

**S&P U.S. Mortgage-Backed  
Securities Index**  
*Methodology*

November 2018

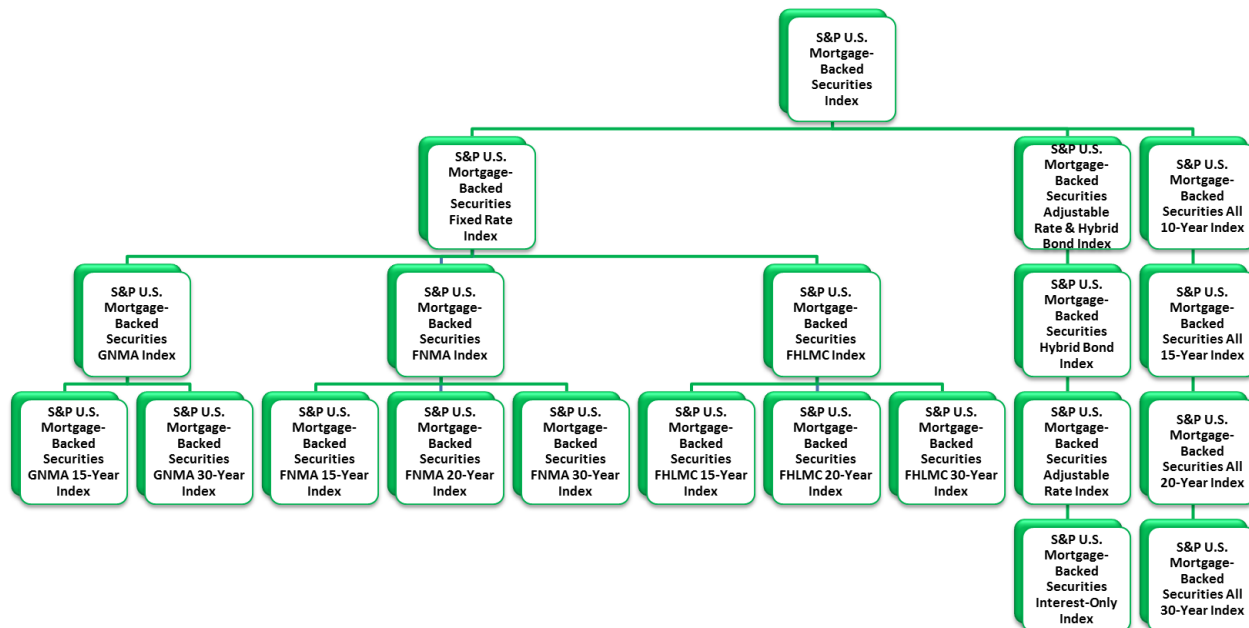
# Table of Contents

Introduction	2
<b>Index Objective</b>	<b>2</b>
<b>Supporting Documents</b>	<b>2</b>
Eligibility Criteria	3
<b>Eligibility Factors</b>	<b>3</b>
<b>Sub-Index Rules</b>	<b>3</b>
Index Construction	4
<b>Index Calculations</b>	<b>4</b>
Index Maintenance	5
<b>Rebalancing</b>	<b>5</b>
<b>Currency and Currency Hedged Indices</b>	<b>5</b>
<b>Base Dates and History Availability</b>	<b>6</b>
Index Governance	7
<b>Index Committee</b>	<b>7</b>
Index Policy	8
<b>Announcements</b>	<b>8</b>
<b>Holiday Schedule</b>	<b>8</b>
<b>Rebalancing</b>	<b>8</b>
<b>End of Day Calculation</b>	<b>8</b>
<b>Recalculation Policy</b>	<b>8</b>
<b>Contact Information</b>	<b>8</b>
Index Dissemination	9
<b>Tickers</b>	<b>9</b>
<b>FTP</b>	<b>9</b>
<b>Web site</b>	<b>9</b>
Appendix – Index Calculations	10
<b>Calculating Total Return</b>	<b>10</b>
<b>Constituent Level Daily Mortgage Return</b>	<b>12</b>
<b>Index Level Daily Mortgage Return</b>	<b>12</b>
Disclaimer	13

# Introduction

## Index Objective

The S&P U.S. Mortgage-Backed Securities Index measures the performance of residential mortgage pass-through securities publicly issued by U.S. agencies in the U.S. domestic market.



## Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology	<a href="#">Fixed Income Policies &amp; Practices</a>
S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology	<a href="#">Index Mathematics Methodology</a>

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

# Eligibility Criteria

## Eligibility Factors

**Eligible Issuers.** U.S. agencies.

**Currency.** Bonds must be issued in U.S. dollars.

**Country.** The country of incorporation of the issuer must be the U.S.

**Maturity.** Each bond must have a maturity greater than one month from the rebalancing date. No bonds mature in the index.

**Pricing.** Daily pricing is provided by Interactive Data Corporation (IDC).

**Bond Type.** Residential mortgage pass-through securities publicly issued by U.S. agencies are eligible.

**Market of Issue.** Bonds must be publicly issued in the U.S. market.

**Size.** A minimum par amount of US\$ 250 million at each rebalancing is required.

## Sub-Index Rules

The following table details the Issuer, Coupon and Size rules for each sub-index of the S&P U.S. Mortgage-Backed Securities Index. Each sub-index is market-value-weighted.

Sub-Index	Issuer	Coupon	Size
S&P U.S. Mortgage-Backed Securities Adjustable Rate & Hybrid Bond Index	GNMA, FNMA or FHLMC	Adjustable rate or hybrid mortgage pass-through securities	A minimum par amount of US\$ 250 million at each rebalancing is required
S&P U.S. Mortgage-Backed Securities Interest-Only Index		Interest-only mortgage pass-through securities	
S&P U.S. Mortgage-Backed Securities Adjustable Rate Index		Adjustable rate mortgage pass-through securities	
S&P U.S. Mortgage-Backed Securities Hybrid Bond Index		Hybrid mortgage pass-through securities	
S&P U.S. Mortgage-Backed Securities Fixed Rate Index		Fixed rate mortgage pass-through securities	
S&P U.S. Mortgage-Backed Securities All 10-Year Index <sup>1</sup>			
S&P U.S. Mortgage-Backed Securities All 15-Year Index <sup>2</sup>			
S&P U.S. Mortgage-Backed Securities All 20-Year Index <sup>3</sup>			
S&P U.S. Mortgage-Backed Securities All 30-Year Index <sup>4</sup>			
S&P U.S. Mortgage-Backed Securities GNMA Index	GNMA		
S&P U.S. Mortgage-Backed Securities GNMA 15-Year Index <sup>2</sup>			
S&P U.S. Mortgage-Backed Securities GNMA 30-Year Index <sup>4</sup>			
S&P U.S. Mortgage-Backed Securities FNMA Index	FNMA		
S&P U.S. Mortgage-Backed Securities FNMA 15-Year Index <sup>2</sup>			
S&P U.S. Mortgage-Backed Securities FNMA 20-Year Index <sup>3</sup>			
S&P U.S. Mortgage-Backed Securities FNMA 30-Year Index <sup>4</sup>			
S&P U.S. Mortgage-Backed Securities FHLMC Index	FHLMC		
S&P U.S. Mortgage-Backed Securities FHLMC 15-Year Index <sup>2</sup>			
S&P U.S. Mortgage-Backed Securities FHLMC 20-Year Index <sup>3</sup>			
S&P U.S. Mortgage-Backed Securities FHLMC 30-Year Index <sup>4</sup>			

<sup>1</sup> Includes 10-year securities only.

<sup>2</sup> Includes 15-year securities only.

<sup>3</sup> Includes 20-year securities only.

<sup>4</sup> Includes 30-year securities only.

# Index Construction

## **Index Calculations**

The indices are weighted by market value.

The total return is calculated by aggregating the interest return, reflecting the return due to paid and accrued interest, and price return, reflecting the gains or losses due to changes in the end-of-day price and principal repayments.

*For further details regarding Index Calculations, please refer to the Appendix.*

# Index Maintenance

## Rebalancing

Indices are reviewed and rebalanced in accordance with their stated schedule. The Index Committee, nevertheless, reserves the right to make adjustments to an index at any time that it believes appropriate.

Additions, deletions and other changes to the index arising from the rebalancing are made provided the security's reference information and pricing are available by designated pricing and data providers on the rebalancing reference date. Changes to the index are published on the announcement date and become effective on the rebalancing date. Information related to the rebalancing is obtained and disseminated after the close of business.

Rebalancing Schedule	
Rebalancing Frequency	Monthly
Rebalancing Date	Last day of the rebalancing period (T)
Announcement Date	T minus 3
Reference Date	T minus 4

*All days reflect after the close and count business days*

## Ongoing Maintenance

The indices are also reviewed on an ongoing basis to account for the following:

- When an index bond is in default or misses an interest payment, the price reported by the pricing source is used. However, the Index Committee may determine that the bond be removed from the index at a different price and may specify a price of 0.00. The decision of the Index Committee is final.
- If an index bond is no longer priced by the pricing source, the last available price is used.

However, the Index Committee may determine that a different price be used. The decision of the Index Committee is final. For clarity, index bonds that are no longer priced by the pricing source fail to meet the pricing eligibility factors and are removed at the next rebalancing date. If the bond is priced for at least one of the five business days prior to the rebalancing announcement date, the bond remains in the index. Otherwise, it is removed from the index at the subsequent rebalancing date.

## Currency and Currency Hedged Indices

Additional currency and currency hedged versions of the indices, as well as maturity, sector and rating-based sub-indices are available. For a list of available sub-indices and tickers, please refer to S&P Dow Jones Indices' Fixed Income Index Directory available at [www.spdji.com](http://www.spdji.com).

*For more information on currency and currency hedged indices, please refer to S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology.*

## Base Dates and History Availability

Index history availability, base dates and base values are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P U.S. Mortgage-Backed Securities Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities Fixed Rate Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities All 10-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities All 15-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities All 20-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities All 30-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities GNMA Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities GNMA 15-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities GNMA 30-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FNMA Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FNMA 15-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FNMA 20-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FNMA 30-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FHLMC Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FHLMC 15-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FHLMC 20-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities FHLMC 30-Year Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities Adjustable Rate & Hybrid Bond Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities Hybrid Bond Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities Adjustable Rate Index	07/15/2014	12/31/2008	12/31/2008	100
S&P U.S. Mortgage-Backed Securities Interest-Only Index	07/15/2014	12/31/2008	12/31/2008	100

# Index Governance

## Index Committee

S&P Dow Jones Indices' Fixed Income Index Committee maintains the indices. All committee members are full-time professionals at S&P Dow Jones Indices. Meetings are held quarterly, but interim meetings may be held whenever deemed appropriate.

The Index Committee oversees the day-to-day management of the indices, including the monthly rebalancing, determinations of intra-rebalancing changes to the indices, and maintenance and inclusion policies, including additions or deletions of bonds and other matters affecting the maintenance and calculation of the indices.

In fulfilling its responsibilities, the Index Committee has full and complete discretion to (i) amend, apply, or exempt the application of index rules and policies as circumstances may require and (ii) add, remove, or by-pass any bond in determining the composition of an index.

The Index Committee may rely on any information or documentation submitted to it or gathered by it that the Index Committee believes to be accurate. The Index Committee reserves the right to reinterpret publicly available information and to make changes to the indices based on a new interpretation of that information at its sole discretion. All Index Committee discussions are confidential.

The Index Committee is separate from and independent of other analytical groups at S&P Global. In particular, the Index Committee has no access to or influence on decisions by S&P Global Ratings analysts.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

*For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.*



# Index Policy

## **Announcements**

Announcements of any relevant information pertaining to the indices are made after market close. Press releases are posted on the S&P Dow Jones Indices Web site at [www.spdji.com](http://www.spdji.com).

## **Holiday Schedule**

The indices are calculated when the Securities Industry and Financial Markets Association (SIFMA®) declares the U.S. fixed income markets to be open.

*A complete holiday schedule for the year is available at [www.spdji.com](http://www.spdji.com).*

## **Rebalancing**

The index committee may change the date of a given rebalancing for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with proper advance notice where possible.

## **End of Day Calculation**

Index levels are calculated at the end of each business day, via S&P Dow Jones Indices' Web site. This may be subject to change.

## **Recalculation Policy**

For information on the recalculation policy please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.

*For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.*

## **Contact Information**

For questions regarding an index, please contact: [index\\_services@spglobal.com](mailto:index_services@spglobal.com).

# Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com), major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

## Tickers

The table below lists headline indices covered by this document. All currency, currency hedged, maturity, sector and rating-based sub-indices as well as return type versions of the below indices that may exist are also covered by this document. Please contact [index\\_services@spglobal.com](mailto:index_services@spglobal.com) for a complete list of indices covered by this document.

Index (Total Return)	Ticker
S&P U.S. Mortgage-Backed Securities Index	SPMBST
S&P U.S. Mortgage-Backed Securities Fixed Rate Index	SPMBFRT
S&P U.S. Mortgage-Backed Securities All 10-Year Index	SPMBAL1T
S&P U.S. Mortgage-Backed Securities All 15-Year Index	SPMBAL5T
S&P U.S. Mortgage-Backed Securities All 20-Year Index	SPMBAL2T
S&P U.S. Mortgage-Backed Securities All 30-Year Index	SPMBAL3T
S&P U.S. Mortgage-Backed Securities GNMA Index	SPMBGNT
S&P U.S. Mortgage-Backed Securities GNMA 15-Year Index	SPMBGN5T
S&P U.S. Mortgage-Backed Securities GNMA 30-Year Index	SPMBGN3T
S&P U.S. Mortgage-Backed Securities FNMA Index	SPMBFNT
S&P U.S. Mortgage-Backed Securities FNMA 15-Year Index	SPMBFN5T
S&P U.S. Mortgage-Backed Securities FNMA 20-Year Index	SPMBFN2T
S&P U.S. Mortgage-Backed Securities FNMA 30-Year Index	SPMBFN3T
S&P U.S. Mortgage-Backed Securities FHLMC Index	SPMBFLMT
S&P U.S. Mortgage-Backed Securities FHLMC 15-Year Index	SPMBFM5T
S&P U.S. Mortgage-Backed Securities FHLMC 20-Year Index	SPMBFM2T
S&P U.S. Mortgage-Backed Securities FHLMC 30-Year Index	SPMBFM3T
S&P U.S. Mortgage-Backed Securities Adjustable Rate & Hybrid Bond Index	SPMBHBDT
S&P U.S. Mortgage-Backed Securities Hybrid Bond Index	SPMBHBT
S&P U.S. Mortgage-Backed Securities Adjustable Rate Index	SPFIARMT
S&P U.S. Mortgage-Backed Securities Interest-Only Index	SPMBIOT

## FTP

Daily index level data is available via FTP subscription.

For product information, please contact S&P Dow Jones Indices, [www.spdji.com/contact-us](http://www.spdji.com/contact-us).

## Web site

For further information, please refer to S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com).

## Appendix – Index Calculations

The percentage change in market value (i.e. total return) for a bond can be broken out into price, income and paydown components.

### Calculating Total Return

Total return (assuming no reinvestment of cash flows) for a bond in a given timeframe is defined to be the change in its market value divided by its beginning market value, as shown below.

$$\text{Total Return} = \frac{\text{Change in Market Value}}{\text{Beginning Market Value}} = \frac{MV_1 - MV_0}{MV_0}$$

where:

$MV_0$  = Beginning market value from a single bond.

$MV_1$  = Ending market value from a single bond, including any cash flows during that time frame.

The beginning market value of the bond is the product of its beginning price (including accrued interest) and its par balance (i.e. number of units owned). Mathematically, the beginning market value is represented by:

$$MV_0 = (P_0 + A_0) * B_0$$

where:

$P_0$  = Beginning flat price (as a percent of par) of the bond.

$A_0$  = Beginning accrued interest (as a percent of par).

$B_0$  = Beginning par amount of the bond.

Similarly, to define the ending market value, we first determine the market value of the remaining principal (i.e. the ending principal amount or  $B_1$ ).

$$\text{Market Value of Remaining Principal} = (P_1 + A_1) * B_1$$

where:

$P_1$  = Ending flat price (as a percent of par) of the bond.

$A_1$  = Ending accrued interest (as a percent of par).

$B_1$  = Ending par amount of the bond.

Next, add any paid cash flows (either interest or principal) during the timeframe. If the bond paid an interest cash flow during the given timeframe (so that  $\Phi = 1$ ), the payment is the product of  $\Phi$ , the beginning par balance of the bond, and the coupon rate (in decimal form) divided by the payment frequency as shown below:

$$\text{Interest Cash Flow} = \Phi * \left( \frac{C}{F} \right) * B_0$$

where:

$\Phi$  = Number of coupon payments made by the bond in the given timeframe.

$C$  = Coupon rate of the bond.

$F$  = Payment frequency of the bond.

$B_0$  = Beginning par amount of the bond.

If the bond also pays principal during the timeframe (either scheduled or due to prepayment), it is assumed that the payment will be made at face value (i.e. at par). This means that the principal paydown,  $D_1$ , is simply the difference between the beginning par balance and the par balance as observed from actual payments made by the bond.

$$\text{Principal Paydown} = D_1 = B_0 - B_1$$

where:

$B_0$  = Beginning par amount of the bond.

$B_1$  = Ending par amount of the bond.

Combining these components, the ending market value of the bond is given by:

$$\begin{aligned} \text{Ending Market Value} &= \text{Market Value of Remaining Principal} \\ &+ \text{Interest Cash Flow} \\ &+ \text{Principal Paydown} \end{aligned}$$

Using the beginning and ending market values, total return is given by:

$$\begin{aligned} \frac{MV_1 - MV_0}{MV_0} &= \frac{[(P_1 + A_1) * B_1 + \Phi * (\frac{C}{F}) * B_0 + (B_0 - B_1)] - (P_0 + A_0)B_0}{(P_0 + A_0)B_0} \\ &= \frac{[(P_1 + A_1) * (B_0 + (B_1 - B_0)) + \Phi * (\frac{C}{F}) * B_0 + (B_0 - B_1)] - (P_0 + A_0)B_0}{(P_0 + A_0)B_0} \\ &= \frac{(P_1 - P_0)}{P_0 + A_0} + \frac{(A_1 - A_0) + \Phi * (\frac{C}{F})}{P_0 + A_0} + \frac{(100 - (P_1 + A_1))(B_0 - B_1)}{(P_0 + A_0)B_0} \\ &= \underbrace{\frac{(P_1 - P_0)}{P_0 + A_0}}_{\text{Price}} + \underbrace{\frac{(A_1 - A_0) + \Phi * (\frac{C}{F})}{P_0 + A_0}}_{\text{Coupon Income}} + \underbrace{\frac{[100 - (P_1 + A_1)] \left( \frac{B_0 - B_1}{B_0} \right)}{(P_0 + A_0)}}_{\text{No Loss Paydown}} \end{aligned}$$

To summarize, the sources of return (excluding currency) are as follows.

$$\text{Price} = \frac{(P_1 - P_0)}{P_0 + A_0}$$

$$\text{Income} = \frac{(A_1 - A_0) + \Phi * (\frac{C}{F})}{P_0 + A_0}$$

$$\text{Paydown} = \frac{(100 - (P_1 + A_1)) \left( \frac{B_0 - B}{B_0} \right)}{(P_0 + A_0)}$$

### Constituent Level Daily Mortgage Return

#### Daily Income Return

$$IR_t = \frac{\text{Accrued Interest}_t - \text{Accrued Interest}_{t-1} + \text{Interest}_{t-1,t}}{\text{Dirty Price}_{t-1}}$$

#### Daily Price Return

$$PR_t = \frac{\text{Clean Price}_t - \text{Clean Price}_{t-1}}{\text{Dirty Price}_{t-1}}$$

#### Daily Paydown Return

$$PD_t = \frac{(\text{Redemption Price} - \text{Dirty Price}_t) * \left( 1 - \frac{\text{mortgage factor}_t}{\text{mortgage factor}_{t-1}} \right)}{\text{Dirty Price}_{t-1}}$$

#### Daily Return

$$\text{Total Return } (TR_t) = IR_t + PR_t + PD_t$$

where:

$t$  = Current time.

$t-1$  = Previous time.

Note: accrued interest and interest are in percent of par price.

#### Cash

Cash is in percent units and includes any interest paid and any principle reductions (uses change in mortgage factor) occurring within the month.

$$\text{Cash} = \text{Interest}_{RB,t} \% + \left( 1 - \frac{\text{mortgage factor}_t}{\text{mortgage factor}_{RB,t}} \right) \%$$

where:

$RB$  = Time at rebalance.

Note: interest is usually paid on the first of the month while mortgage factor updates/changes occur at the end of the month.

### Index Level Daily Mortgage Return

$$\text{Index Total Return} = \sum w_i * TR_i$$

where:

$w_i$  = Market value weight of security  $i$  at  $t-1$  ( $MV_i / MV_{total}$ ).

$TR_i$  = Total return of security  $i$  at  $t$ .

# Disclaimer

Copyright © 2018 S&P Dow Jones Indices LLC. All rights reserved. STANDARD & POOR'S, S&P, S&P 500, S&P 500 LOW VOLATILITY INDEX, S&P 100, S&P COMPOSITE 1500, S&P MIDCAP 400, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, S&P TARGET DATE INDICES, GICS, SPIVA, SPDR and INDEXOLOGY are registered trademarks of Standard & Poor's Financial Services LLC ("S&P"). DOW JONES, DJ, DJIA and DOW JONES INDUSTRIAL AVERAGE are registered trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other investment product or vehicle. S&P Dow Jones Indices LLC is not a tax advisor. A tax advisor should be consulted to evaluate the impact of any tax-exempt securities on portfolios and the tax consequences of making any particular investment decision. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be

liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

Credit-related information and other analyses, including ratings, research and valuations are generally provided by licensors and/or affiliates of S&P Dow Jones Indices, including but not limited to S&P Global's other divisions such as S&P Global Market Intelligence. Any credit-related information and other related analyses and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. Any opinion, analyses and rating acknowledgement decisions are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P Dow Jones Indices does not assume any obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P Dow Jones Indices LLC does not act as a fiduciary or an investment advisor. While S&P Dow Jones Indices has obtained information from sources they believe to be reliable, S&P Dow Jones Indices does not perform an audit or undertake any duty of due diligence or independent verification of any information it receives.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P Global Ratings reserves the right to assign, withdraw or suspend such acknowledgement at any time and in its sole discretion. S&P Dow Jones Indices, including S&P Global Ratings, disclaim any duty whatsoever arising out of the assignment, withdrawal or suspension of an acknowledgement as well as any liability for any damage alleged to have been suffered on account thereof. Affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, may receive compensation for its ratings and certain credit-related analyses, normally from issuers or underwriters of securities or from obligors. Such affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, reserve the right to disseminate its opinions and analyses. Public ratings and analyses from S&P Global Ratings are made available on its Web sites, [www.standardandpoors.com](http://www.standardandpoors.com) (free of charge), and [www.ratingsdirect.com](http://www.ratingsdirect.com) and [www.globalcreditportal.com](http://www.globalcreditportal.com) (subscription), and may be distributed through other means, including via S&P Global Ratings publications and third-party redistributors. Additional information about our ratings fees is available at [www.standardandpoors.com/usratingsfees](http://www.standardandpoors.com/usratingsfees).

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.