

## Hartford Multifactor Index Methodologies

Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index	LRODMX
Hartford Risk-Optimized Multifactor US Equity Index	LROUSLX
Hartford Risk-Optimized Multifactor Emerging Markets Index	LROAMX
Hartford Risk-Optimized Multifactor Global Small Cap Index	LROGSX
Hartford Risk-Optimized Multifactor REIT Index	LROREX

This document details the rules-based methodologies that govern Hartford Risk-Optimized Multifactor Indices currently in effect. Version 2.4 dated March 1, 2018

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# Overview of Hartford Multifactor Indices

Hartford Risk-Optimized Multifactor Indices are designed to capture the performance potential of targeted asset classes by deliberately allocating toward risks and opportunities more likely to enhance return potential. The indices are constructed via an integrated process that seeks to improve diversification across countries, currencies, sectors, and/or companies while seeking to capture the potential performance benefits of certain common factors, such as value, momentum, and quality.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to de-concentrate country, sector, and/or size risks relative to capitalization-weighted universes while selecting companies exhibiting favorable risk premia factors.

While the index methodologies follow substantially similar approaches, each was designed to address the risks and opportunities inherent to each asset class or equity region. Thus, there are important distinctions. This document describes the methodologies for the following indices:

- **Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index (LRODMX)**  
**Hartford Risk-Optimized Multifactor US Equity Index (LROUSLX)**
- **Hartford Risk-Optimized Multifactor Emerging Markets Index (LROAMX)**  
**Hartford Risk-Optimized Multifactor Global Small Cap Index (LROGSX)**
- **Hartford Risk-Optimized Multifactor REIT Index (LROREX)**

The Indices are calculated and distributed by Solactive AG. The Indices' Provider (Lattice Strategies LLC ("Lattice Strategies" or "Lattice"), a wholly owned subsidiary of Hartford Funds Management Company, LLC ("HFMC")) is responsible for the methodology and selection of each index component. The Indices are calculated as price and total return indices.

## Eligible Securities – All Hartford Multifactor Indices

To exercise maximum control over final index content, the eligible securities for each of the indices are derived from universes composed of companies within the following general parameters:

Hartford Risk-Optimized Multifactor Index	Eligible Universe
Developed Markets (ex-US) Index	Includes companies that represent economic coverage up to 85% of the market capitalization of 22 countries within developed Europe, Australasia, North America (ex-US) and Japan
US Equity Index	Includes the 1,000 largest companies domiciled in the US by market capitalization
Emerging Markets Index	Includes countries with economic development levels considered by most institutions to be “emerging”. Country eligibility is based on the level of economic development, growth, fiscal considerations, market breadth, foreign investment restrictions, and other criteria. Includes companies that represent economic coverage up to 70% of each country’s market capitalization
Global Small Cap Index	Includes smaller companies with market capitalizations ranging from \$500m to \$5B across 28 countries within US, developed and emerging markets
REIT Index	Includes US-listed Real Estate Investment Trust (REIT) securities with greater than \$100m market capitalization

*See Appendix for itemized list of country eligibility for each index*

## Overview of Index Construction Methodology

Hartford Multifactor Indices deploy an integrated process that seeks to deliberately allocate risk and maximize exposure to multiple factors.

- **Risk-First Portfolio Construction** – Establishes risk parameters of each index by setting country- and sector-level diversification objectives. This initial step expands the opportunity set and tends to drive capital allocation deeper into the eligible universe. When applicable, certain indices may include volatility targets as part of the index design.
- **Multifactor Security Selection** – Selects companies with a favorable combination of factors such as value, momentum, and quality. The methodologies seek companies exhibiting multiple favorable factors – a design feature intended to enhance return potential and reduce risk.

# Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index (LRODMX)

## Index Overview

Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index (LRODMX or the "Index") seeks to address risks and opportunities within developed market stocks located outside the United States by selecting equity securities exhibiting a favorable combination of factors, including value, momentum, and quality.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to de-concentrate individual country and currency risks and reduce volatility while selecting companies exhibiting favorable risk premia factors. The methodology seeks to further address active risks versus the capitalization-weighted universe by managing size, country, and liquidity risks.

## Composition of the Index

### A. Selection of Index Components

The initial composition of the Index, as well as any on-going adjustment, is based on the following rules:

#### 1. Country Eligibility

The eligible universe of developed markets countries excludes the United States and follows generally accepted institutional definitions of developed market classifications. Country eligibility and inclusion are determined annually, based on the following criteria:

- A. Market size (Market capitalization (market cap) as % of GDP, Country Total Market Cap, Market cap as % of World Market Cap)
- B. Size of Economy (Gross Domestic Product (GDP), Country GDP as % of World GDP)
- C. Level of development (GDP per capita)
- D. The country's restrictions on foreign capital investment
- E. Institutional feedback from the international investment community regarding economic development levels and market accessibility

*See appendix for a complete list of eligible countries as of the latest Index reconstitution*

#### 2. Equity Universe

The next step is to select the stocks which meet the criteria for inclusion in the universe. Unlike the country selection process, stock selection rules are applied semi-annually at each rebalance period. All stocks included in the Index must pass the following screening criteria:

- A. The company must be domiciled in one of the countries included in the index. Country of domicile classifications are assigned by applying at least one of the following criteria (in order of priority):
  - Country of incorporation
  - Country of primary exchange listing
- B. Master Limited Partnerships (MLPs) are excluded
- C. The stock is in the top 85% of the developed market equity universe's market capitalization
- D. The average daily trading volume (ADTV) over the last 6 months exceeds 1.5Mn USD

#### 3. Establishing the Index Constituents

Upon determination of the stocks to be included in the universe, an optimization process is applied to determine which stocks are held and how they are weighted. The objectives and constraints of the process are discussed below.

- **Strategy Risk Controls**

The Index includes multi-layered risk controls, including:

1. Size and liquidity caps on positions (0.75% or 1x ADTV)

2. Minimum effective number of equities must exceed 300
3. Seek up to 20% reduction in volatility (based on historical standard deviation of a capitalization-weighted universe)<sup>1</sup>
4. Large cap stocks (defined as stocks with market cap over \$10Bn USD) must not be less than 50% of the total Index; smaller companies (defined as companies <\$2B) must be ≤20% of the total Index
5. Active sector allocation limitations are set at ±2% from each sector's representation in an initial capitalization-weighted universe
6. Active country allocation limitations range from ±2% to ±5% from each country's representation in an initial capitalization-weighted universe according to the following formula:

*When the sum ( $\Sigma$ ) of all company weights within a country (i) reaches a threshold,*

*then the maximum allocation to that country will equal its representation in the market capitalization-weighted universe + ...*

$\Sigma_{country} weight_i > 15\%$	-1%
$10\% < \Sigma_{country} weight_i \leq 15\%$	5%
$5\% < \Sigma_{country} weight_i \leq 10\%$	3%
$\Sigma_{country} weight_i \leq 5\%$	2%

*When the sum ( $\Sigma$ ) of all company weights within a country (i) reaches a threshold,*

*then the minimum allocation to that country will equal its representation in the market capitalization-weighted universe - ...*

$\Sigma_{country} weight_i > 10\%$	5%
$5\% < \Sigma_{country} weight_i \leq 10\%$	3%
$\Sigma_{country} weight_i \leq 5\%$	2%

<sup>1</sup> The intended result of this target is to seek up to a 15% reduction in volatility, although the optimizer is set at 20% in order to achieve this intended target.

- **Factor Enhancement**

The stock selection process seeks to identify and allocate capital to stocks with attractive factor characteristics. In this analysis, factors covering the traditional dimensions of value, momentum and quality are utilized. Stocks are selected with an aim to enhance the overall factor characteristics of the index while also meeting the strategy risk controls outlined above.

**Hartford Value Factor Mix (50% Weighting)**

The Hartford Value Factor Mix equally weights multiple valuation metrics to arrive at an aggregated valuation metric. Valuation metrics include: Earnings Yield, EBITDA/Enterprise Value (EV), Operating Cash Flow/EV, Revenue/EV, Dividend Yield, and Book Value (used only in financials and real estate as a replacement to EBITDA/EV)

**Hartford Momentum Factor Mix (30% Weighting)**

The Hartford Momentum Factor Mix equally weights multiple price momentum metrics to arrive at an aggregated momentum metric. Momentum metrics include: Last 12 ex-1 monthly returns and Last 6 ex-1 monthly returns.

**Hartford Quality Metrics (20% Weighting)**

Gross profitability/total assets is used to measure quality in the index. Where the factor is not available (i.e. for financial and real estate stocks), quality is excluded from the factor mix.

**Creating Aggregated Factor Scores**

Once the Valuation, Momentum and Quality scores have been calculated, factor scores are weighted for each security according to the following: Value = 50%, Momentum 30%, Quality 20% and combined to create a single aggregated score for each stock. (Weightings of 65% Value and 35% Momentum are combined to create a single aggregated score for stocks within the financial and real estate sectors.)

## B. Determining the Final Risk-Optimized Index

With the above inputs in place, the Index is constructed using a proprietary optimization process. The optimization uses the initial starting universe of eligible securities as the baseline and the optimization objectives and constraints determine the composition of the Index during each reconstitution and rebalance period. The process layer determines a suitable combination of stocks that allows for the greatest expression of index objectives, including factor expression, diversification goals and volatility targets.

### 1. Turnover Reduction

The optimization process seeks to mitigate unnecessary and counterproductive turnover while maintaining index attributes and other risk controls.

## C. Reconstitution and Rebalancing

The composition of the Index is reconstituted and reweighted on the second Wednesday in March and on the second Wednesday in September (the "Selection Days"). The composition of the Index is reviewed on each Selection Day and the necessary adjustments are announced. The Inception Date of the Index is December 31, 2013.

*(See Appendix for definitions of terms)*

# Hartford Risk-Optimized Multifactor US Equity Index (LROUSLX)

## Index Overview

Hartford Risk-Optimized Multifactor US Equity Index (LROUSLX or the "Index") seeks to improve returns through a market cycle relative to traditional cap-weighted US large cap market indices and active US large cap market strategies. Toward this objective, the Index construction methodology seeks to reshape the strategy's composition relative to cap-weighted US large cap market exposures by seeking to provide:

- Greater Diversification: lower concentration among individual stock exposures
- Enhanced Returns: an optimization process is utilized to enhance potential returns by improving the factor attributes of the portfolio along the dimensions of value, momentum, and quality
- Size Allocation: the Index takes limited active size allocations
- Sector Allocation: the Index takes limited active sector allocations

The rules-based, proprietary methodology allocates capital toward companies with a favorable combination of factors, including value, momentum, and quality.

## Composition of the Index

### A. Selection of Index Components

The initial composition of the Index, as well as any ongoing adjustment, is based on the following rules:

#### 1. Equity Universe

All stocks included in the Index must pass the following screening criteria:

- A. The company must be domiciled in the United States. Country of domicile classification is assigned by applying at least one of the following criteria (in order of priority):
  - Country of incorporation
  - Country of primary exchange listing
- B. Master Limited Partnerships (MLPs) are excluded
- C. The stock is in the top 1,000 stocks of the large cap universe as ranked by total market cap
- D. The average daily trading volume (ADTV) over the last 6 months exceeds 1.5Mn USD

#### 2. Establishing the Index Constituents

Upon determination of the stocks to be included in the universe, an optimization process is applied to determine which stocks are held and how they are weighted. The objectives and constraints of the process are discussed below.

- **Strategy Risk Controls**

The Index includes multi-layered risk controls, including:

1. Size and liquidity caps on positions (1.5% or 1x ADTV)
2. Minimum effective number of equities must exceed 200
3. Two-thirds of the index allocation must be in the top 300 largest stocks as ranked by total market capitalization within the initial universe as defined above
4. Active sector allocation limitations are set at  $\pm 2\%$  from each sector's representation in an initial capitalization-weighted universe

- **Factor Enhancement**

The stock selection process seeks to identify and allocate capital to stocks with attractive factor characteristics. In this analysis, factors covering the traditional dimensions of value, momentum and quality are utilized. Stocks are selected with the goal of enhancing the overall factor characteristics of the Index while also meeting the strategy risk controls outlined above.

#### Hartford Value Factor Mix (50% Weighting)



The Hartford Value Factor Mix equally weights multiple valuation metrics to arrive at an aggregated valuation metric. Valuation metrics include: Earnings Yield, EBITDA/Enterprise Value (EV), Operating Cash Flow/EV, Revenue/EV, Dividend Yield, and Book Value (used only in financials and real estate as a replacement to EBITDA/EV).

#### **Hartford Momentum Factor Mix (30% Weighting)**

The Hartford Momentum Factor Mix equally weights multiple price momentum metrics to arrive at an aggregated momentum metric. Momentum metrics include: Last 12 ex-1 monthly returns and Last 6 ex-1 monthly returns.

#### **Hartford Quality Metrics (20% Weighting)**

Gross profitability/total assets is used to measure quality in the Index. Where the factor is not available (i.e. for financial and real estate stocks), quality is excluded from the factor mix.

#### **Creating Aggregated Factor Scores**

Once the Valuation, Momentum and Quality scores have been calculated, factor scores are weighted for each security according to the following: Value = 50%, Momentum 30%, Quality 20% and combined to create a single aggregated score for each stock. (Weightings of 65% Value and 35% Momentum are combined to create a single aggregated score for stocks within the financial and real estate sectors.)

## **B. Determining the Final Risk-Optimized Index**

With the above inputs in place, the Index is constructed using a proprietary optimization process. The optimization uses the initial starting universe of eligible securities as the baseline and the optimization objectives and constraints determine the composition of the Index during each reconstitution and rebalance period. The process layer determines a suitable combination of stocks that allows for the greatest expression of index objectives, including factor expression, diversification goals and volatility targets.

### **1. Turnover Reduction**

The optimization process seeks to mitigate unnecessary and counterproductive turnover while maintaining index attributes and other risk controls.

## **C. Reconstitution and Rebalancing**

The composition of the Index is reconstituted and reweighted on the second Wednesday in March and on the second Wednesday in September (the "Selection Days"). The composition of the Index is reviewed on the Selection Day and the necessary adjustments are announced. The Inception Date of the Index is December 31, 2013.

*(See Appendix for definitions of terms)*

# Hartford Risk-Optimized Multifactor Emerging Markets Index (LROAMX)

## Index Overview

The Hartford Risk-Optimized Multifactor Emerging Markets Index (LROAMX or the “Index”) seeks to balance risks within and across the equity markets of emerging economies while emphasizing constituents exhibiting a favorable combination of factor characteristics. The starting universe is comprised of companies domiciled within emerging market countries representing the top 70% of the market capitalization of each country. Overall, the Index seeks to provide risk-balanced exposure to smaller, generally faster-growing emerging economies within a similar risk profile of a capitalization-weighted approach.

The rules-based, proprietary methodology employs a multi-layered risk allocation approach that seeks to balance risk across all countries in the universe. From the risk-balanced baseline, the methodology selects companies with a favorable combination of factors, including value, momentum, and quality.

## Composition of the Index

### A. Selection of Index Components

The initial composition of the Index, as well as any ongoing adjustment, is based on the following rules:

#### 1. Country Eligibility

The eligible universe of emerging markets countries follows generally accepted institutional definitions of emerging market classifications. Country eligibility and inclusion are determined annually, based on the following criteria:

- A. Market size (Market cap as % of GDP, Country Total Market Cap, Market cap as % of World market cap)
- B. Size of Economy (GDP, Country GDP as % of World GDP)
- C. Level of development (GDP per capita)
- D. Growth (Last 10 years annual GDP growth, next 5 years’ forecasted GDP growth)
- E. Fiscal considerations (Debt to GDP)
- F. Restrictive liquidity and trading costs
- G. At least 10 stocks meet the minimum inclusion screening criteria (outlined below)
- H. The country’s restrictions on foreign capital investment
- I. Institutional feedback from the international investment community regarding economic development levels and market accessibility

*See appendix for a complete list of eligible countries as of the latest Index reconstitution*

#### 2. Equity Universe

The next step is to select the stocks which will represent each country’s eligible universe. Similar to the country selection process, universe definition is conducted annually. Objectives in creating each country universe are to develop a set of exposures which:

- A. Span the majority of a country’s public market capitalization
- B. Are liquid enough to be traded without significant market impact
- C. Consist of at least 10 stocks in order to facilitate diversification and risk weighting the country allocations

To meet these goals, all stocks included in the universe must first pass the following screening criteria:

- A. The company must be domiciled in one of the countries included in the Index. Country of domicile classifications are assigned by applying at least one of the following criteria (in order of priority):
  - Country of incorporation
  - Country of primary exchange listing
- B. Master Limited Partnerships (MLPs) are excluded
- C. The stock is in the top 70% of the country’s free floating market capitalization

- D. The stock has a free floating market capitalization of at least 500Mn USD
- E. The percentage of free floating market cap represents at least 25% of the company's total market cap
- F. The average daily trading volume (ADTV) over the last 6 months exceeds 1.5Mn USD

### 3. Establishing Country Allocation

When establishing the baseline country universe, a tail risk parity weighting method is applied to determine each country's baseline weight within the index. The tail-risk methodology evaluates expected losses during periods of market turbulence for each country. Once established, each country is weighted inversely to their tail risk to obtain a risk parity design.

### 4. Establishing the Index Constituents

Upon determination of the stocks to be included in the universe, an optimization process is applied to determine which stocks are held and how they are weighted. The objectives and constraints of the process are discussed below.

- **Strategy Risk Controls**

The Index includes multi-layered risk controls, including:

1. Single stock weights must be  $\leq 1\%$
2. Single country weights must be  $\leq 10\%$
3. Notional allocation to any given stock does not exceed 1X ADTV
4. The change in position size of any stock in the Index at any rebalance period is restricted to 1X ADTV
5. Country weights are restricted to  $\pm 1.5\%$  relative to a risk balanced allocation

- **Factor Enhancement**

The stock selection process seeks to identify and allocate capital to stocks with attractive factor characteristics. In this analysis, factors covering the traditional dimensions of value, momentum and quality are utilized. Stocks are selected with a goal of enhancing the overall factor characteristics of the Index while also meeting the strategy risk controls outlined above.

#### **Hartford Value Factor Mix (50% Weighting)**

The Hartford Value Factor Mix equally weights multiple valuation metrics to arrive at an aggregated valuation metric. Valuation metrics include: Earnings Yield, EBITDA/Enterprise Value (EV), Operating Cash Flow/EV, Revenue/EV, Dividend Yield, and Book Value (used only in financials and real estate as a replacement to EBITDA/EV).

#### **Hartford Momentum Factor Mix (30% Weighting)**

The Hartford Momentum Factor Mix equally weights multiple price momentum metrics to arrive at an aggregated momentum metric. Momentum metrics include: Last 12 ex-1 monthly returns and Last 6 ex-1 monthly returns.

#### **Hartford Quality Metrics (20% Weighting)**

Gross profitability/total assets is used to measure quality in the Index. Where the factor is not available (i.e. for financial and real estate stocks), quality is excluded from the factor mix.

#### **Creating Aggregated Factor Scores**

Once the Valuation, Momentum and Quality scores have been calculated, factor scores are weighted for each security according to the following: Value = 50%, Momentum 30%, Quality 20% and combined to create a single aggregated score for each stock. (Weightings of 65% Value and 35% Momentum are combined to create a single aggregated score for stocks within the financial and real estate sectors.)

## B. Determining the Final Risk-Optimized Index

With the above inputs in place, the Index is constructed using a proprietary optimization process. The optimization uses the initial starting universe of eligible securities as the baseline and the optimization objectives and constraints determine the composition of the Index during each reconstitution and rebalance period. The process layer determines a suitable combination of stocks that allows for the greatest expression of index objectives, including factor expression, diversification goals and volatility targets.

### **1. Turnover Reduction**

The optimization process seeks to mitigate unnecessary and counterproductive turnover while maintaining index attributes and other risk controls.

## **C. Reconstitution and Rebalancing**

The composition of the Index is reconstituted and reweighted on the second Wednesday in March, and reweighted on the second Wednesday in September (the "Selection Days"). The composition of the Index is reviewed on the Selection Day and the necessary adjustments are announced. The Inception Date of the Index is December 31, 2013.

*(See Appendix for definitions of terms)*

# Hartford Risk-Optimized Multifactor Global Small Cap Index (LROGSX)

## Index Overview

The Hartford Risk-Optimized Multifactor Global Small Cap Index (LROGSX or the "Index") seeks to address risks and opportunities within global small cap stocks by selecting equity securities of companies domiciled within the global small cap equity universe and exhibiting a favorable combination of factors, including valuation, momentum, and quality.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to de-concentrate individual country and currency risks and reduce volatility while selecting companies exhibiting favorable risk premia factors. The strategy seeks to constrain active country, sector and size risks relative to the cap-weighted universe.

## Composition of the Index

### A. Selection of Index Components

The initial composition of the Index, as well as any ongoing adjustment, is based on the following rules:

#### 1. Country Eligibility

The eligible country universe currently includes 23 developed market countries and 5 emerging market countries. Country eligibility and inclusion are determined annually, based on the following criteria:

- A. Market size (Market cap as % of GDP, Country Total Market Cap, Market cap as % of World Market Cap)
- B. Size of Economy (GDP, Country GDP as % of World GDP)
- C. Level of development (GDP per capita)
- D. Restrictive liquidity and trading costs
- E. The country's restrictions on foreign capital investment
- F. Institutional feedback from the international investment community regarding economic development levels and market accessibility

*See appendix for a complete list of eligible countries as of the latest Index reconstitution*

#### 2. Equity Universe

Upon selecting the countries to be included in the Index, the next step is to select the stocks, which meet the criteria for inclusion in the universe. Unlike the country selection process, stock selection is conducted semi-annually at each rebalance period. All stocks included in the Index must pass the following screening criteria:

- A. The company must be domiciled in one of the countries included in the Index. Country of domicile classifications are assigned by applying at least one of the following criteria (in order of priority):
  - Country of incorporation
  - Country of primary exchange listing
- B. Master Limited Partnerships (MLPs) are excluded
- C. Exclude stocks within the universes of Hartford Risk-Optimized Multifactor US Equity Index, Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index, and Hartford Risk-Optimized Multifactor Emerging Markets Index
- D. The stock has a total market value of less than 5Bn USD, and have a market cap at least 500Mn USD, and a free floating market cap at least 250Mn USD
- E. The average daily trading volume (ADTV) over the last 6 months exceeds 1.5Mn USD

#### 3. Establishing the Index Constituents

Upon determination of the stocks to be included in the universe, an optimization process is applied to determine which stocks are held and how capital is allocated. The objectives and constraints of the process are discussed below.

▪ **Strategy Risk Controls**

The Index includes multi-layered risk controls, including:

1. Size and liquidity caps on positions (0.50% or 1x ADTV)
2. Minimum effective number of equities must exceed 300
3. Seek up to 20% reduction in volatility (based on historical standard deviation of a capitalization-weighted universe)<sup>2</sup>
4. Active sector allocation limitations are set at  $\pm 2\%$  from each sector's representation in an initial capitalization-weighted universe
5. Active country allocation limitations range from  $\pm 2\%$  to  $\pm 5\%$  from each country's representation in an initial capitalization-weighted universe according to the following:

<i>When the sum (<math>\Sigma</math>) of all company weights within a country (i) reaches a threshold,</i>	<i>then the maximum allocation to that country will equal its representation in the market capitalization-weighted universe + ...</i>
$\Sigma_{country} weight_i > 15\%$	-1%
$10\% < \Sigma_{country} weight_i \leq 15\%$	5%
$5\% < \Sigma_{country} weight_i \leq 10\%$	3%
$\Sigma_{country} weight_i \leq 5\%$	2%
<i>When the sum (<math>\Sigma</math>) of all company weights within a country (i) reaches a threshold,</i>	<i>then the minimum allocation to that country will equal its representation in the market capitalization-weighted universe - ...</i>
$\Sigma_{country} weight_i > 30\%$	10%
$10\% < \Sigma_{country} weight_i \leq 30\%$	5%
$5\% < \Sigma_{country} weight_i \leq 10\%$	3%
$\Sigma_{country} weight_i \leq 5\%$	2%

▪ **Factor Enhancement**

The stock selection process seeks to identify and allocate capital to stocks with attractive factor characteristics. In this analysis, factors covering the traditional dimensions of value, momentum and quality are utilized. Stocks are selected with the goal of enhancing the overall factor characteristics of the Index while also meeting the strategy risk controls outlined above.

**Hartford Value Factor Mix (50% Weighting)**

The Hartford Value Factor Mix equally weights multiple valuation metrics to arrive at an aggregated valuation metric. Valuation metrics include: Earnings Yield, EBITDA/Enterprise Value (EV),

<sup>2</sup> The intended result of this target is to seek up to a 15% reduction in volatility, although the optimizer is set at 20% in order to achieve this intended target.

Operating Cash Flow/EV, Revenue/EV, Dividend Yield, and Book Value (used only in financials and real estate as a replacement to EBITDA/EV).

#### **Hartford Momentum Factor Mix (30% Weighting)**

The Hartford Momentum Factor Mix equally weights multiple price momentum metrics to arrive at an aggregated momentum metric. Momentum metrics include: Last 12 ex-1 monthly returns and Last 6 ex-1 monthly returns.

#### **Hartford Quality Metrics (20% Weighting)**

Gross profitability/total assets is used to measure quality in the Index. Where the factor is not available (i.e. for financial and real estate stocks), quality is excluded from the factor mix.

#### **Creating Aggregated Factor Scores**

Once the Valuation, Momentum and Quality scores have been calculated, factor scores are weighted for each security according to the following: Value = 50%, Momentum 30%, Quality 20% and combined to create a single aggregated score for each stock. (Weightings of 65% Value and 35% Momentum are combined to create a single aggregated score for stocks within the financial and real estate sectors.)

## **B. Determining the Final Risk-Optimized Index**

With the above inputs in place, the Index is constructed using a proprietary optimization process. The optimization uses the initial starting universe of eligible securities as the baseline and the optimization objectives and constraints determine the composition of the Index during each reconstitution and rebalance period. The process layer determines a suitable combination of stocks that allows for the greatest expression of index objectives, including factor expression, diversification goals and volatility targets.

### **1. Turnover Reduction**

The optimization process seeks to mitigate unnecessary and counterproductive turnover while maintaining index attributes and other risk controls.

## **C. Reconstitution and Rebalancing**

The composition of the Index is reconstituted and reweighted on the second Wednesday in March and on the second Wednesday in September (the "Selection Days"). The composition of the Index is reviewed on the Selection Day and the necessary adjustments are announced. The Inception Date of the Index is December 31, 2013. *(See Appendix for definitions of terms)*

# Hartford Risk-Optimized Multifactor REIT Index (LROREX)

## Index Overview

The Hartford Risk-Optimized Multifactor REIT Index (LROREX or the “Index”) seeks to address risks and opportunities within US-focused equity Real Estate Investment Trusts (REITs) by selecting securities with a favorable combination of factors, including quality, momentum, and value.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to de-concentrate individual security risks while selecting companies exhibiting favorable risk premia factors.

## Composition of the Index

### A. Selection of Index Components

The initial composition of the Index, as well as any ongoing adjustment, is based on the following rules:

#### 1. Equity Universe

All stocks included in the Index must pass the following screening criteria at the time of their inclusion:

- A. Company must operate as a traditional equity REIT (excludes mortgage and operating REITs)
- B. The company must be domiciled in the United States
- C. The average daily trading volume (ADTV) over the last 6 months exceeds 1.0Mn USD
- D. The stock has a total market cap in excess of 100Mn USD

#### 2. Establishing the Index Constituents

Upon determination of the stocks to be included in the universe, an optimization process is applied to determine which stocks are held and how they are weighted. The objectives and constraints of the process are discussed below.

- **Strategy Risk Controls**

The Index includes multi-layered risk controls, including:

1. Size and liquidity caps on positions (2.0% and 2x ADTV)
2. Aggregate weight limits at the property type level are allocated utilizing expected tail loss (ETL) estimations

- **Factor Enhancement**

The stock selection process seeks to identify and allocate capital to US-listed equity REITs with attractive factor characteristics. In this analysis, factors covering the traditional dimensions of quality, momentum and value are utilized. Stocks are selected with the goal of enhancing the overall factor characteristics of the Index, while also meeting the strategy risk controls outlined above.

#### **Hartford Quality Score (50% weighting)**

The Hartford Quality Score utilizes the following metrics to arrive at an aggregated quality metric: Funds from Operations (FFO) Payout, FFO Growth, Return on Invested Capital (ROIC), and Return on Gross Property Value

#### **Hartford Momentum Score (30% weighting)**

The Hartford Momentum Score utilizes the following metrics to arrive at an aggregated momentum metric: Weighted average of 6- and 12-month return (-1, excluding the final month)

#### **Hartford Value Score (20% weighting)**



The Hartford Value Score utilizes the following metrics to arrive at an aggregated valuation metric: Price-to-FFO and Price-to-Adjusted FFO (FFO=Funds from Operations)

#### **Creating Aggregated Factor Scores**

Once the Quality, Momentum and Valuation scores have been calculated, factor scores are weighted for each security according to the following: Quality = 50%, Momentum = 30%, Value = 20% and combined to create a single aggregated score for each stock.

## **B. Determining the Final Risk-Optimized Index**

With the above inputs in place, the Index is constructed using a proprietary optimization process. The optimization uses the initial starting universe of eligible securities as the baseline and the optimization objectives and constraints determine the composition of the Index during each reconstitution and rebalance period. The process layer determines a suitable combination of stocks that allows for the greatest expression of index objectives, including factor expression, diversification goals and volatility targets.

### **1. Turnover Reduction**

The optimization process seeks to mitigate unnecessary and counterproductive turnover while maintaining index attributes and other risk controls.

## **C. Reconstitution and Rebalancing**

The composition of the Index is reconstituted and reweighted on the second Wednesday in March and on the second Wednesday in September (the "Selection Days"). The composition of the Index is reviewed on the Selection Day and the necessary adjustments are announced. The Inception Date of the Index is December 31, 2015.

*(See Appendix for definitions of terms)*

## Appendix: INDEX PUBLISHING AND CALCULATION

### General Information for All Indices

#### Hartford Multifactor Index Tickers and ISINs

Index Name	Total Return		Price Return	
	Ticker	ISIN	Ticker	ISIN
Hartford Risk-Optimized Multifactor Developed Markets (ex-US) Index	LRODMX	DE000SLA68B9	LRODMP	DE000SLA68A1
Hartford Risk-Optimized Multifactor US Equity Index	LROUSLX	DE000SLA7UT6	LROUSLP	DE000SLA7US8
Hartford Risk-Optimized Multifactor Emerging Markets Index	LROAMX	DE000SLA69F8	LROAMP	DE000SLA69E1
Hartford Risk-Optimized Multifactor Global Small Cap Index	LROGSX	DE000SLA4LS4	LROGSP	DE000SLA4LU0
Hartford Risk-Optimized Multifactor REIT Index	LROREX	DE000SLA1H96	LROREP	DE000SLA1JB0

#### Distribution

The Indices are published via the price marketing services of Boerse Stuttgart AG and are distributed to all affiliated vendors. Each vendor decides on an individual basis as to whether the vendor will distribute/display each Hartford Risk-Optimized Multifactor Index via the vendor's information systems.

#### Prices and calculation frequency

The price of the Indices are calculated on each Business Day based on the prices on the respective Exchanges on which the Index Components are listed. The most recent prices of all Index Components are used. Prices of Index Components not listed in the Index Currency are translated using spot rates (London 4pm) as quoted by Thomson Reuters. Should there be no current price available on Reuters, the most recent price or the Trading Price on Reuters for the preceding Trading Day is used in the calculation.

The Indices are calculated every U.S. Business Day from 12:00am to 10:50pm, CET. The Index price is calculated continuously in 15-second intervals during these hours. In the event that data cannot be provided to Reuters or to the pricing services of Boerse Stuttgart AG, the Index cannot be distributed.

Any incorrect calculation is adjusted on a retrospective basis.

Lattice Strategies engages with and pays a fee to Solactive AG for index calculation and distribution services. Lattice Strategies is responsible for the methodology and selection of the index components. The Indices are calculated as price and total return indices in USD.

#### Decision-making bodies

A committee, composed of members as determined by Lattice Strategies LLC, is responsible for decisions regarding the application of any amendments to the rules (in this document referred to as the "committee" or the "index committee"). The committee shall decide if any Extraordinary Events should occur and on the implementation of any necessary adjustments.

Members of the committee can recommend changes to the index methodology rules and submit them to the committee for approval at any time. Refinements to methodology will be communicated in advance of pre-established rebalance and reconstitution periods via updates to the methodology document and noted in the Index Notices section of the Appendix.

#### Publication

All specifications and information relevant for calculating the Index are available via the following link:  
[http://www.solactive.com/wp-content/uploads/2016/06/Index-Calculation-Guideline\\_V1.2.pdf](http://www.solactive.com/wp-content/uploads/2016/06/Index-Calculation-Guideline_V1.2.pdf)

## **Licensing**

Licences to use the Indices as the underlying value for derivative instruments are issued to stock exchanges, banks, financial services providers and investment houses by Lattice Strategies LLC.

## **Extraordinary adjustment**

If a company included in any of the Indices is removed from an Index between two Adjustment Days due to an Extraordinary Event, or is otherwise deemed by the index committee to have experienced an Extraordinary Event that impacts its qualification for inclusion in the Index as determined by the Methodology, if necessary, the index committee shall designate a successor company or otherwise determine a course of action to bring the impacted company position back into alignment with the Methodology. The new Index composition would be communicated to Solactive AG once determination is made by the index committee, and any such change would be published by Solactive AG as soon as practicable thereafter, normally after the close of the US markets on the following business day. To the extent any such index committee determination is made within 45 days of the next Adjustment Day, the index committee may elect to wait until such next Adjustment Day to make the adjustment to the Index.

## Appendix: Definitions

### Definitions

**Adjustment Days** – An adjustment date is the date on which financial adjustments will be made to a contract or transaction as agreed by all the parties involved in the transaction.

**Book Value** – The book value of an asset is the value at which the asset is carried on a balance sheet and calculated by taking the cost of an asset minus the accumulated depreciation.

**Debt-to-GDP** – Debt-to-Gross Domestic Product (GDP) is the ratio of a country's public debt to its gross domestic product and can be interpreted as the number of years needed to pay back debt if GDP is dedicated entirely to debt repayment.

**Dividend Yield** – Dividend Yield is the weighted average dividend yield of the securities in the index (including cash). The number is not intended to demonstrate income earned or distributions made by a portfolio.

**Earnings Yield** – The net income (before extraordinary items and discontinued operations) for the most recent 4 Quarter period divided by the current total public equity value of the company.

**EBITDA/Enterprise Value (EV)** – EBITDA is an acronym for Earnings Before Interest Taxes Depreciation and Amortization. EBITDA/EV is a metric that is used as a valuation tool to allow investors to compare the value of a company, debt included, to the company's cash earnings less noncash expenses.

**Expected Tail-Loss** – Includes events that have a small probability of occurring and occur at the ends of a normal distribution curve.

**Extraordinary Event** – Includes, but is not limited to, a corporate takeover, merger, spin-off, special dividend, or delisting, which may alter the manner in which the company's securities are valued and/or traded.

**Free Floating Market Capitalization** – Free floating market capitalization is another method of calculating market capitalization that requires taking the equity's price and multiplying it by the number of shares readily available in the market.

**Funds from Operations (FFO) Payout** refers to the figure used by real estate investment trusts (REITs) to define the cash flow from their operations. FFO Payout indicates the amount of FFO a REIT pays out to its shareholders.

**FFO Growth** – The figure used by real estate investment trusts (REITs) to define the cash flow from their operations. FFO Growth indicates the growth of FFO over a period of time.

**Gross Domestic Product (GDP)** – Gross domestic product is the monetary value of all finished goods and services produced within a country's borders in a specific time and is used as a broad measurement of a nation's overall economic activity.

**Gross Profitability** – Gross profitability is the profit a company makes after deducting the costs associated with making and selling its products, or the costs associated with providing its services.

**Gross Profits/Total Assets** – Gross profit/total assets is a profitability measure that allows investors to compare the gross profits of a company to the company's total assets.

**Index Component** – Security within an Index

**Index Calculator** – Agent responsible for calculating the value of each index (Solactive AG or any other appropriately appointed successor in this function.)

**Index Currency** – The US Dollar

**Index Provider** – Lattice Strategies LLC.

**Market Cap** – Market cap or market capitalization refers to the total dollar market value of a company's outstanding shares and is calculated by multiplying a company's shares outstanding by the current market price of one share.

**Market Disruption Event** – Market disruption events are situations where markets cease to function in a regular manner, typically characterized by rapid and large market declines.

**Operating Cash Flow/EV** – Operating Cash Flow/EV is the ratio of estimated cash generation to the entire economic value of a company. Cash production is calculated by taking the net income (before extraordinary items and discontinued operations) plus amortization and depreciation plus preferred dividends.

**Rebalance** – Rebalance is the process of realigning the weightings of a portfolio of assets by periodically buying or selling assets in a portfolio to maintain an original desired level of asset allocation.

**Reconstitution** – Reconstitution is the re-setting of an index that involves adding and removing stocks as well as re-ranking existing stocks so that the composition of the index reflects the application of systematic rules.

**Return on Gross Property Value** – Return on gross is the amount that a company earns on the total investment it has made in its business.

**Return on Invested Capital (ROIC)** – Quantifies how well a company generates cash flow relative to the capital it has invested in its business.

**Revenue/EV** – Revenue/EV is a measure of the value of a stock that compares a company's enterprise to value to its revenue and is an indicator that investors use to determine whether a stock is priced well.

**Spot Rate** – The price quoted for immediate settlement on a commodity, a security or a currency.

**Standard Deviation** – Standard Deviation is a statistical measure of the extent to which returns of an asset vary from its average return over a certain period.

## Appendix: Country Eligibility by Index (as of March 2018)

### Risk-Optimized Multifactor Developed Markets (ex-US) Index

Australia	France	Japan	Singapore
Austria	Germany	Netherlands	Spain
Belgium	Hong Kong	New Zealand	Sweden
Canada	Ireland	Norway	Switzerland
Denmark	Israel	Portugal	United Kingdom
Finland	Italy		

### Risk-Optimized Multifactor US Equity Index

United States

### Risk-Optimized Multifactor Emerging Markets Index

Brazil	Indonesia	Russia	Thailand
Chile	Malaysia	South Africa	Turkey
China	Mexico	South Korea	
Colombia	Philippines	Taiwan	
India	Poland		

### Risk-Optimized Multifactor Global Small Cap Index

Australia	Denmark	Israel	Portugal	Switzerland
Austria	Finland	Italy	Singapore South	Taiwan
Belgium	France	Japan	Africa	United Kingdom
Brazil	Germany	Netherlands	South Korea	United States
Canada	Hong Kong	New Zealand	Spain	
China	Ireland	Norway	Sweden	

**Risk-**

### Optimized Multifactor REIT Index

United States

## Appendix: Index Notices

The Index Committee is responsible for all decisions regarding the Index methodologies<sup>3</sup> (the “Methodologies” or “Rules”) and their application to the Hartford Multifactor Indices (the “Indices”). As part of its mandate to maintain the integrity of the Indices and their original design intent, the Index Committee regularly reviews the tools<sup>4</sup> (the “Tools”) employed by the team responsible for applying the Methodology toward the calculation of security weights (i.e. achieving objectives stated in the Methodology). From time to time, the Tools employed in applying the Methodologies may be refined and enhanced. These modifications are technical in nature and do not change, alter, or impact the integrity or objectives of the Rules.

As a matter of record, the following enhancements to the Tools have been made:

### March 2016

#### LROAMX

The Index Committee implemented a linear optimization process as the means by which the Rules (e.g., intended exposures, assignment of country weightings, and selection/weighting of individual securities) are applied to the investment universe that underlies the emerging markets index (LROAMX). The process enhancement was adopted to improve the efficiency through which the LROAMX objectives are achieved. No changes were made to the Rules themselves.

As part of this Tool enhancement, the application of factor tilting within a basket was replaced with selection of securities based on their aggregate factor scores. The factor scoring Rule remained unchanged. These enhancements employed technical Tools already utilized in other Indices (LRODMX, LROUSLX and LROGSX), aligning the processes closer to each other.

#### All Hartford Multifactor Indices

A neutralization Tool was introduced to facilitate the use of the calculation of the value, momentum and quality factor scores in the optimization process for all Indices. Neutralization is meant to help remove biases between companies and securities of different classifications. In particular, the neutralization Tool seeks to jointly mitigate biases by geographic (e.g. country, region) and economic (e.g. sector, industry, property type) exposures. The end result enhanced the ability to compare and evaluate companies and securities relative to each other on a more consistent basis.

An equity risk model Tool was developed and adopted in support of the creation and management of all Indices. This Tool allows for a single, unified approach across all Indices regarding the attribution of equity returns to various sources including geographic (e.g. country, region) exposure and economic (e.g. sector, industry, property type) exposure as well as exposures to equity risk premia such as value, quality, and momentum.

### March 2017

#### All Hartford Multifactor Indices

The Tool utilized for the assessment of the market value - or market size - of publicly traded securities of companies in the eligible universe for each index (i.e., “Market Size”) was expanded to include multiple publicly traded share

<sup>3</sup> Index methodology refers to a pre-defined set of rules that cannot be altered except under extraordinary market, political or macroeconomic conditions. These rules detail market and security coverage, index construction approach and ongoing index maintenance.

<sup>4</sup> Tools refer to the techniques, programs, processes and procedures used to implement the Methodologies.

types of a company such as common, ordinary, preferred, preferred, specialty, ADRs, and units<sup>5</sup>. This Tool enhancement utilizing the Market Size approach allowed for a more effective and consistent assessment of a company's entire public equity value in different markets and geographical regions as some markets emphasize the utilization of particular equity share types more than other markets. By employing a common, more encompassing, standard to all markets, the aggregate value of publicly traded equity securities became more comparable across markets.

Data Sources used in the development of Hartford Multifactor Indices:

S&P Capital IQ/Compustat

S&P Capital IQ/SNL Database

FactSet Research Systems Inc.

Bloomberg L.P.

International Monetary Fund (Country Eligibility)

Organisation for Economic Co-Operation and Development

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<sup>5</sup> The universe of publicly traded share types is not limited to the examples provided.



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