Hartford Multifactor Low Volatility Index Methodologies

Hartford Multifactor Low Volatility International Equity Index   LLVINX
Hartford Multifactor Low Volatility US Equity Index   LLVUSX

This document details the rules-based methodologies that govern Hartford Multifactor Low Volatility Indices currently in effect. Version 1.1 dated March 1, 2018

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Hartford Multifactor Low Volatility Indices

Hartford Multifactor Low Volatility Indices are designed to capture the performance potential of US and International equities while seeking to lower volatility by up to one-quarter over a complete market cycle.

- **Hartford Multifactor Low Volatility International Equity Index (LLVINX)**
- **Hartford Multifactor Low Volatility US Equity Index (LLVUSX)**

Eligible Securities – All Hartford Multifactor Low Volatility 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 Multifactor Low Volatility Index	Eligible Universe
International Equity Index	Developed (excluding the US) and Emerging Markets – Eligible securities include companies within the top 85% of each country's market capitalization
US Equity Index	US – Eligible securities include companies within the top 98% of the US equity market's capitalization

See Appendix for itemized list of country eligibility for each index

Overview of Index Construction Methodology

Hartford Multifactor Low Volatility Indices deploy an integrated process that seeks to deliberately allocate risk and maximize exposure to low volatility stocks displaying positive exposure to value, momentum and quality factors**.**

- **Risk-First Portfolio Construction** – Establishes risk parameters of each index by setting volatility as well as country-and sector-level diversification objectives. This initial step expands the opportunity set and tends to drive capital allocation deeper into the eligible universe. The indices target up to one-quarter reduction in volatility (based on historical standard deviation of the capitalization-weighted universe's 3-year return) as part of the index design.
- **Multifactor Security Selection** – Seeks to select companies exhibiting low volatility and the Indices are constructed in a way that seeks to improve overall exposure to value, momentum and quality factors – a design feature intended to enhance return potential and reduce risk.

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.

Hartford Multifactor
Low Volatility International Equity Index (LLVINX)

Index Overview

Hartford Multifactor Low Volatility International Equity Index (LLVINX or the "Index") seeks to address risks and opportunities within developed (excluding the US) and emerging market stocks by selecting equity securities exhibiting low volatility and constructing the portfolio in a way that is designed to improve overall exposure to value, momentum, quality, and size factors. The Index seeks to provide a means of improving returns through a complete market cycle with up to one-quarter less volatility versus the developed (excluding the US) and emerging market capitalization-weighted universe.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to improve diversification, balance risk across sectors by utilizing expected tail loss (ETL) estimations, and reduce volatility through security selection and portfolio composition. The methodology utilizes an optimization process to help achieve the desired composition and targeted characteristics.

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 developed and emerging markets countries excludes the United States and follows generally accepted institutional definitions of developed and emerging 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

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 classification is assigned by applying at least one of the following criteria (in order of priority):
   ▪ Country of incorporation
   ▪ Country of primary exchange listing
   ▪ Country of headquarters
B. The stock is in the top 85% of each country's estimated free float market capitalization
C. The average daily trading volume (ADTV) over the last 6 months exceeds 1Mn 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 (0.5% and 1x ADTV)

2. Minimum effective number of equities must be at least 150
3. Seek up to one-quarter reduction in volatility (based on historical standard deviation of the developed (excluding US) and emerging markets' capitalization-weighted universe's 3-year return)
4. Based on the estimated free float market capitalization of each country within the international equity universe, securities are allocated across three size categories and weighted within the following active size limitations:

Size Category	Upper/Lower Limitation
Largest 40% (Mega Cap)	±5%
Next largest 30% (Large Cap)	±5%
Next largest 15% (Mid Cap)	Implicitly defined by the results of the preceding categories

5. Active sector allocation limitations are set at ±2% of each sector's implied risk-calculated weight *(see Sector Weight Calculation section for more details)*
6. Active country allocation limitations range from ±2% to ±5% from each country's representation in an estimated free float market capitalization-weighted universe according to the following formula:

When the sum ($\sum$)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 +* ...
$\sum_{country} weight_i > 12\%$	-1%
$8\% < \sum_{country} weight_i \leq 12\%$	5%
$4\% < \sum_{country} weight_i \leq 8\%$	3%
$\sum_{country} weight_i \leq 4\%$	2%

When the sum ($\sum$)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 –* ...
$\sum_{country} weight_i > 8\%$	5%
$4\% < \sum_{country} weight_i \leq 8\%$	3%
$\sum_{country} weight_i \leq 4\%$	2%

- **Sector Weight Calculation**
  The Index seeks to balance risk across sectors using the following methodology:
  A. Calculate returns (last 60 months) for each sector controlling for market, geographic and other idiosyncratic effects
  B. Sort the returns and compute the average of the lowest 5% of the distribution of returns
  C. Apply the absolute value of the average return from step B
  D. Inverse and rescale the weights of each sector to reach a sum of one

  The net result is that the sectors with the greatest risk tend to be assigned lower relative weightings and sectors that have exhibited lower risk tend to be assigned higher relative weightings.

- **Factor Enhancement**
  The stock selection process primarily seeks to identify and allocate to stocks with low volatility characteristics while emphasizing those that may also exhibit other attractive factor characteristics along the traditional dimensions of value, momentum, and quality.

  Low volatility stocks are selected based on the following factors:

  Hartford Low Volatility Factor
  The Hartford Low Volatility Factor considers the standard deviation of historical returns for each stock over the past 130 business days.

  In addition, through an optimization process, positive exposure to the factors listed below is sought at the portfolio level:

  Hartford Value Factor Mix
  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
  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
  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.

  The principle of "neutralization" is applied in the calculation of factor scores. Neutralization is meant to help remove biases between companies and securities of different classifications. In particular, the neutralization employed seeks to jointly mitigate biases by geographic (e.g. country, region) exposure and economic (e.g. sector, industry, property type) exposure.

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, 2016.
(See Appendix for definitions of terms)

Hartford Multifactor
Low Volatility US Equity Index (LLVUSX)

Index Overview

Hartford Multifactor Low Volatility US Equity Index (LLVUSX or the "Index") seeks to address risks and opportunities within US equities across the capitalization spectrum by selecting equity securities exhibiting low volatility and constructing the portfolio in a way that is designed to improve overall exposure to value, momentum, quality, and size factors. The Index seeks to provide a means of improving returns through a complete market cycle with up to one-quarter less volatility versus the US capitalization-weighted universe.

The rules-based, proprietary methodology employs a multi-layered risk-controlled approach that seeks to improve diversification, balance risk across sectors by utilizing expected tail loss (ETL) estimations, and reduce volatility through security selection and portfolio composition. The methodology utilizes an optimization process to help achieve the desired composition and targeted characteristics.

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
   - Country of headquarters
B. The stock is within the top 98% of the US market equity universe's estimated free float market capitalization
C. The average daily trading volume (ADTV) over the last 6 months exceeds 1Mn 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 categories are based on the estimated free float market capitalization of the US equity universe, subject to the following limitations:

Size Category	Max Position Size
Largest 40% (Mega Cap)	1.5% or 1X ADTV
Next 30% (Large Cap)	1.0% or 1X ADTV
Next 15% (Mid Cap)	0.75% or 1X ADTV
Next 13% (Small Cap)	0.50% or 1X ADTV

  2. Minimum effective number of equities must be at least 150
  3. Seek up to one-quarter reduction in volatility (based on historical standard deviation of the US capitalization-weighted universe's 3-year return)
  4. Based on the estimated free float market capitalization of the US equity universe, securities are allocated across four size categories within the following active size parameters:

Size Category	Upper/Lower Limitation
Largest 40% (Mega Cap)	-15% to +10%
Next 30% (Large Cap)	-15% to +10%
Next 15% (Mid Cap)	±10%
Next 13% (Small Cap)	Implicitly defined by the results of the preceding categories

5. Active sector allocation limitations are set at ±2% of each sector's implied ETL calculated weight *(see Sector Weight Calculation section for more details)*

▪ **Sector Weight Calculation**
The Index seeks to balance risk across sectors using the following methodology:
A. Calculate returns (last 60 months) for each sector controlling for market, geographic and other idiosyncratic effects
B. Sort the returns and compute the average of the lowest 5% of the distribution of returns
C. Apply the absolute value of the average return from step B
D. Inverse and rescale the weights of each sector to reach a sum of one

The net result is that the sectors with the greatest risk tend to be assigned lower relative weightings and sectors that have exhibited lower risk tend to be assigned higher relative weightings.

▪ **Factor Enhancement**
The stock selection process primarily seeks to identify and allocate to stocks with low volatility characteristics while emphasizing those that may also exhibit other attractive factor characteristics along the traditional dimensions of value, momentum, and quality.

Low volatility stocks are selected based on the following factors:

Hartford Low Volatility Factor
The Hartford Low Volatility Factor considers the standard deviation of historical returns for each stock over the past 130 business days.

In addition, through an optimization process, positive exposure to the factors listed below is sought at the portfolio level:

Hartford Value Factor Mix
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
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
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.

The principle of "neutralization" is applied in the calculation of factor scores. Neutralization is meant to help remove biases between companies and securities of different classifications. In particular, the neutralization employed seeks to jointly mitigate biases by geographic (e.g. country, region) exposure and economic (e.g. sector, industry, property type) exposure.

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, 2016.

(See Appendix for definitions of terms)

Appendix: INDEX PUBLISHING AND CALCULATION
General Information for All Indices

Hartford Multifactor Low Volatility Index Tickers and ISINs

Index Name	Total Return		Price Return	
	Ticker	ISIN	Ticker	ISIN
Hartford Multifactor Low Volatility International Equity Index	LLVINX	DE000SLA2142	LLVINP	DE000SLA2159
Hartford Multifactor Low Volatility US Equity Index	LLVUSX	DE000SLA2167	LLVUSP	DE000SLA2175

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 Multifactor Low Volatility 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

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.

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 Float Market Capitalization – Free float 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.

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.

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)

Hartford Multifactor Low Volatility International Equity Index

Developed Markets

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

Emerging Markets

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

Hartford Multifactor Low Volatility US Equity Index

United States

Appendix: Index Notices

The index committee is responsible for all decisions regarding methodology and application of Hartford Multifactor Low Volatility Indices. As part of its mandate, the committee regularly reviews the tools and techniques employed by the team responsible for applying index methodology rules toward the calculation of security weights (i.e. achieving objectives stated in the methodology).

From time to time, the tools, program, and procedures employed in applying the index methodologies may be refined and enhanced.

Data Sources used in the development of Hartford Multifactor Low Volatility 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
Quandl

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*Hartford Funds refers to Hartford Funds Management Group, Inc., and its subsidiaries, including Hartford Funds Management Company, LLC (HFMC) and Hartford Funds Distributors, LLC, as well as Lattice Strategies LLC, a wholly owned subsidiary of HFMC.

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