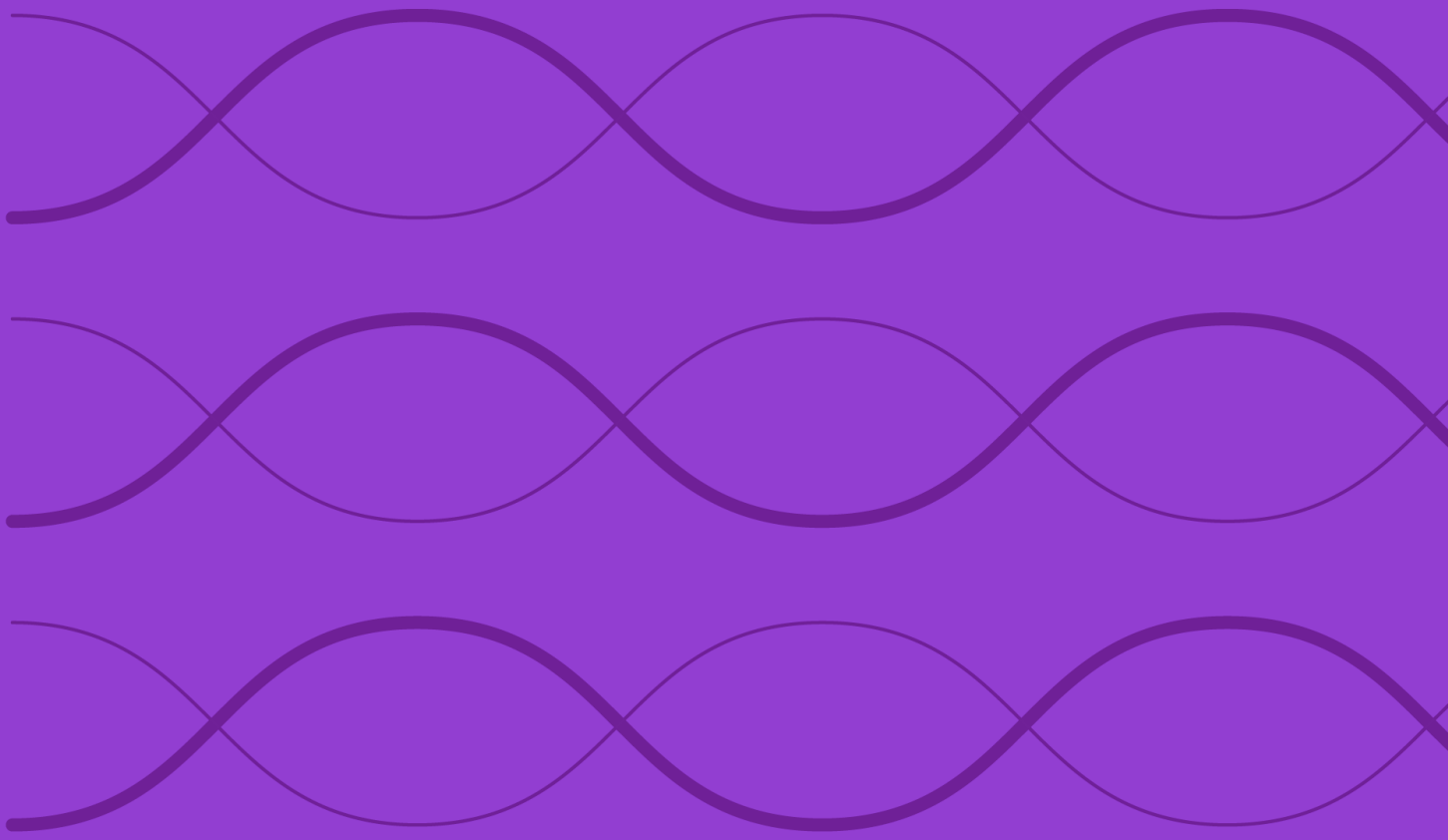
MORNINGSTAR Indexes

Construction Rules for the Morningstar® Global Style Indexes℠



May 2024

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Overview

The Morningstar Global Style Indexes are designed to accurately represent size and valuation segments of the global equity market using a transparent, rules-based methodology. They align with the value/growth style methodology of the Morningstar Style Box for equities. Size index assignments are determined targeting a fixed percentage of market capitalization, which maintains consistency over time. Style index assignments are underpinned by a 10-factor model incorporating both backward- and forward-looking metrics. The indexes reflect that companies can display both growth and value characteristics and may therefore be members of both growth and value indexes.

The global style indexes provide an accurate and consistent representation of the opportunity set available to international style investors, facilitating performance benchmarking. This modular system with distinct building blocks simplifies asset allocation and portfolio construction.

The Morningstar Global Style Index family is built from the Morningstar Global All Cap Target Market Exposure Index, which represents 99% of the global investable market by free float. The style scores are separately calculated across each market capitalization size segment as per the TME Index methodology for each region.

The Morningstar Global Style Index family consists of indexes that track the global equity markets by capitalization and investment style. The style segments within each of the size segments:

- Large-cap: 70% of market capitalization by free float
- Mid-cap: 70%-85% of market capitalization by free float
- Small-cap: 85%-99% of market capitalization by free float

These indexes do not incorporate environmental, social, or governance criteria.

Index Inception and Performance Start Dates

The inception, performance start date, and target market coverage threshold for each index is listed in Appendix 7.

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Index Construction

Methodology Summary

Starting Universe	Eligibility	Portfolio Construction	
• Select constituents from the appropriate parent index from the Morningstar Global All Cap Target Market Exposure Index: ○ United States (US) ○ Japan (JAP) ○ Canada (CAN) ○ Australia/New Zealand (ANZ) ○ Developed Europe/Developed Middle East (DEU) ○ Developed Asia-Pacific ex-JP, AUS, NZ (DAP) ○ Emerging Europe (EEU) ○ Emerging Asia (EAS) ○ Emerging Latin America (ELA) ○ Emerging Middle East (EMA)	• Style score must be available.	• Rank stocks in ascending order (pure value to pure growth) according to style score. • Stocks in the pure value and pure growth regions have their entire float-adjusted market capitalization allocated to the broad value and broad growth index, respectively. • Stocks in the blend region have their float-adjusted market capitalization allocated between the broad value and broad growth index based on a tilt inclusion factor.	Morningstar Global Style Indexes

Starting Universe

At each reconstitution, securities for Morningstar Global Style Index are derived from the Morningstar Global All Cap Target Market Exposure Index. Each security is assigned a market capitalization size segment as per the Morningstar Global All Cap Target Market Exposure Index methodology.

Assigning Stocks to a Size Segment

Companies in the developed markets economic segment are ordered by company full market cap in descending order, and the cumulative free float company market cap is calculated. Upper and Lower bounds for each capitalization are calculated as follows:

- Developed Markets:
  - Large-cap: If the cumulative free float company market cap of the security ranked at the large-cap minimum size reference at the last reconstitution falls between 70% and 71%, the existing rank is retained as the large-cap minimum size reference. If that level is less than 70%, the minimum size reference is reset to 70%. If it is greater than 71%, it is reset to 71%.

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  - Mid-cap: If the cumulative free float company market cap of the security ranked at the mid-cap minimum size reference at the last reconstitution falls between 85% and 85.5%, the existing rank is retained as the mid-cap minimum size reference. If that level is less than 85%, the minimum size reference is reset to 85%. If it is greater than 85.5%, it is reset to 85.5%.
  - Small-cap: If the cumulative free float company market cap of the security ranked at the mid-cap minimum size reference at the last reconstitution falls between 99% and 99.25%, the existing rank is retained as the small-cap minimum size reference. If that level is less than 99%, the minimum size reference is reset to 99%. If it is greater than 99.25%, it is reset to 99.25%.

- Emerging Markets
  - The emerging markets size cutoffs are 0.5 times the cutoffs calculated for developed markets.

- An upper and lower bound is taken around each of the capitalization breakpoints (large, mid, and small). The upper bound is 1.15 times the breakpoint, and the lower bound is 0.5 times the breakpoint. For example, if the developed-market large-capitalization breakpoint is $10 billion, then the upper bound is $10 billion * 1.15 = $11.5 billion and the lower bound is $10 billion * 0.5 = $5 billion.

Calculating the Economic Segment-Level Capitalization Breakpoints

The capitalization breakpoints calculated in the previous section are applied within each country to arrive at the country-specific capitalization breakpoints. For each country, the companies are ordered by company full market cap in descending order, and the cumulative market-capitalization percentages for the companies are calculated. The market capitalization of the largest stock whose cumulative cap percentage is greater than the following values is taken as the initial capitalization breakpoint for that cap band:

- Large-cap: 70%
- Mid-cap: 85%
- Small-cap: 99%

If the initial country-specific breakpoint is smaller than the economic segment-level capitalization lower bound, then the country-specific breakpoint is set to the economic segment-level capitalization lower bound. If the initial country-specific breakpoint is between the upper economic segment-level capitalization and lower economic segment-level capitalization bounds, then no adjustment is made. If the initial country-specific breakpoint is above the upper economic segment-level capitalization bound, the country-specific breakpoint is set to the economic segment-level capitalization upper bound.

Assigning Companies to Capitalization Bands

The adjusted country-level capitalization breakpoints calculated in the previous section are applied within each country to assign companies to one of three capitalization bands: large, mid, and small. All companies that have a market capitalization greater than the large-cap adjusted capitalization breakpoint are assigned to that large-cap band. The same goes for the mid- and small-cap bands.

Capitalization Bands Buffer

A buffer is applied around the capitalization bands to reduce turnover from small changes in market capitalization.

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- An existing constituent is retained in its current size segment if its company full market capitalization is more than 0.67 times the country-specific size segment breakpoint.
- A new constituent is included in the size segment index only if its company full market capitalization is more than 1.5 times the country-specific size segment breakpoint.

Eligibility

Each index constituent within its respective market capitalization segment index (the parent index) is assigned a style weight such that every security in the parent index is a member of either the growth index or the value index, or both indexes. In cases where a company is a member of both the growth and value index, its float market capitalization in the growth index and the value index sums to its float market capitalization in the parent index. That is, a company's growth style weight + value style weight = 1.0.

- The value index contains all stocks that have a nonzero value style weight.
- The growth index contains stocks that have a nonzero growth style weight.

Determining a Stock's Style Orientation Score

Each stock is assigned a value orientation score and a growth orientation score between zero and 100 (see the "Measuring Stock Value Orientation" and "Measuring Stock Growth Orientation" sections for how stock style scores are calculated). The style score is calculated for each stock by subtracting the stock's value orientation score from its growth orientation score. The result can range from 100 (for low-yield, extremely growth-oriented stocks) to negative 100 (high-yield, low-growth stocks).

*Portfolio Construction*Stocks in each parent index are divided into three groups that represent their style characteristics along the growth/value spectrum: pure growth, blend, and pure value. Each range is targeted to account for one third of the float market capitalization of the parent index. The breakpoints, or thresholds, that separate these ranges are determined as follows:

- Rank stocks within the parent index by their style score in ascending order.
- Calculate the cumulative free-float market cap for stocks in the parent index.
- The current value threshold, or CVT, is equal to the style score for the stock corresponding to the cumulative free-float market cap equal to or just greater than the target weight for the pure value range.
- The current growth threshold, or CGT, is equal to the style score for the stock corresponding to the cumulative free-float market cap equal to or just greater than the target weight for the pure value range plus the target weight for the blend range.

Style Assignment and Buffering

- Stocks whose style score is less than CVT-5% of the cumulative free-float market capitalization of the parent index are assigned to the value index.
- Stocks whose style score falls between CVT-5% and CVT are classified as either pure value or blend. Among these, stocks that were classified as blend or pure growth at the previous reconstitution date are assigned to the blend range. The rest are assigned to the pure value range.

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- Stocks that fall between CVT and CVT+5% are classified as either pure value or blend. Among these, stocks that were classified as pure value at the previous reconstitution date are assigned to the pure value range. The rest are assigned to the blend range.
- Stocks that fall between CVT+5% and CGT-5% are assigned to the blend range.
- Stocks whose style score falls between CGT-5% and CGT are classified as either blend or pure growth. Among these, stocks that were classified as pure growth at the previous reconstitution date are assigned to the pure growth range. The rest are assigned to the blend range.
- Stocks whose style score falls between CGT and CGT+5% are classified as either blend or pure growth. Among these, stocks that were classified as blend or pure value at the previous reconstitution date are assigned to the blend range. The rest are assigned to the pure growth range.
- Stocks whose style score falls beyond the CGT+5% are assigned to the pure growth range.

Splitting the Blend Range Between Value and Growth

Weights of constituents assigned to the blend range are allocated to the value and growth indexes based on a tilt factor calculated from the cumulative standard normal function. This process is detailed below.

- Rank stocks within the parent index by their style score in ascending order.
- Calculate a standardized z-score for all constituents of the parent index using the formula below:

$$z = \frac{X - \mu}{\sigma}$$

Where:

X = stock's style score

μ = style score corresponding to the dollar-weighted median based on cumulative float market cap

σ = standard deviation of style score across the parent index

- For all stocks in the blend range, the calculated z-scores are transformed to a growth index tilt factor using the cumulative standard normal distribution function described in the formula below. This transformation converts the standardized style score of each stock to a tilt factor value between 0 and 1.

Growth Index Tilt Factor = $F(z) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z} e^{-\frac{x^2}{2}} dx$

- To avoid including stocks with small style weights in either index, stocks whose growth index tilt factor is less than 5% or more than 95% have their growth style tilt factor set to 0% and 100%, respectively.
- The growth index tilt factor for pure growth stocks is 1.0, and the growth index tilt factor for pure value stocks is 0.0.
- The float market capitalization weight of stocks in the parent index are multiplied with the growth index tilt factor to derive their style weights in the value and growth index, respectively.

- Style weight in the growth index = growth index tilt factor * float market cap weight
- Style weight in the value index = (1-growth index tilt factor) * float market cap weight

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- The growth index is derived as the union of the pure growth range and all stocks with nonzero growth style weights in the blend range. The value index is derived as the union of all stocks in the pure value range and all stocks with nonzero value style weights in the blend range.
- This process results in a growth and value index for each parent index that each represents approximately 50% of the parent index. This symmetry may not always hold; when the distribution of style scores is not normally distributed, the proportion of the parent index allocated to the growth/value index may be different than 50%.
- The large-mid growth and value indexes are derived by aggregating the respective growth and value indexes determined for the large-cap and mid-cap parent indexes:
    - Large-mid growth index = large-cap growth index + mid-cap growth index
    - Large-mid value index = large-cap value index + mid-cap value index

Number of Stocks

The number of stocks in the index is variable, subject to the selection and eligibility criteria at the time of reconstitution.

Index Weighting

The Morningstar Global Styles Indexes are weighted by modified float market capitalization. Stocks in the pure value and pure growth range are weighted according to their full float-adjusted market capitalization in their respective style indexes. Stocks in the blend region have their float-adjusted market capitalization allocated between the broad value and broad growth index based on a tilt inclusion factor as described above. For more details, refer to the Morningstar Indexes Calculation Methodology rulebook.

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Index Maintenance and Calculation

Scheduled Maintenance

The indexes are reconstituted, where, the membership is reset, semi-annually on the third Friday of June and December. Adjustments are made after Friday's market close and reflected the following Monday. If Monday is a holiday, reconstitution is reflected the next business day. The market data used for reconstitution is as of the last trading day of April and October.

The indexes are rebalanced quarterly on the third Friday of March, June, September, and December Adjustments are implemented after Friday's market close and reflected the following Monday. If Monday is an index holiday, the rebalance is reflected on the next business day. The market data used for rebalancing is as of the last trading day of January, April, July, and October.

Refer to Appendix 2 for details on reconstitution and rebalancing.

Index files are published according to the global calendar schedule. For more information, please refer to the Morningstar Indexes Holiday Calendar.

Corporate Actions

The treatment of corporate actions will be as per the float market capitalization weighted indexes.
For more details, please refer to the "Treatment for float market capitalization indexes" section in the Morningstar Indexes Corporate Actions Methodology rulebook.

For more details, please refer to the Morningstar Indexes Corporate Actions Methodology rulebook.

Index Calculation and Price Data

Details about index calculations and price data can be found in their respective rulebooks: Morningstar Indexes Calculation Methodology and Equity Closing Prices Used for Index Calculation.

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Methodology Review and Index Cessation Policy

The index methodology is continually reviewed to ensure it achieves all stated objectives. These reviews take into account corporate action treatment, selection, and maintenance procedures. Subscribers to the index will be notified before any methodology changes are made. For more details, refer to the Morningstar Index Methodology Change Policy.

Morningstar also notifies all subscribers and stakeholders of the index that circumstances might arise that require a material change to the index, or a possible cessation of the index. Circumstances that could lead to an index cessation include, but are not limited to, market structure change, product definition change, inadequate supply of data, insufficient revenue associated with the index, insufficient number of clients using the index, and/or other external factors beyond the control of the Morningstar Index Committee.

Because the cessation of the index or benchmark index could disrupt subscriber products that reference this index, all subscribers are encouraged to have robust fallback procedures if an index is terminated. For more details, refer to the Morningstar Index Cessation Process.

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Data Correction and Precision

Intraday Index Data Corrections

Commercially reasonable efforts are made to ensure the accuracy of data used in real-time index calculations. If incorrect price or corporate action data affects index calculation, corrections applied prospectively.

Index-Related Data and Divisor Corrections

Incorrect pricing and corporate action data for individual issues in the database will be corrected upon detection. In addition, an incorrect divisor of an index, if discovered within two days of its occurrence, will always be fixed retroactively on the day it is discovered to prevent an error from being carried forward. Commercially reasonable efforts are made to correct an older error subject to its significance and feasibility.
For more details, refer to the Recalculation Guidelines.

Exceptions

While Morningstar will seek to apply the method described above, the market environment, supervisory, legal, financial, or tax reasons may require an alternative approach to be adopted. A decision to take an alternative approach will be made by the relevant Morningstar Indexes Methodology Committee, and in all instances, the application of a nonstandard process will be reported to the Morningstar Indexes Oversight Committee.

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Appendixes

Appendix 1: Modifications to the Rulebook

Section	Description of Change	Update Date
Overview and Assigning Stocks to the Indexes	• "Morningstar Global Target Market Exposure Index" changed to "Morningstar Global All Cap Target Market Exposure Index"	January 2023
Overview	• Added "Small-cap: 85%-99% of market capitalization by free float"	January 2023
Entire Rulebook	• Moved to new template	January 2023
Data Correction and Precision	• Computational and Reporting Precision section removed	September 2024

Appendix 2: Glossary

Terms	Description
Reconstitution	Each reconstitution involves the following: • Updating the global market investable equity universe. • Reviewing the economic segment- and country-level size segment breakpoints. • Assigning companies to capitalization bands taking into account the buffer zones. • Changes in index shares (free float, total shares outstanding, index-specific adjustment factor) of each constituent.
Rebalance	During each rebalancing, the following activities are undertaken: • Changes in index shares (free float, total shares outstanding, index-specific adjustment factor) of each constituent. • Addition of U.S. spin-offs/IPOs to the global markets index.
Free Float	The free float is defined as a security's outstanding shares adjusted by block ownership to reflect only truly tradable and investable shares. A security's outstanding shares are adjusted if an entity owns 5% or more of the security through one of the following types of block ownership: • Cross-ownership—shares that are owned by other companies (including banks and life insurance companies). • Government ownership—shares that are owned by governments (central or municipal) or their agencies. • Private ownership—shares that are owned by individuals or families. • Restricted shares—shares that cannot be traded during a certain time period. However, a security's outstanding shares are not adjusted for institutional investors' holdings, which include, but are not limited to, the following categories: • Custodian nominees • Trustee companies • Mutual funds • Investment companies • Pension fund holdings

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Appendix 3: Determining the Value-Core-Growth Assignment for Common Stocks

A stock's value orientation and growth orientation are separate measures, each of interest to investors. As such, they are estimated using related but separate variables. Once estimated, depending on the purpose, they may be used individually or combined into a single value-core-growth, or VCG, orientation measure. For instance, style-based index construction requires the use of a single VCG measure for each stock.

VCG orientation is calculated within capitalization classes, or cap bands. That is, a stock is assigned to a cap band before its VCG orientation is determined. Two stocks that have similar financial ratios and growth prospects but are in different cap bands may be given different VCG assignments.

A high value orientation score (as defined below) indicates that a stock's price is relatively low, given the anticipated per share earnings, book value, revenue, and so forth that the stock provides to investors. A high price relative to these measures indicates that a stock's value orientation is weak but does not necessarily mean that the stock is growth-oriented.

A high growth orientation score (as defined below) indicates that a stock's per share earnings, book value, revenue, and so on are expected to grow faster than those of other stocks in the same cap band. A weak growth orientation does not necessarily mean that a stock has a strong value orientation.

It follows that an individual stock may have any combination of strong or weak growth and value characteristics. Where one set of characteristics is dominant, the stock can be classified accordingly. Where the stock's growth and value characteristics are similar in strength, the stock will be assigned a blend VCG orientation.

Terminology and Notation

The following short forms relate to the 10 factors used to determine a stock's VCG score:

e1/p	=	prospective earnings yield (forecast earnings per share for the current fiscal year, divided by current price per share)
r1/p	=	prospective revenue yield
c1/p	=	prospective cash flow yield
d1/p	=	prospective dividend yield
b1/p	=	prospective book value yield
g'(e)	=	forecast growth rate of earnings per share
g'(c)	=	forecast growth rate of cash flow per share
g'(r)	=	forecast growth rate of revenue per share
g'(b)	=	forecast growth rate of book value per share
g'(e5)	=	median long-term earnings growth forecast

The following short forms relate to a company's fundamental data (earnings per share, for example):

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e1	=	forecast earnings per share for the current fiscal year (the basis for the yield variable defined above).
e0	=	EPS for most recent fiscal year
e–1	=	EPS for the fiscal year prior to e0
e–2	=	EPS for the fiscal year prior to e–1
e–3	=	EPS for the fiscal year prior to e–2
e–4	=	EPS for the fiscal year prior to e–3

As needed to determine the stock's VCG score, the same notations are used for cash flow per share, revenue per share, book value per share, and dividends per share except that "c," "r," "b," or "d," respectively, are substituted for "e" in the example above.

Appendix 4: Measuring Stock Value Orientation

A stock's value orientation reflects the price investors are willing to pay for a share of some combination of the stock's prospective earnings, dividends, sales, cash flow, and book value.

Value orientation is determined using the following three steps:

- Calculate up to five prospective yields (e1/p, d1/p, c1/p, r1/p, and b1/p) for each stock. These values are determined using the process described in the next section.
- Calculate a float market cap-weighted percentile score for each available yield factor, for each stock, within each cap band (large, mid, and small).
- Calculate a weighted average of the individual percentile scores for each stock, using the weighting scheme detailed in "Calculating Overall Value Orientation Scores" below. The weighted average score represents the strength of the stock's value orientation.

Details of each of these steps are provided below.

Calculating Prospective Yields

As many as possible of e1/p, d1/p, c1/p, r1/p, and b1/p are calculated for each stock. Because p is known, the method used to forecast e1, d1, and so on, is key.

If e1, c1, r1, or b1 is forecast to be negative, prospective yield on that factor is excluded for that stock. If no third-party forecast is available and e0, c0, r0, or b0 is positive, then forecast values are calculated as described below (using EPS as an example).

The relationship between prospective and current EPS is straightforward:

[1] $$e_1 = e_0 * (1 + g(e_1))$$

Because e_0 is known, only $g(e_1)$ must be calculated to provide a forecast of e_1. Also, $g(e_1)$ is calculated from historical earnings information.

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First calculate as many as possible of four periodic growth rates:

[2] $$g(e)_{-4} = \left(\frac{e_0}{e_{-4}}\right)^{\frac{1}{4}} - 1$$

[3] $$g(e)_{-3} = \left(\frac{e_0}{e_{-3}}\right)^{\frac{1}{3}} - 1$$

[4] $$g(e)_{-2} = \left(\frac{e_0}{e_{-2}}\right)^{\frac{1}{2}} - 1$$

[5] $$g(e)_{-1} = \left(\frac{e_0}{e_{-1}}\right)^{1} - 1$$

Where e-1, e-2, e-3, or e-4 is negative, no growth rate is calculated using that data point. Availability for restated cash flow is limited to three years.

When as many as possible of the growth rates defined above have been calculated, average the results:

[6] $$g(e)_1 = \text{Average}\left[g(e)_{-4}, g(e)_{-3,}, g(e)_{-2}, g(e)_{-1}\right]$$

Thus:

- Estimated earnings growth g(e1) and forecast earnings (e1) are calculated only for stocks where e0 is a positive number.
- In calculating g(e1), recent growth rates are included in more of the averaged terms than are older growth rates; recent growth rates are therefore weighted more heavily than are older growth rates.
- If third-party forecasts are unavailable, e1/p, c1/p, r1/p, and b1/p are calculated in the same way.

The prospective dividend is determined based on the stock's most recent dividend and published frequency:

$$d_1 = d_0 * f_0$$

If d1/p is the only available forecast yield figure, the stock is not given a VCG assignment.

Calculating Percentile Scores for Each Value Factor

When one or more of e1/p, d1/p, c1/p, r1/p, and b1/p values have been calculated, with or without d1/p, each stock is assigned a float market-cap-weighted percentile score for each relevant factor. The percentile scores are calculated within the stock's cap classification.

Prospective earnings yield scores for stocks within each cap are used in the following example.

To calculate an earnings yield score for each stock in the cap band.

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- Order all stocks in the cap band by their e1/p scores in ascending order.
- Determine the total float market cap of all stocks in the cap band.
- Calculate the float market-cap-weighted average of e1/p within the cap band.
- If all the stocks are within 3 weighted standard deviations of the weighted mean, no stocks are trimmed.
- If not, trim all stocks that are outside 3 weighted standard deviations outside the weighted median. View Appendix 5 for the trimming algorithm.
- Recalculate the float-weighted average e1/p for the cap band and then calculate the percentile score for each factor according to the following equation:

$$F_i = 50 * (1 + \frac{Xi - \mu}{3\sigma})$$

Where:

F_i = Percentile score for individual factor
X_i = Stock factor value
μ = Float market-cap-weighted factor average
σ = Float market-cap-weighted factor standard deviation

- Trimmed stocks are then added back into the cap band and receive the score of lowest- and highest-scoring non trimmed stocks.

All of the steps in this section are then repeated for each of c1/p, r1/p, and b1/p, and d1/p.

Calculating Overall Value Orientation Scores

When the steps above are complete for each of the five value factors, a weighted average is calculated for each stock. In calculating the weighted average, e/p scores, if available, are assigned a weight of 50%; each of the other value factors is assigned an equal share of the remaining weight (either 50% or, if e/p is unavailable, 100%). The weighted average result is the stock's overall value orientation score.

Appendix 5: Measuring Stock Growth Orientation

A stock's growth orientation reflects the rates at which its earnings, sales, cash flow, and book value are expected to grow. Forecast dividend growth rates are not used to determine stock growth orientation.

Determining a stock's growth orientation consists of three steps:

- For each stock, calculate as many as possible of the four average growth rates g'(e), g'(c), g'(r), and g'(b) using the process described in the next section.
- Calculate a float-weighted percentile score for each calculated growth rate, for each stock, within each cap band (large and mid), and a float-weighted percentile score for g(e5), if this is available from a third party.
- Calculate a weighted average of the individual growth rate percentile scores for each stock, using the weighting scheme detailed in the "Calculating Overall Growth Orientation Scores" section below.

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The weighted average score calculated in Step 3 above represents the strength of the stock's growth orientation.

Calculating Stock Growth Scores

As many as possible of g'(e), g'(c), g'(r), and g'(b) are calculated for each stock. In addition, if g(e5) is available from a third party, it is used as a fifth growth rate indicator. The example growth rate calculation below uses g'(e), but the process is identical for g'(c), g'(r), and g'(b).

If e0 and e–1 are negative, then g'(e) is not calculated. If e0 or e–1 is positive, then g'(e) is calculated as follows:

First calculate as many as possible of five periodic growth rates:

[1] $$g'(e)_{-4} = \left(\frac{e_n}{e_{-4}}\right)^{\frac{1}{n+4}} - 1$$

[2] $$g'(e)_{-3} = \left(\frac{e_n}{e_{-3}}\right)^{\frac{1}{n+3}} - 1$$

[3] $$g'(e)_{-2} = \left(\frac{e_n}{e_{-2}}\right)^{\frac{1}{n+2}} - 1$$

[4] $$g'(e)_{-1} = \left(\frac{e_n}{e_{-1}}\right)^{\frac{1}{n+1}} - 1$$

[5] $$g'(e)_{0} = \left(\frac{e_n}{e_{0}}\right)^{\frac{1}{n}} - 1$$

Where:

n = Latest period (0 or -1) in which EPS is positive

If e0, e–1, e–2, e–3, or e–4 is negative, no growth rate is calculated using that data point. If n=0, up to four rates are calculated and if n=–1, up to three growth rates are calculated.

When all available growth rates defined above have been calculated, average the results:

[6] $$g'(e) = \text{Average}\left[g'(e)_{-4}, g'(e)_{-3}, g'(e)_{-2}, g(e)_{-1}\right]$$

Revenue, cash flow, and book value growth rates are calculated in the same way.

If growth information for at least one factor, spanning at least two separate growth periods, is unavailable for a given stock, the stock is not given a VCG assignment.

Calculating Percentile Scores for Each Growth Factor

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As with value orientation factors, the growth orientation factor scores for each stock are next translated into rescaled percentile scores. The percentile scores are calculated within the stock's cap band.

Prospective earnings growth rate scores for stocks within each cap are used in the following example.

To calculate an earnings growth score for each stock in the cap band:

- Order all stocks in the cap band by their g'(e) scores in ascending order.
- Determine the total float market cap of all stocks in the cap band.
- Calculate the float market-cap-weighted average of g'(e) within the cap band.
- If all the stocks are within 3 weighted standard deviations of the weighted mean, no stocks are trimmed.
- If not, trim all stocks that are outside 3 weighted standard deviations outside the weighted median. View Appendix 5 for the trimming algorithm.
- Recalculate the float-weighted average g'(e) for the cap band and then calculate the percentile score for each factor according to the following equation:

$$F_i = 50 * (1 + \frac{Xi - \mu}{3\sigma})$$

Where:
F_i = Percentile score for individual factor
X_i = Stock factor value
μ = Float market-cap-weighted factor average
σ = Float market-cap-weighted factor standard deviation

- Trimmed stocks are then added back into the cap band and receive the score of lowest- and highest-scoring non-trimmed stocks.

All of the steps in this section are then repeated for each of the other four growth orientation factors, including g(e5).

Calculating Overall Growth Orientation Scores

When the above steps are completed for each of the five growth orientation factors, a weighted average is calculated for each stock. In calculating the weighted average, g(e5) scores, if available, are assigned a weight of 50%; each of the other growth factors is assigned an equal share of the remaining weight (either 50% or, if g(e5) is unavailable, 100%). The weighted average result is the stock's overall growth orientation score.

Appendix 6: Trimming Algorithm

The following describes two processes related to calculating percentile scores for each of the 10 factors:

- Test whether trimming should be applied to datasets for individual factors.
- If so, determine what values to trim.

w_i' is calculated as: $$w_i' = \frac{w_i}{\sum_{j \in \Omega} w_i}$$

We define the following statistics,

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Weighted mean: $\mu = \sum_{i \epsilon \Omega} w_i' x_i$

Weighted standard deviation: $\sigma = \sqrt{\sum_{i \epsilon \Omega} w_i' (x_i - \mu)^2}$

Minimum and maximum: $\text{Min}[x] = \text{Min}\{x_i \mid i \in \Omega\}$
$\text{Max}[x] = \text{Max}\{x_i \mid i \in \Omega\}$

Where:

N = the number of securities
x_i = the variable in the question for security i
w_i = the float market cap weight of security i for the full set of N securities within the cap band
Ω = the set of securities that have not been trimmed
$\bar{\Omega}$ = the set of securities that have been trimmed
w_i' = the float market cap weight of security i for Ω

Weighted Median

To calculate the weighted median:

- Sort the values of x_i i ∈ Ω from lowest to highest. Let M = the number of elements of Ω. Let (m) denote the index for the m^{th} lowest value of x_i so that $x_{(1)} \leq x_{(2)} \leq \ldots \leq x_{(M)}$.
- Find the smallest value of m* such that $\sum_{m=1}^{m*} w'_{(m)} \geq \frac{1}{2}$
- The median is Med Med[x] = $x_{(m*)}$

Weight in Untrimmed Set

$$p = \sum_{i \in \Omega} w_i$$

We set a threshold for p, p*=0.95

The Algorithm:

1. Set $\Omega = \{1,2,\ldots,N\}$ and $\bar{\Omega} = \Phi$.
2. Calculate μ, σ, Min[x], Max[x], Med[x], and p.
3. If ($\text{Min}[x] \geq \mu - 3\sigma$ and $\text{Max}[x] \leq \mu + 3\sigma$) or $p \leq p^*$, go to step 6.
4. For each $i \in \Omega$, if $x_i < \text{Med}[x] - 3\sigma$ or $x_i > \text{Med}[x] + 3\sigma$, move i from $\bar{\Omega}$ to Ω.
5. Go to step 2.
6. For each $i \in \bar{\Omega}$, for replace any $x_i < \text{Min}[x]$ with Min[x], and any $x_i > \text{Max}[x]$ with Max[x].

Calculating the Score

Using the values of μ and σ from the final interation of the algorithm, the score of each stock is:

$$S_i = 50 * (1 + \frac{Xi - \mu}{3\sigma})$$

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Appendix 7: Individual Indexes

Index Name	Target Exposure %	Inception Date	Performance Inception Date
Morningstar Global Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Global Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Global ex-US Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Global ex-US Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Global Small Cap Growth TME Index	85%-99%	23-Mar-28	08-Jun-20
Morningstar Global Small Cap Value TME Index	85%-99%	23-Mar-28	08-Jun-20
Morningstar Japan Value TME Index	Top 85	23-Jan-20	08-Jun-20
Morningstar Japan Growth TME Index	Top 85	23-Jan-20	08-Jun-20
Morningstar Developed Markets Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Developed Markets Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Emerging Markets Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Emerging Markets Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Developed Markets ex-US Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Developed Markets ex-US Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Canada Growth TME Index	Top 85	23-Feb-21	08-Jun-20
Morningstar Canada Value TME Index	Top 85	23-Feb-21	08-Jun-20
Morningstar Developed Markets ex-North America Value TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Developed Markets ex-North America Growth TME Index	Top 85	21-Nov-24	08-Jun-20
Morningstar Australia Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Australia Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Asia Pacific Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Asia Pacific Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Europe Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Europe Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Eurozone Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets Eurozone Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Europe Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Europe Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar UK Growth TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar UK Value TME Index	Top 85	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-North America Small Cap Growth TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-North America Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-US Small Cap Growth TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-US Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets Small Cap Growth TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Emerging Markets Small Cap Growth TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Emerging Markets Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Global ex-US Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20

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Morningstar Japan Small Cap Growth TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Japan Small Cap Value TME Index	85%-99%	23-Jun-13	08-Jun-20
Morningstar Japan Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Japan Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global ex-US Small Cap Growth Target Market Exposure	85%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-North America Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-North America Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-US Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Developed Markets ex-US Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Emerging Markets Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Emerging Markets Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global ex-US Small-Mid Cap Growth TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global ex-US Small-Mid Cap Value TME Index	70%-99%	23-Jun-13	08-Jun-20
Morningstar Global All Cap Growth TME Index	Top 99	23-Jun-16	08-Jun-20
Morningstar Global All Cap Value TME Index	Top 99	23-Jun-16	08-Jun-20
Morningstar Japan Mid Growth TME Index	Top 85	23-Jun-16	08-Jun-20
Morningstar Japan Mid Value TME Index	Top 85	23-Jun-16	08-Jun-20
Morningstar Brazil Growth TME Index	Top 85		08-Jun-20
Morningstar Brazil Value TME Index	Top 85		08-Jun-20
Morningstar Brazil Small-Mid Cap Growth TME Index	70%-99%		08-Jun-20
Morningstar Brazil Small-Mid Cap Value TME Index	70%-99%		08-Jun-20
Morningstar Mexico Growth TME Index	Top 85		08-Jun-20
Morningstar Mexico Value TME Index	Top 85		08-Jun-20
Morningstar Mexico Small-Mid Cap Growth TME Index	70%-99%		08-Jun-20
Morningstar Mexico Small-Mid Cap Value TME Index	70%-99%		08-Jun-20

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