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PROSPECTUS SUPPLEMENT  
Filed Pursuant to Rule 424(b)(2)  
Registration Statement No. 333-225551  
(To Prospectus dated October 31, 2018)  
Index Supplement

Debt Securities and Warrants

Linked to an Index or a Basket of Indices

UBS AG may offer and sell from time to time certain debt securities and warrants (collectively, the “Securities”), as part of our Medium-Term Notes, Series B, linked to an index or a basket of indices. Periodically, UBS AG will file with the Securities and Exchange Commission (the “SEC”) final terms supplements, prospectus supplements and/or pricing supplements (collectively, “pricing supplements”) which describe some of the general terms that apply to the Securities and the general manner in which they may be offered. This prospectus supplement, which we refer to as an “index supplement”, describes some of the potential indices to which the Securities may be linked, as well as related matter concerning the relationship, if any, between UBS AG and the sponsors or publishers of each such index. The specific terms of any Securities that we offer will be described for each particular offering of Securities in the applicable pricing supplements, including the name of the underlying index or indices comprising the weighted basket of indices to which the return on the Securities is linked and any additions or changes to the terms specified in the product supplement relating to the Securities or the descriptions of the relevant index or indices set forth in this index supplement. If there is any inconsistency between the terms of the Securities described in this index supplement, the accompanying prospectus and the pricing supplements, the following hierarchy will govern: first, the pricing supplements (relatively as indicated therein); second, this index supplement; and last, the accompanying prospectus.

This index supplement describes only select indices to which the Securities may be linked. We do not guarantee that we will offer Securities linked to any of the indices described herein. In addition, we may in the future offer Securities linked to an index that is not described herein. In such an event, we will describe any such additional index in an applicable pricing supplement.

Issuer:	UBS AG	
Potential Underlying Indices:	<b>U.S. Indices</b>	<b>Non-U.S. Indices</b>
	Dow Jones Industrial Average™	
	NASDAQ-100 Index®	EURO STOXX 50® Index
	Russell 2000® Index	FTSE™ 100 Index
	S&P 500® Index	Hang Seng China Enterprises Index
	<b>Commodity Indices</b>	
	Bloomberg Commodity Index <sup>SM</sup>	MSCI-EAFE® Index
	UBS Bloomberg Constant Maturity Commodity Index Excess Return	MSCI® Emerging Markets Index <sup>SM</sup>

MSCI® Europe Index

**See “Risk Factors” in the applicable pricing supplements for risks related to an investment in any series of the Securities.**

**Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of the Securities or passed upon the adequacy or accuracy of this index supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.**

The Securities are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or any other governmental agency.

**UBS Investment Bank UBS Financial Services Inc.  
Prospectus Supplement dated October 31, 2018**

**ADDITIONAL INFORMATION ABOUT THE SECURITIES**

You should read this index supplement together with the prospectus dated October 31, 2018, relating to our Medium-Term Notes, Series B, of which the Securities are a part, and any applicable pricing supplements that we may file with the SEC from time to time, which contains a description of the terms of particular categories of Securities or the specific terms of your Securities. You may access these documents on the SEC website at [www.sec.gov](http://www.sec.gov) as follows (or if such address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated October 31, 2018:

<http://www.sec.gov/Archives/edgar/data/1114446/000119312518314003/d612032d424b3.htm>

**Other than the above website containing the prospectus dated October 31, 2018, the information on any other website that is referred to in this index supplement is not and will not be deemed to be part of this index supplement. Our Central Index Key, or CIK, on the SEC website is 0001114446.**

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## Index Supplement Summary

*This index supplement describes some of the potential indices to which the Securities may be linked and the relationship, if any, between UBS AG and the sponsors or publishers of each such index. If there is any inconsistency between the terms of the Securities described in this index supplement and accompanying prospectus or the pricing supplements, the following hierarchy will govern: first, the pricing supplements (relatively as indicated therein); second, this index supplement; and last, the accompanying prospectus. Any preliminary terms supplement in relation to one or more offerings of Securities should also be read in connection with this index supplement and the applicable pricing supplements.*

*References to “UBS”, “we”, “our” and “us” refer only to UBS AG and not to its consolidated subsidiaries. In this index supplement, when we refer to the “Securities”, we mean the debt securities and warrants that may be offered by UBS from time to time. Also, references to the “accompanying prospectus” mean the prospectus, dated October 31, 2018, of UBS and references to “applicable pricing supplements” refer to any final terms supplements, prospectus supplements and/or pricing supplements that we may file from time to time.*

Unless otherwise specified herein, we have derived all information regarding each index contained in this index supplement from publicly available information. Such information reflects the policies of, and is subject to change by the sponsor or publisher of the applicable index. Historical performance of an index is not an indication of future performance and future performance of an index may differ significantly from historical performance, either positively or negatively.

## **Licenses**

Unless otherwise specified in the applicable pricing supplement, UBS has contracted with the sponsor or publisher of the index to which your Securities may be linked for the rights to use such index and certain associated trademarks or service marks for such index. UBS generally obtains these licenses either on an individual basis for a particular offering of Securities or for a term of years. Although UBS anticipates that it will continue to enter into and renew such licenses, any such license could be terminated upon the occurrence of certain events in the future.

## Underlying Indices And Underlying Index Publishers

### U.S. Indices

#### Dow Jones Industrial Average™

We have derived all information regarding Dow Jones Industrial Average™ (the “DJIA Index”) contained in this index supplement from publicly available information. Such information reflects the policies of, and is subject to change by, S&P Dow Jones Indices LLC (“S&P Dow Jones”). S&P Dow Jones owns the copyright and all other rights to the DJIA Index. S&P Dow Jones has no obligation to continue to publish, and may discontinue publication of, the DJIA Index. Historical performance of the DJIA Index is not an indication of future performance. Future performance of the DJIA Index may differ significantly from historical performance, either positively or negatively.

The DJIA Index is a benchmark of performance for leading companies in the U.S. stock market, with the exception of those in the transportation and utilities industry. The DJIA Index is a price-weighted average of 30 “blue-chip” U.S. stocks that are generally the leaders in their industry, although this has not always been the case. The number of stocks in the DJIA Index was 12 in 1896, rose to 20 in 1916, then to 30 in 1928, and has been at that level ever since. The DJIA Index is calculated in U.S. dollars as well as Japanese yen.

While there are no rules for component selection, a stock typically is added only if it has an excellent reputation, demonstrates sustained growth, is of interest to a large number of investors and adequately represents the sector(s) covered by the average within the indices. The DJIA Index serves as a measure of the entire U.S. market such as financial services, technology, retail, entertainment and consumer goods and is not limited to traditionally defined industrial stocks. Companies should be incorporated and headquartered in the U.S. In addition, a plurality of revenues should be derived from the U.S.

The DJIA Index is maintained by an Averages Committee comprised of three representatives of S&P Dow Jones Indices LLC and two representatives of *The Wall Street Journal* (“WSJ”). The Averages Committee was created in March 2010, when Dow Jones Indexes became part of CME Group Index Services, LLC and meets regularly. At each meeting, the Averaging Committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the DJIA Index to the market, companies that are being considered as candidates for addition to the DJIA Index and any significant market events. In addition, the Averages Committee may revise index policy covering rules for selectin companies, treatment of dividends, share counts and other matters.

In addition to daily governance of the DJIA Index and maintenance of the methodology, the Index Committee reviews the methodology at least once within any 12-month period to ensure the DJIA Index continues to achieve its stated objectives, and that the data and methodology remain effective. Changes to the DJIA Index are made on an as-needed basis. There is no annual or semi-annual reconstitution. Rather, changes in response to corporate actions and market developments can be made at any time. Constituent changes are typically announced one to five days before they are scheduled to be implemented.

The DJIA Index is price weighted rather than market capitalization weighted. Therefore, the component stock weightings are affected only by changes in the stocks’ prices, in contrast with the weightings of other indices that are affected by both price changes and changes in the number of shares outstanding. The value of the DJIA Index is the sum of the primary exchange prices of each of the 30 common stocks included in the DJIA Index, divided by a divisor that is designed to provide continuity in the level of the DJIA Index. The divisor is changed in accordance with a mathematical formula to adjust for composition changes, stock dividends, stock splits, other corporate actions and other price adjustments. The current divisor of the DJIA Index is published daily in the WSJ and other publications.

While this methodology reflects current practice in calculating the DJIA Index, no assurance can be given that S&P Dow Jones will not modify or change this methodology in a manner that may affect the return on your investment.

#### License Agreement

We have entered into a non-exclusive license agreement with S&P Dow Jones, which grants us a license in exchange for a fee to use the DJIA Index in connection with the issuance of certain securities, including the Securities. “Dow Jones” and “Dow Jones Industrial Average<sup>TM</sup>” are service marks of S&P Dow Jones and have been licensed for use for certain purposes by UBS.

The Securities are not sponsored, endorsed, sold or promoted by S&P Dow Jones. S&P Dow Jones makes no representation or warranty, express or implied, to the owners of the Securities or any member of the public regarding the advisability of investing in securities generally or in the Securities particularly. S&P Dow Jones’ only relationship to UBS is the

**Dow Jones Industrial Average™**

licensing of certain trademarks, trade names and service marks of S&P Dow Jones and of the Dow Jones Industrial Average™, which is determined, composed and calculated by S&P Dow Jones without regard to UBS or the Securities. S&P Dow Jones has no obligation to take the needs of UBS or the owners of the Securities into consideration in determining, composing or calculating the Dow Jones Industrial Average™. S&P Dow Jones is not responsible for and has not participated in the determination of the timing of, prices at, or quantities of the Securities to be issued or in the determination or calculation of the equation by which the Securities are to be converted into cash. S&P Dow Jones has no obligation or liability in connection with the administration, marketing or trading of the Securities.

S&P DOW JONES DOES NOT GUARANTEE THE ACCURACY AND/OR THE COMPLETENESS OF THE DOW JONES INDUSTRIAL AVERAGE™ OR ANY DATA INCLUDED THEREIN AND S&P DOW JONES SHALL HAVE NO LIABILITY FOR ANY ERRORS, OMISSIONS, OR INTERRUPTIONS THEREIN. S&P DOW JONES MAKES NO WARRANTY, EXPRESS OR IMPLIED, AS TO RESULTS TO BE OBTAINED BY UBS, OWNERS OF THE SECURITIES, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF THE DOW JONES INDUSTRIAL AVERAGE™ OR ANY DATA INCLUDED THEREIN. S&P DOW JONES MAKES NO EXPRESS OR IMPLIED WARRANTIES, AND EXPRESSLY DISCLAIMS ALL WARRANTIES, OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE WITH RESPECT TO THE DOW JONES INDUSTRIAL AVERAGE™ OR ANY DATA INCLUDED THEREIN. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT SHALL S&P DOW JONES HAVE ANY LIABILITY FOR ANY LOST PROFITS OR INDIRECT, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSSES, EVEN IF NOTIFIED OF THE POSSIBILITY THEREOF. THERE ARE NO THIRD PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN S&P DOW JONES AND UBS.



## NASDAQ-100 Index®

The NASDAQ-100 Index® (the “NASDAQ Index”) includes 100 of the largest domestic and international non-financial securities listed on The Nasdaq Stock Market® (“NASDAQ”) based on market capitalization. The NASDAQ Index reflects companies across major industry groups including computer hardware and software, telecommunications, retail and wholesale trade and biotechnology. It does not contain securities of financial companies, including investment companies. The NASDAQ Index was first published in January 31, 1985 at a base value of 125.00, as adjusted. Current information regarding the level of the NASDAQ Index is available from NASDAQ, Inc. and its affiliates (collectively referred to herein as the “Corporations”) and from numerous market information services. The level of the NASDAQ Index is determined based on the top 100 largest issuers based on market capitalization meeting all other eligibility requirements. Market capitalization is determined by multiplying a security’s last sale price by its total shares outstanding.

The NASDAQ Index is calculated under a modified market capitalization-weighted methodology. The value of the NASDAQ Index equals the aggregate value of the NASDAQ Index share weights (the “Index Shares”), of each of the securities meeting all eligibility requirements for the NASDAQ Index (the “Index Securities”) multiplied by each security’s last sale price and divided by the divisor of the NASDAQ Index. The methodology is expected to retain in general the economic attributes of capitalization-weighting while providing enhanced diversification. To accomplish this, the Corporations will review the composition of the NASDAQ Index on a quarterly basis and adjust the weightings of components using a proprietary algorithm, if certain pre-established weight distribution requirements are not met.

Securities generally eligible for inclusion in the NASDAQ Index are common stocks, ordinary shares, ADRs and tracking stocks. Closed-end funds, convertible debentures, exchange traded funds, limited liability companies, limited partnership interests, preferred stocks, rights, shares or units of beneficial interest, warrants, units and other derivative stocks are not eligible for inclusion in the NASDAQ Index. For purposes of NASDAQ Index eligibility criteria, if the stock is a depositary receipt representing a stock of a non-U.S. issuer, then references to the “issuer” are references to the issuer of the underlying stock. The NASDAQ Index does not contain securities of investment companies.

### **Inclusion in the NASDAQ Index**

#### *Initial Inclusion Eligibility*

To be eligible for initial inclusion in the NASDAQ Index, a security must meet the following criteria:

- the issuer of the security’s primary U.S. listing must be exclusively listed on the Nasdaq Global Select Market or the (a) Nasdaq Global Market (unless the security was dually listed on another U.S. market prior to January 1, 2004 and has continuously maintained such listing);
- the security must be issued by a non-financial company. Non-financial companies are those companies that are (b) classified under any Industry Code except 8000 according to the Industry Classification Benchmark (ICB), a product of FTSE International Limited;
- (c) the security may not be issued by an issuer currently in bankruptcy proceedings;
- the stock must have a minimum three-month average daily trading volume (“ADTV”) of 200,000 shares (measured (d) annually during the annual Ranking Review process). The ADTV is determined by calculating the average of the sum product of the stock’s daily trading volume for each day during the previous three month period;
- if the issuer of the security is organized under the laws of a jurisdiction outside the U.S., then such security must (e) have listed options on a recognized options market in the U.S. or be eligible for listed-options trading on a recognized options market in the U.S. (measured annually during the Ranking Review process);
- (f) the issuer of the security may not have entered into a definitive agreement or other arrangement which would likely result in the security no longer being eligible for the NASDAQ Index;

- (g) the issuer of the security may not have annual financial statements with an audit opinion that is currently withdrawn. This will be determined based upon a stock issuer's public filings with the SEC; and
- (h) the issuer of the security must have "seasoned" on NASDAQ, NYSE or NYSE Amex. Generally, a company is considered to be seasoned if it has been listed on a market for at least three full months (excluding the

### **NASDAQ-100 Index®**

first month of the initial listing); in the case of spin-offs, the operating history of the spin-off will be considered).  
*Continued Eligibility Criteria*

To be eligible for continued inclusion in the NASDAQ Index, besides meeting the criteria (a), (b), (c), (d), (e), (h) above, the issuer must have an adjusted market capitalization equal to or exceeding 0.10% of the aggregate adjusted market capitalization of the NASDAQ Index at each month-end. In the event a company does not meet this criterion for two consecutive month-ends, it will be removed from the NASDAQ Index effective after the close of trading on the third Friday of the following month.

### *NASDAQ Index Evaluation*

Except under extraordinary circumstances that may result in an interim evaluation, the composition of the NASDAQ Index is reviewed on an annual basis (“Ranking Review”). Securities listed on the NASDAQ which meet the applicable eligibility criteria are ranked by market value. Index-eligible securities which are already in the NASDAQ Index and which are ranked in the top 100 eligible companies (based on market capitalization) are retained in the NASDAQ Index. An issuer that is ranked 101 to 125 is also retained, provided that such security was ranked in the top 100 eligible issuers as of the previous Ranking Review or was added to the NASDAQ Index subsequent to the previous Ranking Review. Issuers not meeting such criteria are replaced. The replacement securities chosen are those NASDAQ Index-eligible securities not currently in the NASDAQ Index whose issuers have the largest market capitalization.

The data used in the Ranking Review includes market data through the end of October for the relevant year and is updated for total shares outstanding submitted in a publicly filed SEC document via EDGAR through the end of November for such year. If a stock is a depositary receipt, the total shares outstanding is the actual depositary shares outstanding as reported by the depositary banks.

The final list of constituents included in the NASDAQ Index, including any replacements made during the Annual Review, is made effective after the close of trading on the third Friday in December. Generally, the list of annual additions and deletions as a result of the annual review is publicly announced by Nasdaq, Inc. via a press release in the early part of December, in conjunction with an announcement on Nasdaq, Inc.’s website.

### **NASDAQ Index Calculation**

The discussion below describes the “price return” calculation of the NASDAQ Index. As compared to the total return or notional net total return versions of the NASDAQ Index, the price return version is ordinarily calculated without regard to cash dividends on the NASDAQ Index stocks. However, all NASDAQ Index calculations reflect extraordinary cash distributions and special dividends.

The NASDAQ Index is a modified market capitalization-weighted index. The value of the NASDAQ Index equals the NASDAQ Index market value *divided* by the NASDAQ Index divisor. The overall NASDAQ Index market value is the aggregate of each NASDAQ Index stock’s market value, as may be adjusted for any corporate actions. A NASDAQ Index stock’s market value is determined by multiplying the last sale price by its index share weight, also known as “index shares”. Index shares are equal to the total number of shares outstanding for a NASDAQ Index stock. In other words, the value of the NASDAQ Index is equal to (i) the *sum* of the *products* of (a) the index shares of each of the NASDAQ Index stocks *multiplied* by (b) each such stock’s last sale price (adjusted for corporate actions, if any), *divided* by (ii) the divisor of the NASDAQ Index.

The price return NASDAQ Index divisor is calculated as the ratio of (i) the start of day market value of the NASDAQ Index *divided* by (ii) the previous day NASDAQ Index value.

If trading in a NASDAQ Index stock is halted on its primary listing market, the most recent last sale price for that stock is used for all NASDAQ Index computations until trading on such market resumes. Similarly, the most recent last sale price is used if trading in a NASDAQ Index stock is halted on its primary listing market before the market opens.

The NASDAQ Index is calculated in U.S. dollars during the U.S. market trading day based on the last sale price and are disseminated once per second from 09:30:01 until 17:16:00 ET. The closing level of the NASDAQ Index may change up until 17:15:00 ET due to corrections to the last sale price of the NASDAQ Index stocks. The official closing level of the NASDAQ Index is ordinarily disseminated at 17:16:00 ET.

### **NASDAQ Index Maintenance**

#### *Changes to NASDAQ Index Constituents*

Changes to the NASDAQ Index constituents may be made during the annual ranking review. In addition, if at any time during the year other than the annual review, it is determined that an index stock issuer no longer meets the criteria for continued inclusion in the NASDAQ Index, or is otherwise determined to have become ineligible for

### **NASDAQ-100 Index®**

continued inclusion in the NASDAQ Index, it is replaced with the largest market capitalization issuer not currently in the NASDAQ Index that meets the applicable eligibility criteria for initial inclusion in the NASDAQ Index.

Ordinarily, a stock will be removed from the NASDAQ Index at its last sale price. However, if at the time of its removal the NASDAQ Index stock is halted from trading on its primary listing market and an official closing price cannot readily be determined, the NASDAQ Index stock may, in Nasdaq, Inc.'s discretion, be removed at a price of \$0.00000001 ("zero price"). This zero price will be applied to the NASDAQ Index stock after the close of the market but prior to the time the official closing level of the NASDAQ Index is disseminated.

### *Divisor Adjustments*

The divisor is adjusted to ensure that changes in NASDAQ Index constituents either by corporate actions (that adjust either the price or shares of a NASDAQ Index stock) or NASDAQ Index participation outside of trading hours do not affect the value of the NASDAQ Index. All divisor changes occur after the close of the applicable index stock markets.

### *Quarterly NASDAQ Index Rebalancing*

On a quarterly basis coinciding with the quarterly scheduled index shares adjustment procedures, as discussed below, the NASDAQ Index will be rebalanced if it is determined that (1) the current weight of the single NASDAQ Index stock with the largest market capitalization is greater than 24.0% of the NASDAQ Index *or* (2) the collective weight of those stocks whose individual current weights are in excess of 4.5% exceeds 48.0% of the NASDAQ Index. In addition, a "special rebalancing" of the NASDAQ Index may be conducted at any time if Nasdaq, Inc. determines it necessary to maintain the integrity and continuity of the NASDAQ Index. If either one or both of the above weight distribution conditions are met upon quarterly review, or Nasdaq, Inc. determines that a special rebalancing is necessary, a weight rebalancing will be performed.

If the first weight distribution condition is met and the current weight of the single NASDAQ Index stock with the largest market capitalization is greater than 24.0%, then the weights of all stocks with current weights greater than 1.0% ("large stocks") will be scaled down proportionately toward 1.0% until the adjusted weight of the single largest NASDAQ Index stock reaches 20.0%.

If the second weight distribution condition is met and the collective weight of those stocks whose individual current weights are in excess of 4.5% (or adjusted weights in accordance with the previous step, if applicable) exceeds 48.0% of the NASDAQ Index, then the weights of all such large stocks in that group will be scaled down proportionately toward 1.0% until their collective weight, so adjusted, is equal to 40.0%.

The aggregate weight reduction among the large stocks resulting from either or both of the rebalancing steps above will then be redistributed to those stocks with weightings of less than 1.0% ("small stocks") in the following manner. In the first iteration, the weight of the largest small stock will be scaled upwards by a factor which sets it equal to the average NASDAQ Index weight of 1.0%. The weights of each of the smaller remaining small stocks will be scaled up by the same factor reduced in relation to each stock's relative ranking among the small stocks such that the smaller the NASDAQ Index stock in the ranking, the less its weight will be scaled upward. This is intended to reduce the market impact of the weight rebalancing on the smallest component stocks in the NASDAQ Index.

In the second iteration of the small stock rebalancing, the weight of the second largest small stock, already adjusted in the first iteration, will be scaled upwards by a factor which sets it equal to the average NASDAQ Index weight of 1.0%. The weights of each of the smaller remaining small stocks will be scaled up by this same factor reduced in relation to each stock's relative ranking among the small stocks such that, once again, the smaller the stock in the ranking, the less its weight will be scaled upward. Additional iterations will be performed until the accumulated

increase in weight among the small stocks equals the aggregate weight reduction among the large stocks that resulted from the rebalancing in accordance with the two weight distribution conditions discussed above.

Finally, to complete the rebalancing process, once the final weighting percentages for each NASDAQ Index stock have been set, the index share weights (or index shares) will be determined anew based upon the last sale prices and aggregate capitalization of the NASDAQ Index at the close of trading on the last calendar day in February, May, August and November. Changes to the index shares will be made effective after the close of trading on the third Friday in March, June, September and December, and an adjustment to the divisor is made to ensure continuity of the NASDAQ Index. Ordinarily, new rebalanced index share weights will be determined by applying the above procedures to the current index share weights. However, Nasdaq, Inc. may, from time to time, determine rebalanced weights, if necessary, by applying the above procedure to the actual current market capitalization of the NASDAQ Index components. In such instances, Nasdaq, Inc. would announce the different basis for rebalancing prior to its implementation.

During the quarterly rebalancing, data is cutoff as of the previous month end and no changes are made to the NASDAQ Index from that cutoff until the quarterly index share change effective date, except in the case of changes due to corporate actions with an ex-date.

**NASDAQ-100 Index®***Corporate Actions and NASDAQ Index Adjustments*

Aside from changes resulting from quarterly rebalancing, intra-quarter changes in index shares driven by corporate events can also result from a change in a NASDAQ Index stock's total shares outstanding that is greater than 10.0%. If a stock is a depositary receipt, the total shares outstanding is the actual depositary shares outstanding as reported by the depositary banks. Changes in the price and/or index shares driven by corporate events such as stock dividends, stock splits and certain spin-offs and rights issuances are adjusted on the ex-date. Changes in total shares outstanding are determined by an index stock issuer's public filings with the SEC. If the change in total shares outstanding arising from other corporate actions is greater than or equal to 10.0%, the change is made as soon as practicable. Otherwise, if the change in total shares outstanding is less than 10.0%, then all such changes are accumulated and made effective at one time on a quarterly basis after the close of trading on the third Friday in each of March, June, September and December. The index shares are derived from the stock's total shares outstanding. The index shares are then adjusted by the same percentage amount by which the total shares outstanding have changed.

The following corporate actions will be made effective on the ex-date. If there is no ex-date announced by the index exchange, there will be no adjustment to the NASDAQ Index as a result of a corporate action.

*Stock Split and Stock Dividend.* A stock split and stock dividend is the action of a NASDAQ Index stock in increasing its index shares and decreasing the par value proportionately. There is no flow of capital into or out of the company. The number of index shares in the NASDAQ Index increases but the market capitalization of the stock remains unchanged. The price of the NASDAQ Index stock is adjusted to reflect the ratio of a stock split and stock dividend and a corresponding inverse adjustment to the index shares is made.

*Reverse Stock Split.* A reverse stock split is the action of a NASDAQ Index stock in decreasing its index shares and decreasing the par value in proportion. There is no flow of capital into or out of the company. The number of index shares in the NASDAQ Index decreases but the market capitalization of the stock remains unchanged. The price of the NASDAQ Index stock is adjusted to reflect the ratio of the reverse stock split and a corresponding inverse adjustment to the index shares is made.

*Special Cash Dividends.* A dividend is considered "special" if the information provided by the listing exchange in their announcement of the ex-date indicates that the dividend is special. Other nomenclature for a special dividend may include, but is not limited to, "extra", "extraordinary", "non-recurring", "one-time" and "unusual". The price of the NASDAQ Index stock in the NASDAQ Index is adjusted for the amount of the special cash dividend.

*Cash and Stock Dividends.* If a NASDAQ Index stock is paying a cash and stock dividend on the same date, the cash dividend is applied *before* the stock dividend unless otherwise indicated in the information provided by the index exchange. Additionally, in the case of an optional dividend which allows the holder to choose between receiving cash or stock, the adjustment will be made in the manner in which the dividend has been announced by the index exchange.

*Stock Distribution of Another Stock.* If a NASDAQ Index stock is distributing shares of a different stock, the value of the NASDAQ Index stock will be adjusted downward to reflect the ratio of the distribution. There is no adjustment to index shares. If the stock being distributed is another class of common shares of the same issuer, the value of the existing NASDAQ Index stock will be adjusted downward to reflect the ratio of the distribution with no adjustment to index shares, and the new class of shares may be added to the NASDAQ Index on a pro-rata basis.

*Spin-offs.* If a NASDAQ Index stock is spinning off a stock, the value of the NASDAQ Index stock will be adjusted downward to reflect the ratio of the distribution. There is no adjustment to index shares. If a when-issued market is established for the spin-off company, the price of the NASDAQ Index stock is adjusted downward by the value of the spinoff. The value of the spin-off is determined by multiplying the spin-off ratio by the when-issued price. In the event the value of the spinoff has not been established as indicated above then no price adjustment is made to the NASDAQ Index stock. The new stock resulting from the spin-off transaction is not added to the NASDAQ Index.

*Rights Offerings.* The price of a NASDAQ Index stock is adjusted on the ex-date for rights offerings if the rights are transferable and the offering has a subscription price on an equivalent per share basis that is less than the closing price of the underlying stock (the NASDAQ Index stock the right entitles a holder to purchase) on the day prior to

the ex-date. The price of the NASDAQ Index stock is adjusted downward for the value of the right. The value of the right is equal to (1) (i) the previous last sale price of the underlying stock *minus* (ii) the *sum* of (a) the subscription price of the right *plus* (b) the cash dividend of the underlying stock, if any, *divided* by (2) the number of rights required to purchase one share *plus* one.



### **NASDAQ-100 Index®**

Corporate actions are implemented in the NASDAQ Index in accordance with the NASDAQ Index maintenance rules discussed above. The divisor will also be adjusted as a result of corporate actions that adjust either the price or shares of a NASDAQ Index stock. Nasdaq, Inc. will make announcements prior to the effective date of any corporate actions.

In the case of mergers and acquisitions, the index stock issuer may be removed the day following the shareholder vote or the expected expiration of the tender offer, provided the acquisition is not contested. In the event the acquisition is contested, the removal of the NASDAQ Index stock will occur as soon as reasonably practicable, once results have been received indicating that the acquisition will likely be successful.

If a company files for bankruptcy, the NASDAQ Index stock or stocks of the issuer will be removed from the NASDAQ Index as soon as practicable thereafter. The value of the NASDAQ Index stock will be considered \$0.00000001 if no other applicable price can be observed on the Nasdaq Global Select Market or the Nasdaq Global Market.

### *Discretionary Adjustments*

In addition to the above, Nasdaq, Inc. may, from time to time, exercise reasonable discretion as it deems appropriate in order to ensure NASDAQ Index integrity, including, but not limited to, changes to quantitative inclusion criteria. Nasdaq, Inc. may also, due to special circumstances, if deemed essential, apply discretionary adjustments to ensure and maintain the quality of the NASDAQ Index construction and calculation.

### *Market Disruption Events*

If a NASDAQ Index stock does not trade on its primary listing market on a given day or such index market has not opened for trading, the most recent last sale price from the index market (adjusted for corporate actions, if any) is used. If a NASDAQ Index stock is halted from trading on its index market during the trading day, the most recent last sale price is used until trading resumes.

### *Corrections and Calculations*

The closing level of the NASDAQ Index may change up until 17:15:00 ET due to corrections to the last sale price of the NASDAQ Index stocks. In the event that a change has been made to the NASDAQ Index intraday, Nasdaq, Inc. will make an announcement describing such change. In the event a NASDAQ Index calculation has been corrected retroactively, an announcement will be provided.

All information in this index supplement regarding the NASDAQ Index is derived from publicly available information. Such information reflects the policies of, and is subject to change by the Corporations. The Corporations own the copyright and all other rights to the NASDAQ Index. The Corporations have no obligation to continue to publish, and may discontinue publication of, the NASDAQ Index. Historical performance of the NASDAQ Index is not an indication of future performance. Future performance of the NASDAQ Index may differ significantly from historical performance, either positively or negatively.

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We have entered into a non-exclusive license agreement with NASDAQ, Inc., which grants us a license in exchange for a fee to use the NASDAQ-100 Index® in connection with the issuance of certain securities, including the Securities.

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**NASDAQ-100 Index®**

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## Russell 2000® Index

The Russell 2000® Index (the “Russell Index”) is an index calculated, published, and disseminated real-time by FTSE Russell (the “Russell Index Sponsor”), and measures the composite price performance of stocks of approximately 2,000 companies in the U.S. equity market. All 2,000 stocks form a part of the Russell 3000® Index. The Russell 3000® Index is composed of the 3,000 largest U.S.-Based Companies (as defined below) as determined by market capitalization. The Russell Index consists of the smallest 2,000 companies included in the Russell 3000® Index. The Russell Index is designed to track the performance of the small capitalization segment of the U.S. equity market. Both the Russell Index and the Russell 3000® Index are subsets of the Russell 3000E® Index, which is composed of the 4,000 largest U.S.-Based Companies as determined by market capitalization and represents approximately 99.00% of the U.S. equity market.

### Stocks Included in the Russell 2000® Index

Only common stocks of companies satisfying one of the following criteria (“U.S.-Based Companies”) are eligible for inclusion in the Russell 3000® Index and the Russell Index:

- Ø (1) the company is incorporated in the U.S., has its headquarters in the U.S. and trades on a standard exchange in the U.S.;
- Ø (2) (i) the company is incorporated in the U.S., has its headquarters in the U.S. or trades with the highest liquidity in the U.S. (as defined by a two-year average daily dollar trading volume from all exchanges within the U.S.), and (ii) the primary location of the company’s assets or revenue is the U.S.; or
- Ø (3) if there is insufficient information to determine a company’s primary location of assets or revenue, (i) the company has its headquarters in (a) the U.S. or (b) Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Curacao, Faroe Islands, Gibraltar, Isle of Man, Jersey, Liberia, Marshall Islands, Panama, Saba, Sint Eustatius, Sint Maarten, or Turks and Caicos Islands (each, a “benefit-driven incorporation country” or “BDI Country”), and (ii) the company’s most liquid stock exchange in the U.S.

Eligible securities must trade on a major U.S. exchange. Based on closing values on the last trading day of May each year (the “Rank Date”), the Russell Index Sponsor reconstitutes the composition of the Russell 3000® Index using the then-existing market capitalizations of eligible companies. As of the last Friday in June of each year (except when the last Friday in June is the 29<sup>th</sup> or 30<sup>th</sup>, in which case reconstitution will occur on the second to last Friday in June), the Russell Index is adjusted to reflect the reconstitution of the Russell 3000® Index for that year. The primary criterion used to select securities for inclusion in the Russell 3000® Index is total market capitalization, which is determined by multiplying a company’s total outstanding shares by the last price traded on the company’s primary exchange on the Rank Date, as described below.

Stocks must have a closing price at or above \$1.00 on their primary exchange on the Rank Date each year to be eligible for inclusion in the Russell Index. Moreover, if an existing member’s closing price is less than \$1.00 on the Rank Date, it will be considered eligible if the average of the daily closing prices (from its primary exchange) during the 30 days prior to such Rank Date is equal to or greater than \$1.00. If an existing member does not trade on the Rank Date, it must price at \$1.00 or above on another eligible U.S. exchange to remain eligible.

For mergers and spin-offs that are effective between the Rank Date and the Friday prior to annual reconstitution in June, the market capitalizations of the impacted securities are recalculated and membership is reevaluated as of the effective date of the corporate action. For corporate events that occur during the final week of reconstitution (during which reconstitution is finalized Friday after U.S. market close), market capitalizations and memberships will not be reevaluated. Non index members that have been considered ineligible as of rank day will not be reevaluated in the

event of a subsequent corporate action that occurs between rank day and the reconstitution effective date.

**Exclusions from the Russell 2000® Index**

The following companies and securities are specifically excluded from the Russell 3000® Index and the Russell Index: (i) preferred and convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, depositary receipts, installment receipts and trust receipts; (ii) companies structured as royalty trusts, limited liability companies, closed-end investment companies, companies that are required to report Acquired Fund Fees and Expenses (as defined by the SEC), including business development companies, blank check companies, special-

### **Russell 2000® Index**

purpose acquisition companies and limited partnerships; (iii) exchange traded funds and mutual funds; (iv) companies with a total market capitalization less than \$30 million; (v) companies with only a small portion of their shares available in the marketplace (companies with 5% or less float); (vi) bulletin board, pink sheets or over-the-counter traded securities, including securities for which prices are displayed on the FINRA ADF; and (vii) real estate investment trusts and publicly traded partnerships that generate, or have historically generated, unrelated business taxable income and have not taken steps to block their unrelated business taxable income to equity holders.

In addition, a company (including any U.S.-Based Company) will not be eligible for inclusion if it has been designated by the Russell Index Sponsor as a Chinese “N Share.” A company will be designated as a Chinese “N Share” if (i) the company is incorporated outside the People’s Republic of China, (ii) the company is listed on the New York Stock Exchange, the NASDAQ exchange, or the NYSE American, (iii) over 55% of the revenue or assets of the company are derived from the People’s Republic of China, and (iv) the company is controlled by a mainland Chinese entity, company or individual (if the shareholder background cannot be determined with publicly available information, the Russell Index Sponsor will assess the “N Share” status of the company with the help of other criteria including whether the establishment and origin of the company are in mainland China and whether the company is headquartered in mainland China).

### **Multiple Share Classes**

If an eligible company trades under multiple share classes or if a company distributes shares of an additional share class to its existing shareholders through a mandatory corporate action, the Russell Index Sponsor will review each share class independently for inclusion in the Russell Index. Share classes in addition to the primary share class (the pricing vehicle) that have a total market capitalization larger than the smallest company in the Russell 3000E® Index, an average daily dollar trading value that exceeds that of the global median, and a float greater than 5% of shares available in the market place are also eligible for inclusion.

For companies with multiple share classes, the pricing vehicle will generally be designated as the share class with the highest two-year trading volume as of the rank day. In the absence of two years’ worth of data, all available data will be used for this calculation. If the difference between trading volumes for each share class is less than 20%, the share class with the most available shares outstanding will be used as the pricing vehicle. At least 100 day trading volume is necessary to consider the class as a pricing vehicle for existing members. New members will be analyzed on all available data, even if that data is for less than 100 days.

### **Computation of the Russell 2000® Index**

As a capitalization-weighted index, the Russell Index reflects changes in the capitalization, or market value, of the component stocks relative to the capitalization on a base date. The current Russell Index value is calculated by adding the market values of the Russell Index’s component stocks, which are derived by multiplying the price of each stock by the number of available shares, to arrive at the total market capitalization of the 2,000 stocks. The total market capitalization is then divided by a divisor, which represents the “adjusted” capitalization of the Russell Index on the base date of December 31, 1986. To calculate the Russell Index, last sale prices will be used for stocks. If a component stock is not open for trading, the most recently traded price for that stock will be used in calculating the Russell Index. In order to provide continuity for the Russell Index’s value, the divisor is adjusted periodically to reflect certain events, including changes in the number of common shares outstanding for component stocks, company additions or deletions, corporate restructurings, and other capitalization changes.

Available shares are assumed to be shares available for trading. Adjustments to a company’s total outstanding shares to determine available shares or “free float” are made based on information recorded in SEC filings. Other sources are used in cases of missing or questionable data.

The following types of shares are excluded for the purposes of capitalization determinations:

- Ø Officers' and directors' holdings — officers' and directors' holdings are all considered unavailable and removed entirely from available shares;
- Ø ESOP or LESOP shares — shares held within Employee Stock Ownership Plans are removed entirely;
- Ø Cross-Ownership by another Russell 3000E Index or Russell Global Index member — shares held by another member of a Russell Index (including Russell global indexes) is considered cross-ownership, and all shares will be excluded regardless of the percentage held;

## Russell 2000® Index

- Ø Large private and corporate shares — when an individual, a group of individuals acting together, or a corporation not in the index owns shares representing 10.00% or more of the shares outstanding such shares will be adjusted, although institutional holdings (*i.e.*, holdings of investment companies, partnerships, insurance companies, mutual funds, banks, or venture capital companies) are not included in this adjustment;
- Ø Institutional holdings — investment companies, partnerships, insurance companies, mutual funds, and banks will be removed from available shares if their holding is greater than 30%;
- Ø IPO lock ups — shares locked up during an initial public offering (“IPO”) are not available to the public and will be excluded from the market value at the time the company enters the Russell Index; and
- Ø Government holdings — holdings held directly by government (listed as “government of”) are considered unavailable and will be removed entirely from available shares, and shares held indirectly by government investment boards and/or investment arms will be treated similar to large private holdings and removed if the holding is greater than 10.00%, although any holding by a government pension plan is considered an institutional holding and will not be removed from available shares unless the holding is greater than 30%.

The following summarizes the types of Russell Index maintenance adjustments and indicates whether or not an index adjustment is required.

- Ø General rule for corporate action-driven changes — In general, adjustments for corporate action-driven changes are made by the Russell Index Sponsor when an action is final (determined by the Russell Index Sponsor with reference to a variety of public sources) and, depending on the time an action is determined to be final, the Russell Index Sponsor will either apply the action after the close of the current market day (t) or after the close of the following market day (t+1), referred to as a “delayed action.” Stocks removed after the close of the current market day are typically removed at the last traded price.

- Ø “No replacement” rule — Securities that leave the Russell Index, between reconstitution dates, for any reason (*e.g.*, mergers, acquisitions, or other similar corporate activity) are not replaced. Thus, the number of securities in the Russell Index over a year will fluctuate according to corporate activity.

- Ø Mergers and acquisitions — When mergers or acquisitions take place between members of the Russell Index, the acquired company is deleted and its market capitalization moves to the acquiring company’s stock. Special procedures apply to acquisitions or mergers between a member of the Russell Index and a non-member or reverse mergers, and adjustments are made based on a variety of factors, including whether the member is the acquiring or acquired company and, if the acquired company, on whether the transaction results in a publicly traded company that meets all requirements for inclusion in the Russell Index.

- Ø Reincorporations — Members of the Russell Index that are reincorporated in a country other than the United States and its territories or a BDI Country are deleted from the Russell Index. Members of the Russell Global Index reincorporating in the United States or its territories or a BDI country will be added to the Russell 3000E® Index and may be included in the Russell Index if its market capitalization warrants such inclusion.

- Ø Reclassifications of share classes (primary vehicles) — Primary vehicles will not be assessed or changed outside of a reconstitution period unless the existing class ceases to exist. In the event of extenuating circumstances signaling a necessary primary vehicle change, proper notification will be made.

- Ø Rights offerings — The Russell Index Sponsor will only adjust the Russell Index to account for a rights offering if the subscription price of the rights is at a discount to the market price of the stock. Where the subscription price is equal to or at a premium to the market price, there will be no adjustment or share increase on the next ex-date, and any additional shares will be reviewed for inclusion at the next quarterly review.

- Ø Changes to shares outstanding — Changes to shares outstanding due to buybacks (including Dutch auctions), secondary offerings, merger activity with a non-Russell Index member and other potential changes are updated quarterly, on the third Friday of the month (after the close), although the Russell Index June reconstitution will continue to be implemented on the last Friday of June (unless the last Friday occurs on the 29<sup>th</sup> or 30<sup>th</sup>, when reconstitution will occur on the Friday prior). Outside of the quarterly update cycle, shares and free float will be updated with at least two days’ notice if occasioned by primary or secondary offerings if (i) there is a \$1 billion investable market capitalization change related to such offering measured by multiplying the change to





**Russell 2000® Index**

Russell Index shares by the subscription price, or (ii) there is a resultant 5% change in Russell Index shares related to such offering and a \$250 million investable market capitalization change measured by multiplying the change to Russell Index shares by the subscription price. These changes will be implemented after the close on the day that the subscription period closes.

Spin-offs — Spin-off companies are added to the parent company's index and capitalization tier of membership, if the spin-off is large enough. To be eligible, the spun-off company's total market capitalization must be greater than the market-adjusted total market capitalization of the smallest security in the Russell 3000E® Index at the latest reconstitution. If the spun-off company is not large enough to be added to the Russell Index, but the parent company is large enough to be added, the spun-off company will be added to the Russell Index on the ex-date of the distribution. It will remain in the Russell Index for two business days and then deleted at market price. If the ineligible security does not trade on the ex-date, it will remain in the Russell Index until it commences trading and then deleted after two business days at market price.

Tender offers — A company acquired as a result of a tender offer is removed if: (1) (i) the tender offer acceptances reach 90% (initial, extension or subsequent); (ii) shareholders have validly tendered, not withdrawn, and the shares have been accepted for payment; and (iii) all pertinent offer conditions have been fulfilled and the acquirer has not explicitly stated that it does not intend to acquire the remaining shares; (2) the acquiring company is able to finalize the acquisition via a short-form merger, top-up option or other compulsory mechanism; or (3) there is reason to believe that the remaining free float is under 5% based on available information. Where the previous conditions for company removal are not met, the Russell Index Sponsor may make a share adjustment to the target company's shares, on a date pre-announced by the Russell Index Sponsor, in cases where (a) the minimum acceptance level as stipulated by the acquirer has been met, (b) shareholders have validly tendered and the shares have been irrevocably accepted for payment, (c) all pertinent offer conditions have been reasonably met, and (d) the change to the current float factor is greater than 3%. Any adjustment will occur on a pre-date announcement by the Russell Index Sponsor.

Voluntary exchange offers — A publicly traded company may offer to exchange or split-off some or all of its ownership in a separated publicly traded company. Shareholders are given the option to retain their shares; or to exchange them, in full or in part, for shares of the 'split-off' company. Once the offer expires, the Russell Index Sponsor will decrease the available shares in the offering company, and increase the available shares in the 'split-off' company, based on the results of the offering. The Russell Index Sponsor will effect this changes based on, but not limited to, preliminary results, company filings, and exchange notices.

Delisting — Only companies listed on U.S. exchanges are included in the Russell Index. Therefore, when a company is delisted from a U.S. exchange, the company is removed from the Russell Index.

Bankruptcy and voluntary liquidations — Companies filing for Chapter 7 liquidation bankruptcy or that file any other liquidation plan will be removed from the Russell Index at the time of filing. Companies filing for Chapter 11 reorganization bankruptcy will remain members of the Russell Index, unless the companies are delisted from their primary exchange, in which case normal delisting rules as described above will apply.

Scrip issues and stock distributions — a scrip issue (also called a capitalization or a bonus issue) and a stock distribution are the automatic distribution of shares (existing or newly-issued) to existing shareholders at no charge, pro rata to existing holders. In both cases, the price adjustment is done on the ex-date of the distribution.

Dividends — Gross dividends are included in the daily total return calculation of the Russell Index based on their ex-dates. In cases where a company pays a special cash dividend in a recurring cycle (e.g., monthly, quarterly, semi-annually or annually) on more than three consecutive occasions which are not deemed to be extraordinary, the Russell Index Sponsor will treat any further such distributions as ordinary dividends.

Quarterly IPO Additions — Eligible companies that have recently completed an initial public offering are added to the Russell Index at the end of each calendar quarter based on total market capitalization ranking within the market-adjusted capitalization breaks established during the most recent reconstitution. Fourth-quarter IPO additions will be processed after the close on the third Friday of each December. Market adjustments will be made using the returns of the Russell 3000E® Index. In order to be added in a quarter outside of reconstitution, the IPO company must meet all Russell Index eligibility requirements. Additionally, the IPO company must meet the following criteria on the final trading day of the month prior to quarter-end: (1) price/trade; (2) rank larger in total market

capitalization than the market-adjusted smallest company in the Russell 3000E<sup>®</sup> Index as of the latest reconstitution; and (3) meet criteria (1) and (2) during an initial offering period.

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### **Russell 2000® Index**

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We have derived all information regarding the Russell Index contained in this index supplement, including its make-up, method of calculation, and changes in its components, from publicly available information. That information reflects the policies of, and is subject to change by, the Russell Index Sponsor. The Russell Index Sponsor has no obligation to continue to publish, and may discontinue publication of, the Russell Index. Historical performance of the Russell Index is not an indication of future performance. Future performance of the Russell Index may differ significantly from historical performance, either positively or negatively.

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The license agreement between us and the Russell Index Sponsor requires that the following language be stated in this index supplement:

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## S&P 500® Index

The S&P 500® Index (the “S&P Index”) is calculated by S&P Dow Jones Indices LLC, a part of S&P Global (“S&P Dow Jones Indices”) and is maintained by Index Committee (the “Index Committee”), a team of S&P’s economists and index analysts who meet on a monthly basis. Stocks are chosen for inclusion in the S&P Index by the Index Committee with the goal of ensuring that the S&P Index is a leading indicator of United States equities (as determined below), reflecting the risk and return characteristics of the broader large cap universe on an ongoing basis. The calculation of the value of the S&P Index, discussed below in further detail, is based on the relative value of the aggregate market value of specified classes of common stock of 500 companies (the “S&P Index Constituent Stocks”) as of a particular time compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943 (the “Base Period”). The S&P Index Constituent Stocks are considered leading companies in leading industries, but do not represent the common stocks of the 500 largest companies listed on the New York Stock Exchange and not all 500 companies whose common stock are included in the S&P Index are listed on the New York Stock Exchange. The S&P 500 focuses on the large-cap sector of the market; however, since it includes a significant portion of the total value of the market, it also represents the market.

S&P Dow Jones Indices, calculates the S&P Index by reference to the prices of the S&P Index Constituent Stocks without taking account of the value of dividends paid on such stocks. As a result, the return on the Securities will not reflect the return you would realize if you actually owned the stocks that compose the S&P Index and received the dividends paid on such stocks.

On November 4, 2011, S&P Global (previously called McGraw-Hill Financial), the owner of the S&P Indices business, and CME Group, the 90% owner of the CME Group and Dow Jones & Company, Inc. joint venture that owns the Dow Jones Indexes business, announced a new joint venture, S&P Dow Jones Indices, which now owns the S&P Indices business and the Dow Jones Indexes business, including the S&P Index.

## Stocks Included in the S&P Index

Eligible securities include all U.S. common equities listed on the NYSE (including NYSE Arca and NYSE MKT), the NASDAQ Global Select Market, the NASDAQ Select Market, the NASDAQ Capital Market, Investors Exchange (IEX), Bats BZX, Bats BYZ, Bats EDGA and Bats EDGX.. Ineligible securities include business development companies (BDCs), limited partnerships, master limited partnerships, limited liability companies, special purpose acquisition companies (SPAC), OTC bulletin board issues, closed-end funds, exchange-traded funds, exchange-traded notes, royalty trusts, , pink sheets, preferred and convertible preferred stock, unit trusts, equity warrants, convertible bonds, investment trusts, rights, American depositary receipts, and MLP IT units. Real estate investment trusts are eligible for inclusion. Further, for the common stock of a company to be eligible for inclusion in the S&P Index it must meet all of the following additional criteria, as determined by the Index Committee in its sole discretion:

- Ø Market Capitalization — Unadjusted market capitalization of US \$6.1 billion or more. The ranges are reviewed from time to time by the Index Committee to assure consistency with market conditions.
- Ø Liquidity — Using composite pricing and volume, the ratio of annual dollar value traded (defined as average over the Ø period multiplied by historical volume) to float adjusted market capitalization should be at least 1.00 , and the company should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date.
- Ø Public Float — Public float of at least 50% of the common stock.
- Ø Sector Classification — Sector balance, as measured by a comparison of each GICS sector’s weight in an index with its weight in the market, in the relevant market capitalization range.
- Ø Financial Viability — Financial viability as measured by the sum of the most recent four consecutive quarters’ Generally Accepted Accounting Principles (GAAP) earnings (net income excluding discontinued operations) should be positive, as should the most recent quarter.
- Ø

Treatment of Initial Public Offerings — Initial public offerings should be seasoned for at least twelve months before being considered for addition.

United States Company — Companies listed must be U.S. companies with the following characteristics: (1) files 10-K annual reports with the SEC and is not considered a foreign entity by the SEC; (2) the U.S. portion of fixed assets and revenues constitutes a plurality of the total, but need not exceed 50% (when these factors are in

## S&P 500® Index

conflict, assets determine plurality; revenue determines plurality when there is incomplete asset information) and(3) the primary listing of common stock is the NYSE (including NYSE Arca and NYSE Amex), the NASDAQ Global Select Market, the NASDAQ Select Market, the NASDAQ Capital Market, Investors Exchange (IEX), Bats BZX, Bats BZY, Bats EDGA or Bats EDGX(ADRs are not eligible);. Where criteria (2) is not met or is ambiguous, companies may still be eligible for inclusion if its primary listing, headquarters, and incorporation are all in the U.S. or certain enumerated offshore locations. Where the only factor suggesting that a company is not a U.S. company is its tax registration in one of the enumerated offshore locations or another location chosen for tax-related reasons, the index sponsor will generally determine that the company is still a U.S. company.

Because S&P Dow Jones Indices believes turnover in index membership should be avoided whenever possible, the above criteria are for addition to the S&P Index, not for continued membership. As a result, an S&P Index Constituent Stock that appears to violate criteria for addition to the S&P Index is not deleted unless ongoing conditions warrant an index change. Furthermore, there are exceptions to the above eligibility criteria:

Non-S&P Composite 1500 (which is made up of the S&P Index, the S&P MidCap 400 Index and the S&P SmallCap 600 Index) that acquire S&P Composite 1500 Index Constituents— Non-S&P Composite 1500 companies that acquire S&P Composite 1500 constituents, but do not fully meet the financial viability of the investible weight factor (discussed below) criteria, may still be added to the S&P Index at the discretion of the Index Committee if the committee decides that the addition could minimize turnover and enhance the representativeness of the S&P Index as a market benchmark.

S&P Composite 1500 Migrations— Current S&P Composite 1500 constituents can be migrated from one S&P Composite 1500 component Index to another without meeting the financial viability, public float and/or liquidity eligibility criteria if the Index Committee decides that such a move will enhance the representatives of the index as a market benchmark.

Spin-offs from current S&P Composite 1500 index constituents— Companies that are spun off from current S&P Composite 1500 constituents do not need to meet the outside addition criteria, but they should be considered U.S. domiciled for index purposes. For spin-offs, index membership eligibility is determined using when-issued prices, if available. At the discretion of the Index Committee, a spin-off company may be retained in the parent stock's index if the committee determines it has a total market capitalization representative of the parent index. If the spin-off company's estimated market capitalization is below the minimum defined in the outside additional criteria but there are other constituent companies in the parent index that have a significantly lower total market capitalization than the spin-off company, the committee may be decide to retain the spin-off company in the parent index. Prior to their spin-off, these companies were part of the parent index and keeping them in the S&P Composite 1500 and the parent index, where appropriate, helps the Index Committee meet the objective of minimizing turnover whenever possible.

As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the S&P Index. Constituents of the S&P Index prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the S&P Index. Companies are considered to have multiple share class structures (and are therefore ineligible for the S&P Index) if they have more than one class of common stock on their balance sheet. Only common shares are considered when determining whether a company has a multiple share class structure. Preferred shares are not considered in the multiple share class structure determination. If a constituent company of the S&P Index reorganizes into a multiple share class line structure, that company will remain in the S&P Index at the discretion of the S&P Index Committee. Berkshire Hathaway Inc. (NYSE: BRK.B) is an exception to the multiple share class rules.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible.

## Criteria for Removal from the S&P Index

The common stock of a company may be removed from the S&P Index when the Index Committee determines, in its sole discretion, that one of the following criteria is met:



Ø A company involved in a merger, acquisition or significant restructuring no longer meets the inclusion criteria, or  
Ø A company substantially violates one more of the criteria for inclusion in the S&P Index, as described above.  
Any company that is removed from the S&P Index (including discretionary and bankruptcy/exchange delistings) must wait a minimum of one year from its index removal date before being reconsidered as a replacement candidate. Changes to the S&P Index Constituent Stocks are announced with one to five days' advanced notice.

**S&P 500® Index**

## Computation of the S&amp;P Index

The calculation of the value of the S&P Index (discussed below in further detail) is based on the relative value of the aggregate Market Value (as defined below) of the common stocks of approximately 500 companies as of a particular time as compared to the aggregate Market Value of the common stocks of approximately 500 similar companies during the Base Period. The Market Value of any index constituent stock is the total float-adjusted market capitalization of such index constituent stock. Where the company has multiple classes of stock the market value is calculated by determining the weighted average “investable weight factor” (“IWF”) for the stock by using the proportion of total company market capitalization of each share class as the weights. The result is then reviewed to assure that when the weighted average IWF is applied to the class included in the S&P Index, the shares to be purchased are not significantly larger than the available float for the included class.

The level of the S&P Index is calculated using a base-weighted aggregate methodology: the level of the S&P Index reflects the total Market Value of all the S&P Index Constituent Stocks relative to the Base Period. An indexed number is used to represent the results of this calculation in order make the value easier to work with and track over time. The actual total Market Value of the S&P Index Constituent Stocks in the S&P Index during the Base Period has been set equal to an indexed value of 10. In practice, the daily calculation of the S&P Index is computed by dividing the total Market Value of the level of S&P Index Constituent Stocks by a number called the “S&P Divisor”. By itself, the S&P Divisor is an arbitrary number. However, in the context of the calculation of the level of the S&P Index, it is the only link to the original Base Period value of the S&P Index. Continuity in the S&P Index value is maintained by adjusting the S&P Divisor for certain events as described below.

Changes to the S&P Index are made on an as-needed basis. There is no annual or semi-annual reconstitution. Rather changes in response to corporate actions and market developments can be made at any time.

An adjustment to the S&P Divisor is required when any change to any S&P Index Constituent Stocks alters the total market value of the S&P Index while holding stock prices constant. S&P Divisor adjustments are made “after the close” meaning that after the close of trading the closing prices are used to calculate the new S&P Divisor based on whatever changes are being made. The table below summarizes some of the types of maintenance adjustments which require a divisor adjustment:

**Type of Corporate Action**

Company added / deleted

Change in Shares Outstanding

Stock Split

Spin-Off (Only if spun-off company is not being added to S&amp;P Index)

Spin-Off (Only if spun-off company added to S&amp;P Index and another company deleted from S&amp;P Index)

Special Dividend

Rights Offering

**Adjustment Factor**

Net change in market value determines the S&amp;P Divisor adjustment.

Any combination of secondary issuance, share repurchase or buy back – share counts revised to reflect change.

Share count revised to reflect new count. Divisor adjustment is not required since the share count and price changes are offsetting.

The divisor adjustment reflects the decline in the index market value.

The spin-off is added to the index on the ex-date at the price of zero.

When a company pays a special dividend the share price is assumed to drop by the amount of the dividend; the divisor adjustment reflects this drop in index market value.

Each shareholder receives the right to buy a proportional number of additional shares at a set (often discounted) price. The calculation assumes that the offering is fully subscribed. Divisor adjustment reflects increase in market cap measured as the shares issued multiplied by the price paid.

Change in IWF

Divisor change reflects the change in market value caused by the change to an IWF.

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### **S&P 500® Index**

Each of the corporate actions in the table above has the effect of altering the market value of an S&P Index Constituent Stock and consequently the aggregate market value of the S&P Index Constituent Stocks. To keep the level of the S&P Index prior to such corporate action from being affected by the change in market value of the S&P Index Constituent Stocks, a new S&P Divisor is derived as follows:

∅ Market value of the S&P Index Constituent Stocks after the corporate action / New S&P Divisor = Market Value of the S&P Index Constituent Stocks prior to the corporate action.

∅ New S&P Divisor = Market value of the S&P Index Constituent Stocks after the corporate action / Market Value of the S&P Index Constituent Stocks prior to the corporate action.

In cases where there is no achievable market price for a stock being deleted, such stock may be removed from the S&P Index at zero or minimal price at the discretion of the Index Committee, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.

A large part of the maintenance of the S&P Index involves adjustments in response to changes in a company's shares outstanding. The Index Committee follows a 5% rule. Generally, changes in a company's shares outstanding of 5% or more due to mergers, acquisitions, public offerings, private placements, tender offers, Dutch auctions or exchange offers are made as soon as reasonably possible. Other changes of 5% or more (such as those due to stock repurchases, private placements, and other means) are made after the market close on Friday for implementation after the close of trading the following Friday (i.e. one week later). Other changes of 5% or more (such as those due to stock repurchases, private placements, and other means) are made weekly. Changes of less than 5% of a company's shares outstanding are accumulated and made quarterly on the third Friday of March, June, September and December, with the exception of an acquisition of another company in the S&P Index which are made as reasonably as possible. In the case of certain rights issuances, in which the number of rights issued and/or terms of their exercise are deemed substantial by the Index Committee, a price adjustment and/or share increase may be implemented immediately.

Neither UBS nor any of its affiliates accepts any responsibility for the calculation, maintenance or publication of, or for any error, omission or disruption in, the S&P Index or any successor index. While S&P currently employs the above methodology to calculate the S&P Index, no assurance can be given that S&P Dow Jones Indices will not modify or change this methodology in a manner that may affect the amount payable at maturity to beneficial owners of the Securities. S&P Dow Jones Indices does not guarantee the accuracy or the completeness of the S&P Index or any data included in the S&P Index. S&P Dow Jones Indices assumes no liability for any errors, omissions or disruption in the calculation and dissemination of the S&P Index. S&P Dow Jones Indices disclaims all responsibility for any errors or omissions in the calculation and dissemination of the S&P Index or the manner in which the S&P Index is applied in determining the amount payable at maturity.

We have derived all information regarding the S&P Index contained in this index supplement, including, without limitation, its make-up, method of calculation and changes in its components, from publicly available information. Such information reflects the policies of, and is subject to change by, S&P Dow Jones Indices.

S&P Dow Jones Indices has no obligation to continue to publish the S&P Index, and may discontinue publication of the S&P Index.

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equation by which the Securities are to be converted into cash. S&P has no obligation or liability in connection with the administration, marketing or trading of the Securities.

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## Commodity Indices

Bloomberg Commodity Index<sup>SM</sup>

The following is a description of the Bloomberg Commodity Index<sup>SM</sup> (the “Bloomberg Commodity Index”), including, without limitation, its make-up, method of calculation and changes in its components. The information in this description has been taken from (i) publicly available sources and (ii) a summary of the “Bloomberg Commodity Index<sup>SM</sup> Methodology” (a document that is considered proprietary to Bloomberg Finance L.P. (“Bloomberg”), and UBS Securities LLC and is available at

[https://data.bloomberglp.com/professional/sites/10/BCOM-Methodology-January-2018\\_FINAL.pdf](https://data.bloomberglp.com/professional/sites/10/BCOM-Methodology-January-2018_FINAL.pdf)). Such information reflects the policies of, and is subject to change at any time by, UBS Securities LLC and Bloomberg. UBS AG (“UBS”), the issuer of the Securities, has not independently verified information from publicly available sources described above in clause (i). You, as an investor in the Securities, should make your own investigation into the Bloomberg Commodity Index, Bloomberg and UBS Securities LLC.

Bloomberg, the Index Oversight Committee and the Index Advisory Council and/or members of the Index Oversight Committee and Index Advisory Council have no obligation to consider your interests as a holder of the Securities. However, employees of UBS Securities LLC, an affiliate of UBS, are members of the Index Oversight Committee and the Index Advisory Council and UBS’ affiliates are involved in the public offering and sale of the Securities and may be engaged in secondary market making transactions in the Securities. Bloomberg and UBS Securities LLC have no obligation to continue to publish the Bloomberg Commodity Index, and may discontinue publication of the Bloomberg Commodity Index at any time in their sole discretion.

## Overview

The Bloomberg Commodity Index was created by AIG International Inc. (“AIGI”) in 1998 and acquired by UBS Securities LLC in May 2009, at which time UBS Securities LLC and Dow Jones & Company, Inc. (“Dow Jones”) entered into an agreement to jointly market the Bloomberg Commodity Index. The joint marketing agreement with Dow Jones was terminated in 2014 as UBS Securities LLC entered into a Commodity Index License Agreement with Bloomberg. Bloomberg, in conjunction with UBS Securities LLC, calculates the Bloomberg Commodity Index and each of the related indexes and Sub-Indexes.

The Bloomberg Commodity Index is designed to be a highly liquid and diversified benchmark for commodities as an asset class. The Bloomberg Commodity Index currently is composed of the prices of twenty-two exchange-traded futures contracts on physical commodities, representing twenty commodities which are weighted to account for economic significance and market liquidity. An exchange-traded futures contract is a bilateral agreement providing for the purchase and sale of a specified type and quantity of a commodity or financial instrument during a stated delivery month for a fixed price. For a general description of the commodity future markets, see “*The Commodity Futures Markets*” below. The commodities included in the Bloomberg Commodity Index will be specified in an applicable pricing supplement.

The Bloomberg Commodity Index is a proprietary index that Dow Jones and AIGI developed and that Bloomberg, on behalf of UBS Securities LLC, calculates. Prior to July 1, 2014, the Bloomberg Commodity Index was referred to as the Dow Jones-UBS Commodity Index. Material changes or amendments to the methodology for determining the composition and weighting of the Bloomberg Commodity Index and for calculating its value are subject to approval by the Benchmark Oversight Committee (“Index Oversight Committee”) in consultation, if possible, with UBS, except during periods of extraordinary circumstances, such as during a market emergency.

UBS and its affiliates actively trade futures contracts and options on futures contracts on the commodities that underlie the Bloomberg Commodity Index, as well as commodities, including commodities included in the Bloomberg Commodity Index. UBS and its affiliates also actively enter into or trade and market securities, swaps, options,

derivatives and related instruments which are linked to the performance of commodities or are linked to the performance of the Bloomberg Commodity Index. Certain of UBS' affiliates may underwrite or issue other securities or financial instruments indexed to the Bloomberg Commodity Index and related indices, and UBS Securities LLC and Bloomberg and their affiliates may license the Bloomberg Commodity Index for publication or for use by unaffiliated third parties. These activities could present conflicts of interest and could affect the level of the Bloomberg Commodity Index. For instance, a market maker in a financial instrument linked to the performance of the Bloomberg Commodity Index may expect to hedge some or all of its position in that financial instrument. Purchase (or selling) activity in the underlying Bloomberg Commodity Index components in order to hedge the market maker's position in the financial instrument may affect the market price of the futures contracts included in the Bloomberg Commodity



### **Bloomberg Commodity Index<sup>SM</sup>**

Index, which in turn may affect the value of the Bloomberg Commodity Index. With respect to any of the activities described above, none of UBS Securities LLC, Bloomberg or their respective affiliates has any obligation to take the needs of any buyers, sellers or holders of the Securities into consideration at any time.

#### The Index Oversight Committee and Index Advisory Council

Bloomberg and UBS Securities LLC have established a robust oversight structure comprised of the Index Oversight Committee, Index Operating Subcommittee and Index Advisory Council.

The Index Oversight Committee provides oversight and accountability over all aspects of the Bloomberg Commodity Index process, and consists of senior representatives from various Bloomberg business units. The Index Oversight Committee will make all final decisions relating to the Bloomberg Commodity Index, given any advice and recommendations of the Index Advisory Council. Voting members of the Index Oversight Committee do not directly participate in the index business. The Index Oversight Committee meets on a quarterly basis to review matters such as material risks, conflicts of interest, industry developments, client complaints and material index errors and restatements. The Index Operating Subcommittee assists the Index Oversight Committee in its oversight functions. The Index Operating Subcommittee is composed of senior benchmark and strategy index managers designated by the Index Oversight Committee. Members include Bloomberg personnel with significant index experience. The Index Operating Subcommittee meets at least monthly to discuss matters such as new index approvals, periodic review of existing indices, index pricing, management of errors and restatements, identification and management of actual and potential conflicts of interest, approvals of changes to indices and approvals of cessation of indices. The Index Operating Subcommittee reports to the Index Oversight Committee at least quarterly on all matters.

The Index Advisory Council, composed of key market participants and other influential individuals, assists Bloomberg in setting index priorities, to discuss potential rules changes and to provide ideas for new products. Index Advisory Councils are generally constituted on an annual basis and while potential benchmark changes are discussed through this process, all feedback received is non-binding and all final decisions on benchmark index rules are made by the Index Operating Subcommittee (which are subject to review by the Index Oversight Committee) after the review period has ended.

As discussed in more detail below, the Bloomberg Commodity Index is reconstituted and rebalanced annually each January with respect to relative liquidity and production percentages. The composition and annual weightings for the Bloomberg Commodity Index are determined yearly by Bloomberg under the supervision of the Index Oversight Committee in consultation with the Index Advisory Council. In addition, to the extent practicable, Bloomberg may solicit stakeholder feedback, including by means of the Index Advisory Council. Once approved by the Index Oversight Committee, the new composition of the Bloomberg Commodity Index is publicly announced, and takes effect in the January immediately following the announcement.

#### Four Main Principles Guiding the Creation of the Bloomberg Commodity Index

The Bloomberg Commodity Index was created using the following four main principles:

- Ø *Economic significance.* A commodity index should fairly represent the importance of a diversified group of commodities to the world economy. To achieve a fair representation, the Bloomberg Commodity Index uses both liquidity data and dollar-weighted production data in determining the relative quantities of included commodities.

The Bloomberg Commodity Index primarily relies on liquidity data, or the relative amount of trading activity of a particular commodity, as an important indicator of the value placed on that commodity by financial and physical market participants.

The Bloomberg Commodity Index also relies on production data as a useful measure of the importance of a commodity to the world economy. Production data alone, however, may underestimate the economic significance of storable commodities (e.g., gold) relative to non-storable commodities (e.g., live cattle). Production data alone also may underestimate the investment value that financial market participants place on certain commodities, and/or the amount of commercial activity that is centered around various commodities. A, production statistics alone do not necessarily provide as accurate a blueprint of economic importance as the pronouncements of the markets themselves. The Bloomberg Commodity Index thus relies on data that is both endogenous to the futures market (liquidity) and exogenous to the futures market (production) in determining relative weightings.

Ø *Diversification.* A second major goal of the Bloomberg Commodity Index is to provide diversified exposure to commodities as an asset class. Disproportionate weightings of any particular commodity or sector increase

### **Bloomberg Commodity Index<sup>SM</sup>**

volatility and negate the concept of a broad-based commodity index. Instead of diversified commodities exposure, the investor is unduly subjected to micro-economic shocks in one commodity or sector. As described further below, diversification rules have been established and are applied annually. Additionally, the Bloomberg Commodity Index is re-balanced annually on a price-percentage basis in order to maintain diversified commodities exposure over time.

*Continuity.* The third goal of the Bloomberg Commodity Index is to be responsive to the changing nature of commodity markets in a manner that does not completely reshape the character of the Bloomberg Commodity Index from year to year. The Bloomberg Commodity Index is intended to provide a stable benchmark, so that end-users may be reasonably confident that historical performance data (including such diverse measures as correlation, spot yield, roll yield and volatility) is based on a structure that bears some resemblance to both the current and future composition of the Bloomberg Commodity Index.

*Liquidity.* Another goal of the Bloomberg Commodity Index is to be highly liquid, suitable for institutional investment. The explicit inclusion of liquidity as a weighting factor helps to ensure that the indices can better accommodate substantial investment flows. The liquidity of an index not only affects transaction costs associated with current investments, but may also affect the reliability of historical price performance data. That is, to the extent that market inefficiencies may result from substantial inflows of investment capital, these inefficiencies—and corresponding distortions in index performance—will be minimized by weighting distributions which more closely mirror actual liquidity in the markets. The liquidity of an index affects transaction costs associated with current investments. It also may affect the reliability of historical price performance data.

These principles represent goals of the Bloomberg Commodity Index and its creators, and there can be no assurance that these goals will be reached by either Bloomberg or UBS Securities LLC.

#### Composition of the Bloomberg Commodity Index

The following methodology has been previously employed by Dow Jones and AIG Financial Products, and by DJI Opco, LLC and UBS Securities LLC and shall continue to be employed by Bloomberg and UBS Securities LLC, in determining the composition of the Bloomberg Commodity Index.

#### Commodities Available for Inclusion in the Bloomberg Commodity Index

The commodities that have been selected for possible inclusion in the Bloomberg Commodity Index are believed by Bloomberg and UBS Securities LLC to be sufficiently significant to the world economy to merit consideration for inclusion in the Bloomberg Commodity Index, and each such commodity is the subject of a qualifying related futures contract (a “Designated Contract”).

With the exception of several metals contracts (aluminum, lead, tin, nickel and zinc) that trade on the London Metal Exchange (“LME”) and the contract for Brent crude oil, each of the commodities is the subject of at least one futures contract that trades on a U.S. exchange. The twenty-four eligible commodities that may be included in the Bloomberg Commodity Index in a given year currently are aluminum, cocoa, coffee, copper, corn, cotton, crude oil (WTI and Brent), gold, ULS Diesel, lead, lean hogs, live cattle, natural gas, nickel, platinum, silver, soybean meal, soybeans, soybean oil, sugar, tin, unleaded gasoline, wheat (Soft and Hard Red Winter) and zinc.

The twenty commodities represented in the Bloomberg Commodity Index for the 2017 year are: aluminum, coffee, copper, corn, cotton, crude oil (WTI and Brent), gold, ULS Diesel, lean hogs, live cattle, natural gas, nickel, silver, soybean meal, soybeans, soybean oil, sugar, unleaded gasoline, wheat (Soft and Hard Red Winter) and zinc.

#### *Designated Contracts for Each Commodity*

One or more commodity contracts (each commodity contract, a “Designated Contract”) is selected by Bloomberg for each of the twenty-four commodities eligible for inclusion in the Bloomberg Commodity Index. Historically, Bloomberg has chosen for each commodity one Designated Contract that is traded in North American and

denominated in U.S. dollars, with the exception of several LME (which are traded in London), crude oil (which has two Designated Contracts selected) and wheat, which has two Designated Contracts that are traded in North America. It is possible in the future that Bloomberg will select more than one Designated Contract for additional commodities or may select Designated Contracts that are traded outside of the U.S. or in currencies other than the U.S. dollar. For example, in the event that changes in regulations concerning position limits materially affect the ability of market participants to replicate the Bloomberg Commodity Index in the underlying futures markets, it may become appropriate to include multiple Designated Contracts for one or more commodities (in addition to crude oil and wheat) in order to enhance liquidity. The termination or replacement of a commodity contract on an established exchange occurs infrequently; if a

### **Bloomberg Commodity Index<sup>SM</sup>**

designated contract were to be terminated or replaced, a comparable commodity contract would be selected, if available, to replace the designated contract.

#### Commodity Groups

For purposes of applying the diversification rules discussed below, the commodities eligible for inclusion in the Bloomberg Commodity Index are assigned to Commodity Groups. The Commodity Groups currently include Energy, Precious Metals, Industrial Metals, Livestock, Grains and Softs.

### **Annual Reconstitution and Rebalancing of the Bloomberg Commodity Index**

The Bloomberg Commodity Index is reconstituted and rebalanced annually each January on a price-percentage basis. The annual constitution and weightings for the Bloomberg Commodity Index are determined yearly by Bloomberg under the supervision of the Index Oversight Committee in consultation with the Index Advisory Council. Once approved by the Index Oversight Committee, the new composition of the Bloomberg Commodity Index is publicly announced, and takes effect in the January immediately following the announcement.

#### Determination of Relative Weightings

The relative weightings of the designated contracts included in the Bloomberg Commodity Index are determined annually according to both liquidity and dollar-adjusted production data in 2/3 and 1/3 shares, respectively. For each commodity designated for potential inclusion in the Bloomberg Commodity Index, liquidity is measured by the Commodity Liquidity Percentage (“CLP”) and production by the Commodity Production Percentage (“CPP”). The CLP for each commodity is determined by taking a five-year average of the product of trading volume and the historic U.S. dollar value of the applicable Designated Contract for that commodity, and dividing the result by the sum of such products for all Designated Contracts. The CPP is determined for each commodity by taking a five-year average of annual world production figures, adjusted by the historic U.S. dollar value of the applicable Designated Contract, and dividing the result by the sum of such production figures for all the commodities which were designated for potential inclusion in the applicable index. The CLP and the CPP are then combined (using a ratio of 2:1) to establish the Commodity Index Percentage (“CIP”) for each commodity. This CIP is then adjusted in accordance with certain diversification rules in order to determine the commodities which will be included in each index (the “Index Commodities”) and their respective percentage weights.

A “BCOM Business Day” means a day on which the sum of the CIPs for the Index Commodities that are open for trading is greater than 50%.

#### Diversification Rules

The Bloomberg Commodity Index is designed to provide diversified exposure to commodities as an asset class. To ensure that no single commodity or commodity sector dominates the Bloomberg Commodity Index, the following diversification rules are applied to the annual reweighting and rebalancing of the Bloomberg Commodity Index as of January of the applicable year:

- Ø No related group of commodities designated as a Commodity Group (i.e. energy, precious metals, livestock or grains) may constitute more than 33% of the Bloomberg Commodity Index.
  - Ø No single commodity may constitute more than 15% of the Bloomberg Commodity Index.
  - Ø No single commodity, together with its derivatives (e.g., WTI crude oil and Brent crude oil, together with ULS diesel and unleaded gasoline), may constitute more than 25% of the Bloomberg Commodity Index.
- Ø No single commodity that is in the Bloomberg Commodity Index (i.e. natural gas, silver) may constitute less than 2% of the Bloomberg Commodity Index.

Following the annual reweighting and rebalancing of the Bloomberg Commodity Index in January, the percentage of any single commodity or group of commodities at any time prior to the next reweighting or rebalancing will fluctuate and may exceed or be less than the percentages set forth above. The 2018 target weightings for the Bloomberg Commodity Index can be found at

<https://data.bloomberglp.com/professional/sites/10/2018-BCOM-Target-Weights11.pdf>.

## **Bloomberg Commodity Index<sup>SM</sup>** Commodity Index Multipliers

Following application of the diversification rules discussed above, CIPs are incorporated into the Bloomberg Commodity Index by calculating the new unit weights for each Bloomberg Commodity Index Commodity. Near the beginning of each new calendar year (the “CIM Determination Date”), the CIPs, along with the settlement prices on that date for Designated Contracts included in the Bloomberg Commodity Index, are used to determine a Commodity Index Multiplier (“CIM”) for each Bloomberg Commodity Index Commodity. This CIM is used to achieve the percentage weightings of the commodities included in the Bloomberg Commodity Index, in U.S. dollar terms, indicated by their respective CIPs. After the CIMs are calculated, they remain fixed throughout the year. As a result, the observed price percentage of each Bloomberg Commodity Index Commodity will float throughout the year, until the CIMs are reset the following year based on new CIPs.

### Calculations

The Bloomberg Commodity Index is calculated on the basis of hypothetical investments in the basket of commodities that make up the Bloomberg Commodity Index (based on their relative weightings). Once the CIMs are determined as discussed above, the calculation of the Bloomberg Commodity Index is a mathematical process whereby the CIMs for the commodities included in the Bloomberg Commodity Index are multiplied by the prices in U.S. dollars for the applicable Designated Contracts. These products are then summed. The percentage change in this sum is then applied to the prior Bloomberg Commodity Index level to calculate the current Bloomberg Commodity Index level. The level of the Bloomberg Commodity Index is disseminated approximately every fifteen seconds (assuming the Bloomberg Commodity Index level has changed within such fifteen-second interval) from 10:00 p.m. to 3:00 p.m. (New York time), and a daily Bloomberg Commodity Index level is published at approximately 4:00 p.m. (New York time) on each BCOM Business Day by Bloomberg under the ticker symbol “BCOM” <Index>”.

The Bloomberg Commodity Index is a Rolling Index

The Bloomberg Commodity Index is composed of futures contracts rather than physical commodities. Unlike equities, which typically entitle the holder to a continuing stake in a corporation, commodity futures contracts normally specify a certain date for the delivery of the underlying physical commodity. In order to avoid delivering the underlying physical commodities and to maintain a long futures position, as the exchange-traded futures contracts that compose the Bloomberg Commodity Index approach expiration, they are replaced by similar contracts that have a later expiration. For example, a futures contract purchased and held in August may specify an October expiration date. As time passes, the contract expiring in October may be replaced by a contract for delivery in December. This process is known as “rolling” a futures position. The rollover for each contract occurs over a period of five BCOM Business Days each month according to a pre-determined schedule.

### Bloomberg Commodity Index Calculation Disruption Events

From time to time, disruptions can occur in trading futures contracts on various commodity exchanges. The daily calculation of the index will be adjusted in the event that Bloomberg determines that any of the following index calculation disruption events (each, a “Market Disruption Event”) exist:

- (a) the termination or suspension of, or material limitation or disruption in the trading of any futures contract used in the calculation of the index on that day,
- (b) the settlement price of any futures contract used in the calculation of the index reflects the maximum permitted price change from the previous day’s settlement price,
- (c) the failure of an exchange to publish official settlement prices for any futures contract used in the calculation of the index, or
- (d) with respect to any futures contract used in the calculation of the Bloomberg Commodity Index that trades on the LME, a business day on which the LME is not open for trading.

If a Market Disruption Event occurs during the “Hedge Roll Period” (defined herein as the fifth through the ninth BCOM Business Days of each month) in any month other than January affecting any Index Commodity, then the daily roll of the relevant Designated Contract for such Index Commodity will be postponed until the next available BCOM Business Day on which a Market Disruption Event does not occur, and the calculation of the Bloomberg Commodity Index will be adjusted accordingly. The Hedge Roll Period will be extended only if a Market Disruption Event affects an Index Commodity on the scheduled final BCOM Business Day comprising the Hedge Roll Period. Note that a Market Disruption Event for any individual Index Commodity in the Bloomberg Commodity Index during the Hedge



### **Bloomberg Commodity Index<sup>SM</sup>**

Roll Period will not postpone the roll for any other Index Commodity for which a Market Disruption Event has not occurred.

If a Market Disruption Event occurs during the Hedge Roll Period scheduled for January of each year affecting any Index Commodity, then the rolling or rebalancing of the relevant Designated Contract will occur in all cases over five BCOM Business Days on which no Market Disruption Event exists at a rate of 20% per BCOM Business Day on any BCOM Business Day following a Market Disruption Event during such Hedge Roll Period. This means that the amounts of a particular Designated Contract rolled or rebalanced in January will always be distributed over five BCOM Business Days will not, for example, “double up” on the BCOM Business Day following a Market Disruption Event.

If a Market Disruption Event occurs on a CIM Determination Date in respect of the applicable futures contract for an Index Commodity that is caused by a "limit event" (as defined by the applicable futures exchange), Bloomberg will use the current day's settlement price of such futures contract to determine the new CIM with respect to such Index Commodity. If a Market Disruption Event occurs due to an exchange's failure to produce a settlement price of such futures contract, Bloomberg will use the first prior BCOM Business Day's settlement price on which a Market Disruption Event had not occurred with respect to such Index Commodity.

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### The Commodity Futures Markets

Contracts on physical commodities are traded on regulated futures exchanges, in the over-the-counter market and on various types of physical and electronic trading facilities and markets. At present, all of the contracts included in the Bloomberg Commodity Index are exchange-traded futures contracts. An exchange-traded futures contract is a bilateral agreement providing for the purchase and sale of a specified type and quantity of a commodity or financial instrument during a stated delivery month for a fixed price. A futures contract on an index of commodities typically provides for the payment and receipt of a cash settlement based on the value of such commodities. A futures contract provides for a specified settlement month in which the commodity or financial instrument is to be delivered by the seller (whose position is described as “short”) and acquired by the purchaser (whose position is described as “long”) or in which the cash settlement amount is to be made.

There is no purchase price paid or received on the purchase or sale of a futures contract. Instead, an amount of cash or cash equivalents must be deposited with the broker as “initial margin”. This amount varies based on the requirements imposed by the exchange clearing houses, but may be as low as 5% or less of the value of the contract. This margin deposit provides collateral for the obligations of the parties to the futures contract.

By depositing margin in the most advantageous form (which may vary depending on the exchange, clearing house or broker involved), a market participant may be able to earn interest on its margin funds, thereby increasing the potential total return that may be realized from an investment in futures contracts. The market participant normally makes to, and receives from, the broker subsequent payments on a daily basis as the price of the futures contract fluctuates. These payments are called “variation margin” and make the existing positions in the futures contract more or less valuable, a process known as “marking to market”.

Futures contracts are traded on organized exchanges, known as “contract markets” in the United States, through the facilities of a centralized clearing house and a brokerage firm which is a member of the clearing house. The clearing house guarantees the performance of each clearing member which is a party to the futures contract by, in effect, taking the opposite side of the transaction. At any time prior to the expiration of a futures contract, subject to the availability of a liquid secondary market, a trader may elect to close out its position by taking an opposite position on the exchange on which the trade obtained the position. This operates to terminate the position and fix the trader’s profit or loss.

U.S. contract markets, as well as brokers and market participants, are subject to regulation by the U.S. Commodity Futures Trading Commission. Futures markets outside the United States are generally subject to regulation by comparable regulatory authorities. However, the structure and nature of trading on non-U.S. exchanges may differ from the foregoing description. From its inception to the present, the Bloomberg Commodity Index has been comprised exclusively of futures contracts traded on regulated exchanges.

## UBS Bloomberg Constant Maturity Commodity Index Excess Return

The following is a description of the UBS Bloomberg Constant Maturity Commodity Index Excess Return (“CMCIER”), one of the CMCI Indices (“CMCI Indices”), including without limitation, composition, weighting, method of calculation and procedures for changes in components and weights. The information in this description has been taken from (i) publicly available sources and (ii) the handbook “UBS Bloomberg CMCI (Constant Maturity Commodity Index): Technical Document” (a document available publicly on the website of the CMCI Indices at <https://www.ubs.com/global/en/investment-bank/bloomberg-cmci.html>), which is summarized but not incorporated by reference herein. Such information reflects the policies of, and is subject to change at any time by, UBS AG, London Branch (“UBS”) and Bloomberg Finance L.P. (“Bloomberg” and, together with UBS, the “Index Sponsors”). We accept responsibility as to the correct reproduction of the information described in (ii) above. UBS has not independently verified information from publicly available sources, described above in clause (i). You, as an investor in the Securities, should make your own investigation into the CMCI Indices. None of the CMCI Benchmark Oversight Committee and Index Operating Subcommittee, as discussed below, and/or members of the CMCI Benchmark Oversight Committee or Index Operating Committee individually is involved in the offer of the Securities and has no obligation to consider your interests as a holder of the Securities. However, employees of UBS, the issuer of the Securities, may be members of the CMCI Benchmark Oversight Committee and Index Operating Subcommittee and its affiliates are involved in the public offering and sale of the Securities and may be engaged in secondary market making transactions in the Securities.

Bloomberg and UBS have no obligation to continue to publish the CMCI Indices, and may discontinue publication of the CMCI Indices at any time in their sole discretion.

### Overview

The CMCIER was introduced in January 2007 to provide an innovative alternative to traditional commodity indices. The CMCIER is based on the same methodology and contains the same components as the Constant Maturity Commodity Index (“CMCI”), which was also introduced in January 2007. Where the CMCI has weightings across commodities, the CMCIER is weighted across both commodities and maturities. The CMCIER represents a basket of 29 commodity futures contracts with a series of up to five different investment maturities for each individual commodity using the calculation methodology of constant maturity forwards. Traditional commodity indices tend to focus on front-month contracts with short tenors (time to maturity) whereas the CMCIER is based on commodity futures contracts with tenors ranging from three months to three years. The CMCIER also offers continuous roll mechanisms for each constant maturity with respect to each commodity futures contract, which, in contrast to rolling of front-month contracts offered in traditional commodity indices, offers the potential to mitigate negative roll yield. Roll yield arises from the differential between the price levels of the contracts that an index rolls out of and those it rolls into. The commodities represented in the CMCIER currently include agricultural products, energy products, industrial metals, precious metals and livestock. The exchanges include the New York Mercantile Exchange (including the COMEX division), the Chicago Board of Trade, the Kansas City Board of Trade, the Winnipeg Commodities Exchange, the London Metal Exchange, the New York Board of Trade, the Chicago Mercantile Exchange, ICE Futures, European Energy Exchange and Euronext Liffe.

The CMCIER was developed by UBS and Bloomberg L.P. (“Bloomberg”). The CMCIER is calculated and disseminated by UBS approximately every fifteen seconds (assuming the level of the CMCIER has changed within such fifteen-second interval) from 3:00 a.m. to 4:20 p.m., New York City time, and a daily index level for the CMCIER is published between approximately 4:30 p.m. and 6:00 p.m., New York City time on each trading day. CMCIER information is available under the symbol “CMCIER” from Bloomberg, on the Bloomberg page CUBS <GO> and on the UBS website.

### Governance, Audit and Review Structure

*The Benchmark Oversight Committee and Index Operating Subcommittee*

The CMCI Benchmark Oversight Committee (“BOC”) is the uppermost governance and oversight body for the CMCI Indices, including the CMCIER. The BOC consists of senior representatives from various Bloomberg business units. The voting members of the BOC do not participate in the index business. The BOC meets quarterly to address matters such as material risks, conflicts of interest, industry developments, client complaints and material index errors and restatements.

### **UBS Bloomberg Constant Maturity Commodity Index Excess Return**

The Index Operating Subcommittee (“IOS”) assists the BOC in oversight of the CMCI Indices and is composed of senior benchmark and strategy index managers designated by the BOC, including Bloomberg personnel with significant index experience. The IOS meets each month to review the CMCI Indices to address matters such as new index approvals, periodic review of existing indices, index pricing, management of errors and restatements, identification and management of actual and potential conflicts of interest, approvals of changes to indices and the approvals of cessation of indices.

#### *CMCIER Annual Review*

For the benefit of the Index and all market participants, Bloomberg conducts an annual review of CMCIER. During the annual review, selected index stakeholders advise on any changes that it considers appropriate to the CMCIER in order to promote alignment with its users and the realization of the objectives of the CMCIER as a tradable benchmark representative of the commodity market. Therefore, Bloomberg considers any recommendations and determines, in its reasonable judgment, whether such action is necessary or advisable in order to protect or advance the goals of the CMCIER. Any decisions on proposals made during the annual review are presented to the BOC for ratification.

#### *Internal and External Reviews*

Bloomberg periodically reviews various aspects of its businesses for purposes of internal compliance, including reviews of Bloomberg. In addition, Bloomberg may from time to time appoint an independent external auditor to periodically review and report on its adherence to the IOSCO Principles for Financial Benchmarks.

#### CMCIER Composition

##### The Selection Process

In order to be eligible for inclusion in the CMCIER, a commodity future contract must satisfy certain requirements as described below. Changes in the CMCIER’s composition, as described herein, may be made by Bloomberg. The CMCIER is rebalanced monthly and subject to bi-annual review in order to maintain the intended commodity weightings. No decision can be made to add or withdraw a CMCIER component or affect the weight of such component independently from those made with respect to the CMCI.

The bi-annual composition of the CMCIER is calculated in reliance upon historical price, liquidity and production data. Bloomberg may modify the methodology for calculating the level of the CMCIER and the values of its components. In addition, under certain circumstances Bloomberg may make certain changes to the way in which the level of the CMCIER or any of its components is calculated.

In some special circumstances, the CMCI Governance Committee can also declare “force majeure” or an extraordinary circumstance and can take any actions that it deems necessary or appropriate for the maintenance of the CMCIER and the realization of the objectives of the CMCIER, even if such actions are not specifically provided for under the CMCIER procedure. Any such actions may be taken with immediate effect. All changes to the CMCIER are proposed by Bloomberg and material changes must be approved by the IOS. Bloomberg also reserves the right to amend the composition and methodology for calculating the CMCIER, including additions, deletions and weightings of the component commodities, all of which could affect the level of CMCIER.

#### Component Selection and Target Weights

For a commodity contract to be included in the CMCIER, Bloomberg must determine that it is economically significant and liquid. To be eligible, in addition to certain other requirements, the contract must satisfy a series of

pure financial thresholds based on liquidity, including, among other things, open interest and market volume. Open interest, which reflects positions in contracts that remain open on an overnight or multi-day basis, is used to assess past and future liquidity. Market volume, which reflects the number of contracts traded in a given period of time, indicates immediate interest, and over a period of time provides a usable measure of liquidity.

#### CMCIER Weightings

##### Initial Weightings

The weighting process for the CMCIER is designed to reflect the economic significance and market liquidity of each commodity. Bloomberg uses a multi-step approach to determining target weights of the futures contracts in the CMCIER. First, Bloomberg uses primary economic indicators such as Consumer Price Indexes (CPI), Producer Price



### UBS Bloomberg Constant Maturity Commodity Index Excess Return

Indexes (PPI) and Gross Domestic Product (GDP), as well as commodity-level consumption data, to produce the Fundamental Weight of each of the five sectors of the CMCIER — the five sectors of the CMCIER are currently agriculture, livestock, energy, precious metals and industrial metals. Second, the Liquidity Weights for each sector are obtained from a combination of open interest and volume data, as reported on the relevant exchanges. The target weights of each relevant component in the CMCIER are determined based on the Fundamental and Liquidity Weights.

#### Changes in the Weights and/or CMCIER Composition

As noted above, Bloomberg reviews the selection and weightings of the futures contracts in CMCIER bi-annually. In addition, the target weights themselves are adjusted annually each July.

#### Continuous Rolling of Contracts

The CMCIER distributes exposure to each underlying across all available CMCI constant maturities (ranging from three months to three years). The distribution of weightings to available tenors (time to maturity) is a function of relative liquidity of the underlying futures contracts. As with most asset classes, the liquidity of commodity futures contracts tends to reduce as time to maturity increases. Therefore, the continuous rolling (constant maturity) of the CMCIER limits the dilution of liquidity of the underlying commodity futures contracts.

#### Rebalancing of the CMCIER Components

Because of price movements, the weight of each commodity in the CMCIER will move away from its target weight over time. The weight of each CMCIER component is therefore rebalanced over the final three business days of each month in order to bring each commodity back to its target weight. The process is automatic and is implemented via a pre-defined algorithm.

In addition, once annually in July there is a maintenance period at which time the target weights themselves are adjusted.

#### Material Changes

Any “material change” to the CMCIER by Bloomberg must be approved by the BOC and IOS. In determining whether a change is a “material change,” the following factors are taken into account:

- Ø the economic and financial impact of the change,
- Ø whether the change affects the original purpose of the CMCIER, and/or
- Ø whether the change is consistent with the overall objective of the CMCIER and the underlying market interests it seeks to measure.

#### Market Emergency and Force Majeure

In some extraordinary circumstances, Bloomberg can deem an event a “market emergency and force majeure” event if, in the judgment of Bloomberg, such circumstances are reasonably likely to have a material adverse effect on the tradability of CMCIER or the ability of CMCIER to serve as a benchmark for the commodities market. Such extraordinary circumstances include:

- Ø the imposition of a currency control mechanism,
- Ø the adoption or issuance of tax-related rules, regulations, orders or other actions,
- Ø an announcement or other public action regarding scientific discoveries or events relating to the commodities markets,
- Ø

a governmental, regulatory or other public announcement that is reasonably likely to affect the commodity markets generally,

Ø

any climate or weather related emergencies,

Ø

a war,

## UBS Bloomberg Constant Maturity Commodity Index Excess Return

Ø a terrorist event,  
 any event other than those specifically identified herein, making the calculation of CMCIER impossible or  
 Ø infeasible either on a technical basis or otherwise, or that makes CMCIER non representative of market prices or  
 undermines the realization of the objectives of the indices, and  
 Ø any event creating a situation of unfair advantage or disadvantage for any market participant, group of market  
 participants or Bloomberg.  
 Whenever a “market emergency and force majeure” event has been identified, Bloomberg, can take any action it deems  
 appropriate, including, but not limited to:

Ø the replacement of a daily contract nearby price when there is a manifest error in the officially settled price or when  
 a market abuse is likely to have taken place,  
 Ø the temporary or final revoking of the membership of a component in CMCIER,  
 Ø the immediate change of a CMCIER parameter,  
 Ø the suspension of the calculation of CMCIER, a sub-index, a standard constant maturity series, or a currency series,  
 or  
 Ø in general, any action necessary to preserve the reputation of CMCIER as fair and tradable commodity benchmarks.  
 Adjustments for “Market Disruption Event Day”

When an exchange fails to publish a settlement price for components involved in any of the CMCIER maintenance  
 procedures (rebalancing or re-weighting), the CMCIER business day is deemed a “market disruption event day.” The  
 components involved are not rolled or rebalanced on that day. For those contracts or components, the roll periods  
 remain identical to the value they had on the CMCIER business day immediately preceding the “market disruption  
 event day” in such a way that the maintenance period is extended for as long as no settlement price is made available  
 by the affected exchange. If, after a period of five standard business days, no settlement price has been made available  
 by the exchange or trading platform, Bloomberg will determine, in good faith, taking into account the objectives of the  
 CMCIER and the interests of market participants, the one or more exchange settlement or official closing prices  
 necessary for the maintenance of the component and the calculation of the CMCIER.

### Adjustments for “FX Market Disruption Event Day”

In the event of a reference price source failing to publish a valid fixing rate for a referenced currency exchange rate,  
 the CMCIER business day is deemed an “FX market disruption event day.” If no fixing price has been made available  
 by the affected price source, the one or more foreign exchange currency rate fixing prices necessary for the calculation  
 of the CMCIER will be obtained by Bloomberg from commercially reasonable sources in the market, or determined in  
 good faith, bearing in mind both the interest of investors and market participants, and with the aim of maintaining and  
 enhancing the CMCIER as a tradable commodity investment benchmark. A commercially reasonable method would  
 be, for example, the averaging of three foreign exchange broker-dealer quotes at the approximate time when the fixing  
 would have been determined by the price source. In the event that the rate source becomes permanently deficient,  
 Bloomberg may characterize the event as a “force majeure” event and decide to replace it by a new source effective  
 immediately thereafter.

CMCI Indices’ information is available on the Bloomberg website: <http://www.bloomberg.com> (Select  
 “COMMODITIES” from the “Quick Links” banner at the top of the page). For further information on CMCI, investors  
 can go to <https://www.ubs.com/global/en/investment-bank/bloomberg-cmci.html>.

### Excess Return vs. Total Return

The CMCIER measures for a given basket composition and standard constant maturity, the uncollateralized returns of  
 the CMCI basket components. The term “Excess Return” in the title of the CMCIER is not intended to suggest that the  
 performance of the CMCIER at any time or the return on your Securities will be positive or that the CMCIER is

designed to exceed a particular benchmark.

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**UBS Bloomberg Constant Maturity Commodity Index Excess Return**

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The Commodity Futures Markets

For descriptions of the commodity futures markets, see “Bloomberg Commodity Index — The Commodity Futures Markets”.

## Non-U.S. Indices

### EURO STOXX 50<sup>®</sup> Index

The EURO STOXX 50<sup>®</sup> Index (the “EURO STOXX 50 Index”) seeks to provide exposure to large capitalization equity securities in the Eurozone. The EURO STOXX 50 Index is maintained and published by STOXX Limited (the “EURO STOXX 50 Index Sponsor”). The EURO STOXX 50 Index covers 50 stocks of market sector leaders mainly from 11 Eurozone countries: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. The EURO STOXX 50 Index captures approximately 60% of the free-float market capitalization of each of the 19 EURO STOXX regional Total Market Index (TMI) Supersector Index (each, a “STOXX TMI Supersector Index”). The EURO STOXX 50 Index universe is defined as all components of the 19 STOXX TMI Supersector indices.

### EURO STOXX 50 Index Composition

The EURO STOXX 50 Index is composed of 50 underlier stocks from the 19 STOXX TMI Supersector indices. The 19 supersectors from which stocks are selected for the EURO STOXX 50 Index are Automobiles & Parts, Banks, Basic Resources, Chemicals, Construction & Materials, Financial Services, Food & Beverage, Health Care, Industrial Goods & Services, Insurance, Media, Oil & Gas, Personal & Household Goods, Real Estate, Retail, Technology, Telecommunications, Travel & Leisure and Utilities, although stocks from each of these supersectors are not necessarily included at a given time.

### EURO STOXX 50 Index Component Selection

For each of the 19 STOXX TMI Supersector indices, the component stocks are ranked by free-float market capitalization. The largest stocks are added to the selection list until the coverage is close to, but still less than, 60% of the free-float market capitalization of the corresponding STOXX TMI Supersector Index. If the next highest-ranked stock brings the coverage closer to 60% in absolute terms, then it is also added to the selection list. All current EURO STOXX 50 Index components are then added to the selection list. The stocks on the selection list are then ranked by free-float market capitalization to produce the final selection list. In exceptional cases, the EURO STOXX 50 Index Sponsor may make additions and deletions to the selection list.

The 40 largest stocks on the selection list are chosen as components. The remaining 10 stocks are selected from the largest remaining current components of the EURO STOXX 50 Index ranked between 41 and 60 are added as EURO STOXX 50 Index components. If the number of components is still below 50, then the largest remaining stocks on the selection list are added until the EURO STOXX 50 Index contains 50 stocks. The EURO STOXX 50 Index composition is reviewed annually each September and is subject to change with the review cut-off date being the last trading day in August.

### Ongoing Maintenance of Component Stocks

The EURO STOXX 50 Index is weighted by free-float market capitalization. Each component’s weight is capped at 10% of the EURO STOXX 50 Index’s total free-float market capitalization. Weights are reviewed quarterly and are also subject to change in response to specific events affecting the EURO STOXX 50 Index component stocks, including initial public offerings, mergers and takeovers, spin-offs, de-listings and bankruptcy.

Each component stock is subject to a “fast exit” rule – it will be deleted if (1) it ranks 75 or below on the monthly selection list and (2) it ranked 75 or below on the selection list of the previous month. The highest-ranked non-component stock will replace the exiting component stock. The EURO STOXX 50 Index is also subject to a “fast entry” rule. All stocks on the latest selection lists and initial public offering stocks are reviewed for a fast-track addition

quarterly. A stock is added if (1) it qualifies for the latest blue-chip selection list generated at the end of February, May, August or November and (2) it ranks between 1 and 25 on the selection list. If added, the stock replaces the smallest component stock.

A deleted stock is replaced immediately to maintain the fixed number of stocks. The replacement is based on the latest monthly selection list. In the case of a merger or acquisition where a component stock is involved, the original component stock is replaced by the new component stock. In the case of a spin-off, if the original stock was a component stock, then each spin-off stock qualifies for addition if it lies within ranks 1 to 40 on the latest selection list.

**EURO STOXX 50® Index**

The largest qualifying spin-off stock replaces the original component stock, while the next qualifying spin-off stock replaces the lowest ranked component stock and likewise for other qualifying spin-off stocks.

The free-float factors and outstanding number of shares for each underlier stock that STOXX Limited uses to calculate the EURO STOXX 50 Index, as described below, are reviewed, calculated and implemented on a quarterly basis and are fixed until the next quarterly review. Certain extraordinary adjustments to the free-float factors and/or the number of outstanding shares are implemented and made effective more quickly. Each component’s weight is capped at 10% of the EURO STOXX 50 Index’s total free-float market capitalization. The free-float factor reduces the underlier stock’s number of shares to the actual amount available for trading. All holdings that are larger than 5% of the total outstanding number of shares and held on a long-term basis are excluded from the index calculation (including, but not limited to, stock owned by the company itself, stock owned by governments, stock owned by certain individuals or families, and restricted shares).

**EURO STOXX 50 Index Calculation**

The EURO STOXX 50 Index is calculated with the Laspeyres formula, which measures price changes in the component stocks against a fixed base quantity weight. The EURO STOXX 50 Index is also subject to a unique divisor, which is adjusted to maintain the continuity of the EURO STOXX 50 Index’s values across changes due to certain corporate actions.

The formula for calculating the EURO STOXX 50 Index value can be expressed as follows:

$$\text{EURO STOXX 50 Index} = \frac{\text{Free-Float Market Capitalization of the EURO STOXX 50 Index}}{\text{Divisor}}$$

The “free-float market capitalization of the EURO STOXX 50 Index” is equal to the sum of the products of the price, the number of shares, the free-float factor and the weighting cap factor for each underlier stock as of the time the EURO STOXX 50 Index is being calculated. The index stocks trade in Euros and thus, no currency conversion is required. Where any index component stock price is unavailable on any trading day, the underlier sponsor will generally use the last reported price for such component stock.

In case the investability and tradability of the index and index based products is affected by an upcoming market or company event that is considered significant or “extreme” by the EURO STOXX 50 Index Sponsor Management Board, the following actions or a combination of the following actions are taken. For all such changes a minimum notification period of two full trading days will be observed. The action scope may include but is not limited to:

- application of expert judgment for index component pricing data,
- adjustment of operational procedures,
- postponement of index adjustments,
- adjustment of selection lists,
- change of weights of index constituents by adjusting the number of shares, free-float factors or weighting cap-factors,
- or
- adjustment of index compositions.

**EURO STOXX 50 Divisor**

The EURO STOXX 50 Index is calculated using a divisor that helps to maintain the continuity of the index’s value so that corporate actions do not artificially increase or decrease the level of the EURO STOXX 50 Index.

The divisor is calculated by starting with the previous divisor in effect for the EURO STOXX 50 Index (the “original divisor value”) and multiplying it by a fraction, the numerator of which is the previous free-float market capitalization of the EURO STOXX 50 Index, plus or minus the difference between the closing market capitalization of the EURO



STOXX 50 Index and the adjusted closing market capitalization of the EURO STOXX 50 Index, and the denominator of which is the previous free-float market capitalization of the EURO STOXX 50. The adjusted free-float market capitalization is calculated for stocks of companies that have experienced a corporate action of the type described below as of the time the new divisor value is being calculated using the free-float market capitalization calculated with

**EURO STOXX 50® Index**

adjusted closing prices, the new number of shares, and the new free-float factor minus the free-float market capitalization calculated with that stock's original closing price, number of shares, and free-float factor, in each case as used in calculating the original divisor value. Errors in divisor calculation are corrected on an intraday basis if discovered on the same day the new divisor is effective. If the error is discovered later, the error is corrected on an intraday basis if feasible and only if the error is considered significant by the EURO STOXX 50 Index Sponsor Management Board.

**Divisor Adjustments**

STOXX Limited adjusts the divisor for the EURO STOXX 50 Index to maintain the continuity of the EURO STOXX 50 Index values across changes due to corporate actions. Changes in weights due to corporate actions are distributed proportionally across all index components and equal an investment into the portfolio. The following is a summary of the adjustments to any underlier stock made for corporate actions and the effect of such adjustments on the divisor, where shareholders of the underlier stock will receive "B" new shares for every "A" share held (where applicable) and assuming that the version of the index to which your notes are linked is the price return version. All adjusted prices consider withholding taxes based on the new shares being distributed, using "B x (1 - withholding tax where applicable)".

## (1) Special cash dividend:

$$\text{Adjusted price} = \text{closing price} - \text{dividend announced by the company} \times (1 - \text{withholding tax if applicable})$$

Divisor: decreases

## (2) Split and reverse split:

$$\text{Adjusted price} = \text{closing price} \times A / B$$

$$\text{New number of shares} = \text{old number of shares} \times B / A$$

Divisor: no change

## (3) Rights offering:

$$\text{Adjusted price} = (\text{closing price} \times A + \text{subscription price} \times B) / (A + B)$$

$$\text{New number of shares} = \text{old number of shares} \times (A + B) / A$$

Divisor: increases

If the subscription price is not available or if the subscription price is equal to or greater than the closing price on the day before the effective date, then no adjustment is made.

Extremely dilutive rights issues having a share ratio larger or equal to 2000% ( $B/A > 20$ ) are treated as follows:

The EURO STOXX 50 Index Sponsor will announce the deletion of the company from the index following the standard rules for index replacements if sufficient notice of two trading days before the ex-date can be given.

The company may enter the index again at the next periodic index review, but only after the new rights issue shares have been listed.

Extremely dilutive rights issues for which two trading days' notice before the ex-date cannot be given, and all highly dilutive rights issues having a share ratio larger or equal to 200% ( $B/A > 2$ ) are treated as follows:

The rights issue shares are included into the index with a theoretical price on the ex-date;

The rights issue shares must be listed on an eligible stock exchange and tradable starting on the ex-date, otherwise, only a price adjustment is made and the rights are not included;

The rights issue shares will have the same parameters as the parent company;

**EURO STOXX 50® Index**

o The rights issue shares will be removed at the close of the day they start to trade with traded price being available;  
o and

o The number of shares and weighting factors will be increased after the new rights issue shares have been listed.

(4) Stock dividend:

$$\begin{aligned} \text{Adjusted price} &= \text{closing price} \times A / (A + B) \\ \text{New number of shares} &= \text{old number of shares} \times (A + B) / A \\ \text{Divisor:} & \text{no change} \end{aligned}$$

(5) Stock dividend from treasury stock if treated as extraordinary dividend:

$$\begin{aligned} \text{Adjusted close} &= \text{close} - \text{close} \times B / (A + B) \\ \text{Divisor:} & \text{decreases} \end{aligned}$$

(6) Stock dividend of another company:

$$\begin{aligned} \text{Adjusted price} &= (\text{closing price} \times A - \text{price of other company} \times B) / A \\ \text{Divisor:} & \text{decreases} \end{aligned}$$

(7) Return of capital and share consolidation:

$$\begin{aligned} \text{Adjusted price} &= [\text{closing price} - \text{capital return announced by company} \times (1 - \text{withholding tax})] \times A / B \\ \text{New number of shares} &= \text{old number of shares} \times B / A \\ \text{Divisor:} & \text{decreases} \end{aligned}$$

(8) Repurchase of shares / self-tender:

$$\begin{aligned} \text{Adjusted price} &= [(\text{price before tender} \times \text{old number of shares}) - (\text{tender price} \times \text{number of tendered shares})] / (\text{old} \\ \text{number of shares} - \text{number of tendered shares}) \\ \text{New number of shares} &= \text{old number of shares} - \text{number of tendered shares} \\ \text{Divisor:} & \text{decreases} \end{aligned}$$

(9) Spin-off:

$$\begin{aligned} \text{Adjusted price} &= (\text{closing price} \times A - \text{price of spin-off shares} \times B) / A \\ \text{Divisor:} & \text{decreases} \end{aligned}$$

(10) Combination stock distribution (dividend or split) and rights offering:

For this corporate action, the following additional assumptions apply:

o Shareholders receive “B” new shares from the distribution and “C” new shares from the rights offering for every “A” share held; and

o If A is not equal to one, all the following “new number of shares” formulae need to be divided by A.

**EURO STOXX 50® Index**

- If rights are applicable after stock distribution (one action applicable to another):
  - o Adjusted price =  $[\text{closing price} \times A + \text{subscription price} \times C \times (1 + B / A)] / [(A + B) \times (1 + C / A)]$
  - o New number of shares =  $\text{old number of shares} \times [(A + B) \times (1 + C / A)] / A$ 
    - o Divisor: increases
- If stock distribution is applicable after rights (one action applicable to another):
  - o Adjusted price =  $(\text{closing price} \times A + \text{subscription price} \times C) / [(A + C) \times (1 + B / A)]$
  - o New number of shares =  $\text{old number of shares} \times [(A + C) \times (1 + B / A)]$ 
    - o Divisor: increases
- Stock distribution and rights (neither action is applicable to the other):
  - o Adjusted price =  $(\text{closing price} \times A + \text{subscription price} \times C) / (A + B + C)$
  - o New number of shares =  $\text{old number of shares} \times (A + B + C) / A$ 
    - o Divisor: increases

(11) Addition/deletion of a company

- No price adjustments are made. The net change in market capitalization determines the divisor adjustment.

(12) Free-float and shares changes

- No price adjustments are made. The net change in market capitalization determines the divisor adjustment. The EURO STOXX 50 Index is denominated in Euros. The EURO STOXX 50 Index return will be calculated based on the closing levels of the EURO STOXX 50 Index, as reported by Bloomberg L.P. under ticker symbol “SX5E.”

We have derived all information regarding the EURO STOXX 50 Index contained in this index supplement from publicly available information without independent verification. Such information reflects the policies of, and is subject to change by, the EURO STOXX 50 Index Sponsor. The EURO STOXX 50 Index Sponsor owns the copyright and all other rights to the EURO STOXX 50 Index. The EURO STOXX 50 Index Sponsor has no obligation to continue to publish, and may discontinue publication of, the EURO STOXX 50 Index. Historical performance of the EURO STOXX 50 Index is not an indication of future performance. Future performance of the EURO STOXX 50 Index may differ significantly from historical performance, either positively or negatively.

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**EURO STOXX 50® Index**

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## FTSE™ 100 Index

The FTSE™ 100 Index (the “FTSE 100 Index”) was developed with a base value of 1,000 with a base date of December 30, 1983. The FTSE 100 Index is a market capitalization-weighted index and designed to measure the performance of the 100 largest companies traded on the London Stock Exchange (the “Exchange”) that pass screening for size and liquidity. All constituents of the FTSE 100 Index are traded on the SETS trading system of the Exchange. To qualify, companies must have a full listing on the Exchange with a Sterling or Euro denominated price on the Exchange’s SETS trading system, subject to eligibility screens. The FTSE Europe, Middle East & Africa Regional (“EMEA”) Equity Advisory Committee meets quarterly, in March, June, September and December, to review the constituents of the FTSE 100 Index.

A security will be inserted in the FTSE 100 Index at the periodic review if it rises to or above the 90th position when the eligible securities are ranked by market value. Consequently, a security will be deleted from the FTSE 100 Index at the periodic review if it falls to or below the 11th position. A constant number of constituents are maintained for the FTSE 100 Index. Where a greater number of companies qualify to be inserted in the FTSE 100 Index than those qualifying to be deleted, the lowest ranking constituents presently included in the FTSE 100 Index will be deleted to ensure that an equal number of companies are inserted and deleted at the periodic review. Likewise, where a greater number of companies qualify to be deleted than those qualifying to be inserted, the securities of the highest ranking companies which are presently not included in the FTSE 100 Index will be inserted to match the number of companies being deleted at the periodic review.

For the purposes of computing the FTSE 100 Index, the number of shares in issue for each constituent security is amended only when the total shares in issue held within the index system changes by more than 1% on a cumulative basis. Changes are made quarterly after the close of business on the third Friday of March, June, September and December. In the June review, the shares and free float updates will be implemented regardless of size (i.e. no buffers will be applied) and the June updates will be implemented using data sourced primarily from company filings for all constituents, with free floats being rounded to 12 decimal places. However, updates can occur outside the quarterly update cycle if (a) a corporate action is applied to a FTSE 100 Index constituent which involves a free float or a share change in the number of shares due to a corporate event, the change in shares will be applied simultaneously with the corporate action or (b) there is a \$1 billion investable market cap change related to a primary/secondary offering measured by multiplying the change to index shares by the subscription price, or there is a resulting change in index shares related to a primary or secondary offering and a \$250 million investable market cap change measured by multiplying the change to index shares by the subscription price. A minimum of 2 days’ notice is given to users of the FTSE 100 Index. WM/Reuters Spot Rates are used to convert the market capitalization into U.S. dollars.

The FTSE 100 Index is calculated in real-time and published every 15 seconds during the FTSE 100 Index opening hours between 08:00 a.m. and 04:30 p.m. GMT using real time prices. The FTSE 100 Index Return is calculated based on the closing levels of the FTSE 100 Index on the Exchange, as reported by Bloomberg L.P. under ticker symbol “UKX.”

The FTSE 100 Index is calculated by (i) multiplying the per share price of each stock included in the FTSE 100 Index by the number of outstanding shares and by the free float factor applicable to such stock, (ii) calculating the sum of all these products (such sum referred to hereinafter as the “FTSE Aggregate Market Value”) as of the starting date of the FTSE 100 Index and (iii) dividing the FTSE Aggregate Market Value by a divisor which represents the total issued share capital of the FTSE 100 Index on the base date and which can be adjusted to allow changes in the issued share capital of individual underlying stocks (including the deletion and addition of stocks, the substitution of stocks, stock dividends and stock splits) to be made without distorting the FTSE 100 Index. Because of such capitalization weighting, movements in share prices of companies with relatively larger market capitalization will have a greater effect on the level of the entire FTSE 100 Index than will movements in share prices of companies with relatively smaller market capitalization.

Under this methodology, FTSE International Limited (“FTSE”, also the “FTSE 100 Index Sponsor”) excludes from free floating shares directly owned by state, regional, municipal and local governments (excluding shares held by independently managed pension schemes for governments); shares held by sovereign wealth funds where each holding is 10% or greater (if the holding subsequently decreases below 10%, the shares will remain restricted until the holding falls below 10%), shares held by directors senior executives and managers of the company, and by their family and direct relations, and by companies with which they are affiliated; shares held within employee share plans; shares held by public companies or by non-listed subsidiaries of public companies; shares held by founders, promoters, former directors, venture capital and private equity firms, private companies and individuals (including employees) and shares held by several holders acting in concert, where the holding is 10% or greater (if the holding

### **FTSE™ 100 Index**

subsequently decreases below 10%, the shares will remain restricted until the holding falls below 10%); all shares where the holder is subject to a lock-in clause (free float changes resulting from the expiry of a lock-in will be implemented at the next quarterly review subsequent to there being a minimum of 20 business days between the lock-in expiry date and the Tuesday before the first Friday of the review month); shares held for publicly announced strategic reasons and shares that are subject to on-going contractual agreements (such as swaps) where they would ordinarily be treated as restricted.

Constituents of the FTSE 100 Index are adjusted for free float. Free float is calculated using available public information rounded to 12 decimal places and companies with a free float of 5% or below are excluded from the index. To be eligible for inclusion in the FTSE 100 Index, a security must have a minimum free float of 25% if the issuing company is UK incorporated and 50% if it is non-UK incorporated. However, a new company may be initially included in the FTSE 100 Index with a free float below the above parameters (provided it is above 5%) where the free float is expected to meet the minimum requirements within 12 months of the company's first day of trading. During the March, September and December quarterly updates, free float and shares outstanding will be updated to reflect changes greater than 3 percentage points for cumulative free float changes. A constituent with a free float of 15% or below will not be subject to the 3 percentage points threshold and will instead be updated if the change is greater than 1 percentage point. A constituent's free float will also be reviewed on publication of further information on restricted shareholdings (i.e. where shares being offering were previously restricted, free float will be adjusted).

Securities must be sufficiently liquid to be included in the FTSE 100 Index. The following criteria will be used to ensure that illiquid securities are excluded:

*Price.* There must be an accurate and reliable price for the purposes of determining the market value of a company.

*Size.* In order to determine membership, all companies with eligible securities will be ranked by their full market capitalization i.e. before the application of any investability weightings. Only the quoted equity capital of a constituent company will be included in the calculation of its market capitalization. Where a company has two or more classes of equity, significant and liquid secondary lines will be included in the calculation of the market capitalization of the company, based on the market price of that secondary line.

*Liquidity.* Each security will be tested for liquidity annually in June by calculation of its median daily trading volume per month. Liquidity will be tested from the first business day in May of the previous year to the last business day of April. When calculating the median of daily trades per month of any security, a minimum of 5 trading days in each month must exist, otherwise the month will be excluded from the test. The median trading volume is calculated by ranking each daily trading volume and selecting the middle ranking day if there is an odd number of days and the mean of the middle two if there is an even number of days. Daily totals with zero trades are included in the ranking, therefore a security that fails to trade for more than half of the days in a month will have a zero median trading volume. Any period of suspension will not be included in the test. For newly eligible securities where the testing period is less than 12 months, the liquidity test will be applied on a pro-rata basis.

### **Liquidity Thresholds:**

A - Securities which do not turnover at least 0.025% of their shares in issue (after the application of any investability weightings\*) based on their median daily trading volume per month for at least 10 of the 12 months prior to the annual index review, will not be eligible for inclusion in the FTSE 100 until the next annual review.

B - An existing constituent which does not turnover at least 0.015% of its shares in issue (after the application of any investability weightings\*) based on its median daily trading volume per month for at least 8 of the 12 months prior to the annual index review will be removed and will not be eligible for inclusion in the FTSE UK Index Series until the next annual review.

o



C - New issues which do not have a twelve month trading record must have a minimum 20 day trading record when reviewed. They must turnover at least 0.025% of their shares in issue (after the application of any investability weightings\*) based on their median daily trading volume per month since listing. This rule will not apply to new issues added under the Fast Entry Rule except for demutualizations.

\*When testing liquidity, the published free float weight on the final trading day of each month will be used for the calculation of the liquidity test for that month.

### **FTSE™ 100 Index**

D - In assessing liquidity, data will be aggregated from trading venues exhibiting a market share of greater than 2%. If the company fails the liquidity screen on this basis, data may also be obtained from Depository Receipt (“DR”) otrades. For the purpose of this rule, where the majority of trading is in the DR, 100% of DR trading will be aggregated with 50% of the trades in the UK. Where the majority of trading is in the UK, 50% of DR trading will be aggregated with 100% of the trades in the UK.

In assessing liquidity, data will be obtained from a constituent’s exchange in the country in which the company is classified by FTSE. If the constituent fails the liquidity screen on this basis, data may also be reviewed from other markets (including trading in ADRs and GDRs) and the trading volumes aggregated. Trading volumes from other markets will not normally be considered unless the majority of the liquidity is met from the constituent’s exchange in the country in which the company is classified.

We have derived all information regarding the FTSE 100 Index contained in this index supplement from publicly available information without independent verification. Such information reflects the policies of, and is subject to change by, the FTSE 100 Index Sponsor. The FTSE 100 Index Sponsor has copyright and all other rights to the FTSE 100 Index. The FTSE 100 Index Sponsor has no obligation to continue to publish, and may discontinue publication of, the FTSE 100 Index.

### **The London Stock Exchange**

The London Stock Exchange (the “Exchange”) organizes, operates and regulates key aspects of the United Kingdom’s capital market. All securities listed in the FTSE 100 Index must be listed on the Exchange. The Exchange is subject to the law of the United Kingdom, which stipulates the concept of self-regulation and compliance with international standards. The Exchange has two primary markets — the Main Market and the Alternative Investment Market.

### **License Agreement**

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## Hang Seng China Enterprises Index

### Hang Seng China Enterprises Index Composition and Maintenance

The Hang Seng China Enterprises Index (the “HSCE Index”) is compiled, published and managed by Hang Seng Indexes Company Limited (“HSIL”), a wholly-owned subsidiary of the Hang Seng Bank. The HSCE Index is a free float-adjusted market capitalization weighted index with a 10% cap on individual constituent weightings. The HSCEI is calculated and disseminated in real-time at 2-second intervals during the trading of the Stock Exchange of Hong Kong. Launched on August 8, 1994, the HSCE Index is comprised of H-shares, which are Hong Kong listed shares of Chinese mainland enterprises (“H-share companies”); Red-chips, which are securities with a minimum of 30% of shareholdings held by Mainland entities (including state-owned organizations); and P-chips, which are companies that have more than 50% of their sales revenue (or profits or assets, if more appropriate) derived from mainland China, but which are not H-shares or Red-chips.

The HSCE Index had a base value of 1,000 at launch, but was rebased as of January 3, 2000 with a value of 2,000. The HSCE Index is reviewed quarterly with data cut-off dates of the end of March, June, September and December of each year. The number of constituents of the HSCE Index is fixed at 50, broken down into a fixed number of 40 H-shares and a total of 10 Red-chips and P-chips.

#### *Implementation of Adding 10 Red-chip and P-chip constituents*

In May 2017, HSIL announced that Red-chips and P-chips would begin to be included in the HSCE Index in March 2018. HSIL announced in August 2017 that the Red-chips and P-chips constituents will be added to the HSCEI in five phases over a 12-month by applying the following inclusion factor and adjusted cap level in each phase:

Phase	Month	Inclusion Factor	Adjusted Cap Level
1	March 2018	0.2	2%
2	June 2018	0.4	4%
3	September 2018	0.6	6%
4	December 2018	0.8	8%
5	March 2019	1.0	10%

#### *Eligibility Criteria*

A component stock is selected or removed from the HSCE Index quarterly based on the following selection criteria and process:

Stocks should be listed for at least one month, starting from the listing date to the review cut-off date (both dates inclusive), in order to be considered in the index review.

The turnover velocity in each of the past 12 months is calculated by observing the quotient of the (i) median of daily traded shares in such calendar month and (ii) free float-adjusted issued shares at such calendar month end. In order to meet the turnover requirement, a stock should have (i) minimum turnover velocity of 0.1% for at least 10 out of the past 12 months, and (ii) for the latest three months, minimum turnover velocity of 0.1% for all three months. For an existing constituent, only (a) needs to be fulfilled.

However, if an existing constituent fails to meet the turnover requirement in (a), then a supplementary turnover test is applied for those months in which the turnover velocity is less than 0.1%. The monthly aggregate turnover is calculated, and if that turnover is among the top 90th percentile of the total market—which includes securities primarily listed on the Main Board of the Stock Exchange of Hong Kong, excluding securities that are secondary listings, foreign companies, preference shares, debt securities, mutual funds or other derivatives—then the constituent passes the

monthly turnover test for that month. The constituent will meet the turnover requirement if (a) is fulfilled after applying the supplementary test.

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### **Hang Seng China Enterprises Index**

For a stock with a trading history of less than 12 months or a stock that has transferred from the Growth Enterprise Market to the Main Board in the past 12 months before the data review cut-off date the following requirements apply with respect to turnover velocity:

- o If less than 6 months, the minimum turnover velocity must be 0.1% for all trading months.

If greater than or equal to 6 months, (i) the stock cannot have more than one month in which it has failed to obtain a turnover velocity of at least 0.1% and (ii) for the latest three months, a stock needs to have attained a turnover velocity 0.1% for all three months if it is not an existing constituent.

For a stock which has been suspended for any of the complete month(s) during the past 12 months before the review cut-off date, the relevant month(s) will be excluded from the velocity calculation. The stock should meet the requirements as described above.

There are additional eligibility criteria for Red-chips and P-chips—namely, such stocks are subject to listing history requirements, price volatility requirements, and financial requirements. In terms of the listing history requirements, for stocks listed through an initial public offering, such stocks should have been listed for at least three years, starting from the listing date to the review cut-off date (inclusive of both dates). For stocks listed through a backdoor listing, such stocks should have been listed for at least six years, starting from the listing date to the review cut-off date (inclusive of both dates).

Regarding the price volatility requirements, the past one-month, three-month and 12-month historical price volatility of a stock should not be greater than three times the historical price volatility of the HSCE Index for the respective period. The stock will not be eligible if its trading has been suspended for a complete month in the past one month before the review cut-off date.

Regarding the financial requirements, the following parameters recorded in the annual reports of a stock should be greater than zero for three consecutive fiscal years: (a) net profit attributable to equity holders of the company; (b) net cash generated from operating activities; (c) cash dividends.

#### *Constituent Selection*

##### H-Shares

All eligible H-share stocks are ranked in terms of Combined Market Value (“MV”) Score, calculated from MV rank and Free float-adjusted Market Value (“FFMV”) rank using the below formula. The “MV” of an individual stock refers to the average of month-end H-share MVs for the past 12 months (“12-month-average MV”) of any review period and “FFMV” of an individual stock refers to the 12-month-average MV after free float adjustment

(1)  $0.5 \text{ MV Rank} + 0.5 \text{ FFMV Rank} = \text{Combined MV Score}$

(2)  $\text{rank of the Combined MV Score} = \text{Combined MV Rank}$

If two H-share constituents have the same Combined MV Score, a higher rank will be assigned to the stock with the higher MV Rank

The top 40 eligible H-share stocks with the highest Combined MV Rank will be selected as constituents of the HSCE Index subject to a buffer zone where existing constituents ranked 49th or lower will be removed from the HSCE Index while non-constituent stocks ranked 32nd or above will be included. In case the number of incoming stocks is greater than the number of outgoing constituents, constituents with the lowest Combined MV Rank will be removed from the index in order to maintain the number of constituents at 40. If the number of incoming stocks is smaller than the number of outgoing constituents, stocks with the highest Combined MV Rank will be added to the index in order to maintain the number of H-share constituents at 40.

*Red-chip and P-chip*

Throughout the Red-chip and P-chip transition period (from the March 2018 rebalancing to the March 2019 rebalancing), constituent selection for Red-chips and P-chips will only be performed once at the beginning of the transition period, with the data cut-off date being December 31, 2017.

### **Hang Seng China Enterprises Index**

All eligible Red-chip and P-chip share stocks are ranked in terms of Combined MV Score, calculated from MV rank and FFMV rank using the below formula. The “MV” of an individual stock refers to the average of month-end H-share MVs for the past 12 months (“12-month-average MV”) of any review period and “FFMV” of an individual stock refers to the 12-month-average MV after free float adjustment:

(1)  $0.5 \text{ MV Rank} + 0.5 \text{ FFMV Rank} = \text{Combined MV Score}$

(2)  $\text{rank of the Combined MV Score} = \text{Combined MV Rank}$

If two Red-chip and P-chip constituents have the same Combined MV Score, a higher rank will be assigned to the stock with the higher MV Rank.

Throughout the Red-chip and P-chip transition period (from the March 2018 rebalancing to the March 2019 rebalancing), constituent selection for Red-chips and P-chips will only be performed once at the beginning of the transition period, with the data cut-off date being December 31, 2017.

The top 10 eligible Red-chip and P-chip stocks with the highest Combined MV Rank will be selected as constituents of the HSCE Index, with no buffer zone applied for these 10 constituents.

### **Calculation Methodology**

The HSCE Index is calculated using the following formula:

The FAF represents the proportion of shares that are free floated as a percentage of the issued shares. The FAF is between 0 and 1 and is rounded up to the nearest multiple of 5% for index calculation. The CF is calculated so that no constituent stock has a weighting that exceeds 10%. The FAF, CF and IS are adjusted quarterly.

We have derived all information contained in this index description regarding the HSCE Index, including, without limitation, its composition, method of calculation and changes in its components, from publicly available information. Such information reflects the policies of HSIL and is subject to change at the discretion of HSIL. HSIL is under no obligation to continue to publish, and may discontinue or suspend the publication of, the Hang Seng China Enterprises Index at any time. Historical performance of the HSCE Index is not an indication of future performance. Future performance of the HSCE Index may differ significantly from historical performance, either positively or negatively.

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## MSCI Indexes

We may offer a Security linked to one or more indexes that are part of the “MSCI Global Investable Market Indexes” sponsored by MSCI Inc. (“MSCI”), including the MSCI-EAFE<sup>®</sup> Index (Europe, Asia, Australia and the Far East, the “MSCI-EAFE Index”), the MSCI<sup>®</sup> Emerging Markets Index<sup>SM</sup> (the “MSCI-EM Index”) and the MSCI<sup>®</sup> Europe Index (the “MSCI Europe Index” and, together with the MSCI-EAFE Index and the MSCI-EM Index, the “MSCI Indexes”).

We have derived all information regarding the MSCI Indexes contained in this index supplement, including, without limitation, the make-up, method of calculation and changes in the components of each such MSCI Index, from publicly available information. Such information reflects the policies of, and is subject to change by MSCI. MSCI has no obligation to continue to publish any such index, and may discontinue publication of the any MSCI Index. Historical performance of the MSCI Indexes is not an indication of future performance. Future performance of the MSCI Indexes may differ significantly from historical performance, either positively or negatively.

Each MSCI Index is constructed and maintained in the manner described below.

### MSCI-EAFE<sup>®</sup> Index

The MSCI-EAFE Index is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe, Asia, Australia and the Far East, excluding the United States and Canada. The MSCI-EAFE Index includes components from all countries in Europe, Australia and the Far East that are designated by MSCI as Developed Markets (“DMs”). The MSCI-EAFE Index was developed with a base value of 100 as of December 31, 1969.

### MSCI<sup>®</sup> Emerging Markets Index<sup>SM</sup>

The MSCI-EM Index is a free float-adjusted market capitalization index designed to measure equity market performance of the global emerging market countries of Europe, the Middle East & Africa. The MSCI-EM Index captures large- and mid-capitalization representation across 23 emerging market countries that include Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. The MSCI-EM Index has a base date of December 31, 1987.

### MSCI<sup>®</sup> Europe Index

The MSCI Europe Index is a free-float adjusted market capitalization index designed to measure equity market performance of the DMs in Europe and is one of the MSCI Global Investable Market Indices. The MSCI Europe Index captures large and mid-capitalization representation across 15 DM countries in Europe, including Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. The MSCI Europe Index has a base date of March 31, 1986.

## Constructing the MSCI Global Investable Market Indexes

MSCI undertakes an index construction process which involves:

- Ø Defining the eligible equity securities (“Equity Universe”) for each market.
- Ø Determining the eligible companies and securities in the Equity Universe for each market (“Market Investable Equity Universe”), where a market is equivalent to a single country, except that all DM countries in Europe are aggregated into a single market for index construction purposes.
- Ø Determining market capitalization size-segments for each market.

Ø  
Ø      Applying index continuity rules for the Standard Index.  
Classifying securities under the Global Industry Classification Standard (“GICS”).

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### **Defining the Equity Universe**

The Equity Universe is defined by identifying eligible equity securities and classifying these eligible equity securities into the appropriate country.

#### *Identifying Eligible Equity Securities*

All listed equity securities, including Real Estate Investment Trusts (“REITs”) and certain income trusts listed in Canada are eligible for inclusion in the Equity Universe. Limited partnerships, limited liability companies and business trusts, which are listed in the United States and are not structured to be taxed as limited partnerships, are likewise eligible for inclusion in the Equity Universe. Conversely, mutual funds, exchange-traded funds, equity derivatives and most investment trusts are not eligible for inclusion in the Equity Universe. Preferred shares that exhibit characteristics of equity securities are also eligible for inclusion in the Equity Universe. As the definition of the preferred shares may vary from country to country or even from one company to another, MSCI analyzes this type of security on a case-by-case basis. The key criterion for a preferred share to be eligible is that it should not have features that make it resemble—and behave like—a fixed income security, such as the entitlement to a fixed dividend and/or, in case of liquidation, an entitlement to a company’s net assets which is limited to the par value of the preferred share. On the other hand, preferred shares whose only difference compared to common shares is a limited voting power are eligible for inclusion in the Equity Universe.

#### *Country Classification of Eligible Securities*

Each company and its securities (i.e., share classes) is classified in one and only one country, which allows for a distinctive sorting of each company by its respective country.

### **Determining the Market Investable Equity Universes**

A Market Investable Equity Universe for a market is derived by (i) identifying eligible listings for each security in the Equity Universe and (ii) applying investability screens to individual companies and securities in the Equity Universe that are classified in that market. A market is equivalent to a single country, except that all DM countries in Europe are aggregated into a single market for index construction purposes.

#### *Identifying Eligible Listings*

A security may have a listing in the country where it is classified (“Local Listing”) and/or a listing in a different country (“Foreign Listing”). A security may be represented in the aggregation of all Market Investable Equity Universes (the “Global Investable Equity Universe”) by either a Local Listing or a Foreign Listing (including a depositary receipt). A security may be represented by a Foreign Listing only if the security is classified in a country that meets the Foreign Listing Materiality Requirement (as described below), and the security’s Foreign Listing is traded on an eligible stock exchange of a DM country if the security is classified in a DM country or, if the security is classified in an emerging market (“EM”) country, an eligible stock exchange of a DM country or an EM country.

In order for a country to meet the Foreign Listing Materiality Requirement, the following is determined: all securities represented by a Foreign Listing that would be included in the country’s MSCI Country Investable Market Index if Foreign Listings were eligible from that country. The aggregate free-float adjusted market capitalization for all such securities should represent at least (i) 5% of the free float-adjusted market capitalization of the relevant MSCI Country Investable Market Index and (ii) 0.05% of the free-float adjusted market capitalization of the MSCI ACWI Investable Market Index. If a country does not meet the Foreign Listing materiality requirement, then securities in that country may not be represented by a Foreign Listing in the Global Investable Equity Universe.

*Applying Investability Screens*

Some of the investability requirements are applied at the individual security level and some at the overall company level, represented by the aggregation of individual securities of the company. As such, the inclusion or exclusion of one security does not imply the automatic inclusion or exclusion of other securities of the same company.

The investability screens used to determine the Market Investable Equity Universe in each market are:

- Ø Equity Universe Minimum Size Requirement;
- Ø Equity Universe Minimum Float-Adjusted Market Capitalization Requirement;

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Ø	DM and EM Minimum Liquidity Requirement;
Ø	Global Minimum Foreign Inclusion Factor Requirement;
Ø	Minimum Length of Trading Requirement; and
Ø	Minimum Foreign Room Requirement.

*Equity Universe Minimum Size Requirement*

This investability screen is applied at the company level. In order to be included in a market investable equity universe, a company must have the required minimum full market capitalization. The equity universe minimum size requirement applies to companies in all markets, developed and emerging, and is derived as follows:

First, the companies in the DM equity universe are sorted in descending order of full market capitalization and the cumulative coverage of the free float-adjusted market capitalization of the DM equity universe is calculated for each company. Each company's free float-adjusted market capitalization is represented by the aggregation of the free float-adjusted market capitalization of the securities of that company in the equity universe.

Second, when the cumulative free float-adjusted market capitalization coverage of 99% of the sorted equity universe is achieved, by adding each company's free float-adjusted market capitalization in descending order, the full market capitalization of the company that reaches the 99% threshold defines the equity universe minimum size requirement. The rank of this company by descending order of full market capitalization within the DM equity universe is noted, and will be used in determining the equity universe minimum size requirement at the next rebalance.

*Equity Universe Minimum Float-Adjusted Market Capitalization Requirement*

This investability screen is applied at the individual security level. To be eligible for inclusion in a Market Investable Equity Universe, a security must have a free float-adjusted market capitalization equal to or higher than 50% of the Equity Universe Minimum Size Requirement.

*DM and EM Minimum Liquidity Requirement*

This investability screen is applied at the individual security level. To be eligible for inclusion in a Market Investable Equity Universe, a security must have at least one eligible listing of adequate liquidity as measured by: the 12-month and 3-month Annual Traded Value Ratio ("ATVR"), and the 3-month Frequency of Trading (defined below).

The ATVR of each security is calculated in a 3-step process. First, monthly median traded values are computed using the median daily traded value, multiplied by the number of days in the month that the security traded. The daily traded value of a security is equal to the number of shares traded during the day, multiplied by the closing price of that security. The median daily traded value is the median of the daily traded values in a given month. Second, the monthly median traded value of a security is divided by its free float-adjusted security market capitalization at the end of the month for each month, giving the monthly median traded value ratio. Finally, the 12-month ATVR is obtained by taking the average of the monthly median traded value ratios of the previous 12 months – or the number of months for which this data is available (previous 6 months, 3 months or 1 month) – and annualizing it by multiplying it by 12. The 3-month ATVR is obtained by taking the average of the monthly median traded value ratios of the previous 3 months—or 1 month if 3 months of data are not available—and annualizing it by multiplying it by 12.

The 3-month Frequency of Trading equals (i) the number of days a security traded during a 3-month period divided by (ii) the maximum possible number of trading days within such period. If 3 months of data are not available, 1 month of data is used for calculating the 3-month Frequency of Trading.

A minimum liquidity level of 20% of 3-month ATVR and 90% of 3-month Frequency of Trading over the last 4 consecutive quarters, as well as 20% of 12-month ATVR are required for the inclusion of a security in a Market Investable Equity Universe of a DM. A minimum liquidity level of 15% of 3-month ATVR and 80% of 3-month Frequency of Trading over the last 4 consecutive quarters, as well as 15% of 12-month ATVR are required for the

inclusion of a security in a Market Investable Equity Universe of an EM. In addition to the ATVR and Frequency of Trading requirements, securities in the MSCI China Equity Universe will not be eligible for inclusion in the Market

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Investable Equity Universe if the securities (i) are suspended on any one of the last 10 business days of April for the May semi-annual index review, any one of the last 10 business days of October for the November semi-annual index review, any one of the last 10 business days of January for the February quarterly index review, or any one of the last 10 business days of July for the August quarterly index review (each such date a “Price Cutoff Date” for the relevant index review), or (ii) have been suspended for 50 consecutive days or more in the past 12 months.

Only one listing per security may be included in the Market Investable Equity Universe. In instances when a security has two or more eligible listings that meet the above liquidity requirements, then the following priority rules are used to determine which listing will be used for potential inclusion of the security in the Market Investable Equity Universe: (a) the Local Listing (if there are two or more Local Listings, the listing with the highest 3-month ATVR would be used), (b) the Foreign Listing in the same geographical region and (c) the Foreign Listing in a different geographical region. In instances when a security does not meet the above criteria, the security will be represented by a relevant liquid eligible depositary receipt if it is trading in the same geographical region. Depositary receipts are deemed liquid if they meet all the above mentioned criteria for 12-month ATVR, 3-month ATVR and 3-month Frequency of Trading. Because there may be liquidity issues for securities trading at a very high stock price, a limit of USD 10,000 has been set and securities with stock prices above USD 10,000 fail the liquidity screening. This rule applies only for non-constituents of the MSCI Global Investable Market Indexes. Consequently, current constituents of the MSCI Global Investable Market Indexes would remain in the index if the stock price passes the USD 10,000 threshold.

### *Global Minimum Foreign Inclusion Factor Requirement*

This investability screen is applied at the individual security level. To be eligible for inclusion in a Market Investable Equity Universe, a security’s Foreign Inclusion Factor (“FIF”) must reach a certain threshold. The FIF of a security is defined as the proportion of shares outstanding that is available for purchase in the public equity markets by international investors. This proportion accounts for the available free float of and/or the foreign ownership limits applicable to a specific security (or company). In general, a security must have an FIF equal to or larger than 0.15 to be eligible for inclusion in a Market Investable Equity Universe. Exceptions to this general rule are made only in the limited cases where the exclusion of securities of a very large company would compromise the Standard Index’s ability to fully and fairly represent the characteristics of the underlying market.

### *Minimum Length of Trading Requirement*

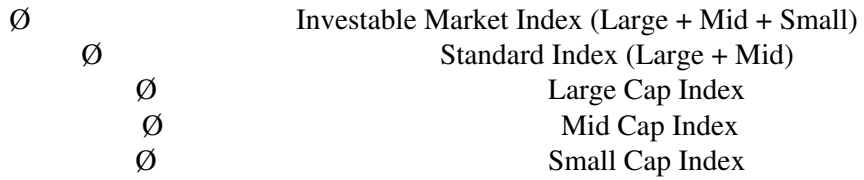
This investability screen is applied at the individual security level. For an initial public offering (“IPO”) to be eligible for inclusion in a Market Investable Equity Universe, the new issue must have started trading at least three months before the implementation of a semi-annual index review. This requirement is applicable to small new issues in all markets. Large IPOs and large primary/secondary offerings of non-index-constituents are not subject to the Minimum Length of Trading Requirement and may be included in a Market Investable Equity Universe and the Standard Index outside of a quarterly or semi-annual index review.

### *Minimum Foreign Room Requirement*

This investability screen is applied at the individual security level. For a security that is subject to a foreign ownership limit to be eligible for inclusion in a Market Investable Equity Universe, the proportion of shares still available to foreign investors relative to the maximum allowed (referred to as “foreign room”) must be at least 15%.

### *Defining Market Capitalization Size Segments for Each Market*

Once a Market Investable Equity Universe is defined, it is segmented into the following size-based indexes (“Market Size Segments”):



The Investable Market Index, the Standard Index and the Large Cap Index are created first, while the Mid Cap Index is derived as the difference between the Standard Index and the Large Cap Index and the Small Cap Index is derived



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as the difference between the Investable Market Index and the Standard Index. In addition, in 2010 MSCI introduced a Micro Cap Index size segment for DMs.

In order to create size segments that can be meaningfully aggregated into composites, the individual Market Size Segments are balanced according to the following two objectives:

*Achieving Global Size Integrity* by ensuring that, within a given size segment of a composite index, only companies of comparable and relevant sizes are included across all markets. This can be measured by looking at a size segment cutoff relative to a free float-adjusted market capitalization coverage target based on the Global Investable Equity Universe.

*Achieving Consistent Market Coverage* by ensuring that each market’s size segment is represented in its proportional weight in the composite universe. This can be measured by looking at a size segment cutoff relative to a consistent and comparable target size segment coverage within each market.

It is not possible to achieve both of these objectives consistently and simultaneously across all markets. Therefore, to balance these objectives, the methodology sets a minimum size cutoff for each size segment in each market using:

- Ø A size range for all markets derived from a free float-adjusted target market capitalization of the Global Investable Equity Universe, together with
  - Ø A target free float-adjusted coverage range set within each individual Market Investable Equity Universe.
- The intersection of these ranges specifies a size and coverage target area. This is done for each of the three size segment indexes, namely the Investable Market Index, the Standard Index, and the Large Cap Index.

Creating the Market Size Segments in each market involves the following steps:

- Ø Defining the market coverage target range for each size segment.
- Ø Determining the global minimum size range for each size segment.
- Ø Determining the Market Size Segment cutoffs and associated segment number of companies.
- Ø Assigning companies to the size segments.
- Ø Applying final size segment investability requirements.

**Index Continuity Rules**

In order to achieve index continuity, as well as provide some basic level of diversification within a market index, notwithstanding the effect of other index construction rules applied by MSCI, a minimum number of five constituents will be maintained for a DM Standard Index and a minimum number of three constituents will be maintained for an EM Standard Index. The application of this requirement involves the following steps.

If after the application of the index construction methodology, a Standard Index contains fewer than five securities in a DM or three securities in an EM, then the largest securities by free float-adjusted market capitalization are added to the Standard Index in order to reach five constituents in that DM or three in that EM.

At subsequent index reviews, if after the application of the index maintenance methodology, a Standard Index contains less than five securities in a DM or three securities in an EM, then the remaining securities are selected for inclusion in the Standard Index using the following process: (a) the securities included in the updated Market Investable Equity Universe are identified, (b) such securities are then ranked by descending free float-adjusted market capitalization, but the free float-adjusted market capitalization of the securities included in the Standard Index prior to the index review is multiplied by a factor of 1.50 and (c) the securities are added to the Standard Index to reach five constituents for a DM or three for an EM in the ranking order determined in the step above.

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**Creating Style Indexes Within Each Size Segment**

All securities in the investable Equity Universe are classified into “Value” or “Growth” segments using the MSCI Global Value and Growth methodology.

**Classifying Securities Under the Global Industry Classification Standard**

All securities in the Global Investable Equity Universe are assigned to the industry that best describes their business activities. To this end, MSCI has designed, in conjunction with Standard & Poor's Financial Services LLC, S&P Global Inc., the GICS.

The GICS entails four levels of classification: (1) sector; (2) industry group; (3) industries; and (4) sub-industries. Under the GICS, each company is assigned to one sub-industry according to its principal business activity. Therefore, a company can belong to only one industry grouping at each of the four levels of the GICS.

The GICS guidelines used to determine the appropriate industry classification are as follows:

- Ø A security is classified in a sub-industry according to the business activities that generate approximately 60% or more of the company’s revenues.
- Ø A company engaged in two or more substantially different business activities, none of which contributes 60% or more of revenues, is classified in the sub-industry that provides the majority of both the company’s revenues and earnings.
- Ø Where the above guidelines cannot be applied, or are considered inappropriate, further analysis is conducted, and other factors are analyzed to determine an appropriate classification.

**Maintaining the MSCI Global Investable Market Indexes**

The MSCI Global Investable Market Indexes are maintained with the objective of reflecting the evolution of the underlying equity markets and segments on a timely basis, while seeking to achieve:

- Ø Index continuity,
- Ø Continuous investability of constituents and replicability of the indexes, and
- Ø Index stability and low index turnover.

In particular, index maintenance involves:

- Ø Semi-annual index reviews in May and November of the Market Size Segments and Global Value and Growth Indexes which include:
  - o Updating the indexes on the basis of a fully refreshed Equity Universe.
  - o Taking buffer rules into consideration for migration of securities across size and style segments.
  - o Updating FIFs and Number of Shares (“NOS”).
- Ø Quarterly index reviews in February and August of the Market Size Segments aimed at:
  - o Including significant new eligible securities (such as IPOs which were not eligible for earlier inclusion) in the index.
  - o Allowing for significant moves of companies within the Market Size Segments, using wider buffers than in the semi-annual index reviews.
    - o Reflecting the impact of significant market events on FIFs and updating NOS.
- Ø Ongoing event-related changes. Changes of this type are generally implemented in the indexes as they occur.
- Ø Significantly large IPOs are included in the indexes after the close of the company’s tenth day of trading.

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### *Semi-Annual Index Reviews in May and November*

The objective of the semi-annual index reviews is to systematically reassess the various dimensions of the Equity Universe for all markets on a fixed semi-annual timetable. A semi-annual index review involves a comprehensive review of the Market Size Segments and Global Value and Growth Indexes.

During each semi-annual index review, the Equity Universe is updated and the global minimum size range is recalculated for each size segment. Then, the following index maintenance activities are undertaken for each market:

- Ø Updating the Market Investable Equity Universe.
- Ø Recalculating the global minimum size references and global minimum size ranges.
- Ø Reassessing the segment number of companies and the Market Size Segment cutoffs.
- Ø Assigning companies to the size segments taking into account buffer zones.
- Ø Assessing conformity with final Market Size Segment investability requirements.

### **Quarterly Index Reviews in February and August**

Quarterly index reviews are designed to ensure that the indexes continue to be an accurate reflection of the evolving equity marketplace. This is achieved by a timely reflection of significant market driven changes that were not captured in the index at the time of their actual occurrence but are significant enough to be reflected before the next semi-annual index review. Quarterly index reviews may result in:

- Ø Additions or deletions due to migration to another Market Size Segment.
- Ø Addition of significant new investable companies to the Standard Index.
- Ø Deletion of companies from the Investable Market Indexes due to low liquidity.
- Ø Changes in FIFs and NOS.

The buffer zones used to manage the migration of companies from one segment to another are wider than those used in the semi-annual index reviews. The style classification is reviewed only for companies that are reassigned to a different size segment.

### **Ongoing Event-Related Changes**

Ongoing event-related changes to the indexes are the result of mergers, acquisitions, spin-offs, bankruptcies, reorganizations and other similar corporate events. They can also result from capital reorganizations in the form of rights issues, bonus issues, public placements and other similar corporate events that take place on a continuing basis. These changes generally are reflected in the indexes at the time of the event.

These corporate events can affect many aspects of an index and its constituents, including inclusion or deletion of companies outside of the index reviews, weight changes due to changes in foreign ownership limits, foreign inclusion factors, number of shares, etc., and changes in size, style and/or industry classification.

### **Announcement Policy**

The results of the semi-annual index review are announced at least two weeks in advance of their effective implementation dates as of the close of the last business day of May and November.

The results of the quarterly index review are announced at least two weeks in advance of their effective implementation dates as of the close of the last business day of February and August.

All changes resulting from corporate events are announced prior to their implementation in the MSCI Global Investable Market Indexes.

The changes are typically announced at least ten business days prior to the changes becoming effective in the indexes as an “expected” announcement, or as an “undetermined” announcement, when the effective dates are not known yet or when aspects of the event are uncertain. MSCI sends “confirmed” announcements at least two business

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days prior to events becoming effective in the indexes, provided that all necessary public information concerning the event is available.

In exceptional cases, events are announced during market hours for same or next day implementation. Announcements made by MSCI during market hours are usually linked to late company disclosure of corporate events or unexpected changes to previously announced corporate events. A descriptive text announcement is sent for all corporate events effective on the same day or on the next day. MSCI also sends text announcement for corporate events effective within the next 48 hours, except for US Equities' equity offerings and market neutral events such as split, reverse split or stock dividend.

In the case of secondary offerings representing more than 5% of a security's number of shares for existing constituents, these changes will be announced prior to the end of the subscription period when possible and a subsequent announcement confirming the details of the event (including the date of implementation) will be made as soon as the results are available.

Both primary equity offerings and secondary offerings for US securities, representing at least 5%, 10% or 25% for Standard, Small-Cap and Micro Cap Indexes, respectively, of the security's pre-event number of shares, will be confirmed through an announcement during market hours for next day or shortly after implementation, as the completion of the events cannot be confirmed prior to the notification of the pricing.

MSCI implements pending number of shares and/or free float updates simultaneously with the event. Note that if the number of shares update is smaller than +/-1% on a post-event number of shares basis, it will be implemented at a subsequent index review.

All additions and deletions of constituents of the MSCI Global Investable Market Indexes resulting from corporate events are publicly announced prior to their implementation. Early deletions of constituents due to bankruptcy or other significant cases are announced as soon as practicable prior to their implementation in the MSCI indexes.

Early inclusions of large IPOs in the Standard Index series are announced no earlier than the first day of trading and no later than before the opening of the third day of trading in the market where the company has its primary listing.

Early inclusions of already listed securities following large secondary offerings of new and/or existing shares are announced no earlier than shortly after the end of the offer period.

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