CRSP INDEXES

METHODOLOGY GUIDE

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CHICAGO BOOTH | CRSP® | Center for Research in Security Prices

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Chapter 1: Introduction

Since its launch more than 50 years ago, 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 institutions including, but not limited to, academic organizations, investment banks, brokerage firms, corporations, and government agencies.

Situated within the University of Chicago, Booth School of Business, CRSP is one of 12 research centers that play an integral role in maintaining the University's reputation as one of the leading academic research institutions in the nation. Chicago Booth is renowned for conducting impactful financial and economic research, and for producing ideas and leaders that have shaped the world 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 mark. In 2010, CRSP introduced the first product in its series of transparent and investable indexes. The CRSP Indexes are relevant to practitioners, academics, and commercial entities alike for the purposes of managing funds, benchmarking, and conducting research.

CRSP is committed to the oversight and transparency of its index governance structure. In order to provide 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.

CRSP Governance Committees	
Index Oversight 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 Indexes is maintained
Index Advisory Council	Provides guidance with respect to the construction, methodology, and maintenance of the indexes. It is consulted for input and advice to ensure the relevance of the CRSP Indexes, and to ensure that the indexes meet the needs of CRSP's clients
Index Eligibility Committee	Evaluates securities whose eligibility is indeterminate after applying eligibility 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

Chapter 2: Index Construction

CRSP's investable, real-time indexes strive to blend advancements in academic research with current commercial practice in a fundamentally sound manner and under the premise that an index must reflect the way that money managers actually invest. In order to achieve that goal, CRSP offers market capitalization-based, sector, and style (value and growth) indexes that utilize leading-edge methodology in order to truly capture the stock market's depth and evolution.

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

- Packeting approach to migration
- Emphasis on cost efficiency
- Quarterly transitional reconstitution
- Objective and transparent rule-based methodology
- Breakpoints based on cumulative market capitalization
- Investability screens
- Float-adjusted market capitalization

CRSP's methodology was originally backtested for a 10-year period between January 2, 2001, and March 30, 2011. A subsequent backtest was run using June 29, 2001, as the start date in order to better align the beginning of the value and growth indexes with the availability of estimates data. Additionally, CRSP's sector index methodology was backtested for a six-year period from January 3, 2005, to March 31, 2011.

Index Construction Process

All CRSP Indexes begin with the determination of the eligible universe. The index eligibility and investability screening process includes the application of restrictions in listing exchange, incorporation and headquarter location, organization and share types, and the application of investability screens – after which the broadest index, the CRSP US Total Market Index, is formed. 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 the Mega, Mid, Large, Small-Mid, Small, and Micro Cap indexes. Each of these capitalization-based indexes (with the exception of Micro Cap) is then further broken down into value and growth classifications to produce the set of CRSP Value and Growth Indexes. Additionally, the constituents of the US Total Market Index are subdivided by the industry classification of each member's core business to produce the CRSP Sector Indexes.

Creating the Index-eligible US Equity Market Universe

The CRSP Indexes are designed to represent the market of investable US equity securities. They encompass 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, Bats Global Markets, and the Investors Exchange (IEX). The same eligibility rules are applied across all indexes.

The table on page 3 specifies which exchanges, and organization and share types are eligible/ineligible for inclusion in the CRSP security universe.

Universe Category	CRSP Index Eligible	Eligible for Market Capitalization Assignment
Primary Exchange Listing		
NYSE	Y	Y
NYSE American	Y	Y
NYSE ARCA	Y	Y
NASDAQ	Y	Y
Bats Global Markets	Y	Y
The Investors Exchange	Y	Y
OTCCBB	N	Y*
Pink Sheets	N	Y*
Other Consolidated US	N	Y*
International	N	Y*
Organization Types		
Corporation	Y	Y
Real Estate Investment Trust (REIT)	Y	Y
Berkshire Hathaway A & B	Y	Y
Business Development Company (BDC)	N	N
Closed-End Investment Company	N	N
Exchange Traded Fund (ETF) / Exchange Traded Note (ETN)	N	N
Limited Liability Company (LLC)	N	N
Limited Partnership (LP)	N	N
Royalty Trust	N	N
Special Purpose Acquisition Company (SPAC or Blank Check Company)	N	N
Special Purpose Vehicle (SPV)	N	N
Share Types		
Common Shares	Y	Y
American Depository Receipt (ADR)	N	N
Preferred and Convertible Preferred Stock	N	N
Convertible Class B Common Stock	N	Y*
Shares of Beneficial Interest (SBI)	Y (unless a fund)	Y (unless a fund)
Rights	N	N
Warrants	N	N
Participating Preferred Stock	N	N
Redeemable Shares	N	N
Trust Receipts	N	N
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)

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

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. **The company's headquarters and incorporation are in the United States:** Companies both incorporated in and with headquarters in the United States are eligible. Others move to criteria 2.
2. **The company is headquartered 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 move on to Criteria 3. See Appendix F for list of UST, DOC and TH locations. Others are considered foreign and are not eligible.
3. **The company has an Employer Identification Number:** Companies that 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 foreign and are not eligible.
4. **Securities are owned by more than 5 percent of US domestic equity funds:** If more than 5 percent of domestic equity funds own a security, as determined by holdings data, US manager sentiment indicates that the security is viewed as US eligible (giving an inclusion bias in criteria 4). Irrespective of manager sentiment, CRSP will collect any information deemed necessary, but may include additional information on US fund sentiment, asset/operation location, tax/regulatory jurisdiction, history, revenue origin, corporate structure/ownership, primary exchange, etc. All securities from criteria 4 are appraised by CRSP's Index Eligibility Committee in criteria 5.
5. **Committee:** The above rules were developed to capture the characteristics of the vast majority of securities, however, when exceptions occur, the Committee will make the final determination of whether or not a security is domestic and included in the CRSP Indexes. For these exceptions, which will include new securities or those that experienced a fundamental change in their characteristics, the Committee will verify by other sources whether a firm actually has notable US assets, revenue, employment and relevant operations, or has obtained an EIN only for nominal visibility purposes. In practice, the Committee may also approve some additional jurisdictions deemed valid for business purposes for a particular company.

These criteria will be reapplied prior to each ranking. Any security that has been included in or removed from the CRSP Indexes based on the committee's decision will retain that status for one year, unless there is a fundamental change in the security's characteristics. After one year, the security's eligibility status will be reevaluated by the committee. It is also possible for subscribers to nominate companies for committee review of eligibility status.

Investability Screens

At quarterly 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 chart on page 5 summarizes these screens and also provides threshold criteria that each security must meet.

The investability screens are:

- **Minimum Total 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 Requirement:** 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.
- **Minimum Trading Volume:** CRSP determines a sparse trading score for each security by calculating the average daily split-adjusted 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 Indexes falls below 0.0008 for two consecutive quarters, 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.

- **Consecutive Trading Days Requirement:** To be considered for index inclusion at ranking, a security must not have a sequence of 10 or more consecutive nontrading (zero volume) days during the previous quarter. If it does, 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 the security remains suspended for the entire pro forma period, it will be removed at a price of zero.
  - If the security resumes trading during the pro forma period, the security will be removed at its last known closing price.
  - If a security is suspended from trading on the ranking day, it will not be added to the CRSP indexes.

- **Seasoning of New Securities:** New securities are eligible for index inclusion if they fulfill at least one of the two following conditions:
  - First day of regular way trading on a CRSP exchange of interest was at least 20 trading days before ranking day.
  - First day of regular way trading on a CRSP exchange of interest was at least five trading days before ranking day and the company's capitalization is greater than or equal to the lower breakpoint of the Small Cap index determined at the last ranking. These companies are considered to be fast-track IPOs.
  - Securities created by a corporate action payout are not subject to seasoning rules.

CRSP Investability Screen Summary		
Investability Screen	Add	Drop
Market Cap	$15 million or greater	Less than $10 million
Float Shares	12.5% or more of shares outstanding, 10% or more for fast-track add	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
10 Day No-trading Sequences	None in last quarter	At least one in last quarter
Suspended	Not currently suspended	Suspended at least 40 days
Seasoned	20 days trading or greater, or 5 days or greater if satisfying fast-track rules	n/a

If a security is removed from the CRSP Indexes for failing one of the investability screens (deemed uninvestable) it must pass the below "drop" thresholds for four consecutive quarters before it is considered for reinclusion. Once a security has met the four consecutive quarters requirement for a drop threshold, that requirement is considered met.

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

An uninvestable security that has subsequently passed all of the investability drop screens for four consecutive quarters (now considered for reinclusion) must also pass the more restrictive "add" thresholds before it can be readmitted (added back) to the CRSP 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 quarters (March, June, September, and December of 2021).
3. At the December 2021 rebalance the security may be readmitted to the CRSP indexes if, in addition to passing the drop thresholds for four consecutive quarters, 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 Minimum Total Market Capitalization and FSO requirement investability screens are also applied midquarter when adding or reevaluating securities after certain corporate actions such as spin-offs or large capitalization mergers.

Direct Listings

CRSP will consider for index inclusion companies that IPO via direct listings — and skip the traditional underwriting process — 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.

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 CRSPs eligible and investable universe.

Universe Shares and Index Holdings

Total and Float Shares Outstanding

The CRSP Indexes are free float adjusted capitalization-based indexes. Float shares outstanding represent 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 to be 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 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 intra quarter unless a security undergoes a corporate action. If a nonneutral 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.

Effective Float Factor

At ranking, CRSP generates an effective float factor (EFF) for all index constituents, defined as the security's float factor rounded to the nearest 5 percent. An EFF will remain in place from reconstitution day until the following quarter unless the security is affected by an intra-quarter nonneutral corporate action, such as a merger, spin-off, or secondary offering. CRSP calculates an EFF when applying intra-quarter nonneutral corporate events 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 for each by multiplying the security's TSO by its EFF as well as index-specific multipliers. These multipliers exist for size, style, and sector indexes to enforce shared holdings due to migration or to change holdings in order to satisfy legally-mandated US Internal Revenue Service concentration constraints. Like the EFF, index holdings are calculated on ranking day and remain in place until the following ranking, unless affected by an intra-quarter corporate action. 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 or fluctuations in index capitalization of other securities in the index.

See chapters 4 and 5 for information on sector and value/growth index construction.

CRSP Capitalization-based Indexes

The following capitalization-based indexes are currently offered:

Index Name	NASDAQ Symbol	
	Total Return	Price Return
CRSP US Total Market Index	CRSPTMT	CRSPTM1
CRSP US Mega Cap Index	CRSPMET	CRSPME1
CRSP US Mid Cap Index	CRSPMIT	CRSPMI1
CRSP US Large Cap Index	CRSPLCT	CRSPLC1
CRSP US Small-Mid Cap Index	CRSPSMT	CRSPSM1
CRSP US Small Cap Index	CRSPSCT	CRSPSC1
CRSP US Micro Cap Index	CRSPMCT	CRSPMC1

Assigning Companies to Indexes: Capitalization-based Breakpoints and Bands

CRSP assigns companies eligible for the US Total Market Index to more size-specific capitalization-based indexes according to total company market capitalization calculated using TSO. Unlike count-based indexes, the CRSP Indexes do not have a limit on the number of companies that may comprise an index. This feature allows for the CRSP Indexes to better reflect the market's evolution, as the number of listed securities 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 using a security's TSO multiplied by the security's price on a random price day (see Chapter 3 – 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 used for ranking. 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 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.

At each ranking, the actual market capitalization of the largest company and the smallest company in each 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 two composite indexes that combine base level indexes; Large is a combination of Mega and Mid, and Small-Mid is a combination of Mid and Small.

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 diagram on page 10. 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.

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 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.

When a company is new to an index family (such as an IPO), it is added fully to the appropriate capitalization-based index strictly on breakpoints (bands are ignored).

See Appendix A for migration examples.

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

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

CRSP US Large Cap Index:
- Index range: $0 < X_{i,t} \leq 85\%$
- Band range: $81\% < X_{i,t} \leq 89\%$; breakpoint: $X_{i,t} = 85\%$
- Adjacent core $89\% < X_{i,t} \leq 96\%$ (small core)

CRSP US Small / Mid Cap Index:
- Index range: $70\% < X_{i,t} \leq 98\%$
- Band ranges:
  - $64\% < X_{i,t} \leq 76\%$; breakpoint: $X_{i,t} = 70\%$ and
  - $96\% < X_{i,t} \leq 99.5$; breakpoint: $X_{i,t} = 98\%$
- Adjacent cores:
  - $50 < X_{i,t} \leq 64\%$ and (mega core)
  - $99.5\% < X_{i,t} \leq 100.0\%$ (micro core)

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

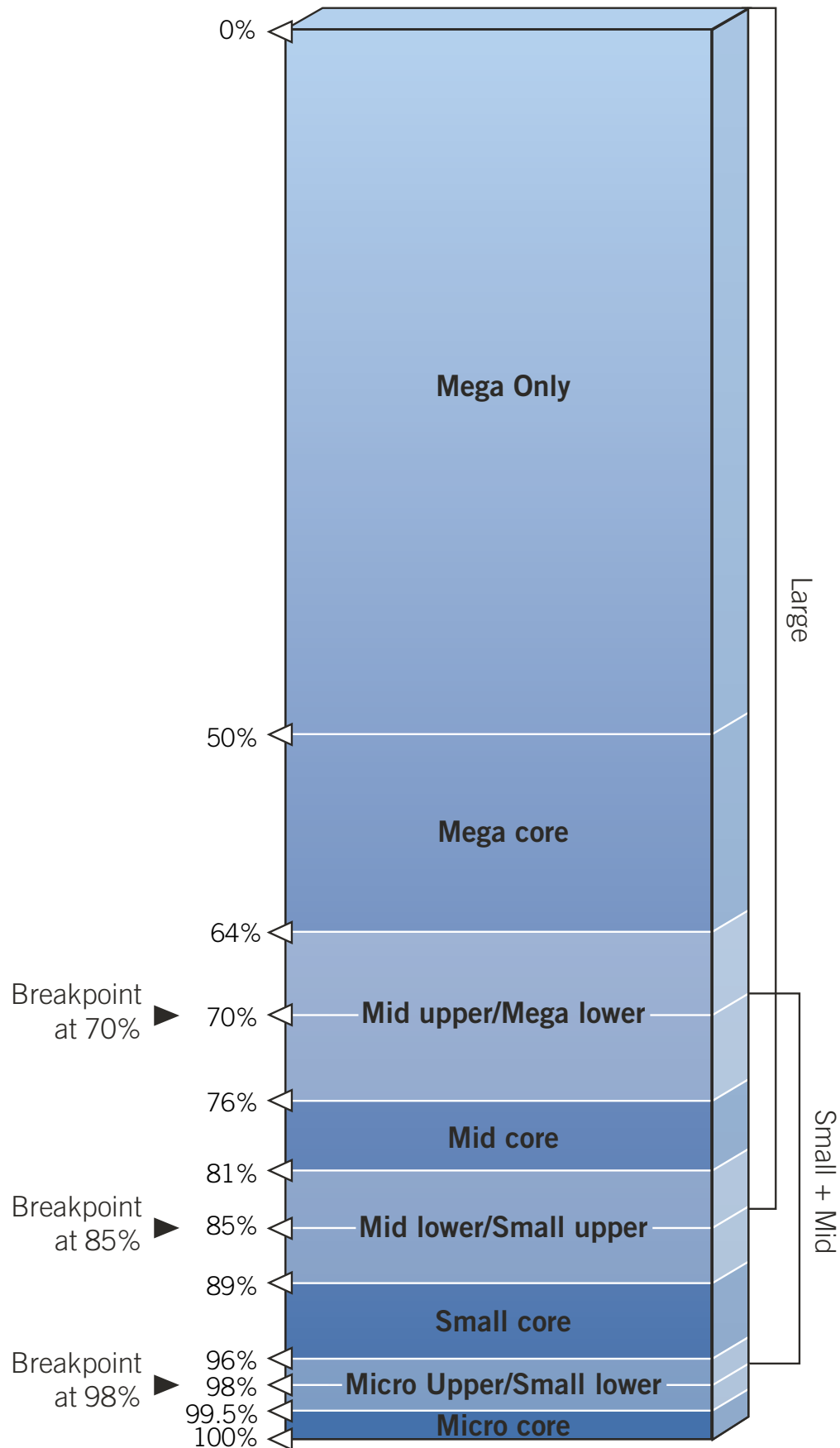**CRSP US Micro Cap Index:**
- Index range: $98\% < X_{i,t} \leq 100\%$
- Band range: $96\% < X_{i,t} \leq 99.5\%$; breakpoint: $X = 98\%$
- Adjacent core $89\% < X_{i,t} \leq 96\%$ (small core)

Capitalization-based Breakpoints and Bands Diagram

Chapter 3: Index Maintenance

Quarterly Maintenance

Ranking and Reconstitution

CRSP 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. (See chapter 2: Index Construction for more information on the review and the process undertaken for the CRSP US Total Market and capitalization indexes. Chapters 4 and 5 include information regarding sector and style index construction rules.)

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

Transitional Reconstitution

Transitional Reconstitution represents a departure from the standard practice of making all changes to an index in a single day and better aligns CRSP Indexes with the investment community's best practices. The conversion from current index membership and holdings to their updated pro forma targets is done over a five-day transition period. The transition period commences 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, including the final day of the five-day 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, generally 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.

Pro forma indexes are subject to daily maintenance for corporate actions like other indexes. In some cases there are adjustments to the rules for handling corporate actions during the pro forma period. These are noted on the following page and in the appropriate daily maintenance chapters. CRSP may make adjustments to the holdings of individual pro forma constituents. Pro forma holdings adjustments are generally applied during the first week following the ranking day.

Appendix H: Transitional Reconstitution Calendar defines the various segments of the pro forma period. Generally, in cases of holidays or unscheduled market closures during the ranking period, the pro forma adjustment period may be shortened, but the transition period will remain five days and be adjusted if necessary.

Determining Price on Random Price Day

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

- The two days with the highest aggregate absolute price moves (using the CRSP US Total Market Index as the point of reference) are excluded.
- The two days with the lowest aggregate trading volume (using the CRSP US Total Market Index as the point of reference) are excluded.
- The excluded days above may overlap.
- The remaining days will be used to randomly select the random price day.

Prices are adjusted for all corporate actions to place companies on the same basis on 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 noncapitalization-neutral corporate action that impacts holdings occurs during the pro forma period, CRSP seeks to evaluate and move the resultant entity only once. If the corporate action causes a reevaluation during this time, the affected company will be migrated from its location in the primary indexes, not the pro forma index.

<u>Secondary Offerings during the Pro Forma Period</u>

Before the Transition Period

1. If offering number of shares is greater than or equal to 5 percent of 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 offering number of shares is greater than or equal to 5 percent of 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 offering number of shares is greater than or equal to 5 percent of 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 offering number of shares is less than 5 percent of the US Total Market Index pro forma and primary holdings, CRSP not will apply the secondary offering.

During the Transition Period

If offering number of shares is greater than or equal to 5 percent of 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).

<u>Reverse Mergers during the Pro Forma Period</u>

If the new company size is greater than or equal to the CRSP US Large Cap breakpoint from the last ranking, then no transition or reconstitution is done for the new company until the reevaluation, i.e. the transition is frozen.

Special Cases:
- If the company is reevaluated by the final transition day, then it will migrate from the packeting location in the primary index.
- If the 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 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 potentially impactful 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, rights distributions, returns of capital, and spin-offs. See section on Corporate Actions (chapter 3: Index Maintenance – Daily Maintenance – Corporate Actions) and the Price Adjustment Table in Appendix B for further information on the calculation of 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, move to 2.
2. The last trade price from consolidated price feeds. If no volume on the primary or consolidated tape, move to 3.
3. The last traded date end-of-day price carried forward. Bid-ask averages are not used to fill gaps, and no adjustment is made to adjust prices based on 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 1:30 p.m. CT 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 1:30 p.m. CT 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, go to step 2.
2. 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, go to step 3.
3. The security is marked at a price of zero.

Price Adjustments as a Result of Corporate Actions

If a security is held in an index but is in the process of exchanging itself for other property (or another security) 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 10th day the security is generally removed at a price of zero.

See Price Adjustment Table in Appendix B.

Corporate Actions

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

Share Changes Reported in Corporate Filings

Any changes to TSO or FSO that are not directly attributable to a single corporate action on a specific day, but are reported in corporate filings, are applied at the next regularly scheduled quarterly ranking. If a nonneutral corporate action that impacts holdings occurs intra-quarter, the last known TSO and FSO (adjusted for the corporate event) are used to calculate index holdings.

Mergers

A merger is a corporate action in which two or more companies are combined into one, creating a new entity. Shares of the nonsurviving entity are exchanged for shares of the surviving entity, cash, or both. The surviving entity will be evaluated for index inclusion immediately, and the nonsurvivor will be removed from the CRSP Indexes and universe.

Implementation of Mergers

Nonsurviving participants of a merger are generally removed from the index after the market close on the day before the effective date. However, if necessary, the nonsurvivor may be kept 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 shares outstanding for the surviving security and, consequently, its index holdings after the close on the trading day before the effective date (i.e., the first day of trading of the combined entity).

CRSP will reevaluate large mergers intra quarter if the resultant (combined) entity's market capitalization is at least as large as the lower breakpoint of the CRSP US Large 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, sector, and value/growth placement by 1:30 p.m. CT 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 on 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 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 stock to purchase a company that is not in the CRSP US Total Market Index due to eligibility or investability, 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 noncapitalization-neutral corporate event (e.g. secondary offering). In other words, the holdings of the acquiring company will not be adjusted on the effective date of the merger.

Late Announcement of Completed Mergers

If the completion of a merger is confirmed after 1:30 p.m. CT on the trading day before the effective date, then the nonsurviving entity 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 shares received plus any cash amounts distributed, and it 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 Creating a New Security

If a merger results in a new security in a merger of equals or other cases where shareholders of acquired companies in indexes represent all index eligible shares of the new security, reevaluation can be done as early as after the close of the first day the new security can trade regular way.

If an on-time announcement or stock only, the new security can be added to the indexes on the effective date as received stock in the indexes of the acquired securities to replace the acquired securities. A synthetic start of day price is used for the new security. This is calculated from an acquired security by subtracting the cash amount from its previous day end of day price and then dividing by the rate of shares of the new security paid in the merger. If there is more than one acquired security, the one with the highest security capitalization contribution to the new security is used in the synthetic start-of-day price calculation.

If not a late announcement, the reevaluation will use the capitalization using a synthetic price as calculated above but based on prices known on the start of day on the day before the effective date. If it is a late announcement it will use the same synthetic price as used above when adding the new security to the index.

Merger and Concurrent Spin-off

If a corporate action involves both merger and spin-off components, the spin-off rules take precedence. All involved companies are reevaluated after close of the first day that all participant securities are trading regular way. As opposed to the large capitalization merger reevaluation methodology there is no minimum size requirement to block companies from packeting between indexes.

In general, the nonsurviving merger security will not trade on the effective date of the merger/ spinoff. The company's pre-event index capitalization is held constant for a day. This is done by either continuing its holdings and valuing as described in the Late Announcement of Completed Mergers section, or if possible converting its holdings to a trading security with a known start-of-day price at the rate denoted in the corporate action.

If a corporate action involves both reverse merger and spin-off components, reevaluation is no earlier than after the close of the fifth trading day after the effective date, but otherwise is processed as above.

Merger with Election

In some mergers, shares of the acquired company will be exchanged for a combination of cash and stock of the surviving company where either the cash amount or the number of shares is limited. Standard merger implementation applies, but a prorated stock and cash payout will be used, taking into account the stated limits. If the final shares payout cannot be determined on the day before the effective date, the merger will be completed when the final payout is known.

Reverse Mergers

Any 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. If the resulting security from the reverse merger is index ineligible, then CRSP will remove it from its indexes after the close of the trading day before the effective date. Otherwise, current index holdings will be replaced by an equivalent amount of the survivor after the merger terms are applied.

CRSP will reevaluate large reverse mergers intra-quarter after the close on the fifth day of regular way trading of the new entity if at least one of the resultant company's market capitalization, as of the close of the first day of regular way trading, is at least as large as the lower breakpoint of the US Large Cap Index as of the last ranking. If the resultant entity's change in size, industry or style is significant enough to warrant moving indexes, CRSP will remove the old entity and reassign the new entity to the appropriate market cap, sector and/or style indexes. A new EFF will be calculated and multiplied by TSO on the first day of regular way trading in order to determine the new index holdings.

A reverse merger that does not qualify for reevaluation will be kept in the current index with holdings reflective of the entitlement received on the effective date.

Exchanges and Conversions

An exchange or conversion is a mandatory swapping of one security for another security of the same company, such as a preferred stock being converted into a common stock or one class of security being exchanged for another class.

The holdings of the payout 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 payout security will continue at these holdings until the next ranking or actionable 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 payout 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 dropped as soon as possible. If the converted or exchanged security is continuing, then

the payout security will be removed after the close on the ex-date. If the converted or exchanged security is delisting from exchanges of interest the payout security will not be added.

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 take control of 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 security will not be reinstated immediately. Instead, it 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.

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 an exchange of interest. Total company market capitalization is calculated using the closing price and shares known on the first day of trading.

If the offered security's total company 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 security 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 the Creating the Index-Eligible US Equity Market Universe section of chapter 2. Otherwise, the security is not immediately added to indexes but is reviewed for 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 corporate action events, such as mergers and acquisitions, bankruptcies, and liquidations.

Unrelated to Corporate Actions

A security that delists from an exchange of interest voluntarily or due to a failure to meet regulatory requirements will be removed from indexes. If the exchange delist is confirmed by 1:30 p.m. CT on the day before the delist and actively trading on that day, it will be removed after close of that day. If not, the security will continue in indexes until it can be valued. See the Final Closing Value for Delisted Securities section on .

Mergers and Acquisitions

A security that delists from an exchange of interest due to the exchange of its stock as part of a merger or acquisition is removed from all indexes after the close of the last day of trading, assuming the event is confirmed effective before 1:30 p.m. CT on the trading day before the effective date. If the merger or acquisition event is confirmed to be final after 1:30 p.m. CT on the trading day before the effective date, the security is kept in its indexes and is removed on the following trading day.

Bankruptcy

In the event that a company declares bankruptcy, CRSP will continue to hold its securities in their respective indexes as long as each security remains listed on a CRSP exchange of interest. The securities will be reviewed at ranking using the same investability and eligibility screens.

When a company's bankruptcy results in a security's removal from an exchange of interest, the security will be removed from all indexes after the close of the last day of trading on an exchange of interest. If the delist due to bankruptcy is confirmed after 1:30 p.m. CT on a day when the affected security is still trading on a exchange of interest, or it is suspended from trading on the day before delisting, the security will be kept in all indexes until a final valuation can be assigned. See the Final Closing Value for Delisted Securities section on .

Liquidation

When a company announces its intention to delist from an exchange of interest due to liquidation, the security will be removed from all indexes after the close of the last day of trading on an exchange of interest. If the delisting is confirmed after 1:30 p.m. CT on the last day of trading, the security will be kept in all indexes until a final valuation can be assigned to the security. See the Final Closing Value for Delisted Securities section on .

These rules are adjusted for liquidations if an official final or partial payment is announced and known before the security can be removed. If a final payment is announced, the security will be removed from indexes as soon as practicable at that value. If partial payments are announced prior to the tenth day after the delist, then the security will be removed at the total of the partial payments rather than zero.

Capital Raising Events

Rights Offerings (Distributions)

A rights distribution is an event in which current 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), typically set at a discount relative to the recent trading price of those shares.

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 rights distribution, the rights are "in-the-money" and are generally assumed to be fully subscribed and 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 in the index, its index 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 effective after the close of the ex-date.

On the ex-date the right and the issuing security are represented in the index as a package (issuing security plus right). However, only the issuing 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, the right is considered exercised, sold, or discarded on the ex-date, and not considered a constituent of any CRSP index after the close of the ex-date.

Price Adjustment to the Issuing Security to Reflect the Value of the Distribution

At the end of the ex-date, the entitlement to the right is valued and added as a "payment value" (end-of-day price adjustment) to the issuing company's security(s). The payment value is computed using the maximum of the right's "fair market value" (intrinsic value/in-the-money amount) or the closing price of the right. In other words, the payment value added to the issuing security is set to the maximum of the fair market value of the right or the market value of the right.

If the right is trading by the ex-date the "market value" of the distribution can be calculated as:

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

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

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

A fair market value of the right is calculated as:

If the underlying security trades on the ex-date, then the fair market value of the right equals:

$$\text{Fair Market Value} = Rr \times Sr \times \text{Max}(0, Up - Sp)$$

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

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

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

Up = Underlying Security's Price

If the underlying security is not trading on the ex-date, then the fair market value of the right is computed using the most recent closing price of the underlying security as follows:

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

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

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

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

Up = Underlying Security's Price

Rights received in an offering that entitle 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 shares, foreign equities, unlisted securities) are implemented in the following manner:

The end-of-day (ex-date) price of the distributing security is adjusted only if the value of the right can be determined on the ex-date. The holdings of distributing company generally remain unchanged.

Warrant Offerings (Distributions)

A warrant distribution is a corporate event in which current shareholders are given the option to buy, within a certain period of time, a specified number of additional shares from the 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 distributions, index holdings are not increased effective after the close of the ex-date.

Secondary Offerings

A secondary offering involves the selling of new or existing shares after the company's IPO. CRSP makes the following distinction between two types of secondary share offerings:

Primary equity offerings (primary shares) involve the issuance of additional "new" shares of a security. 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 distribution of already issued "old" shares. The FSO will be increased by the number of shares distributed, using the most recently available share figures, however, since the company did not issue additional shares, the TSO 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 US Total Market Index are implemented as of the close on the day after the issue prices or the following trading day, if all necessary information is known before 1:30 p.m. CT 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 US Total Market Index are implemented at the next quarterly ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

Exclusions

Index holdings are not immediately impacted upon the pricing of a forward sales agreement. However, the increased number of issued shares will be considered at the next ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

Block Trades or Spot Secondaries (Strategic Shareholder Sales)

CRSP considers a spot secondary or block trade to be a privately-negotiated transaction involving a change in strategic ownership that does not require US Securities & Exchange Commission registration. Unlike a standard secondary offering, a block trade is generally only made available to institutional investors and is implemented without an underwriter or prospectus. CRSP requires an official press release or news story confirming the terms of the block trade in order to make the associated holdings change.

Implementation

Five Percent Threshold and Timing

Changes in index holdings resulting from strategic block trades that represent 5 percent or more of a security's holdings in the US Total Market Index will be implemented on a best-efforts basis. CRSP will increase holdings no later than effective after the close two trading days after the sale is consummated. Otherwise, the event will be implemented at the next regularly scheduled ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

Capital Distribution Events

Spin-offs

A spin-off (divestiture) is the creation of an independent company through the distribution of new shares of an existing business or division/subsidiary. Shares of the new organization are allocated to equity holders of the parent organization at a ratio established by the parent.

Implementation of Spin-offs

Capitalization, style, and sector index placement for the participants in a spin-off are determined based 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 nonneutral corporate action for the parent (e.g. secondary offering), other than the spin off, which occurs after the first day of when-issued trading but before the ex-date of the spin off.

Prices and TSO known at one of the above times will be used to determine the market capitalization used in reevaluation. The post spin-off industry classification codes for both the parent company and spun-off company will be used to determine industry sector placement. If no industry classification code is available for the spun-off company, the spun-off company will inherit the parent company's sector placement. Both the parent and spun-off companies will be reevaluated for style index placement at this time as well. If no style determination is able to be made, the spun-off company will inherit the parent company's style.

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. This represents the preservation of the previous end-of-day index capitalization, distributed among the spin-off parent and received security.

The new company is reevaluated on its own merits effective after the close on the ex-date. The parent company will also be reevaluated at the same time as the new company. Either or both may move to new indexes, or may drop altogether.

At reevaluation both parent and received company are migrated independently on the day after the ex-date from the parent's index based on each company's capitalization, which in most cases is determined at the end of the first day of when issued trading. Banding and packeting 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 set a company capitalization, and ineligible securities, or securities that fail investability limits for security float (10 percent) or company size ($10 million), are excluded from the CRSP Indexes.

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

Parent Price

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

P_v = Parent price

R_v = Received security price

S_r = Spin off ratio, in post-split terms

R_{vi} , S_{ri} = Price and ratio for any additional children created from the spin-off

Parent Shares

$$\text{TSOP} = \text{TSO}_v \times \text{EventSplitFactor}$$

TSOP = Parent's TSO

TSO_v = Total Shares Outstanding on valuation day

Received Price

$$R_v = \textbf{Price of the child received from the exchange at the end of the day before the ex-date}$$

Received Shares

$$R_s = \text{TSOP} \times S_r$$

R_s = Received shares

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, a detached security (dummy) is created after the close on the trading day before the ex-date. The detached security is used as a placeholder until a trade in the spun-off security occurs. The detached security will be added to the same index as the parent security. The detached security will be replaced as soon as an end-of-day trading price for the received (child) security is available. Until then, the detached security is kept in the parent's index and its start-of-day price is carried forward. If the parent undergoes a split or reverse split as part of the corporate action, both its start-of-day price and the spin-off ratio are adjusted to account for the split. 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)

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

Detached Security's Start-of-Day Price

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

DsSOD = Detached 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	Unknown, no index	Unknown	$12 trading RW	$12 (and reevaluated for new index)
Detached Security B'	$0, in A's index	= $40-$30 = $10 from A	$12 from B	Removed

CRSP will not reevaluate companies until there is an opportunity to trade both parent and child securities on a regular way basis, with at least one day of notice for any reevaluation results. If the child does not trade regular-way on the ex-date and did not trade when-issued before it, then both companies will be reevaluated at the close on either the day after regular way trading begins or the second trading day after any trading, whichever comes last.

If there are multiple parents distributing one security, or one parent distributing multiple securities, then all the entities involved will be reevaluated at the same time. A company's index eligible securities are kept in the same indexes after reevaluation 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

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 business 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.

Cash Payments

Cash Dividends

Cash dividends are corporate actions in which a shareholder receives cash for each share held and are typically scheduled at regular intervals. There is no adjustment to a security's start-of-day price for payments received as cash dividends.

The following unique situations related to cash dividends are recognized:

- A dividend paid in a foreign currency where the exchange rate is given by the company is converted into US dollars using the provided exchange rate. If no exchange rate is provided, the dividend amount is converted into US dollars using the spot exchange rate available on the day before, or on, the ex-date.
- A cash dividend with an ex-date on the same day as a stock split will be reported in post-split terms.
- A dividend with a payout amount that is only conditionally approved before the ex-date will not be applied.

Return of Capital

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

Special Cash Dividends

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

Special Dividend (Cash Stock Election)

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:

- The security's start-of-day price (ex-date) will be adjusted by the cash value of the total special dividend known on the day before the ex-date.
- Index holdings will be adjusted as soon as practicable after the stock/cash proration is disseminated via an official company press release.

Redemptions

Full Call

A full call is the redemption of a security by the issuer (usually prior to the maturity date) at the call (redemption) price. A security that is called and delists from a CRSP exchange of interest is generally removed after the close on the last day of trading.

Limited Self-tender Offers (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 US Total Market Index 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 a noncapitalization-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 US Total Market Index will be implemented at the next quarterly ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

When a Dutch tender offer is implemented, the 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 US Total Market Index 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 noncapitalization-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 US Total Market Index will be implemented at the next quarterly ranking or upon the application of an intra-quarter noncapitalization-neutral corporate action.

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

Buybacks on the Open Market

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

Neutral Capital Structure Events

Stock Dividend

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 the price per share. Stock dividends have no net impact on the company's market capitalization.

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 the price per share. A reverse stock split is a decrease in a company's total shares accompanied by a corresponding increase in its stock price. On the ex-date, index holdings are increased or decreased by the 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 to be capitalization neutral corporate events.

Chapter 4: CRSP Sector Indexes

CRSP developed the set of Sector Indexes listed below in order to highlight industry segment-specific characteristics of all companies included in the CRSP US Total Market Index. To accomplish that objective, CRSP uses Industry Classification Benchmark (ICB®) codes to assign companies to the appropriate industry.

There are 10 sector indexes based on the ICB industry level and two based on the REIT subsectors within the Financials industry. Since the ICB REIT classification is a subset of the Financials industry, companies may be assigned to both.

CRSP Sector Index	NASDAQ Symbol	
	Total Return	Price Return
CRSP US Oil and Gas Index	CRSPENT	CRSPEN1
CRSP US Materials Index	CRSPMTT	CRSPMT1
CRSP US Industrials Index	CRSPIDT	CRSPID1
CRSP US Consumer Goods Index	CRSPCGT	CRSPCG1
CRSP US Health Care Index	CRSPHCT	CRSPHC1
CRSP US Consumer Services Index	CRSPCST	CRSPCS1
CRSP US Telecom Index	CRSPTET	CRSPTE1
CRSP US Utilities Index	CRSPUTT	CRSPUT1
CRSP US Financials Index	CRSPFNT	CRSPFN1
CRSP US Technology Index	CRSPITT	CRSPIT1
CRSP US REIT Index	CRSPRET	CRSPRE1
CRSP US Small Cap ex-REIT Index	CRSPSXT	CRSPSX1

Industry Level Sector Indexes

All securities included in the US Total Market Index are assigned to an industry level sector index based on their ICB code. Therefore eligibility and investability screens for the sector indexes are consistent with those used for other CRSP Indexes.

Eligible securities are assigned to CRSP Sector Indexes based on their ICB industry code:

ICB Industry Identifier	Industry	CRSP Index
0001	Oil & Gas	CRSP US Oil and Gas Index
1000	Materials	CRSP US Materials Index
2000	Industrials	CRSP US Industrials Index
3000	Consumer Goods	CRSP US Consumer Goods Index
4000	Health Care	CRSP US Health Care Index
5000	Consumer Services	CRSP US Consumer Services Index
6000	Telecommunications	CRSP US Telecom Index
7000	Utilities	CRSP US Utilities Index
8000	Financials	CRSP US Financials Index
9000	Technology	CRSP US Technology Index

REIT Index

The CRSP US REIT Index applies a further restriction on the Financials industry based on the REIT classification specified at the ICB subsector level.

As is the case with its other industry sector indexes, CRSP utilizes the ICB code assigned to each security to determine eligibility for the CRSP US REIT Index. The ICB codes listed in the table below are included in the CRSP US REIT Index. Mortgage REITs (ICB code 8676) and Timber REITs (a subset of the specialty REIT classification, ICB code 8675, maintained by CRSP) are not eligible for inclusion in the CRSP US REIT Index but may be included in other CRSP indexes.

The following ICB subsector codes are eligible for the US REIT Index:

ICB Subsector Identifier	REIT Classification	CRSP Index	NASDAQ Symbol	
			Total Return	Price Return
8671	Industrial & Office			
8672	Retail			
8673	Residential	CRSP US REIT Index	CRSPRET	CRSPRE1
8674	Diversified			
8675*	Specialty			
8677	Hotels and Lodging			

*included if not a Timber REIT

If an index constituent of the US REIT Index becomes ineligible for the index due to loss of REIT status or change of REIT type, or if a security not a member of the US REIT Index becomes eligible due to change in REIT status or change of REIT type, no change is made in REIT index eligibility at the time of the announcement or filing; rather, the security will be reviewed and added or removed, if appropriate, at the next ranking or reevaluation.

Small Cap ex-REIT Index

The CRSP US Small Cap ex-REIT Index includes all those securities in the CRSP US Small Cap Index except those identified as REITs. For this index all REITs, identified by ICB codes between 8671 and 8677, are excluded. A mortgage or a timber REIT is excluded from both the US REIT Index and the US Small Cap ex-REIT Index.

IRS Code 25/50 Concentration Constraints

The CRSP Sector Indexes comply with the IRS concentration rules required for a company to qualify as a regulated investment company (RIC). These rules state that at the end of each quarter, a RIC must meet the following constraints:

- 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 total assets should not exceed 50 percent of the fund's total assets.

In order to minimize unnecessary turnover, CRSP created buffers around the IRS' concentration constraints with the goal of allowing some limited, but typical, movement of prices between ranking and reconstitution, whilst remaining compliant with the IRS' rules. Consequently, CRSP sets its holdings constraints at ranking to:

- No more than 22.5 percent (maximum company buffer) of the value of the index's capitalization may be represented by a single issuer.
- The sum of the weights of all issuers representing more than 4.9 percent (larger company buffer) of the total index capitalization may not exceed 45 percent (concentration buffer) of the index's total capitalization.

A "least squares" approach is used to minimize any changes to company weights within an index. This method favors small changes to a larger set of companies over larger changes to a smaller set of companies. Because even small changes

are relatively big for very small companies, CRSP includes the additional constraint that, if possible, the ratio of the new weight to the old weight for any one company can never exceed a ten-to-one ratio.

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), $\sum_{i=1}^{N} (\overline{w}_i - w_i)^2$, subject to the following three criteria:

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

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

2. The weight for a specific company must fall between zero and the maximum company buffer:

$$\text{for all i, } 0 \leq w_i \leq 22.5\%$$

3. The total weight of companies above the large company buffer should not exceed the concentration buffer:

$$\text{where } w_i > 4.9\%, \sum w_i \leq 45\%$$

The second step first determines whether the maximum ratio of the constrained weight to the ideal weight does not exceed 10 ($\max(\frac{w_i}{\overline{w}_i}) > 10$). If it does, then the optimizer is run again with the following two additional constraints:

The number of large companies (where $w_i > 4.9\%$) is not allowed to change.

The maximum ratio is 10:

$$\text{for all i, } \frac{w_i}{\overline{w}_i} \leq 10$$

The third step is to calculate the concentration limit multiplier (CLM) that is used to adjust index holdings on a security basis. The CLM is defined in the constrained index relative to the holdings in an unconstrained index. By convention, the CLM is set such that the maximum value is one, and all others are adjusted proportionately, $\frac{w_i}{\overline{w}_i} * \min(\frac{\overline{w}_i}{w_i})$. The multiplier used for a company at reconstitution to meet compliance remains in effect until the next ranking period, unless there is a corporate action as detailed below.

CRSP reviews compliance of its pro forma Sector Indexes daily during the pro forma period. Primary Sector Indexes are reviewed for compliance on compliance days and upon the application of a qualifying corporate action type.

Quarterly Maintenance

Ranking and Reconstitution

The CRSP Sector Indexes are fully reviewed on a quarterly basis, following the same schedule and process as all CRSP Indexes. See also chapter 3: Index Maintenance - Quarterly Maintenance for the ranking schedule and chapter 2: Index Construction for more information on the reviews and process undertaken at each ranking. Additionally, changes in a security's industry sector intra-quarter not attributed to a corporate action will be implemented at ranking. If a security is reclassified from one industry sector to another, it is moved 100 percent to its newly assigned sector. CRSP does not apply the concept of packeting to its Sector Indexes. Newly eligible or ineligible securities will also be reviewed, and added or removed if necessary, at ranking.

IRS Code 25/50 Compliance at Ranking

At each ranking, CRSP proactively adjusts weights in the initial pro forma indexes to satisfy the standard ranking buffer limits, even if the IRS limits are not violated. If weights in the pro forma index violate the IRS 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 more stringent CRSP buffer limits.

During the pro forma period, primary indexes are not checked for compliance. If pro forma indexes are rebalanced during a transition period, the primary index will continue transitioning to the new target beginning the following trading day. If a security in the new primary or pro forma index is constrained due to concentration limits during transition, then a new concentration limit multiplier is calculated as the ratio of the post-transition holdings of the constrained index to the post-transition holdings of its unconstrained index.

Prices used to determine a company's compliance weight on ranking day are the start-of-day prices on the ranking day. Prices used to validate continued compliance of pro forma indexes during daily maintenance in the pro forma period are the start-of-day prices on the preceding trading day.

Daily Maintenance

Corporate actions and security additions and delistings are researched and applied to sectors in the same manner as in all CRSP Indexes. The processing of corporate actions of securities in constrained indexes preserves the existing concentration ratios where possible. In some cases, a new security must be fitted into a constrained index.

- Secondary offering or buyback — the CLM is preserved and new 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 the holdings and the CLM is preserved.
- Received stock — if shares are distributed from one source, such as in a spin-off, then the CLM is inherited from that source. If shares originate from multiple sources, such as in a merger of equals or a spin-off with two parents, then the CLM is reset to preserve the ratio of constrained to unconstrained holdings.
- New CLM = $\sum$ (holdings$_i$ * rate$_i$) / $\sum$ (holdings$_i$ / CLM$_i$ * rate$_i$) for each input source
- Securities added to constrained indexes — a fast-track IPO or a spin-off or merger that creates a company in a different sector than any of its parents will trigger a review of compliance.

  If the index company cap of any of the new securities is at least the minimum breakpoint of the Large Cap index at the last ranking, or if the index is a pro forma index, then the index is reoptimized. The holdings of all securities are set to their unconstrained values and a concentration check is done, If no more than 22.5 percent of the index weight is allocated to one issuer, and the sum of weights of all issuers at least 4.9 percent does not exceed 45 percent, then the unconstrained weights are used. Otherwise the index is reoptimized. Reoptimization is done using the same targets as at ranking.

  If none of the new securities has an index company cap at least the minimum breakpoint of the US Large Cap Index at the last ranking, and if the index is a primary index, then the new securities are fitted into the existing index. If the existing index is already unconstrained, the new securities are added at their full weight. If not, and the pro forma is active, then the pro forma is reoptimized and the new securities are fitted based on their weights in the pro forma. If the pro forma is inactive, then the new securities are fitted based on the weights they would be assigned if the index was reoptimized. Any reoptimizations are done with the same targets as at ranking.
- Other reevaluated or trued-up securities – if resultant securities of a merger, spin-off, or similar action continue in the same constrained index, the concentration ratio is preserved and applied to the new unconstrained holdings. If the security was added or updated via received stock, then the CLM applied at that time will continue.

Compliance Days

The IRS' rules further require that index holdings be compliant at fiscal quarter-end. To comply, CRSP has set its compliance dates to the last trading day of March, June, September, and December. Compliance checks are completed by 1:30 p.m. CT 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. Compliance checks are made against the actual IRS limits and do not use buffers.

If an index is found to be out of compliance, a modified holdings adjustment process is used. This process attempts to minimize turnover by rebalancing the index with ideal weights set based on the current concentration multipliers instead of unconstrained weights. The index is again optimized, but this time to more stringent CRSP buffers. No more than 24.5 percent of the index weight is allocated to one issuer, and the sum of weights of all issuers over 4.95 percent will not be more than 49 percent.

Chapter 5: CRSP US Value and Growth Indexes

CRSP offers 10 Value and Growth Indexes across the market capitalization spectrum. Once a security is assigned to a capitalization-based index, it is evaluated using CRSP's multifactor "style" model to determine its placement in a value or growth index for its specific size. Micro Cap companies are not eligible for inclusion in the CRSP US Value and Growth Indexes.

CRSP US Value and Growth Indexes currently offered:

Index Name	NASDAQ Symbol	
	Total Return	Price Return
CRSP US Mega Cap Value Index	CRSPMEVT	CRSPMEV1
CRSP US Large Cap Value Index	CRSPLCVT	CRSPLCV1
CRSP US Mid Cap Value Index	CRSPMIVT	CRSPMIV1
CRSP US Small-Mid Cap Value Index	CRSPSMVT	CRSPSMV1
CRSP US Small Cap Value Index	CRSPSCVT	CRSPSCV1
CRSP US Mega Cap Growth Index	CRSPMEGT	CRSPMEG1
CRSP US Large Cap Growth Index	CRSPLCGT	CRSPLCG1
CRSP US Mid Cap Growth Index	CRSPMIGT	CRSPMIG1
CRSP US Small-Mid Cap Growth Index	CRSPSMGT	CRSPSMG1
CRSP US Small Cap Growth Index	CRSPSCGT	CRSPSCG1

Constructing the CRSP US Value and Growth Indexes

Construction of the CRSP Value and Growth Indexes is done in concert with 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 ranking:

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

Defining Value and Growth Indexes

CRSP employs a multi-factor model, which capitalizes on five value and six growth factors, when classifying securities to their appropriate value or growth indexes. CRSP is the first index provider to use the investment rate (INV) and the return on assets ratios (ROA) as growth factors when determining a company's style placement.

Value Factors Used in 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 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. Investment-to-Assets Ratio (INV)
6. Return on Assets (ROA)

Refer to Appendix C for detailed definitions and calculations of each factor

Steps for Combining Multiple Style Factors into Single Composite Growth Score and Single Composite Value Score

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 according to the following formula:

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

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 superfactor (V1). The sales-to-price ratio (SP) and dividend-to-price ratio (DP) are then combined to create a secondary value superfactor (V2). Merging the two value superfactors together creates a single composite value score (V), as defined below:

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

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

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

Calculating Growth Composite Style Score:

When determining the growth CSS, CRSP calculates a future growth superfactor (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 superfactor (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 superfactors are combined to create a single composite growth score (G) as defined below:

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

$$FG = (1/3 \times zFLGE) + (1/3 \times zFSGE) + (1/6 \times zINV) + (1/6 \times zROA), \text{ and}$$

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

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 what is termed an AR for each security. A security with a high AR, or mean score above 0.5, is categorized as value, while a security with a low AR, or mean score below 0.5, is categorized as growth.

There is little agreement on exact definitions of value and growth or when exactly securities switch 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 buffer movement between styles.

Details for calculation of the value and growth style indexes:

1. Rank stocks 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 security, 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 its cap-base 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 security 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 securities to value or growth categories according to their AR scores:
   - Securities with an AR > 0.5 are classified as 100 percent value
   - Securities with an AR ≤ 0.5 are classified as 100 percent growth

To visualize this procedure, the following figure plots RV and RG scores for a hypothetical stock. 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. Also see Appendix D for an overview of the entire scoring process.

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 nonmissing input factors is 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 noncomposite 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 style indexes and a new AR score is unavailable, then it 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

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 Equity Indexes. (See also chapter 3: Index Maintenance – Quarterly Maintenance for ranking schedule and chapter 2: Index Construction 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. For these, however, CRSP centers the band around an AR score of 0.5 and sets the threshold bandwidth at an AR of .3333. This means that securities with an AR between .3333 and .6667 are considered to be inside of the band. Once a security crosses through the band between its current style and the adjacent style core, 50 percent of its holdings are moved. If the security stays beyond the threshold in the following ranking period, the remaining 50 percent will be moved. Therefore, a security may be partially held in both a value and a growth index. It is also possible for the same security to be classified differently in different market capitalization–based indexes depending on the characteristics it displays in each segment. In other words, a security 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.

Daily Maintenance

IPO Methodology for Value and Growth Indexes

When an IPO security is added to a capitalization-based index, it is assigned to a corresponding style index. To assign an IPO 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 manually determine the values necessary to generate growth and value scores.

If a company's size is lower than the Large Cap lower breakpoint (85 percent), or a style cannot be assigned for an added company, it will be set to 50 percent in value and 50 percent in growth in corresponding style indexes for each size index it is added. As soon as an AR score can be calculated at a ranking, the company will move to the Value or Growth Index as if it were new.

Corporate Action Methodology for Value and Growth Style 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 in 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 from one of the originating companies of the corporate action. 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, unless the index eligible shares issued to shareholders of a nonsurvivor in the CRSP US Total Market Index are more than the previously existing shares. Then the source is the nonsurviving company with the largest number of shares in the merged company.
- 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 as above, but based on holdings in the pro forma index, not in the primary index.

If there is sufficient time and available sources for a reevaluated entity, and migration is allowed for the event, CRSP may independently evaluate factors as done for large fast-track IPOs, and apply migration rules based on the score found and the starting company style assignment.

Chapter 6: Announcement Policies

Ranking Procedure and Ranking Results

Announcements regarding ranking procedures and results are made available to index subscribers via the CRSP secure index website at 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).

A two-month notice will be given prior to making a change in the ranking schedule.

Exchange 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 will 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 occur 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 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 transition, transition will be extended accordingly.

Chapter 7: Glossary of Terms

Terms	Definition
Bands	Capitalization bands: Different percentage thresholds straddling each capitalization-based breakpoint. Style bands: Different percentage thresholds straddling the value/growth breakpoint. Bands are considered by CRSP when reevaluating a company's index placement in terms of total capitalization or style.
Capitalization-based indexes	Indexes developed to represent capitalization-based size-specific characteristics of companies.
Cap-neutral corporate action	A corporate action that does not change the capital structure of the company is considered cap-neutral. Examples include stock dividends and stock splits.
Cash dividend	An event in which shareholders receive cash for each share held (typically scheduled at regular intervals).
Compliance check	Determines whether or not an index satisfies IRS 20/50 concentration rules .
Compliance days	Last trading day of March, June, September, and December required to comply with the IRS (25/50) concentration constraints.
Compliance rebalance	An action that applies CRSP rules to reset the holdings of an index according to CRSP concentration optimization rules. A compliance rebalance uses a target percentage weight for the largest company, a large company, and the sum of weights of large companies. It can set initial weights at either unconstrained or the current state. Also called a compliance re-optimization.
Concentration limit multiplier (CLM)	A ratio that adjusts the index holdings to satisfy the IRS (25/50) concentration constraints.
Consolidation	A corporate action where a company combines multiple share classes of common stock into one security. It behaves like a merger but is neutral at the company level and company cap is not affected. This is also called an exchange.
Conversion	A corporate action where a company exchanges one of its securities for another type of security.
Constrained index	An index that requires rebalancing to satisfy IRS 25/50 rules. At least one security in the index has a CLM not equal to one.
Corporate action	An event initiated by a company which 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, Bats Global Markets, and the Investors Exchange.
Effective float factor	A security's float factor rounded to the nearest 5 percent.
Employee Identification Number (EIN)	A unique nine-digit number assigned by the IRS to business entities operating in the United States for the purposes of identification.
End-of-day price	Official closing price for a security on its primary listing exchange. If the primary exchange price is not available, price is assigned in a specific order of precedence as defined by CRSP end-of-day price methodology.
Exchanges/conversions	A mandatory swapping of one security for another security of the same company. For example, a preferred stock is converted into a common stock or one class of security is exchanged for another class.

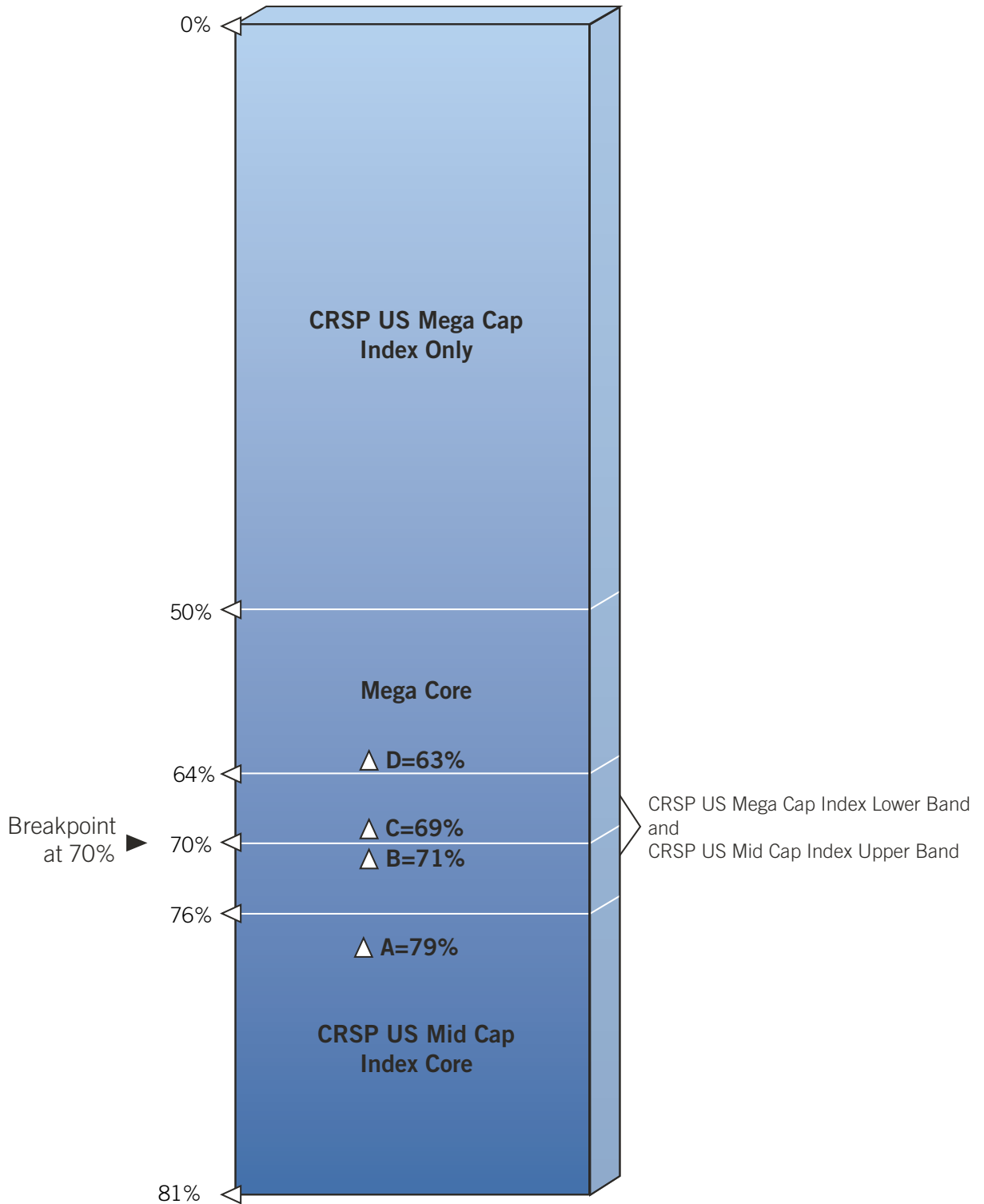|	
Ex-distributed trading	A period of conditional trading with deferred settlement, when a security is traded without post-event rights before the event is effective, at the same time that the original security is trading regular way in its pre-event state.
Fast-track IPO	An IPO that passes a specific company capitalization threshold that is added to CRSP indexes prior to a ranking.
Final transition day	The last of the five Transition Days when the ranking process is complete and the indexes are converted to the holdings determined at the Ranking and the pro forma indexes become inactive. Is also called Reconstitution Day.
Float factor	The ratio of float shares outstanding to total shares outstanding, expressed as a percentage.
Float shares outstanding	The number of shares of a security outstanding that are freely available for trading by the public.
Float-adjusted market capitalization	A security's index holdings multiplied by the security's price (used to determine a security's weight within an index).
Forward stock split	An increase in a company's total shares outstanding accompanied by a corresponding decrease in the price per share.
Full call	The redemption of a security by the issuer (usually prior to the maturity date) at the call (redemption) price.
Holdings	The number of shares held in an Index, calculated by multiplying security's total shares outstanding by its effective float factor as well as other index-specific multipliers.
Index cap	A security capitalization within an index, equal to the index holdings multiplied by the security's price.
Index company cap	A company capitalization within an index, equal to the index holdings multiplied by the security's price, summed for all securities of the company in the index.
Industry Classification Benchmark (ICB)	A classification system that allocates companies to the industry sector whose definition closely describes the nature of its business as determined from the source of its revenue or the source of the majority of its revenue.
Investability	Characteristics of a security in terms of liquidity, defined by the CRSP Indexes investability rules.
Issue split	A corporate action where a company creates a new share class by distributing shares from existing issues. It behaves like a spin-off but is creating a new security, not a new company. It is neutral at the company level and company cap is not affected. This is also called a stock dividend of a new security.
Market cap	The market value of a company's outstanding shares
Market impact	The extent to which the buying or selling of securities moves the price of a security.
Merger/acquisition	An event in which two or more companies are combined into one, creating a new entity.
Merger of equals	A corporate action 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 across various capitalization-based or style breakpoints and associated indexes, applying CRSP packeting and migration rules.
Multipliers	Certain multipliers exist for size, style, and sector indexes to enforce shared holdings due to migration or to change holdings in order to satisfy legally-mandated IRS concentration constraints, such as concentration limit multiplier (CLM).
Noncapitalization 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 does not trade on any public exchange.
Packet	In general, 50 percent of the index's total holdings of a company.
Packeting	Movement between indexes by a packet, in general 50 percent of an index's total holdings of a company.
Partial merger	A corporate action where a company spins off assets and immediately merges those assets with another existing company, resulting in a lower capitalization in the parent company and shares issued and capitalization increased of the child company. This can be done as a mandatory or voluntary action. If voluntary, it is structured as an Exchange Offer, where shareholders of the parent company have the option to tender shares in exchange for shares of the child company.
Price impact	The correlation between an incoming order (to buy or to sell) and the subsequent price change
Primary index	The current index as distinguished from a pro forma index that exists concurrently during a ranking period.
Pro forma adjustment period	Time period after ranking during which CRSP will review challenges to the pro forma assignments. This is generally up to the Friday after the ranking day.
Pro forma period	The time between the ranking and reconstitution date, currently 12 trading days, unless a holiday occurs.
Pro forma index	The announced but not applied composition of the CRSP indexes on a ranking date. On the final transition date, the pro forma index will become the regular/standard index for the upcoming quarter.
Ranking	An activity where CRSP index constituents are reviewed quarterly. CRSP ranking dates are after the close of the first Friday of March, June, September, and December.
Rebalancing	Another term used to describe reconstitution.
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 at 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 the index. All spin-offs make use of received stock, at least on the ex-date. Mergers require received stock only when the acquired security is removed from indexes before a reevaluation is completed.
Reconstitution day	See final transition day.
Reevaluation	The intra-quarter application of CRSP index rules to a company. Examples include index eligibility, investability, and market capitalization methodologies. Typically reevaluation occurs after a spin-off, or merger if the resulting company meets the capitalization threshold defined by the CRSP's methodology.
Regular way trading	A type of trade that is settled through the regular settlement cycle (two days after the trade date (T+2)).
Reverse merger	Any merger in which the surviving entity originates from outside of CRSP's security universe.
Reverse stock split	A decrease in a company's total shares outstanding accompanied by a corresponding increase in the price per share.
Rights distribution	An event in which current shareholders are given 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 number of rights received per share owned in a rights distribution.

Secondary exchange	All stock exchanges excluding NYSE, NYSE American, NYSE ARCA, NASDAQ, Bats Global Markets, and the Investors Exchange. 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.
Spin-off	The creation of an independent company through the distribution of new shares of an existing business or division/subsidiary.
Split factor	Ratio of the number of new shares received to old shares held in a forward or reverse stock split.
Split-off	A corporate action where a company distributes shares it holds of another company. A split-off results in a lower capitalization of the parent company but no change to shares outstanding or capitalization of the child, since only shareholders change. This can be done as a mandatory or voluntary action. If voluntary, it is structured as an exchange offer, where shareholders of the parent company have the option to tender shares in exchange for shares of the child company.
Start-of-day price	Previous day end-of-day price adjusted for all splits and non-ordinary distributions, such as special dividends, rights distributions, or spin-offs.
Stock dividend	A distribution of additional shares of stock to existing stockholders. (See Forward Stock Split)
Style indexes	Indexes developed to represent the value or growth characteristics of companies, as defined by CRSP's multifactor style model.
Subscription ratio	The number of shares that can be purchased per right owned.
Tender offer	An external or internal offer made directly to a firm's shareholders to buy their stock at a specified price, usually at a premium over the prevailing market price.
Total shares outstanding	All of the shares of a specific class of a company's equity securities that are issued and outstanding.
Transition day	One of five days when holdings are partially moved from the current index to the target pro forma holdings.
Transitional reconstitution	Transitional reconstitution moves 20 percent of the holdings each day during a five-day period from the current index to the target pro forma index.
When-distributed trading	A period of conditional trading with deferred settlement, on shares of a security affected by an offer awaiting final allotment of post-offer shares to individual shareholders, at the same time the original shares are trading regular way.
True-up	An index action that synchronizes index holdings of a security with its latest shares data. Effective float factor is recalculated as the float shares outstanding divided by the total shares outstanding, rounded to the nearest 5 percent. The holdings are then set to the total shares outstanding multiplied by the recalculated effective float factor and relevant index multipliers.
Unconstrained Index	An index that passes IRS 25/50 rules and therefore needs no rebalancing of its securities. All securities in the index have a CLM equal to one. Alternately, an index where IRS 25/50 rules are disregarded.
Unit split	A corporate action where securities previously trading as a bundled package (unit) begin trading only independently. A unit split typically occurs when one of the securities in the unit expires or is called.
When-issued trading	A period of conditional trading of a new security with deferred settlement. It typically takes place in securities which are due to be listed or admitted to trading.
Winsorize	The transformation of statistics by limiting extreme values in the statistical data to reduce the effect of possibly spurious outliers.

Appendix A: Migration Examples

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 sake of clarity.

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 Mega Cap core and is allocated 100 percent to the 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 Mid Cap core. Therefore, one 50 percent packet is moved. As a result, 50 percent of the company is allocated to the Mega Cap Index and 50 percent is allocated to the 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 Mid Cap Index.

Q4 state:

Company is ranked at 71 percent (point B).

Because the company's AR score is still in the band adjacent to the Mid Cap core, it maintains its 100 percent allocation in the 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 Mega Cap core. Consequently, one 50 percent packet is moved and allocated to the Mega Cap Index; the other 50 percent packet remains allocated to the 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 Mid Cap core. It did not remain in the Mega Cap core for two consecutive quarters, therefore the 50 percent packet that was moved to the Mega Cap Index during the previous quarter is reallocated to Mid Cap resulting in an 100 percent allocation to the 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 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 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 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 Mid Cap Index. Therefore, one 50 percent packet is moved out of Mega Cap and into Mid Cap. As a result, 50 percent of the company is allocated to Mega Cap and 50 percent is allocated to Mid Cap.

Q4 state:

Company is ranked at 71 percent (point B).
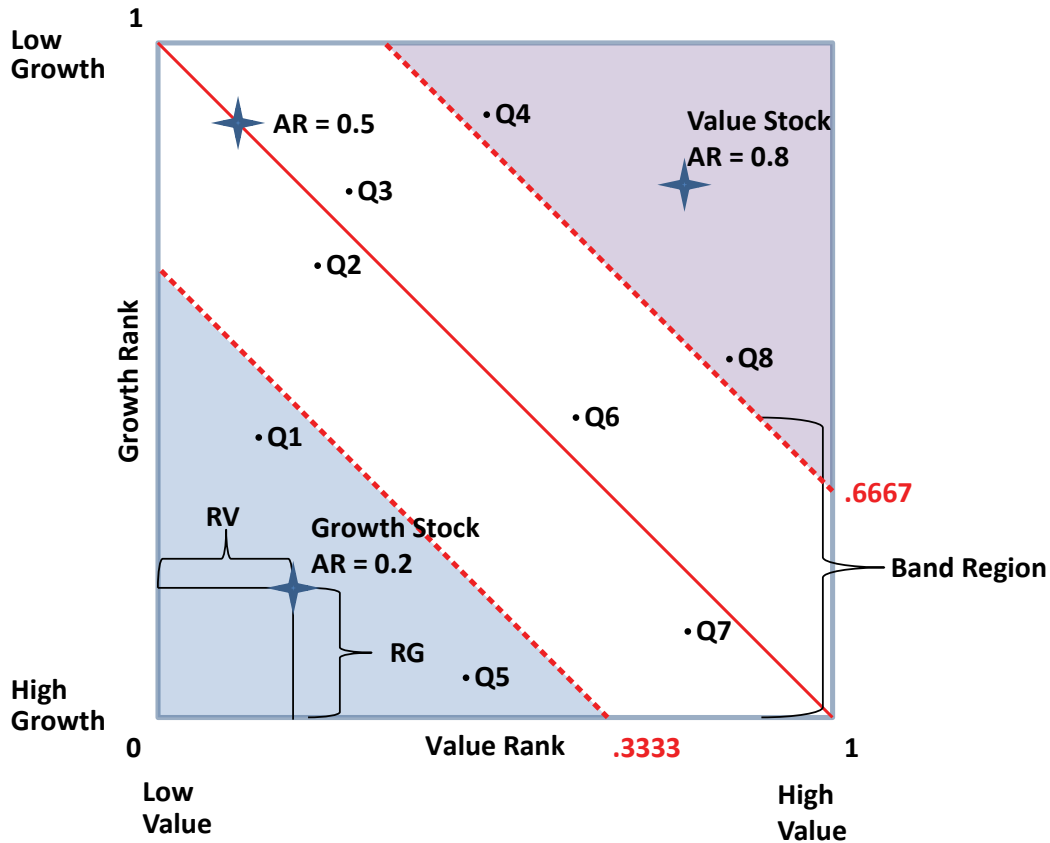
Because the company remains within the band, no movement occurs and the company's allocation remains split (50/50) between the Mid and Mega Cap indexes.

Q5 state:

Company is ranked at 69 percent (point C).

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

Value and Growth Style Migration Example

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 is corresponding to the total market capitalization that the company was allocated to this capitalization category. For example, when a company starts with half of its total market cap in CRSP's US Mid Cap index (e.g., migrating between the Mid Cap index with an adjacent 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 teh 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.

Appendix B: Index Calculations

Index Level

Index Level is the value of an investment relative to its value at one fixed point in time. Index Levels allow convenient comparison of the relative performance of the different portfolios or asset classes. For CRSP U.S. Equity Indexes initial levels were set to 1,000. See Appendix E for a list of inception dates for all CRSP U.S. Equity 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)

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

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 reinvestments 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:

$$\text{CRSP index daily turnover}_t = \frac{\sum_{i=1}^{N} |w_{i,t} - w_{i,t-1}|}{2}$$

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,

$$\text{CRSP index annual turnover} = \sum_{t=1}^{T} \text{CRSP Index Daily turnover}_t$$

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.

Additional Index Calculations

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

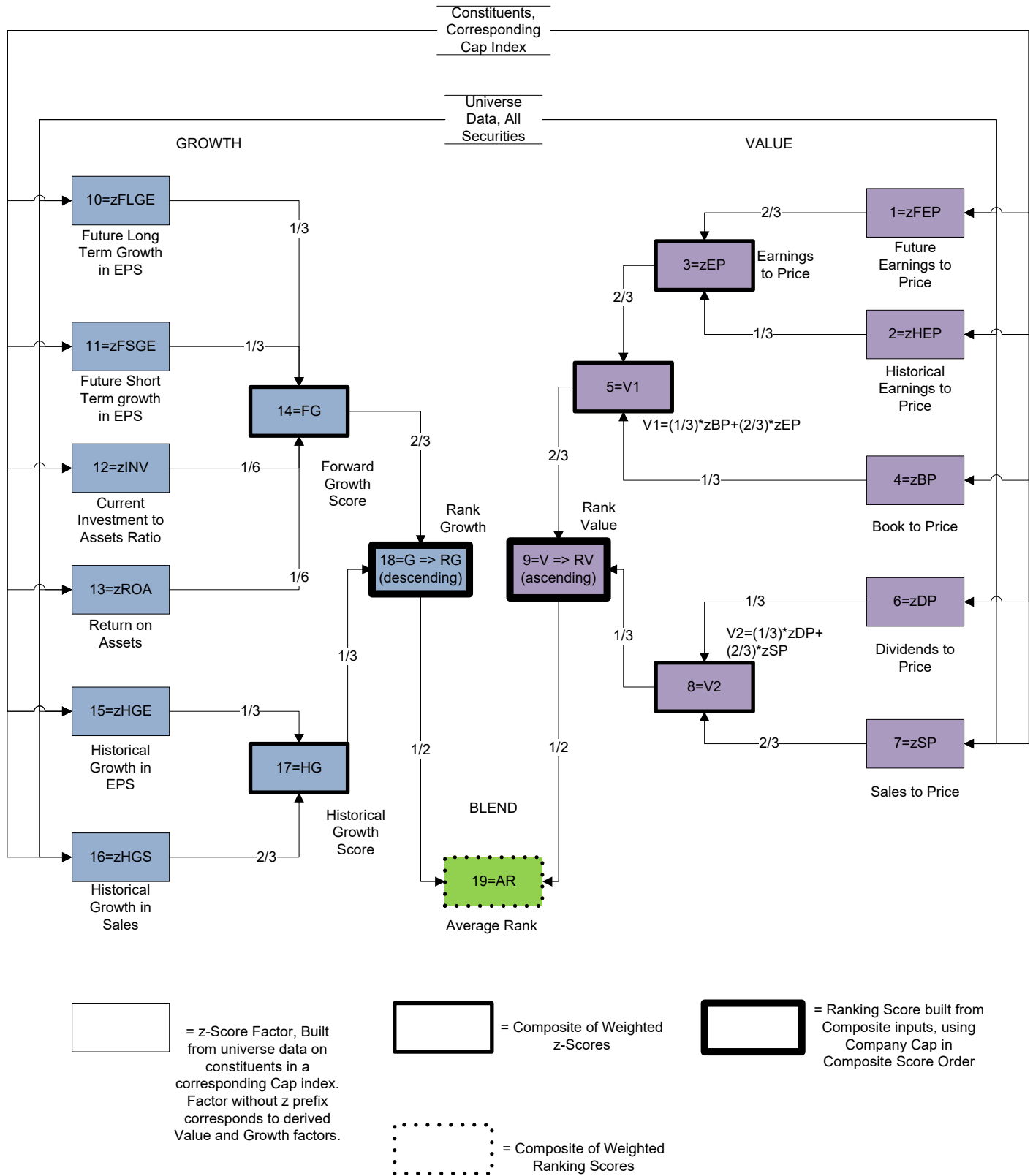| Daily Index Statistic	Description
Total return	The return on an index, including all distributions.
Capital appreciation return	The return on an index, excluding ordinary dividends.
Income return	The return on ordinary dividends in an index.
Total return index level	The value of an index, including 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.
End-of-day market value	In thousands of dollars. End-of-day total index capitalization of all index constituents.
Start-of-day market value	In thousands of dollars. Start-of-day total index capitalization of all index constituents.
Concentration ratio – one	Weight of the largest company in portfolio at start-of-day.
Concentration ratio – ten	Sum of the weights of the largest ten companies in portfolio at start-of-day.
Concentration ratio – large	Sum of the weights of the companies in portfolio with a weight over 5% at 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	$\sum$(end of day price $\times$ 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 a cash payout	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 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 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 C: Value and Growth Factor Definitions and Calculations

Value Factors	Definition	Sources	Calculation	Data Considerations
BP	Book to Price	Compustat quarterly and annual, CRSP price and shares	Book Value = ATQ – LTQ + TXDITCQ – first available of (PSTK, PSTKRV, PSTKL); replace negative result with 0. BP = Book Value / Company Cap	Company Cap is the total capitalization of index eligible securities for the company. If no non-missing preferred stock value, then use 0 in calculation. If both ATQ and LTQ are unavailable at the last quarter, then use the latest quarter within the last four quarters where both are available. If no quarterly data in this range is available, then use the last annual AT and LT values. If still no data for both, then BP is missing. Use TXDITCQ or TXDITC at the corresponding filing used for ATQ and LTQ. If missing in that filing use a 0 in the calculation. If only one of the estimates is available, it is fully weighted.
FEP	Future Earnings per Price	IBES consensus, CRSP price	FEP = (weight_1Y * EPS_EST_1Y + weight_2Y * EPS_EST_2Y) / price, where weight_1Y = # of months, rounded up between current date and next annual reporting period, (minimum of 1) / 12, and weight_2Y = 1 – weight_1Y.	Calculated for primary security according to IBES, inherited by other securities of the same company. Earnings per Share values are split adjusted between report date and current date using CRSP adjustment data.
HEP	Historical Earnings per Price	IBES actual, CRSP price	HEP = sum of last 4 EPS_ACT_QTR / price	Calculated for primary security according to IBES, inherited by other securities of the same company. Earnings per Share values are split adjusted between report date and current date using CRSP adjustment data.
DP	Dividends to Price	Compustat, CRSP price and shares	DP = DVC / Company Cap	Same Company Cap as BP.
SP	Sales to Price	Compustat Quarterly, CRSP price and shares	SP = sum of last 4 SALEQ / Company Cap	Same Company Cap as BP. Pro-rate as in HEP.

Growth Factors	Definition	Sources	Calculation	Data Considerations
FLGE	Future Long Term Growth in EPS	IBES consensus	FLGE = EPS_EST_LTG	No restrictions based on number of estimates. Calculated for primary security according to IBES, inherited by other securities of the same company.
FSGE	Future Short Term Growth in EPS	IBES consensus and Actual	FSGE = ((weight_1Y * EPS_EST_1Y + weight_2Y * EPS_EST_2Y) - sum of last 4 EPS_ACT_QTR) / abs (sum of last 4 ePS_ACT_QTR	Inputs and rules are similar to FEP and HEP, but without price, which is the same and cancels out. Calculated for primary security according to IBES, inherited by other securities of the same company. Missing if sum of EPS_ACT_QTR last 4 quarters is <= 0 or calculated 1 year estimate is negative. Earnings per Share values are split adjusted between report date and current date using CRSP adjustment data.
HGE	Historical Growth in EPS	IBES Actual	HGE = (sum of last four EPS_ACT_QTR - sum of EPS_ACT_QTR 12-15 quarters ago) / abs(sum of EPS_ACT_QTR 12-15 quarters ago)	Pro rate sums separately for quarters 0-3 and 12-15 if not all quarters are available. Missing if sum 12-15 quarters ago is <=0 or sum 0-3 quarters ago is negative. If pro rating base period then pro rate final period using the quarters corresponding to the available base quarters. Earnings per Share values are split adjusted between report date and current date using CRSP adjustment data.
HGS	Historical Growth in Sales	Compustat	HGS = (sum of last four SALEQ - sum of SALEQ 12-15 quarters ago) / abs(sum of SALEQ 12-15 quarters ago)	Pro rate sums separately for quarters 0-3 and 12-15 if not all quarters are available. Missing if sum of SALEQ 12-15 quarters ago is<=0 or sum of SALEQ 0-3 quarters ago is negative. If pro rating base period then pro rate final period using the quarters corresponding to the available base quarters. SALEQ earlier than the most recent quarter can be used even if non-primary as long as the most recent quarter is primary.
INV	Current Investment to Assets Ratio	Compustat	INV= (PPEGTQ – PPEGTQ 4 quarters earlier + INVTQ – INVTQ 4 quarters earlier) / ATQ 4 quarters earlier	If INVTQ is unavailable for the last quarter, then use the latest quarter within the last four quarters where it is found. If still no quarterly data in this range, then use the last annual INVT value. If both INVTQ and ATQ are unavailable five quarters ago, then use the last quarterly filing five to eight quarters ago where both are found. If both are still not found, use INVT and AT from the second to last annual filing. Use the PPEGTQ or PPEGT value corresponding to the quarterly or annual filing used to represent latest INVTQ or four quarters earlier INVTQ and ATQ. If PPEGTQ is not available in either, use a 0 in the calculation for both. If only one is available, then report INV as missing.
ROA	Return on Assets	Compustat	ROA = Sum of last 4 IBQ / ATQ 4 quarters earlier	Pro-rate IBQ quarters as in HEP. If ATQ is missing five quarters ago then use the last annual AT.

Appendix E: CRSP Indexes Quick Reference Summary

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg Ticker
Total Market Index	CRSP US Total Market Index (TR)	CRSPTMT	12628H109	12/31/2012	4/1/2011	BBG003PZ7F43
	CRSP US Total Market Index (PR)	CRSPTM1	12628G101	1/18/2011	4/1/2011	BBG001DQ7123
CRSP Australian Hedged Index	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
CRSP Australian Non-Hedged Index	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
CRSP Canadian Hedged Index	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
CRSP Canadian Non-Hedged Index	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	12627R108	12/31/2012	4/1/2011	BBG003PZ7F61
	CRSP US Mega Cap Index (PR)	CRSPME1	12627R108	8/15/2011	4/1/2011	BBG001YCYN69
Mega Cap Growth	CRSP US Mega Cap Growth Index (TR)	CRSPMEGT	12630R103	12/31/2012	9/10/2012	BBG003PZ7F70
	CRSP US Mega Cap Growth Index (PR)	CRSPMEG1	12630R103	10/1/2012	9/10/2012	BBG003PZ7DH4
Mega Cap Value	CRSP US Mega Cap Value Index (TR)	CRSPMEVT	12630T109	12/31/2012	9/10/2012	BBG003PZ7F89
	CRSP US Mega Cap Value Index (PR)	CRSPMEV1	12630T109	10/1/2012	9/10/2012	BBG003PZ7DJ2
Mega + Mid Cap	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
Mega + Mid Cap Growth	CRSP US Large Cap Growth Index (TR)	CRSPLCGT	12630W102	12/31/2012	9/10/2012	BBG003PZ7FB5
	CRSP US Large Cap Growth Index (PR)	CRSPLCG1	12630W102	10/1/2012	9/10/2012	BBG003PZ7DK0
Mega + Mid Cap Value	CRSP US Large Cap Value Index (TR)	CRSPLCVT	12630X100	12/31/2012	9/10/2012	BBG003PZ7FC4
	CRSP US Large Cap Value Index (PR)	CRSPLCV1	12630X100	10/1/2012	9/10/2012	BBG003PZ7DL9
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 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
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
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 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 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 + 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 Growth	CRSP US Small / Mid Cap Growth Index (TR)	CRSPSMGT	12591P104	3/10/2014	9/102012*	BBG0069LWSF7
	CRSP US Small / Mid Cap Growth Index (PR)	CRSPSMG1	12591M101	3/10/2014	9/10/2012*	BBG0069LWSC0
Small + Mid Cap Value	CRSP US Small / Mid Cap Value Index (TR)	CRSPMVT	12591L103	3/10/2014	9/10/2012*	BBG0069LWSG6
	CRSP US Small / Mid Cap Value Index (PR)	CRSPMV1	12591E109	3/10/2014	9/10/2012*	BBG0069LWSD9
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

Index Description	Index Name	Index Identifier	CUSIP	NASDAQ GIDS Post Date	Inception Date Open Val = 1000	Bloomberg Ticker
Consumer Goods	CRSP US Consumer Goods Index (TR)	CRSPCGT	12631W101	12/31/2012	2/1/2012	BBG003PZ7FM3
	CRSP US Consumer Goods Index (PR)	CRSPCG1	12630G107	7/16/2012	2/1/2012	BBG003PZ7DR3
Consumer Services	CRSP US Consumer Services Index (TR)	CRSPCST	12631X109	12/31/2012	2/1/2012	BBG003PZ7FN2
	CRSP US Consumer Services Index (PR)	CRSPCS1	12630J101	7/16/2012	2/1/2012	BBG003PZ7DS2
Oil and Gas	CRSP US Oil and Gas Index (TR)	CRSPENT	12631Y107	12/31/2012	2/1/2012	BBG003PZ7FP0
	CRSP US Oil and Gas Index (PR)	CRSPEN1	12630A100	7/16/2012	2/1/2012	BBG003PZ7DT1
Financials	CRSP US Financials Index (TR)	CSPFNT	12632A108	12/31/2012	2/1/2012	BBG003PZ7FQ9
	CRSP US Financials Index (PR)	CRSPFN1	12630M104	7/16/2012	2/1/2012	BBG003PZ7DV8
Health Care	CRSP US Health Care Index (TR)	CRSPHCT	12632C104	12/31/2012	2/1/2012	BBG003PZ7FR8
	CRSP US Health Care 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
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
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
Telecommunications	CRSP US Telecom Index (TR)	CRSPTET	12632H103	12/31/2012	2/1/2012	BBG003PZ7FW2
	CRSP US Telecom Index (PR)	CRSPTE1	12630K108	7/16/2012	2/1/2012	BBG003PZ7F07
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
REIT Index	CRSP US REIT Index (TR)	CRSPRET	12632K106	12/31/2012	4/1/2011	BBG003PZ7FY0
	CRSP US REIT Index (PR)	CRSPRE1	12627X105	8/15/2011	4/1/2011	BBG001YCYN96
Small Cap ex-REITs	CRSP US Small Cap ex-REIT Index (TR)	CRSPSXT	12631G106	12/31/2012	2/1/2012	BBG003PZ7FZ9
	CRSP US Small Cap ex-REIT Index (PR)	CRSPSX1	12631G106	10/1/2012	9/10/2012	BBG003PZ7F25

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.

Appendix F: 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 and 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 G: Hours, Holidays, and Early Closures

Hours:

The CRSP Index Operations department is open from 7:00 a.m. to 6:00 p.m. CT.

Holidays:

CRSP Indexes observe the following exchange holidays:

	2018	2019
New Year's Day	January 1	January 1
Martin Luther King, Jr. Day	January 15	January 21
President's Day	February 19	February 18
Good Friday	March 30	April 19
Memorial Day	May 28	May 27
Independence Day*	July 4	July 4
Labor Day	September 3	September 2
Thanksgiving Day**	November 22	November 28
Christmas	December 25	December 25

*CRSP Index Operations will close at Noon CT the day prior to this holiday.

**CRSP Index Operations will close at Noon CT 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 10:30 a.m. CT.

Appendix H: Summary of Methodology Refinements and Transitional Reconstitution Calendar

The 2018 CRSP Index Methodology Guide covers the following changes.

New Methodology

These rules were announced since the 2017 CRSP US Index Methodology Guide was published.

- New Exchanges of Interest (Bats and IEX) – page 3, effective November 2017
- Limited Fixed Self-tender Offers – page 23, effective January 2018

Methodology Refinements in the 2018 Guide

These rule changes were introduced in the 2017 Guide and implemented during the year. They are now built into the methodology.

- Additional Investability Screen for Suspended Securities – page 5
- Transitional Reconstitution – page 11
- Small Fast-track IPOs – page 16
- Rights and Warrant Offerings – pages 17–19
- IRS Code 20/50 Concentration Constraints – page 26
- Default Value and Growth Assignment – pages 33-35

Methodology Clarifications

These rules or situations were clarified in the 2018 guide.

- Direct Listing – page 6
- Voting Rights– page 6
- Merger, Merger of Equals, and Reverse Merger cases – pages 14–15
- Transfers from the Over-the-Counter Market – page 16
- Secondary Offerings – 5 Percent Threshold and Timing – page 19
- Corporate Action maintenance in constrained indexes – page 28
- Value Growth handling when missing and insufficient inputs – page 33

2018 Transitional Reconstitution Calendar

March Quarter 2018:	
Ranking Date:	After end of day Friday, March 2
Pro Forma Indexes Available via FTP:	Sunday evening, March 4
Pro Forma Indexes Available via Website:	Start of business Monday, March 5
Transitional Reconstitution Date:	After end of day Wednesday, March 14 – After end of day Tuesday, March 20
June Quarter 2018:	
Ranking Date:	After end of day Friday, June 1
Pro Forma Indexes Available via FTP:	Sunday evening, June 3
Pro Forma Indexes Available via Website:	Start of business Monday, June 4
Transitional Reconstitution Date:	After end of day Wednesday, June 13 – After end of day Tuesday, June 19
September Quarter 2018:	
Ranking Date:	After end of day Friday, September 7
Pro Forma Indexes Available via FTP:	Sunday evening, September 9
Pro Forma Indexes Available via Website:	Start of business Monday, September 10
Transitional Reconstitution Date:	After end of day Wednesday, September 19 – After end of day Tuesday, September 25
December Quarter 2018:	
Ranking Date:	After end of day Friday, December 7
Pro Forma Indexes Available via FTP:	Sunday evening, December 9
Pro Forma Indexes Available via Website:	Start of business Monday, December 10
Transitional Reconstitution Date:	After end of day Wednesday, December 17 – After end of day Tuesday, December 21

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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

For further information, please visit our website at www.crsp.chicagobooth.edu or email indexes@crsp.chicagobooth.edu.