, September 4
Pro Forma Indexes Available via FTP:	Sunday evening, September 6
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, September 8
Transitional Reconstitution Dates:	After end of day Wednesday, September 16 – After end of day Tuesday, September 22
December Quarter 2026:	
Ranking Date:	After end of day Friday, December 4
Pro Forma Indexes Available via FTP:	Sunday evening, December 6
Pro Forma Indexes Available via CRSPMI Secure Website:	Start of business Monday, December 7
Transitional Reconstitution Dates:	After end of day Wednesday, December 16 – After end of day Tuesday, December 22

APPENDIX F: CRSP MARKET INDEXES RESTATEMENT POLICY

This policy addresses the Center for Research in Security Prices (CRSP), LLC process for correcting errors and provides guidelines for when an index will be recalculated and/or re-issued. CRSP makes every effort to maintain its high standards of data quality and strives to be transparent and consistent when addressing errors or inaccuracies in the information disseminated to its clients. Errors or inaccuracies may occur for a variety of reasons, including but not limited to: incorrect, late announced or missed closing prices, dividends or secondary offerings, complex corporate actions, or market distortions.

As a general policy, if an error is found in a CRSP Market Index that causes an incorrect index level, constituent list, or file, the Index Operating Committee (IOC) will determine the impact and the context, review the situation, and will make an Index restatement recommendation.

1. If the guidelines for restatement are not met, the IOC may make the decision to not restate.
2. If the error is found on the effective date of the action or disseminated via an approved T+1 announcement and meets the guidelines for restatement, the IOC may make the decision to restate, and will notify the Index Management Committee (IMC).
3. If the error is found on a past day and the error meets the guidelines for a restatement, the IOC will make a restatement recommendation to the IMC, who will then make the final decision.

CRSP will use best efforts to follow the Index Restatement Guidelines tabulated below. These guidelines should not be interpreted as mandatory requirements as CRSP reserves the right to address errors in any manner it deems reasonable given the circumstances. In exceptional circumstances, the Chief Executive Officer (or proxy) and at least one member of CRSP's Advisory Board will decide on a course of action.

Stakeholders may be notified at different times as an issue is investigated and resolved. The stages that may be communicated include the following:

1. Notification that an issue is under review. This can reference constituents, events, results, and/or files, and the potential error.
2. Notification that a restatement will be initiated. This will describe the error, impact to indexes, and estimated time of resolution known at the time of the notice. Any known impact to production schedules will also be communicated at this time. If a notice was given that an issue was under review, this may communicate that no restatement will be executed.
3. Any updates on progress, estimated completion time, or impacts to production schedules.
4. Notification that the restatement is completed. This will summarize the correction and describe any new files available.

Notices will be as timely as possible and different stages may be combined into single announcements if appropriate. CRSP may accept comments about an ongoing issue. However, any responses will be sent to all stakeholders in the same communication.

Notifications will be delivered by email to standard index subscriber email lists. Notifications will also be posted as messages on the CRSPMI Secure Website at https://www.crspmi.org/.

Any new files created as part of a restatement will be labeled with a new file name to distinguish it from a file already published. These files will typically include a suffix including _YYYYMMDD_RS#, where YYYYMMDD is the date the restatement is published, and the # is the count of replacement file sets sent on the same day.

See the file specification for each type of file, for the standard file names and the restatement naming convention for that file here.

The latest restatement file available will become the official place of record for that data and will be the only file made available of that type, under the original name, in any historical collections of files made available. The CRSPMI Secure Website will only show the newest restated data once it becomes available.

CRSP does not make any representation or warranty of any kind, either expressed or implied, with respect to the accuracy of the index. Furthermore, CRSP expressly disclaims any and all implied warranties, including, without limitation, warranties of accuracy, completeness, non-infringement, merchantability, and fitness for a particular purpose. CRSP is not liable for any loss or damage incurred as a result of any errors or inaccuracies, whether arising from negligence or otherwise.

CRSP MARKET INDEXES RESTATEMENT GUIDELINES

CATEGORY	RESTATEMENT GUIDELINE
Any missed or incorrect event for which an error* in index results can be measured	If a missed or incorrect event is identified, for which an error* to published index results can be measured: • and a CRSP Headline Index** is impacted • and no more than 2 trading days of index results have been published after the 1st day with the error* Then, • If the absolute value of the error* on any single day in the affected date range > 15bps, or (the affected date range includes a month-end day and the absolute cumulative error* over the affected date range > 3bps)***, then CRSP will recalculate all impacted indexes and reissue Data Files
Index Constituent List error. The index methodology was not followed, or was applied to erroneous data on a date in the past	In general, the constituent in error will be left in the current index and subject to movement at the next Ranking. However, CRSP may decide to make a correction in special cases: • If the original instructions were not investable, and the impact to a CRSP Headline Index** doesn't meet the error thresholds and month-end criteria defined above for a missed or incorrect event, then CRSP may decide to apply the correction going forward as soon as practicable. • If the original instructions were investable and the Constituent in error alters the nature of the index, then CRSP may decide to apply the correction going forward as soon as practicable. • If the original instructions were not investable and the impact to a CRSP Headline Index** meets the error thresholds and month-end criteria defined above for a missed or incorrect event, then CRSP may decide to update the past day Constituent Lists, restate the index results, and reissue the Data Files for those days. • Generally, if more than 2 trading days of index results have been published after the 1st day with the constituent in error, then past Constituent lists will not be updated.
Cash Dividend, Rights	If a missed corporate action is identified which involved a cash payout: • and the cash payout can be applied as an adjustment on a future date to get the correct value • and the impact to a CRSP Headline Index* doesn't meet the error thresholds and month-end criteria defined above for a missed or incorrect event • and no more than two trading days of index results have been published after the 1st day with the error* • Then CRSP may decide to apply the adjustment as soon as practicable.
Rights, Voluntary Elections (Secondary Offering, Partial Tender)	If an event that required a choice by an investor was missed per the rules denoted in the methodology guide, then generally, the holdings will not be modified until the next Ranking.
Splits	If a missed or incorrect split is identified, it will be reviewed according to the guidelines defined above for any missed or incorrect event for which an error* in index results can be measured.
Close Price	If a missed or incorrect price is identified, it will be reviewed according to the guidelines defined above for any missed or incorrect event for which an error* in index results can be measured.

(*) An error to an index is measured by difference between the published Index Return and the expected Index Return for an index series, in basis points.

(**) The CRSP Headline Indexes refer to any CRSP Market Index with a Total Value of greater than $10,000,000 in linked assets according to the posted values contained here https://www.crsp.org/indexes/linked-asset-values/

(***) This criteria, which addresses single day error and cumulative error plus month-end, will be referred to as the "error thresholds and month-end criteria" in this document.

APPENDIX G: UPDATES TO CRSP US SECTOR INDEXES

ICE UNIFORM ENTITY SECTOR BENCHMARK (UES®)

Effective after the close of September 1, 2023, the CRSP US Sector Indexes underwent a transition to a new underlying sector benchmark. The benchmark was switched from the FTSE Enhanced Industry Classification Benchmark (ICB®) to the ICE Uniform Entity Sector Benchmark (UES®). While the indexes and the general set of sector categories and index identifiers remained unchanged, a few index names were adjusted to adhere to the naming convention of the new benchmark. These name changes took effect after the close of September 1, 2023. The pro forma indexes for the September 2023 ranking were determined based on the UES assignments known at the September ranking. The primary indexes, initially aligned with the Enhanced ICB standard, were completely migrated to the new benchmark after the close of September 19, 2023.

The pro forma indexes created for the September 2023 ranking are assigned based on the UES assignments at the time of the ranking. The primary indexes, originally allocated based on the Enhanced ICB standard, were fully transitioned to the new constituents by the close of September 19, 2023.

Current Official Name	Enhanced ICB Range	Updated Official Name	UES Range	Total Return Symbol	Price Return Symbol	Index ID
CRSP US Technology Index	10000000-14999999	Same	1000000000-1099999999	CRSPITT	CRSPIT1	1001630
CRSP US Telecommunications Index	15000000-19999999	CRSP US Media & Communications Index	0800000000-0899999999	CRSPTET	CRSPTE1	1001631
CRSP US Health Care Index	20000000-29999999	CRSP US Healthcare Index	0500000000-0599999999	CRSPHCT	CRSPHC1	1001632
CRSP US Financials Index	30000000-34999999	Same	0400000000-0499999999	CRSPFNT	CRSPFN1	1001633
CRSP US Real Estate Index	35000000-39999999	CRSP US Real Estate & REITs Index	0900000000-0999999999	CRSPRET	CRSPRE1	1001634
CRSP US Consumer Discretionary Index	40000000-44999999	Same	0100000000-0199999999	CRSPCST	CRSPCS1	1001635
CRSP US Consumer Staples Index	45000000-49999999	Same	0200000000-0299999999	CRSPCGT	CRSPCG1	1001636
CRSP US Industrials Index	50000000-54999999	Same	0600000000-0699999999	CRSPIDT	CRSPID1	1001637
CRSP US Basic Materials Index	55000000-59999999	CRSP US Materials Index	0700000000-0799999999	CRSPMTT	CRSPMT1	1001638
CRSP US Energy Index	60000000-64999999	Same	0300000000-0399999999	CRSPENT	CRSPEN1	1001639
CRSP US Utilities Index	65000000-69999999	Same	1100000000-1199999999	CRSPUTT	CRSPUT1	1001640
CRSP US Small Cap ex-Real Estate Index	All but 35000000-39999999	Same	All but 0900000000-0999999999	CRSPSXT	CRSPSX1	1001642

ENHANCED INDUSTRY CLASSIFICATION BENCHMARK (ICB®)

The Industry Classification Benchmark (ICB®) standard underwent a substantial restructuring in June of 2020. Refer to https://www.ftserussell.com/press/ftse-russell-announces-enhancements-its-industry-classification-benchmark-icb-following for an overview of the modifications implemented. CRSP adopted this new standard at the ranking completed after the close of June 5, 2020. Prior to this switch, the legacy Industry Classification Benchmark was used back to the inception of CRSP Sector Indexes. All replacement sector indexes had a predecessor index from those original indexes. The new indexes started with the same constituents and index levels as their predecessors, and they were fully transitioned to the new constituents after the close of June 23, 2020.

Predecessor Official Name	Predecessor ICB Range	Official Name	ICB Range	Current Total Return Symbol	Previous Price Return Symbol	Current Total Return Symbol	Previous Price Return Symbol	Current Indno	Previous Indno
CRSP US REIT Index	8671-8675, 8677 minus Timber REITs	CRSP US Real Estate Index	35000000-39999999	CRSPRET	CRSPRE1	Same	Same	1001329	1001634
CRSP US Oil & Gas Index	100-999	CRSP US Energy Index	60000000-64999999	CRSPENT	CRSPEN1	Same	Same	1001600	1001639
CRSP US Materials Index	1000-1999	CRSP US Basic Materials Index	55000000-59999999	CRSPMTT	CRSPMT1	Same	Same	1001601	1001638
CRSP US Industrials Index	2000-2999	Same	50000000-54999999	CRSPIDT	CRSPID1	Same	Same	1001602	1001637
CRSP US Consumer Goods Index	3000-3999	CRSP US Consumer Staples Index	45000000-49999999	CRSPCGT	CRSPCG1	CRSPCST	CRSPCS1	1001603	1001636
CRSP US Health Care Index	4000-4999	Same	20000000-29999999	CRSPHCT	CRSPHC1	Same	Same	1001604	1001632
CRSP US Consumer Services Index	5000-5999	CRSP US Consumer Discretionary Index	40000000-44999999	CRSPCST	CRSPCS1	CRSPCDT	CRSPCD1	1001605	1001635
CRSP US Telecom Index	6000-6999	CRSP US Telecommunications Index	15000000-19999999	CRSPTET	CRSPTE1	Same	Same	1001606	1001631
CRSP US Utilities Index	7000-7999	Same	65000000-69999999	CRSPUTT	CRSPUT1	Same	Same	1001607	1001640
CRSP US Financials Index	8000-8999	Same	30000000-34999999	CRSPFNT	CRSPFN1	Same	Same	1001608	1001633
CRSP US Technology Index	9000-9999	Same	10000000-14999999	CRSPITT	CRSPIT1	Same	Same	1001609	1001630
CRSP US Small Cap ex-REIT Index	all but 8671-8677	CRSP US Small Cap ex-Real Estate Index	all but 35000000-39999999	CRSPSXT	CRSPSX1	Same	Same	1001612	1001642

APPENDIX H: LATEST METHODOLOGY CHANGES

SUMMARY OF SEPTEMBER 2025 CHANGES

MATERIAL CHANGES

- CUSIPs for the following indexes have been corrected: Mega Cap (TR), Mega Cap Value (TR), Mega Cap Growth (TR), Large Cap Value (TR), Large Cap Growth (TR), Small Cap ex-Real Estate (TR). Bloomberg FIGIs have been updated for Consumer Staples (TR & PR). See Appendix B: CRSP Market Indexes Quick Reference Summary.

SUMMARY OF AUGUST 2025 CHANGES

MATERIAL CHANGES

- Passive Foreign Investment Companies (PFICs), as defined by the IRS, are not eligible for inclusion in CRSP US Market Indexes. See Chapter 2: CRSP US Total Market Index | Page 9.

SUMMARY OF MARCH 2025 CHANGES

MATERIAL CHANGES

- The convention to set CLM's such that the maximum value is one and others are adjusted proportionately was removed. See Chapter 9: IRS RIC 25/50 Concentration Rules | Page 59.
- The Large Company Threshold is lowered at Ranking and on Compliance Days for all non-Sector indexes. See Chapter 9: IRS RIC 25/50 Concentration Rules | Page 59.
- The transition schedule was updated for the December 2025 ranking. See Appendix E: Transitional Reconstitution Calendar | Page 82.

SUMMARY OF JANUARY 2025 CHANGES

ADDED INFORMATION

- **PERMNO® Definition** (Chapter 11: Glossary of Terms & Definitions | Page 68)
  PERMNO® is a proprietary reference key for all securities data maintained by CRSP. PERMNOs are permanent, unique identifiers for all US-listed equities, consistent over the life of each security.

CLARIFICATIONS

- **IPO Lockup** (Chapter 3: CRSP US Total Market Index | Page 12)
  After an IPO, or other event with a defined lockup period, holdings designated as "locked" are not added to FSO until at least the end of the lockup period. In general, share estimates will be made using the registration statement at the time of the event. These share numbers will be used for 180 calendar days unless there is a non-cap-neutral corporate event where the holders' free float status is known.
- **Contingent Value Rights** (Chapter 8: Index Maintenance | Page 43)
  Contingent Value Rights (CVRs) received in a merger or other corporate action are generally given no value in indexes.
- **Cancelled Merger** (Chapter 8: Index Maintenace | Page 46)
  If a security is removed from an index but the tender offer is subsequently terminated, the constituent will not be reinstated immediately. Instead, the company will be reconsidered for index inclusion at the next regularly scheduled quarterly ranking.
- **Rights Special Cases** (Chapter 8: Index Maintenance | Page 49)
  If a rights offering is limited in terms of the total number of shares available for purchase, and the subscription period starts after the ex-date for a portion of those available shares, the holdings in indexes will not be adjusted.
- **Spin-Off Special Cases (Split-Offs and Partial Mergers)** (Chapter 8: Index Maintenance | Page 52)

A spinoff child of a foreign, ineligible company is not added to indexes when it starts trading. The new company will be considered for inclusion at the next quarterly ranking.

- **Multipliers and Use in Calculating Holdings**
  - (Chapter 3: CRSP US Market Cap Indexes | Page 15)
    The packeting level for each security in an index constituent list is maintained as a Size Multiplier. This multiplier shows the allocation of this security within a Market Cap index, or an index derived from a Market Cap Index, relative to its allocation in the Total Market Index. It is set to 1 if fully allocated.
  - (Chapter 4: CRSP US Value and Growth Indexes | Page 24)
    The packeting level for each security in a Value or Growth index constituent list is maintained as a Style Multiplier. This multiplier shows the allocation of a security within a Style index or an index derived from a Style index, relative to its allocation in its underlying Market Cap index. It is set to 1 if fully allocated. The Value and Growth index inherits the size multiplier of its underlying Market Cap Index.
  - (Appendix A: Index Formulas | Page 70)
    Index Holdings & Index Market Cap & Weight Sections
- **Exchange Closures** (Chapter 10: Index Policies | Page 63)
  If there is limited notice so that normal end of day trading processes are not followed, then CRSP will postpone until the next open trading day, any index actions that were scheduled to be effective after the close of the early closure day.
- **Halted Security Definition** (Chapter 11: Glossary of Terms & Definitions | Page 66)
  A security that is not open for trading at some point during the trading day due to an action by its listing exchange. For purposes of index methodology, only the subset of cases where the security traded at some time after market open but was halted at market close are of interest. Any security where a scheduled closing auction is not held by its listing exchange is considered halted on that day.
- **Unconstrained Index Definition** (Chapter 11: Glossary of Terms & Definitions | Page 69)
  An index that is either not enforcing IRS RIC 25/50 rules, or no adjustment is needed to satisfy those rules.
- **Unconstrained Weight Definition** (Chapter 11: Glossary of Terms & Definitions | Page 69)
  The weight that would be assigned to a security in an index if there were no IRS RIC 25/50 rules enforced.

MATERIAL CHANGES

- **Eligibility of Foreign Private Issuers** (Chapter 2: CRSP US Total Market Index | Page 9)
  If a company does not follow US GAAP but reports in USD there must be a GAAP and currency reconcilement filed as a part of its reports to the SEC to be evaluated by the IEC. The IEC also analyzes company's filing status with SEC, and the company under evaluation issuing the security must satisfy the U.S. Securities Exchange Act's periodic reporting obligations by filing certain forms required for domestic issuers, such as but not limited to: Form 10-K annual reports, Form 10-Q quarterly reports, and Form 8-K current reports on an ongoing basis.
- **UES Sectors Not Defined in CRSP Sector Indexes** (Chapter 5: CRSP US Sector Indexes | Page 30)
  CRSP US Total Market Index with a UES ICE Entity Sector code defined in CRSP's Methodology Guide will be assigned to the CRSP US Sector Industry Index based on that code. Securities with a UES ICE Entity Sector of Sovereign, Quasi-Government, or Trust may be assigned to the CRSP US Total Market Index or other indexes if otherwise eligible, and may be assigned another Entity Sector by the CRSP Index Operating Committee, but otherwise will not be assigned to a CRSP US Sector Index and will not contribute to any sector breakdowns.
- **New Price Restriction** (Chapter 8: Index Maintenance | Page 42)
  CRSP will not use a price for a security trading when issued if the volume reported by the primary listing exchange is less than 100 shares.
- **Unregistered Block Trades** (Chapter 8: Index Maintenance | Page 50)
  In general, CRSP will not update index holdings intra-quarter to reflect the pricing of a private placement, registered

direct, confidentially marketed public offering (CMPO), at-the-market, forward sale agreement, or an unregistered block.

- **Rights Distributions Fair Market Value Calculation** (Chapter 8: Index Maintenance | Page 49)
  The calculation of fair market value of the right uses the following formula: Fair Market Value = (Rr × Sr × Max (0,Up - Sp)) / (1 + Rr × Sr), regardless of whether the underlying security's price is from the ex-date or earlier.
- **Special Considerations for Halted Securities** (Chapter 8: Index Maintenance | Page 56)
  If there is a security that is halted at the close of a trading day, and the halt is known before the day's final release, and that security is involved in an approved corporate action with a non-neutral index action reported for after close on that day, then any index actions tied to that corporate action will be postponed until the next trading day.
  For purposes of this action, any time a scheduled closing auction for the security on its listing exchange is cancelled on a trading day, that security is considered halted for that day. Prices used for the purpose of index valuation, or next day weighting, follow normal pricing rules.

  Postponing an event is tied to the specific action:

  - If the event is a reevaluation, the reevaluation is postponed, and the current state is maintained, either by continuing a delisted security or by continuing it as Received Stock.
  - If the event is a Fast-Track IPO, the addition is postponed until the next trading day.
  - If the security is delisted due to a cash merger or an exchange action, the action is treated as a late notification, carrying forward the delisted security in the indexes until it can be valued.
  - The application of Secondary Offerings or Partial Tender Offers will be moved to the next trading day.
  - Transition Reconstitution will follow the same rules as for other untradeable securities in the case of a halt if known before end of day.

LEGAL DISCLAIMER:

The historical performance statistics of CRSP's market cap indexes are based upon 10 years of backtest data from January 1, 2001, through March 31, 2011. Subsequent backtesting was completed with June 29, 2001, as the start date in order to align with the value and growth style indexes. As is common industry practice, CRSP backtest data does not include float shares. Descriptive statistics are based upon current index constituents. Backtest results are not indicative of future performance.

CRSP CONTACT INFORMATION

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