

# REFINITIV™ LIPPER®

## Holdings-based fund classification methodology

### Introduction

The Refinitiv™ Lipper® U.S. Diversified Equity (USDE) fund classification model, predicated on portfolio practice, has proven immeasurably helpful to the investment community since its introduction in September 1999. The model provides a meaningful framework for fund directors and management companies to use for performance evaluation. The USDE fund classifications provide investment practice distinctions and thus set reasonable expectations about funds for retail investors and financial advisors.

Because of the success of the USDE model and for the sake of consistency, our standards for worldwide holdings-based fund classifications are set as close to the USDE model as possible. We follow a two-step equity fund classification methodology, regardless of the investment region: first, we assign a market-capitalization classification to each fund; then we assign a style classification.

Lipper offers mutual fund indices based on nearly all of the diversified equity fund classifications. For additional information on the Lipper Indices, visit us at <http://lipperalpha.refinitiv.com/lipper>

### Changes in version 2

We have simplified the classification process with the aim of providing a more thorough and intuitive model to explain portfolio strategies. The most notable changes are:

- Using up to six portfolios (the current portfolio plus the prior five semiannual and annual portfolios)
- Using six characteristics for the primary L-measure
- Changing the border region style test to resemble the capitalization border region test
- Changing the benchmarks for both the capitalization methodology and relative style for the Global and International fund classifications to MSCI indices

### Data underlying the model

Classifying diversified equity funds with Refinitiv Lipper's model begins with portfolio holdings and associated fundamental financial characteristics. Specifically, classifications are assigned based on certain characteristics of the equity securities held by each fund. Here we explain how Lipper obtains data, how the portfolio characteristics are derived, what types of securities are eligible for evaluation, and the time weightings used in all the classification models.

Fund classification models are built on data received directly from fund companies, their data providers, or independent third-party data providers.

For all funds, characteristics derived from portfolio holdings and the S&P® and MSCI indices are obtained using the Reuters Fundamentals research database. Additionally, Lipper uses the Reuters Fundamentals research database to obtain the month-end market values of securities comprising the various S&P and MSCI indices to determine the monthly market-capitalization breakpoints.

Classifications are based on portfolio holdings that meet certain criteria. Only common stock traded on a U.S. or foreign exchange, including American depositary receipts (ADRs) and global depositary receipts (GDRs), is considered. Lipper does not consider cash, convertible securities, rights, warrants, futures, options or preferred stock in the classification process.

A weighting scheme is used in the equity funds classification process. Funds with three or more years of history have portfolio weightings as follows:

		Portfolio Name	Portfolio Weight
Latest ↓ Latest	Current	P0	40%
	Prior Semi/FYE	P1	20%
	Prior Semi/FYE	P2	15%
	Prior Semi/FYE	P3	10%
	Prior Semi/FYE	P4	8%
	Prior Semi/FYE	P5	7%

The current period portfolio, weighted 40%, is refreshed in the classification model each time Lipper receives updated portfolio data. A minimum of one month separates the current period portfolio (weighted 40%) from the P1 portfolio (weighted 20%), to avoid double-counting when the latest portfolio is also a semiannual or fiscal year-end portfolio. Lipper rolls the previous portfolios (P1 through P5) forward six months upon receipt of the newest semiannual or fiscal year-end portfolio. The P1 through P5 portfolios represent the fund's latest semiannual and fiscal year-end holdings. Lipper rolls the previous portfolios (P1 through P5) forward six months upon receipt of the newest semiannual or fiscal year-end portfolio data. For example, a fund with a fiscal year-end of December 31 has the following weights (when the latest portfolio is dated September 30, 2009):

	Portfolio Name	Date	Portfolio Weight
Latest ↓ Latest	P0	Sept. '09	40%
	P1	June '09	20%
	P2	Dec. '08	15%
	P3	June '08	10%
	P4	Dec. '07	8%
	P5	June '07	7%

Funds with fewer than six portfolios use the same date scheme but with different weightings (see below). A fund with only enough portfolio history for the latest three periods has a 53% weight on the current period portfolio, 27% on the P1 portfolio, and 20% on the P2 portfolio. A fund with only enough portfolio history to account for the current portfolio and two prior fiscal year-end portfolios will have a 63% weight on the current period portfolio, 24% on the prior P2 portfolio, and 13% on the P4 portfolio (the last example is that of a fund with very spotty – albeit unlikely – portfolio history). A fund with portfolio data from only the current period is given a classification with 100% weight on the current portfolio. In unique circumstances, a fund company may petition Lipper to classify its fund based 100% on its current period portfolio. For example, a fund that undergoes a change of investment policy may request that Lipper eliminate the fund's history from the weighting scheme and base its classification on updated portfolio data that supports the new investment policy.

	Current	Prior Semi/FYE	Prior Semi/FYE	Prior Semi/FYE	Prior Semi/FYE	Prior Semi/FYE
Examples	1	1	1	0	0	0
Weights	0.4	0.2	0.15	0	0	0
Converted Weights	53%	27%	20%	0%	0%	0%
Examples	1	0	1	0	1	0
Weights	0.4	0	0.15	0	0.08	0
Converted Weights	63%	0%	24%	0%	13%	0%
Examples	1	1	0	1	0	0
Weights	0.4	0.2	0	0.1	0	0
Converted Weights	57%	29%	0%	14%	0%	0%

\* Examples: 1 = Portfolio, 0 = No Portfolio

## Fiscal date changes

In the event that a fund company changes the fiscal year-end of a fund (for example, from December to November), Refinitiv Lipper will attempt to classify the fund based on the availability of historical portfolios. It may be the case that a fund company has not provided portfolios to the public in excess of fiscal quarters. In Lipper's production system, references to historical semi- and fiscal year-end portfolios are based on the current fiscal year-end. If a fiscal date shifts from December to November and only fiscal quarter portfolios were previously available, the affected fund's classification will henceforth depend entirely upon the newest portfolio, unless the fund's sponsor provides historical portfolios that coincide with the new fiscal calendar.

## Refinitiv Lipper classification methodology

The Refinitiv Lipper classification methodology is a two-step process. The first step is to assign a market-capitalization classification to each fund. Based on that designation, the second step is to assign a style classification. Because of the small number of eligible funds and a lack of market-capitalization commitment by many of them, U.S. closed-end fund classifications are limited to core, growth, and value; similarly, international closed-end funds are not broken out into international classifications (most of them are country- or region-specific).

For all available portfolios, style characteristics are calculated using the Refinitiv Fundamentals research database as of the actual portfolio date. The six characteristics used to classify diversified domestic and foreign equity funds are the price-to-earnings ratio, price-to-book ratio, price-to-sales ratio, return on equity, dividend yield, and three-year sales-per-share growth.

### Style characteristics for all diversified equity classification models

- Price-to-Earnings
- Price-to-Book
- Price-to-Sales
- Return on Equity
- Dividend Yield
- Three-Year Sales-Per-Share Growth

### Step 1: Market-capitalization classification

The first step in the classification process is to calculate the percentages of a fund's equity holdings that fall into each of Refinitiv Lipper's three defined market-capitalization ranges. These ranges can be thought of as market-capitalization slices, each holding a percentage of total net equity. The percentages of equity a fund has in each of the small-, mid-, and large-cap slices sum to 100%. A fund's weighted total in each slice is used to determine the final market-capitalization classification.

For the classification system to remain dynamic, market-sensitive breakpoints are calculated each month (see *Appendix A: Market-capitalization breakpoint calculation*).

To be classified as a large-cap fund, at least 75% of the fund's weighted equity assets must be concentrated above the large-cap threshold(s). To be classified as a mid-cap fund, at least 75% of the fund's weighted equity assets must be concentrated below the mid-cap ceiling; and to be classified as a small-cap fund, at least 75% of the fund's weighted equity assets must be concentrated below the small-cap ceiling. Unlike large-cap funds, mid-cap funds do not have a capitalization floor. A fund is classified as a mid-cap fund by summing the equity assets in the small- and mid-cap ranges. Combining the two capitalization ranges allows a mid-cap manager benchmarking his or her fund to a mid-cap index the latitude to potentially buy every stock in the index.

A fund with less than 75% of its weighted equity assets concentrated in any of the three market-capitalization ranges is classified as a multi-cap fund. The multi-cap classification identifies funds that diversify their market capitalizations and that in many cases are unrestricted (by prospectus) as to the size of the companies in which they invest. A multi-cap fund has more than 25% (but less than 75%) of its assets invested in companies with market capitalizations above the mid-cap ceiling (see *Appendix B: Defining the universe*).

### Market-capitalization border regions

A border-region test is applied to funds falling just short of a market-capitalization classification on a weighted basis. All funds that have between 73.00% and 74.99% of their equity assets allocated in a specific market-capitalization range (or, for mid-cap, a combination of capitalization ranges) are subject to a second test. The second test is the calculation of a simple average over the same available portfolios. For example, a fund with a weighted average total of 74% in large-cap and a simple average total of 76% in large-cap passes the border region test to be included in the large-cap classification. A small-cap fund with a weighted average total of 73.2% and a simple average total of 74.5% is not considered a small-cap fund in the Refinitiv Lipper structure, since neither average passes the 75% threshold. Small-cap funds that do not meet the 75% weighted average test or the simple average test are placed in the mid-cap classification. The border-region test is designed to create greater classification stability for funds whose most recent holdings' aggregate weighted market capitalizations have crossed slightly over a boundary.

### Step 2: Style classification

A composite portfolio characteristic measure, or L-measure, is used to classify funds into one of three style classifications. This composite measure is calculated using a six-factor model that compares funds with their relevant index.

The first step in determining a fund's style classification is to calculate an individual Z-score for each period, using the six primary characteristics (see *Appendix C: Market-capitalization classification example*).

For example, if an international large-cap fund's price-to-sales ratio is 10 and the weighted average price-to-sales ratio of large-cap stocks in its relevant index is 8 with a weighted standard deviation of 4, the Z-score would be 0.500 (see *Appendix E: Z-score calculation*). Once a Z-score has been calculated for each of the six characteristics, those Z-scores are summed and divided by 6 to derive that period's L-measure.

Once an L-measure value has been calculated for each period, the final weighted L-measure Z-score is calculated by weighting each individual L-measure: 40% for the current period (P0), 20% for the P1 portfolio, 15% for the P2, 10% for the P4, 8% for the P5, and 7% for the P6. The final weighted L-measure Z-score is placed on a distribution curve (see Figure 1) and used to place each fund in its appropriate style classification (see *Appendix E: Z-score calculation*). The following ranges on the distribution curve define the Refinitiv Lipper-style classifications:

Z-SCORE (STYLE) REGIONS AMONG FUND CLASSIFICATIONS	
U.S. Diversified Equity	World Equity
Growth: Z-score > +0.20	Growth: Z-score > +0.10
Core: Z-score ≤ 0.20 x ≥ -0.20	Core: Z-score ≤ 0.10 x ≥ -0.10
Value: Z-score < -0.20	Value: Z-score < -0.10

### Border regions style

Refinitiv Lipper further tests portfolios with the style classification "border regions". A border region is defined as plus/minus a fraction of a standard deviation from the boundaries around the core style. For example, the defined border region between world equity fund styles growth/core is  $0.10 \pm 0.05$ , or 0.05 to 0.15, while for USDE the value/core border region is  $-0.20 \pm 0.10$ , or -0.30 to -0.10.

The striped areas on the distribution curve in Figure 1 represent the defined border regions.

A fund maintains its assigned style classification unless the confirming statistic's final Z-score exceeds the border region in the opposite direction. The simple average of the L-measures is used to make a final determination of a fund's style classification in the border region between core and value. For example, if a world equity fund's final weighted L-measure Z-score is minus 0.095 (which is on the core side of the core-value border region among world equity funds) and its unweighted L-measure Z-score is minus 0.138 (which does not exceed the core-value border region in the value direction), then the fund remains classified as a core fund. In summary, if a portfolio's final weighted composite L-measure Z-score is in the border region, the secondary statistic (the simple average composite L-measure Z-score) must exceed the border region in the opposite direction if a fund is to be reclassified (see *Appendix F: Equity fund classification definitions*).

The detailed border-region test procedure is outlined in the table below:

Figure 1 depicts the distribution curve with the value, core, and growth regions designated. The gradient area on either side of CORE designates the value/core and growth/core border regions. The x-axis represents a simulated range of fund Z-scores, and the y-axis represents a simulated number of funds in each of the style regions.

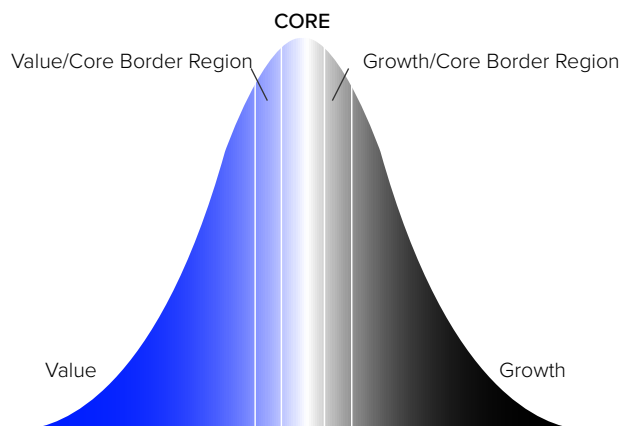


Figure 1: Z-Score Distribution Breakpoints and Border Regions

BORDER REGION TEST		
Core/Growth Border	Weighted Z-Score	Border Test Result
USDE Funds	Between (or equal to) 0.20 and 0.30 Between (or equal to) 0.10 and 0.20	If unweighted Z-score is <0.10 then Core; if >0.10 then Growth If unweighted Z-score is <0.30 then Core; if >0.30 then Growth
ex-USDE Funds	Between (or equal to) 0.10 and 0.15 Between (or equal to) 0.05 and 0.10	If unweighted Z-score is <0.05 then Core; if >0.05 then Growth If unweighted Z-score is <0.15 then Core; if >0.15 then Growth
Core/Value Border	Weighted Z-Score	Border Test Result
USDE Funds	Between (or equal to) -0.20 and -0.10 Between (or equal to) -0.30 and -0.20	If unweighted Z-score is <-0.30 then Value; if >-0.30 then Core If unweighted Z-score is <-0.10 then Value; if >-0.10 then Core
ex-USDE Funds	Between (or equal to) -0.10 and -0.05 Between (or equal to) -0.15 and -0.10	If unweighted Z-score is <-0.15 then Value; if >-0.15 then Core If unweighted Z-score is <-0.05 then Value; if >-0.05 then Core

### U.S. diversified equity funds classification matrices

Table 1A: Open-end and variable annuity USDE funds classification matrix

CAPITALIZATION	Large-Cap Value Funds (LCVE)	Large-Cap Core Funds (LCCE)	Large-Cap Growth Funds (LCGE)
	Multi-Cap Value Funds (MLVE)	Multi-Cap Core Funds (MLCE)	Multi-Cap Growth Funds (MLGE)
	Mid-Cap Value Funds (MCVE)	Mid-Cap Core Funds (MCCE)	Mid-Cap Growth Funds (MCGE)
	Small-Cap Value Funds (SCVE)	Small-Cap Core Funds (SCCE)	Small-Cap Growth Funds (SCGE)
	STYLE		

Table 1B: Closed-end USDE funds classification matrix

NO CAPITALIZATION DIFFERENTIATION	Value Funds (VE)	Core Funds (CE)	Growth Funds (GE)
	STYLE		

### Specialized equity funds (U.S. funds only)

Refinitiv Lipper defines a specialized equity fund as an open-end fund or a variable insurance product that does not meet the criteria to be classified in one of the 12 standard USDE fund classifications. These funds generally:

- Establish a distinct investment strategy in their prospectus language
- Do not conform to any particular capitalization or style mandate
- Have a very low coefficient of determination (r-squared) compared with the 12 standard USDE fund classifications

#### Specialized equity funds without cap/style determination:

Equity Income (EIEI), S&P 500 Index (SPSP), Specialty Diversified Equity (SESE), Dedicated Short Bias (DSB), Extended Large-Cap Core (ELCC), Equity Market Neutral (EMN), Long-Short Equity (LSE) and Diversified Leverage (DL).

## International/global funds classification matrices

World equity funds that concentrate their investments in a specific country or region are reassigned to a more appropriate classification. Tables 2A, 2B, 3A and 3B depict all Refinitiv Lipper international and global fund classifications.

**Table 2A: Open-end international funds classification matrix**

CAPITALIZATION	International Large-Cap Value Funds (ILCV)	International Large-Cap Core Funds (ILCC)	International Large-Cap Growth Funds (ILCG)
	International Multi-Cap Value Funds (MLCV)	International Multi-Cap Core Funds (IMLC)	International Multi-Cap Growth Funds (IMLG)
	International Small- Mid-Cap Value Funds (ISMV)	International Small- Mid-Cap Core Funds (ISMC)	International Small- Mid-Cap Growth Funds (ISMG)
STYLE			

**Table 2B: Variable annuity international funds classification matrix**

NO CAPITALIZATION DIFFERENTIATION	International Value Funds (IFVE)	International Core Funds (IFCE)	International Growth Funds (IFGE)
STYLE			

**Table 3A: Open-end global funds classification matrix**

CAPITALIZATION	Global Large-Cap Value Funds (GLCV)	Global Large-Cap Core Funds (GLCC)	Global Large-Cap Growth Funds (GLCG)
	Global Multi-Cap Value Funds (GMLV)	Global Multi-Cap Core Funds (GMCC)	Global Multi-Cap Growth Funds (GMCG)
STYLE			

**Table 3B: Variable annuity global funds classification matrix**

NO CAPITALIZATION DIFFERENTIATION	Global Value Funds (GLVE)	Growth Funds (GLGE)	Global Growth Funds (GLGE)
STYLE			

## Collection and processing of portfolio data

Funds are classified in Refinitiv Lipper's holdings-based classifications according to portfolio data obtained directly from fund companies or from a third-party portfolio data provider. The vast majority of fund companies provide portfolio data to Lipper as frequently as monthly. Lipper's third-party data provider acquires portfolio data on a semiannual basis from funds' publicly filed documents.

### Portfolio data provided by fund companies or their data providers

To be included in Refinitiv Lipper's monthly processing, month-end holdings and asset allocation, data must be error-free and posted on Lipper's FTP site in the specified format. Portfolio data received by the 25th day of the month is processed on the last business day of that month. For additional information on providing portfolio data to Lipper, contact Client Services toll free at **(877) 955 4773**.

### Portfolio data obtained from Refinitiv Lipper's third-party data provider

Refinitiv Lipper obtains annual and semiannual portfolio data from its third-party portfolio data provider for any funds unable to provide portfolio data to Lipper. Since this data is obtained from publicly filed documents, it typically takes four months from a fund's annual or semiannual reporting date for characteristics to be calculated on third-party-collected portfolio data. For example, characteristics based on December 31, 2013 portfolio holdings would have been processed in Lipper's April 30, 2014 model.

### The semiannual classification review

Although Refinitiv Lipper initiates a review of a fund's current classification only after its latest annual or semiannual portfolio has been processed, fund companies choosing to provide portfolio data to Lipper on a monthly or quarterly basis have a distinct advantage in that they are aware of their portfolio's style and/or capitalization changes well ahead of the review period.

### Classifying new diversified equity funds

Refinitiv Lipper must receive and process an equity fund's first portfolio before assigning a classification to the fund. Lipper accepts data other than month-end portfolio data only for a fund's first portfolio. A fund's first portfolio is valued as of its portfolio date, including non-month-end portfolio dates.

For fund companies choosing not to provide Lipper with an equity fund's first portfolio, Lipper accepts portfolio characteristics in lieu of the requested portfolio data. In turn, Lipper classifies the new equity fund based on portfolio characteristics provided by the fund company or its data provider. If a fund company is unable to provide Lipper with a fund's first portfolio, the fund is assigned a classification once Lipper receives annual or semiannual portfolio data from its third-party provider. (Note that funds lacking a classification are not reported in Lipper's database or to our media partners.)

For additional information on Lipper's policy for classifying new funds, please contact Lipper's Client Services department toll free at **(877) 955 4773**.

### Reclassifying existing equity funds

All fund reclassifications take place from the third week in January through October each year. Because of Refinitiv Lipper's year-end fund classification freeze, all warranted changes identified in November, December and early January are held over until the third week of January.

Equity funds are evaluated at least semiannually. Lipper reviews a fund's classification once the fund's annual or semiannual report is received and processed. If, based on the annual or semiannual portfolio data, Lipper believes a fund should be reclassified, notice is sent to the advisor (see *Appendix G: Sample reclassification request letter from a fund company*).

The advisor has two options:

- **Agree.** Lipper reclassifies the fund soon after receiving confirmation from the advisor.
- **Disagree.** In this instance the advisor or data provider must submit updated portfolio data to Lipper for review. If the updated portfolio data confirms the current classification, the fund is not reclassified. If the updated portfolio data confirms the pending classification, the fund is reclassified. If Lipper does not receive updated portfolio holdings within the allotted time, the fund is reclassified.

In the event that an advisor wishes to petition for a reclassification, the advisor or the advisor's data provider must support the petition by submitting portfolio data that may or may not coincide with the fund's annual or semiannual reporting date. For example, although ABC Fund has a December 31 fiscal year-end, its fund company may send February 28 portfolio data in support of the fund's reclassification. If the updated portfolio data warrants a classification change, Lipper will reclassify the fund accordingly.

Lipper also considers reclassifying funds that have undergone a fundamental change of investment policy. In order for a fund to be reclassified to reflect a fundamental change, Lipper must receive two items: (1) updated portfolio data supporting the change, and (2) a letter signed by an officer of the fund notifying Lipper of the change (see *Appendix G: Sample reclassification request letter from a fund company*).

## Summary

The first step of the fund classification model derives an aggregate market capitalization for each open-end fund and variable insurance product. The second step measures each fund against an appropriate equity index to determine its style classification. The final result of the two-step process places all diversified equity funds into a holdings-based fund classification.

Through this two-step process, Refinitiv Lipper's equity fund classification model meets two important needs. For institutional performance evaluators, it serves as a valuable frame of reference in the analysis of portfolio manager performance. In addition, the fund classifications provide investment practice distinctions and thus set reasonable expectations about funds for retail investors and financial advisors.

## Appendix A: Market-capitalization breakpoint calculation

### U.S. diversified equity fund classifications

Refinitiv Lipper will apply the familiar "70% rule" to the Russell 3000 Index to determine the large-cap floor. All the stocks of the Russell 3000 will be ranked by descending order of market cap; the total market capitalization of the index will be computed by summing each constituent stock's capitalization; and then the large-cap/mid-cap breakpoint will be calculated by adding each stock's capitalization weight until the 70th percentile of the total capitalization is reached.

The small-cap ceiling will be determined in the same way as described above, using the 85th percentile of the total capitalization of the Russell 3000 Index to determine the mid-cap/small-cap breakpoint.

### U.S. registered global/international equity fund classifications

The market-capitalization breakpoints are calculated monthly using the MSCI EAFE Index (for international classifications) and the MSCI World Index (for global classifications).

Refinitiv Lipper will apply a 75% rule to each index to determine the large-cap floor. All the stocks of each index will be ranked by descending order of market cap; the total market capitalization of the index will be computed by summing each constituent stock's capitalization; and then the large-cap/mid-cap breakpoint will be calculated by adding each stock's capitalization weight until the 75th percentile of the total capitalization is reached.

The small-cap ceiling will be determined in the same way as described above, using the 95th percentile of the total capitalization of each index to determine the mid-cap/small-cap breakpoint.

### European equity fund classifications

Refinitiv Lipper will apply a 75% rule to each European index listed below to determine the large-cap floor. All the stocks of each index will be ranked by descending order of market cap; the total market capitalization of the index will be computed by summing each constituent stock's capitalization; and then the large-cap/mid-cap breakpoint will be calculated by adding each stock's capitalization weight until the 75th percentile of the total capitalization is reached.

The small-cap ceiling will be determined in the same way as described above, using the 95th percentile of the total capitalization of each index to determine the mid-cap/small-cap breakpoint.

- Equity Europe funds will use the MSCI Developed Europe Index.
- Equity Eurozone funds will use the MSCI Developed EMU Index.
- Equity Europe ex-UK funds will use the MSCI Developed Europe ex-UK Index.



**UK**

Refinitiv Lipper will use the FTSE 250 and FTSE Small Cap indices with the market-capitalization breakpoints defined monthly as follows:

- Large Cap > median of the top 10 largest cap stocks of the FTSE 250
- Small Cap <= median of the top 10 largest cap stocks of the FTSE Small Cap

**Germany**

Refinitiv Lipper will use the MDAX and SDAX indices with the market-capitalization breakpoints defined monthly as follows:

- Large Cap > median of the top 10 largest cap stocks of the MDAX
- Small Cap <= median of the top 10 largest cap stocks of the SDAX

**Switzerland**

Refinitiv Lipper will use the SPI Mid and SPI Small indices with the market-capitalization breakpoints defined monthly as follows:

- Large Cap > median of the top 10 largest cap stocks of the SPI Mid
- Small Cap <= median of the top 10 largest cap stocks of the SPI Small

**Japan**

Refinitiv Lipper will use the TOPIX Mid400 and TOPIX Small indices with the market-capitalization breakpoints defined monthly as follows:

- Large Cap > median of the top 10 largest cap stocks of the TOPIX Mid400
- Small Cap <= median of the top 10 largest cap stocks of the TOPIX Small

**Appendix B: Defining the universe**

Refinitiv Lipper funds will be selected for holdings-based market-capitalization methodology by mapping from the Lipper Global Classification Extended portfolio to the appropriate market index as follows:

LGC Extended	Market Index
Equity North America	Russell 3000
Equity North America Small- and Mid-Cap	Russell 3000
Equity Active Extension U.S.	Russell 3000
Equity Global ex-U.S.	MSCI EAFE
Equity Global ex-U.S. Small- and Mid-Cap	MSCI EAFE
Equity Global	MSCI World
Equity Global Income	MSCI World
Equity Active Extension Global	MSCI World
Equity Global Small- and Mid-Cap	MSCI World
Equity Germany	MDAX and SDAX
Equity German Small- and Mid-Cap	MDAX and SDAX
Equity UK	FTSE Medium/Small
Equity UK Income	FTSE Medium/Small
Equity UK Small- and Mid-Cap	FTSE Medium/Small
Equity Switzerland	SPI M and SPI S
Equity Swiss Small- and Mid-Cap	SPI M and SPI S
Equity Japan	TOPIX Mid400/TOPIX Small
Equity Japan Small- and Mid-Cap	TOPIX Mid400/TOPIX Small
Equity Europe	MSCI Europe
Equity Europe Small- and Mid-Cap	MSCI Europe
Equity Active Extension Europe	MSCI Europe
Equity EuroZone	MSCI EMU
Equity EuroZone Small- and Mid-Cap	MSCI EMU
Equity Europe ex-UK	MSCI Europe ex-UK

## Appendix C: Market-capitalization classification example

Securities are grouped by market capitalization using Refinitiv Lipper's market-capitalization breakpoints. For example, assume at September 30, 20XX that the mid-cap ceiling (large-cap floor) is \$8.0 billion and the small-cap ceiling is \$2.0 billion.

The fund's percentages of total net assets allocated to each market-capitalization range (\$8 billion+ as large-cap, \$2 billion to <\$8 billion as mid-cap, and <\$2 billion as small-cap) are calculated.

The portfolio weighting for each capitalization range for each portfolio period is calculated.

The capitalization border region is the area between 73.00% and 74.99%. After appropriately weighting each of the portfolios, assuming the fund lands in the mid- to large-cap border region (74.44% in the large-cap range), the capitalization will be confirmed by using the simple average border-region test. In this example, a simple average of each capitalization is calculated and, if that simple average is greater than or equal to 75% in large-cap, that will be its capitalization. If the simple average is less than 75%, the fund will be a multi-cap.

## Appendix D: Definitions of characteristics

### Price-to-Earnings (Trailing 12 Months)

Price divided by EPS, where EPS is the sum of the earnings available for common stockholders over the most recent Trailing 12 Months, divided by a weighted average of common shares outstanding over the most recent four quarters.

### Price-to-Book

Price divided by most recently reported Book Value Per Share.

### Price-to-Sales

Price divided by the most recent four quarters' (year over year) sales per share.

### Return on Equity – Arithmetic

Net income divided by common stockholders' equity.

Calculated at the security level as:

$$ROE = 100 \cdot \frac{EPS}{BPS}$$

where EPS is earnings per share (Trailing 12 Month) and BPS is Book Value Per Share.

### Dividend Yield

The indicated Annual Dividend divided by current price. For classification modeling purposes, the Z-score operation for this characteristic is reversed in order to create negative (value) Z-scores for companies that have higher dividend yields.

### Three-Year Sales-Per-Share Growth

Annualized percentage change in the most recently reported annual Net Sales (or Revenue) Per Share and reported annual Net Sales (or Revenue) Per Share from three years ago. Calculated at the security level as:

$$\left[ \left( \frac{S_t / SHOUT_t}{S_{t-3} / SHOUT_{t-3}} \right)^{1/3} - 1 \right] \times 100$$

where  $S_t$  is the most recently reported annual net sales or revenue,  $S_{t-3}$  is annual net sales or revenue from three years ago, and  $SHOUT_t$  and  $SHOUT_{t-3}$  are the shares outstanding for the security at time t and t-3.



## Appendix E: Z-score calculation

$$Z = \frac{(X - \mu)}{\sigma}$$

**Z** – Individual characteristic standard deviation distance from the population mean

**X** – Characteristic value **weighted** average

**μ** – Characteristic index **weighted** average

**σ** – Characteristic index **weighted** standard deviation

**Note:** All Z-scores are calculated within a specific investment universe group. For instance, all global funds are measured against a capitalization subset of the MSCI World Index, while all international funds are similarly measured against their appropriate capitalization subset of the MSCI EAFE Index. USDE funds are measured against their capitalization-appropriate index from S&P (large-caps: S&P 500, multi-caps: S&P 1500, mid-caps: S&P 400, and small-caps: S&P 600).

## Appendix F: Equity fund classification definitions

### U.S. DIVERSIFIED EQUITY FUND CLASSIFICATIONS – OPEN-END – AND VARIABLE INSURANCE PRODUCT FUNDS

#### Large-cap funds

##### Large-cap growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's USDE large-cap floor. Large-cap growth funds typically have above-average characteristics compared with the S&P 500 Index.

##### Large-cap core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's USDE large-cap floor. Large-cap core funds have more latitude in the companies in which they invest. These funds typically have average characteristics compared with the S&P 500 Index.

##### Large-cap value funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's USDE large-cap floor. Large-cap value funds typically have below-average characteristics compared with the S&P 500 Index.

#### Multi-cap funds

##### Multi-cap growth funds

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Multi-cap growth funds typically have above-average characteristics compared with the S&P SuperComposite 1500 Index.

##### Multi-cap core funds

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Multi-cap core funds typically have average characteristics compared with the S&P SuperComposite 1500 Index.

##### Multi-cap value funds

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Multi-cap value funds typically have below-average characteristics compared with the S&P SuperComposite 1500 Index.

## Mid-cap funds

### Mid-cap growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE large-cap floor. Mid-cap growth funds typically have above-average characteristics compared with the S&P MidCap 400 Index.

### Mid-cap core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE large-cap floor. Mid-cap core funds have more latitude in the companies in which they invest. These funds typically have average characteristics compared with the S&P MidCap 400 Index.

### Mid-cap value funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE large-cap floor. Mid-cap value funds typically have below-average characteristics compared with the S&P MidCap 400 Index.

## Small-cap funds

### Small-cap growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE small-cap ceiling. Small-cap growth funds typically have above-average characteristics compared with the S&P SmallCap 600 Index.

### Small-cap core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE small-cap ceiling. Small-cap core funds have more latitude in the companies in which they invest. These funds typically have average characteristics compared with the S&P SmallCap 600 Index.

### Small-cap value funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's USDE small-cap ceiling. Small-cap value funds typically have below-average characteristics compared with the S&P SmallCap 600 Index.

## Specialized equity funds

### S&P 500 Index funds

Funds that are passively managed and commit by prospectus language to replicate the performance of the S&P 500 Index (including reinvested dividends). In addition, S&P 500 Index funds have limited expenses (advisor fee no higher than 0.50%).

## Equity income funds

Funds that, by prospectus language and portfolio practice, seek relatively high current income and growth of income by investing at least 65% of their portfolio in dividend-paying equity securities.

### Specialty diversified equity funds

Funds that, by portfolio practice, invest in all market-capitalization ranges without restriction. These funds typically have distinctly different strategies and performance, resulting in a low coefficient of determination (r-squared) compared with other U.S. diversified equity funds.

## U.S. DIVERSIFIED EQUITY FUND CLASSIFICATIONS – CLOSED-END FUNDS

### Growth funds

Funds that, by portfolio practice, typically have above-average characteristics compared with the S&P SuperComposite 1500 Index.

### Core funds

Funds that, by portfolio practice, typically have average characteristics compared with the S&P SuperComposite 1500 Index.

### Value funds

Funds that, by portfolio practice, typically have below-average characteristics compared with the S&P SuperComposite 1500 Index.

## U.S. REGISTERED GLOBAL EQUITY FUND CLASSIFICATIONS – OPEN-END FUNDS

### Large-cap funds

#### Global large-cap growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's global large-cap floor. Global large-cap growth funds typically have above-average characteristics compared with their large-cap-specific subset of the MSCI World Index.

#### Global large-cap core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's global large-cap floor. Global large-cap core funds typically have average characteristics compared with their large-cap-specific subset of the MSCI World Index.

**Global large-cap value funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's global large-cap floor. Global large-cap value funds typically have below-average characteristics compared with their large-cap-specific subset of the MSCI World Index.

**Multi-cap funds****Global multi-cap growth funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Global multi-cap growth funds typically have above-average characteristics compared with the MSCI World Index.

**Global multi-cap core funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Global multi-cap core funds typically have average characteristics compared with the MSCI World Index.

**Global multi-cap value funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. Global multi-cap value funds typically have below-average characteristics compared with the MSCI World Index.

**Small- and mid-cap funds****Global small- and mid-cap funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's global large-cap floor.

**U.S. REGISTERED INTERNATIONAL EQUITY FUND CLASSIFICATIONS – OPEN-END FUNDS****Large-cap funds****International large-cap growth funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's international large-cap floor. International large-cap growth funds typically have above-average characteristics compared with their large-cap-specific subset of the MSCI EAFE Index.

**International large-cap core funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's international large-cap floor. International large-cap core funds typically have average characteristics compared with their large-cap-specific subset of the MSCI EAFE Index.

**International large-cap value funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) above Refinitiv Lipper's large-cap floor. International large-cap value funds typically have below-average characteristics compared with their large-cap-specific subset of the MSCI EAFE Index.

**Multi-cap funds****International multi-cap growth funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. International multi-cap growth funds typically have above-average characteristics compared with the MSCI EAFE Index.

**International multi-cap core funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. International multi-cap core funds typically have average characteristics compared with the MSCI EAFE Index.

**International multi-cap value funds**

Funds that, by portfolio practice, invest in a variety of market-capitalization ranges without concentrating 75% of their equity assets in any one market-capitalization range over an extended period of time. International multi-cap value funds typically have below-average characteristics compared with the MSCI EAFE Index.

**Small- and mid-cap funds****International small- and mid-cap growth funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's international large-cap floor. International small- and mid-cap growth funds typically have above-average characteristics compared with their mid- and small-cap-specific subset of the MSCI EAFE Index.

**International small- and mid-cap core funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's international large-cap floor. International small- and mid-cap core funds typically have average characteristics compared with their mid- and small-cap-specific subset of the MSCI EAFE Index.

**International small- and mid-cap value funds**

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. with market capitalizations (on a three-year weighted basis) below Refinitiv Lipper's international large-cap floor. International small- and mid-cap value funds typically have below-average characteristics compared with their mid- and small-cap-specific subset of the MSCI EAFE Index.

## U.S. registered global equity fund classifications – variable insurance product funds

### Global growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. Global growth funds typically have above-average characteristics compared with the MSCI World Index.

### Global core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. Global core funds typically have average characteristics compared with the MSCI World Index.

### Global value funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies both inside and outside the U.S. Global value funds typically have below-average characteristics compared with the MSCI World Index.

## U.S. registered international equity fund classifications – variable insurance product funds

### International growth funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. International growth funds typically have above-average characteristics compared with the MSCI EAFE Index.

### International core funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. International core funds typically have average characteristics compared with the MSCI EAFE Index.

### International value funds

Funds that, by portfolio practice, invest at least 75% of their equity assets in companies strictly outside the U.S. International value funds typically have below-average characteristics compared with the MSCI EAFE Index.

## Appendix G: Sample reclassification request letter from a fund company

May 31, 20XX

Refinitiv Lipper  
8055 E Tufts Ave  
11th Floor  
Denver, CO 80237

Dear Portfolio Group,

It is my understanding that the ABC Fund is pending reclassification from Refinitiv Lipper's global small-cap core classification to its global mid-cap core classification.

Since we currently market another global mid-cap core fund, we are committed to keeping the ABC Fund classified as a global small-cap core fund. As such, we intend to invest at least 75% of the fund's assets in global small-cap stocks. We have submitted a revised prospectus to the SEC, defining global small-cap stocks as stocks that have market capitalizations less than the stated monthly small-cap breakpoint as determined by Lipper.

Per your request, I uploaded a file containing our current portfolio data to Lipper's FTP site. I have also listed the fund's most recent market-capitalization breakdown as follows:

- Current market capitalization
- Percentage of equity assets
- Large-cap 3.75%
- Mid-cap 15.50%
- Small-cap 80.75%

If you require additional statistics, or if you have any questions, please feel free to call me directly at (xxx) xxx-xxxx.

Sincerely,

Jane Smith

(Officer or Director) of the ABC Fund

Refinitiv is one of the world's largest providers of financial markets data and infrastructure, serving over 40,000 institutions in over 190 countries. It provides leading data and insights, trading platforms, and open data and technology platforms that connect a thriving global financial markets community – driving performance in trading, investment, wealth management, regulatory compliance, market data management, enterprise risk and fighting financial crime.

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