S&P Dow Jones Indices
A Division of S&P Global

S&P/TSX Composite Single Factor Indices
Methodology

September 2019

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Introduction

Index Objective and Highlights

S&P/TSX Composite Enhanced Value Index. The index is designed to measure the performance of the highest ranked stocks in the S&P/TSX Composite based on their value score, which is calculated based on three fundamental measures: book value-to-price, earnings-to-price, and sales-to-price (see *Appendix A*). Constituents are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their value score, subject to security and sector constraints.

S&P/TSX Composite Low Volatility High Dividend Index. The index is designed to measure the performance of the 50 least volatile high yielding stocks within the S&P/TSX Composite. Volatility is defined as the standard deviation of the security's daily price returns in local currency over the past one year (see *Appendix B*). Constituents are weighted by dividend yield, subject to security and sector constraints.

S&P/TSX Composite Momentum Index. The index is designed to measure the performance of securities in the S&P/TSX Composite that exhibit the best realized performance (the 1st Quintile) during the specified measurement period. Constituents are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their momentum score, subject to security constraints.

S&P/TSX Composite Quality Index. The index is designed to measure high quality stocks in the S&P/TSX Composite on the basis of their quality score, which is calculated based on three fundamental measures, return on equity, accruals ratio and financial leverage ratio (see *Appendix D*). Constituents are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their quality score, subject to security, sector and country constraints.

S&P/TSX Composite Enhanced Value – Lowest Quintile Index. The index is designed to measure the performance of the 50 lowest ranked stocks in the S&P/TSX Composite based on their value score, which is calculated based on three fundamental measures: book value-to-price, earnings-to-price, and sales-to-price. Constituents are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their value score, subject to security and sector constraints.

S&P TSX Composite Volatility – Highest Quintile Index. The index is designed to measure the performance of the 50 most volatile stocks in the S&P/TSX Composite. Volatility is defined as the standard deviation of the security's daily price returns in local currency over the past year (see *Appendix B*). Constituents are weighted by volatility.

S&P/TSX Composite Momentum – Lowest Quintile Index. The index is designed to measure the performance of the stocks in the S&P/TSX Composite that exhibit the worst realized performance (the 5th Quintile) during the specified measurement period.

S&P/TSX Composite Quality – Lowest Quintile Index. The index is designed to measure the performance of the 50 lowest ranked stocks in the S&P /TSX Composite based on their quality score, which is calculated based on three fundamental measures: return on equity, accruals ratio, and financial leverage ratio. Constituents are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their quality score, subject to security, sector, and country constraints.

Partnership

The S&P/TSX indices are calculated and managed by S&P Dow Jones Indices. The TMX Group Inc. (TMX) is the owner and distributor of all S&P/TSX equity index data.

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' Equity Indices Policies & Practices Methodology	Equity Indices Policies & Practices
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices' Float Adjustment Methodology	Float Adjustment Methodology
S&P Dow Jones Indices' Global Industry Classification Standard (GICS) Methodology	GICS Methodology

This methodology was created by S&P Dow Jones Indices in agreement with the TMX Group Inc. (TMX) 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 and TMX so that the index continues to achieve its objective.

Eligibility Criteria

Universe

The indices are constructed from the constituents of the S&P/TSX Composite, the headline universe index and principal broad market measure for the Canadian equity market.

For more information on the S&P/TSX Composite, please refer to the S&P/TSX Canadian Indices Methodology, available at www.spdji.com.

Universe Selection

For a security to be eligible for consideration for the following indices, it must be an existing member of the S&P/TSX Composite, on the rebalancing reference date:

- S&P/TSX Composite Enhanced Value Index
- S&P/TSX Composite Low Volatility High Dividend Index
- S&P/TSX Composite Quality Index
- S&P/TSX Composite Enhanced Value – Lowest Quintile Index
- S&P TSX Composite Volatility – Highest Quintile Index
- S&P/TSX Composite Quality – Lowest Quintile Index

For a security to be eligible for consideration for the following indices, it must be an existing member of the S&P/TSX Composite, on the rebalancing effective date:

- S&P/TSX Composite Momentum Index
- S&P/TSX Composite Momentum – Lowest Quintile Index

Liquidity

For the following indices, each stock must have been issued and trading on all trading days in the 12 months leading up to the rebalancing reference date:

- S&P/TSX Composite Low Volatility High Dividend Index
- S&P/TSX Composite Volatility – Highest Quintile Index

For the following indices, each stock must have traded at least 150 trading days during the 12-month measurement period:

- S&P/TSX Composite Momentum Index
- S&P/TSX Composite Momentum – Lowest Quintile Index

The following indices do not have any additional liquidity criteria:

- S&P/TSX Composite Enhanced Value Index
- S&P/TSX Composite Quality Index
- S&P/TSX Composite Enhanced Value – Lowest Quintile Index
- S&P/TSX Composite Quality – Lowest Quintile Index

Multiple Share Classes

For the following indices, each company is represented once by the Designated Listing. For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

- S&P/TSX Composite Enhanced Value Index

- S&P/TSX Composite Low Volatility High Dividend Index

- S&P/TSX Composite Quality Index

- S&P/TSX Composite Quality – Lowest Quintile Index

- S&P/TSX Composite Enhanced Value – Lowest Quintile Index

For the following indices, all publicly listed multiple share class lines are eligible for index inclusion, subject to meeting the eligibility criteria. For more information regarding the treatment of multiple share classes, please refer to Approach A within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

- S&P/TSX Composite Momentum Index

- S&P/TSX Composite Momentum – Lowest Quintile Index

- S&P/TSX Composite Volatility – Highest Quintile Index

Index Construction

S&P/TSX Composite Enhanced Value Index

Constituent Selection. The top 50 securities in the eligible universe, based on value scores, are chosen. The value score of each stock is derived from its book value-to-price, earnings-to-price and sales-to-price ratios.

Please refer to Appendix A for value score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover and is implemented as follows:

1. Stocks are ranked based on value score and those ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their value score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their value score until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. For a given rebalancing date, all the securities eligible for inclusion in the Enhanced Value Index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their value score, subject to security and sector constraints. This is done using an optimization procedure such that the maximum weight of each security is the lower of 5% and 20 times its float-adjusted market capitalization weight in the eligible index universe, and the maximum weight of any given Global Industry Classification Standard (GICS) sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their value weights.

Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, and then the maximum weight of the sector.

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of June and December. The rebalancing reference date is the last business day of May and November, respectively. Weights calculated as a result of the reference date data are implemented in the indices using closing prices as of the Wednesday prior to the second Friday of June and December.

S&P/TSX Composite Low Volatility High Dividend Index

Constituent Selection. The selection of index constituents is done as follows:

1. All stocks in the selection universe are ranked in descending order by their 12-month trailing dividend yield, calculated as their dividends per share for the prior 12 months divided by the stock price as of the rebalancing reference date.

2. The top 75 stocks with the highest dividend yield are selected, with the number of stocks from each GICS sector capped at 10. If the number of stocks from a sector reaches 10, the remaining highest yielding stocks from other sectors are selected until the number of selected stock reaches 75.

3. Using available price return data for the trailing 252 trading days leading up to each index rebalancing reference date, the realized volatilities of the 75 selected highest yielding stocks are calculated. Realized volatility is defined as the standard deviation of the security's daily price returns over the prior 252 trading days.

4. The 75 selected highest yielding stocks are, then, ranked in ascending order by realized volatility. The top 50 securities with the lowest realized volatility form the index.

    Please refer to Appendix B for volatility calculation details.

Constituent Weightings. In order to achieve a relatively high index dividend yield, the index constituents are weighted by dividend yield. At each rebalancing, modifications are made to stock weights to ensure diversification across individual stocks and sectors. The weight for each index constituent is constrained between 0.05% and 3.0%, and the weight of each GICS Sector is capped at 25%.

Rebalancing. The indices are rebalanced semi-annually effective after the close of the last business day of January and July. The rebalancing reference dates are the last business day of December and June, respectively. Constituents' shares are calculated using closing prices five business days prior to the rebalancing date as the reference price. Index shares are calculated and assigned to each stock to arrive at the weights determined on the reference date.

S&P/TSX Composite Momentum Index

Constituent Selection. Securities are first ranked in descending order by momentum score into five quintiles. Securities with the highest scores (the 1st Quintile) are then selected for index inclusion. The number of stocks in the 1st Quintile is the "target stock count" of the index.

Please refer to Appendix C for momentum score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover and is implemented as follows:

1. Stocks are ranked based on momentum score and those ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their momentum score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their momentum score until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. For a given rebalancing date, all the securities eligible for inclusion in the index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their momentum score, subject to security constraints. The maximum weight of each security is the lower of 9% and three times its float-adjusted market capitalization weight in the eligible index universe.

Float Adjustment. Investable Weight Factors (IWFs), which define the available float for each stock, are reviewed annually. The float-adjusted shares are used in the calculation of each stock's momentum weight.

Please refer to the S&P Dow Jones' Float Adjustment Methodology for a detailed description of float adjustment and Investable Weight Factor (IWF).

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of March and September. The rebalancing reference date is the last business day of February and August, respectively. Weights calculated as a result of the reference date data are implemented in the index using closing prices as of the respective rebalancing reference date.

S&P/TSX Composite Quality Index

Constituent Selection. The top 50 securities in the eligible universe, based on quality scores, are chosen. The quality score of each stock is derived from its return-on-equity, accruals ratio and financial leverage ratio. The quality score of each stock is updated semi-annually at the June and December index rebalancings.

Please refer to Appendix D for quality score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover and is implemented as follows:

1. Stocks are ranked based on quality score and those ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their quality score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their quality score until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. For a given rebalancing date, all the securities eligible for inclusion in the Quality Index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their quality score, subject to security, sector and country constraints. This is done using an optimization procedure such that the maximum weight of each security is the lower of 5% and 20 times its float-adjusted market capitalization weight in the eligible index universe, and the maximum weight of any given GICS sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their quality weights.

Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, and then the maximum weight of the sector.

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of June and December. The rebalancing reference date is the last business day of May and November, respectively. Weights calculated as a result of the reference date data are implemented in the indices using closing prices as of the Wednesday prior to the second Friday of June and December.

S&P/TSX Composite Enhanced Value – Lowest Quintile Index

Constituent Selection. The bottom 50 securities in the eligible universe, based on value scores, are chosen. The value score of each stock is derived from its book value-to-price, earnings-to-price and sales-to-price ratios.

Please refer to Appendix A for value score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover. The stocks are ranked in ascending order by value score and the buffer rule is implemented as follows:

1. Stocks are ranked based on value score and those ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their value score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their value score until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. Adjusted value scores are calculated for all securities selected for index inclusion. First, each stock's initial Z-score (z_α) is multiplied by -1. Then, adjusted value scores are calculated as detailed in *Appendix A*.

Constituent Weightings. For a given rebalancing date, all the securities eligible for inclusion in the Enhanced Value Index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their adjusted value score, subject to security and sector constraints. This is done using an optimization procedure such that the maximum weight of each security is the lower of 5% and 20 times its float-adjusted market capitalization weight in the eligible index universe, and the maximum weight of any given GICS sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their value weights.

Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, and then the maximum weight of the sector.

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of June and December. The rebalancing reference date is the last business day of May and November, respectively. Weights calculated as a result of the reference date data are implemented in the indices using closing prices as of the Wednesday prior to the second Friday of June and December.

S&P/TSX Composite Volatility – Highest Quintile Index

Constituent Selection. The selection of index constituents is done as follows:

1. Using available price return data for the trailing one year of trading days leading up to each index rebalancing reference date, the volatilities of the constituents within the S&P/TSX Composite are calculated.

2. Constituents meeting the eligibility requirements as described in *Index Eligibility* are, then, ranked in descending order based on their realized volatilities. The 50 stocks with the greatest volatility are selected and form the index.

   Please refer to Appendix B for volatility calculation details.

Constituent Weightings. The methodology employs a non-market-cap-weighting scheme, using the divisor methodology used in all of S&P Dow Jones' equity indices. At each rebalancing, the weight, *w*, for each index constituent, *i*, is set proportional to its volatility.

Rebalancing. The index is rebalanced quarterly effective after the close on the third Friday of March, June, September and December. The rebalancing reference dates are the last business day of February, May, August and November, respectively. Constituents' shares are calculated using closing prices six business days prior to the rebalancing date as the reference price. Index shares are calculated and assigned to each stock to arrive at the weights determined on the reference date.

S&P/TSX Composite Momentum – Lowest Quintile Index

Constituent Selection. Securities are first ranked in descending order by momentum score into five quintiles. Securities with the lowest scores (the 5th Quintile) are then selected for index inclusion. The number of stocks in the 5th Quintile is the "target stock count" of the index.

Please refer to Appendix C for momentum score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover. The stocks are ranked in ascending order by momentum score and the buffer rule is implemented as follows:

1. Stocks ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their value score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their value score until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. Adjusted momentum scores are calculated for all securities selected for index inclusion. First, each stock's initial Z-score (z_α) is multiplied by -1. Then, adjusted momentum scores are calculated as detailed in *Appendix C.*

For a given rebalancing date, all the securities eligible for inclusion in the index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their adjusted momentum score, subject to security constraints. The maximum weight of each security is the lower of 9% and three times its float-adjusted market capitalization weight in the eligible index universe.

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of March and September. The rebalancing reference date is the last business day of February and August, respectively. Weights calculated as a result of the reference date data are implemented in the index using closing prices as of the respective rebalancing reference date.

S&P/TSX Composite Quality – Lowest Quintile Index

Constituent Selection. The bottom 50 securities in the eligible universe, based on value scores, are chosen. The value score of each stock is derived from its book value-to-price, earnings-to-price and sales-to-price ratios.

Please refer to Appendix D for quality score calculation details.

Buffer Rule. A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover. The stocks are ranked in ascending order by quality score and the buffer rule is implemented as follows:

1. Stocks ranked within the top 80% of the target stock count are automatically chosen for index inclusion.

2. All stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their value score.

3. If at this point the target stock count has not been met, the remaining stocks are chosen based on their value score, until the target stock count is reached.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to the index may not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings. Adjusted quality scores are calculated for all securities selected for index inclusion. First, each stock's initial Z-score (z_α) is multiplied by -1. Then, adjusted quality scores are calculated as detailed in *Appendix D*.

For a given rebalancing date, all the securities eligible for inclusion in the Quality Index are weighted by the product of their float-adjusted market capitalization in the eligible index universe and their adjusted quality score, subject to security and sector constraints. This is done using an optimization procedure such that the maximum weight of each security is the lower of 5% and 20 times its float-adjusted market capitalization weight in the eligible index universe, and the maximum weight of any given GICS sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their value weights.

Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, and then the maximum weight of the sector.

Rebalancing. The index is rebalanced semi-annually after the close on the third Friday of June and December. The rebalancing reference date is the last business day of May and November, respectively. Weights calculated as a result of the reference date data are implemented in the indices using closing prices as of the Wednesday prior to the second Friday of June and December.

Index Maintenance

Index Calculations

The indices are calculated by means of the divisor methodology used in all S&P Dow Jones Indices' equity indices.

For more information on index calculations, please refer to the Non-Market Capitalization Weighting section of S&P Dow Jones Indices' Index Mathematics Methodology.

Additions and Deletions

The majority of additions and deletions occur as part of the index rebalancings. Constituents removed from the headline universe index are removed from all other indices simultaneously.

Spin-Offs. For all the indices in this methodology, the spun-off company is added to the index at a zero price and will be dropped from the index after the first day of regular way trading provided the drop event has been announced at least two days prior to the drop date.

Initial Public Offerings (IPOs). IPO additions to the indices take place at the index rebalancings. To be considered eligible for index inclusion, an IPO must first be a constituent of the index universe.

Corporate Actions

Corporate Action	Adjustment Made to the Index	Divisor Adjustment?
Rights Offering	The price is adjusted to the Price of the Parent Company minus (the Price of the Rights Offering/Rights Ratio). Index shares change so that the company's weight remains the same as its weight before the rights offering.	No
Stock Split	Index shares are multiplied by and the price is divided by the split factor.	No
Share Issuance or Share Repurchase	None. Actual shares outstanding of the company play no role in the daily index calculation.	No
Special Dividends	The price of the stock making the special dividend payment is reduced by the per share special dividend amount after the close of trading on the day before the dividend ex-date.	Yes
Delisting, acquisition or any other corporate action resulting in the deletion of the stock from the index universe.	The stock is dropped from the index. This causes the weights of the rest of the stocks in the index to change proportionately. Additions are made to the index only at the time of the index rebalancings.	Yes

For more information, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Other Adjustments

In cases where there is no achievable market price for a stock being deleted, it can be removed at a zero or minimal price at the Index Committee's discretion, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.

Currency of Calculation and Additional Index Return Series

The indices are calculated in Canadian dollars.

Real-time spot Forex rates, as supplied by Reuters, are used for ongoing real-time index calculation.

WM/Reuters foreign exchange rates are taken daily at 04:00 PM London time and used in the calculation of the index. These mid-market fixings are calculated by the WM Company based on Reuters' data and appear on Reuters pages WMRA.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to: currency, currency hedged, decrement, fair value, inverse, leveraged, and risk control versions. For a list of available indices, please refer to *S&P DJI's All Indices by Methodology Report*.

For information on the index calculation, please refer to S&P Dow Jones Indices' 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/TSX Composite Enhanced Value Index	08/21/2017	06/21/2002	06/21/2002	100
S&P/TSX Composite Low Volatility High Dividend Index	08/21/2017	01/31/2002	01/31/2002	100
S&P/TSX Composite Momentum Index	08/21/2017	03/15/2002	03/15/2002	100
S&P/TSX Composite Quality Index	08/21/2017	06/21/2002	06/21/2002	100
S&P/TSX Composite Enhanced Value - Lowest Quintile Index	08/21/2017	06/21/2002	06/21/2002	100
S&P/TSX Composite Volatility – Highest Quintile Index	08/21/2017	03/15/2002	03/15/2002	100
S&P/TSX Composite Momentum - Lowest Quintile Index	08/21/2017	03/15/2002	03/15/2002	100
S&P/TSX Composite Quality - Lowest Quintile Index	08/21/2017	06/21/2002	06/21/2002	100

Index Data

Calculation Return Types

S&P Dow Jones Indices calculates multiple return types which vary based on the treatment of regular cash dividends. The classification of regular cash dividends is determined by S&P Dow Jones Indices.

- Price Return (PR) versions are calculated without adjustments for regular cash dividends.

- Gross Total Return (TR) versions reinvest regular cash dividends at the close on the ex-date without consideration for withholding taxes.

- Net Total Return (NTR) versions, if available, reinvest regular cash dividends at the close on the ex-date after the deduction of applicable withholding taxes.

In the event there are no regular cash dividends on the ex-date, the daily performance of all three indices will be identical.

For a complete list of indices available, please refer to the daily index levels file ("SDL").

For more information on the classification of regular versus special cash dividends as well as the tax rates used in the calculation of net return, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

For more information on the calculation of return types, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

Index Governance

Index Committee

The S&P/TSX Canadian indices are maintained by the S&P/TSX Canadian Index Committee. The Index Committee is comprised of four members representing S&P Dow Jones Indices and three members representing the Toronto Stock Exchange ("TSX"). The Index Committee is chaired by a member designated by S&P Dow Jones Indices. Meetings are held monthly, and from time to time, as needed.

The Index Committee is responsible for setting rules and policies for the S&P/TSX Indices, determining the composition of the Indices and administering the methodology. In fulfilling its responsibilities, the Index Committee has full and complete discretion to amend, apply or exempt the application of the methodology and other index policies as circumstances may require, and add, remove or by-pass any security in determining the composition of any of the indices.

The Index Committee may rely on any information or documentation submitted to or gathered by it that the Index Committee believes to be accurate. Where a public document used by the Index Committee is available in both official languages, the Index Committee shall assume that the contents of both versions are identical. The Index Committee reserves the right to reinterpret publicly available information and to make changes to the index based on a new interpretation of that information at its sole and absolute discretion.

Index corrections and changes to index composition are implemented at such time and in such manner, as the Index Committee deems appropriate. The timing of any index change made in response to a correction shall be at the sole and absolute discretion of the Index Committee.

Stock prices, VWAPs, and prices used to calculate QMV shall be prices determined by trading on the TSX. Canadian and U.S. trading volume is determined using the composite volume. Canadian trading volume includes trading on the TSX, Aequitas (Lit and Neo), Alpha, CSE (Pure Trading), Instinet Canada, Liquidnet Canada, Lynx, Nasdaq CXC, Nasdaq CXD, Nasdaq CX2, Omega and TriAct Match Now. U.S. volume will include trading volume on OTC markets only if the company is dual-listed on a U.S. exchange.

S&P Dow Jones Indices considers information about changes to its Canadian indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

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' Equity Indices Policies & Practices Methodology.

Index Policy

Announcements

Whenever possible, announcements of additions or deletions of stocks or other index adjustments are made five trading days before the adjustments are implemented. In those cases when it is not possible to trade a stock five days after an announcement, the announcement period may be shortened. However, the implementation of an index adjustment is never earlier than the market close of the day following the announcement.

In addition, TMX Datalinx offers a fee-based subscription to Index Notices. The Index Notices provide the most detailed and comprehensive coverage of index changes. Complete data for index replication (including share counts, tickers and data on index levels and returns) are also available through TMX Datalinx. In order to subscribe, contact TMX Datalinx by phone at +1.416.947.4778 or by email at marketdata@tmx.com.

Holiday Schedule

The S&P/TSX Factor indices are calculated when the Canadian equity market is open.

A complete holiday schedule for the year is available on the TMX Web site at www.tmx.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.

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Recalculation Policy

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Real-Time Calculation

Real-time, intra-day, index calculations are executed for certain indices whenever any of their primary exchanges are open. Real-time indices are not restated.

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

Contact Information

For any questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

The TMX Group (TMX) serves as the distributor of both real-time and historical index data. In addition, index levels are available on S&P Dow Jones Indices' Web site at *www.spdji.com,* through major quote vendors (see codes below), through numerous investment oriented Web sites and various print and electronic media.

Tickers

The table below lists headline indices covered by this document. All versions of the below indices that may exist are also covered by this document. Please refer to *S&P DJI's All Indices by Methodology Report* for a complete list of indices covered by this document.

Index (Currency)	Return Type	Bloomberg	Reuters
S&P/TSX Composite Enhanced Value Index	Price Return Total Return Net Total Return	TXEV TXEVT TXEVN	T.XEV-T TR.EVT-T TR.EVN-T
S&P/TSX Composite Low Volatility High Dividend Index	Price Return Total Return Net Total Return	TXLVHD TXLVHDT TXLVHDN	T.VHD-T TR.HDT-T TR.HDN-T
S&P/TSX Composite Momentum Index	Price Return Total Return Net Total Return	TXMM TXMMT TXMMN	T.XMM-T TR.MMT-T TR.MMN-T
S&P/TSX Composite Quality Index	Price Return Total Return Net Total Return	TXQY TXQYT TXQYN	T.XQQ-T TR.XQT-T TR.XQN-T
S&P/TSX Composite Enhanced Value - Lowest Quintile Index	Price Return Total Return Net Total Return	TXEVLQ TXEVLQT TXEVLQN	T.VLQ-T TR.VQT-T TR.VQN-T
S&P/TSX Composite Volatility – Highest Quintile Index	Price Return Total Return Net Total Return	TXVHQ TXVHQT TXVHQN	T.VHQ-T TR.HQT-T TR.HQN-T
S&P/TSX Composite Momentum - Lowest Quintile Index	Price Return Total Return Net Total Return	TXMLQ TXMLQT TXMLQN	T.MLQ-T TR.MQT-T TR.MQN-T
S&P/TSX Composite Quality - Lowest Quintile Index	Price Return Total Return Net Total Return	TXQLQ TXQLQT TXQLQN	T.QLQ-T TR.LQT-T TR.LQN-T

Index Data

Daily constituent and index level data is available from the Toronto Stock Exchange on subscription. Please contact Market Data at 416-947-4778 or, by email, at marketdata@tmx.com.

For further information, please refer to the TMX Web site at www.tmx.com.

Web Site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spdji.com.

Appendix A – Value Score

Fundamental Ratios Calculation

The first step to determine the overall value score is to calculate, as of the rebalancing reference date, the three fundamental ratios below for each security in the index universe. They are defined as follows:

- **Book Value-to-Price Ratio.** This is calculated as a company's latest book value per share divided by its price:

$$\text{Book Value-to-Price} = \frac{BVPS}{P}$$

- **Earnings-to-Price Ratio.** This is calculated as a company's trailing 12-month earnings per share divided by its price:

$$\text{Earnings-to-Price} = \frac{EPS}{P}$$

- **Sales-to-Price Ratio.** This is calculated as a company's trailing 12-month sales per share divided by its price:

$$\text{Sales-to-Price} = \frac{SPS}{P}$$

Outlier Handling and Winsorization. Outlier fundamental ratios are winsorized to ensure that the average values used to calculate the overall value score are less distorted by extreme values. For a given fundamental variable, the values for all securities are first ranked in ascending order. Then, for securities that lie above the 97.5 percentile rank or below the 2.5 percentile rank, their value is set as equal to the value of the 97.5 percentile ranked or the 2.5 percentile ranked security, whichever is applicable.

Z-score & Value Score Computation

Z-score Computation. Computing a z-score is a widely adopted method of standardizing a variable in order to combine it with other variables that may have a different scale or unit of measurement. After winsorizing all the three fundamental ratios, the z-score for each of the three ratios for each security is calculated using the mean and standard deviation of the relevant variable within the index universe.

The z-score is calculated as follows:

$$z_\alpha = \frac{(x_\alpha - \mu_\alpha)}{\sigma_\alpha}$$

where:

z_α = Z-score for a given security

x_α = Winsorized variable for a given security

μ_α = Arithmetic mean of the winsorized variable in the index universe, excluding any missing values

σ_α = Standard deviation of the winsorized variable in the index universe

Average Z-score Computation. For each security, the average z-score is computed by taking a simple average of the three scores. Where there is a missing value, the average z-score is computed by taking a simple average of the remaining two scores. A security must have at least one z-score for it to be included in the index.

Outlier Handling and Winsorization. Outlier average z-scores are winsorized to ensure that the average values used to calculate the overall value score are less distorted by extreme values. To do this, for a given average z-score, the values for all securities are first ranked in ascending order. Then, for securities that lie above 4 or below -4, their value is set as equal to 4 or -4, whichever is applicable.

Value Score Computation. Using the winsorized average z-scores for the three value factors, a value score is computed for each of the securities. For a given security, if its winsorized average z-score is above 0, then its value score will be the addition of 1 and the average z-score. On the other hand, if its winsorized average score is below 0, then its value score will be the result of the reciprocal of 1 subtracted by its average z-score.

If average Z > 0, Value Score = 1 + Z

If average Z < 0, Value Score = (1 / (1 – Z))

If average Z = 0, Value Score = 1

Appendix B – Volatility

Volatility Calculation

Volatility is defined as the standard deviation of the security's daily price returns in local currency over the prior one year of trading days. It can be mathematically expressed as:

$$\sqrt{\frac{\sum_{i=1}^{N}(X_i - \overline{X})^2}{N-1}}$$

where:

X_i = Price change = $\dfrac{P_t}{P_{t-1}} - 1$

P_t = Closing price of the stock on day t

P_{t-1} = Closing price of the stock on day $t-1$

t = 1 to N

$\overline{X}$ = Average price change

N = Number of trading days in a year based on local calendar

Appendix C – Momentum Score

Momentum Value Calculation

Momentum value is calculated for each of the securities in the index universe on each of the rebalancing reference dates. The momentum value is determined as follows:

1. The momentum value is computed as the 12-month price change, excluding the most recent month of the security in **local** currency. If 12 months of price history is not available, momentum value is calculated from nine months of price history. The effective rebalancing month is stated as month (*M*).

   a. Momentum Value $= \left(price_{M-2} \middle/ price_{M-14} \right) - 1$

   b. Or, Momentum Value $= \left(price_{M-2} \middle/ price_{M-11} \right) - 1$ if 12 months of price history is not available.

   NOTE 1: For example, if the effective rebalancing date is on 03/24/2014, the reference date is 02/28/2014, and the momentum value will be calculated based on the prices from 01/31/2014 ($price_{M-2}$) and 01/31/2013 ($price_{M-14}$).

   NOTE 2: If there is no price available on day *M*-2 or day *M*-14, the price from the day prior will be used. If there is no price available on any of the ten days prior, the momentum value will be calculated using formula (b) above. If the same condition exists for formula (b), the stock is excluded from the index.

   NOTE 3: For a stock to be included in the index, it must be trading for at least ten months prior to the rebalancing reference date.

2. The momentum value is further adjusted by the security's volatility to arrive at risk-adjusted momentum value.

   Risk-Adjusted Momentum Value $= \dfrac{MomentumValue_i}{\sigma_i}$

   where:

   σ = Standard deviation of daily price returns for the same date period used in Step 1 above.

Z-Score & Momentum Score Computation

Z-Score Computation. Computing a z-score is a widely adopted method of standardizing a variable. The z-score for risk-adjusted momentum value for each security is calculated using the mean and standard deviation of the relevant variable within the index universe.

The z-score is calculated as follows:

$$z_\alpha = \frac{(x_\alpha - \mu_\alpha)}{\sigma_\alpha}$$

where:

z_α =   Z-score for a given security

x_α =   Observed value for a given security

μ_α =   Arithmetic mean of the winsorized variable in the index universe, excluding any missing values

σ_α =   Standard deviation of the winsorized variable in the index universe

Winsorization reduces the impact of outliers on a data set by limiting them to a designated value or score. For the S&P Momentum Indices, the winsorized z-score of a security is capped at ± 3.

Momentum Score Computation. Using the winsorized z-scores, a momentum score is computed for each of the securities. For a given security, if its winsorized z-score is above 0, then its momentum score will be the addition of 1 and the z-score. On the other hand, if its winsorized z-score is below 0, then its momentum score will be the result of the reciprocal of 1 subtracted from its z-score.

If Z > 0, Momentum Score = 1 + Z

If Z < 0, Momentum Score = (1 / (1 – Z))

If Z = 0, Momentum Score = 1

Appendix D – Quality Score

Fundamental Ratios Calculation

The first step to determine the overall quality score is to calculate, as of the rebalancing reference date, the three fundamental ratios below for each security in the index universe. They are defined as follows:

- **Return on Equity (ROE).** This is calculated as a company's trailing 12-month earnings per share divided by its latest book value per share:

$$\text{ROE} = \frac{EPS}{BVPS}$$

- **Accruals Ratio.** This is computed using the change of a company's net operating assets over the last year divided by its average net operating assets over the last two years:

$$\text{Accruals Ratio} = \frac{(NOA_t - NOA_{t-1})}{((NOA_t + NOA_{t-1}))/2}$$

- **Financial Leverage Ratio.** This is calculated as a company's latest total debt divided by its book value.

$$\text{Leverage} = \frac{Total\ Debt}{(BVPS\ x\ Common\ Shares\ outstanding)}$$

Outlier Handling and Winsorization. Outlier fundamental ratios are winsorized to ensure that the average values used to calculate the overall quality score are less distorted by extreme values.

- **Return on Equity and Accruals Ratio.** For a given fundamental variable, the values for all securities are first ranked in ascending order. Then, for securities that lie above the 97.5 percentile rank or below the 2.5 percentile rank, their value is set as equal to the value of the 97.5 percentile ranked or the 2.5 percentile ranked security, whichever is applicable. If the underlying data points for a given stock's ROE are both negative, leading to a positive ROE, its ROE value will be excluded and the stock will be assigned an ROE Z-score set as equal to the ROE Z-score value of the 2.5 percentile ranked security.

- **Financial Leverage Ratio.** The values for all securities are first ranked in ascending order. Then, for securities that lie above the 97.5 percentile rank or below the 2.5 percentile rank, their value is set as equal to the value of the 97.5 percentile ranked or the 2.5 percentile ranked security, whichever is applicable. If the underlying data point for a given stock's BVPS is negative, leading to a negative Leverage, its Leverage value will be excluded and the stock will be assigned a Leverage Z-score set as equal to the Leverage Z-score value of the 2.5 percentile ranked security.

Z-score & Quality Score Computation

Z-score Computation. Computing a z-score is a widely adopted method of standardizing a variable in order to combine it with other variables that may have a different scale or unit of measurement. After winsorizing all the three fundamental ratios, the z-score for each of the three ratios for each security is calculated using the mean and standard deviation of the relevant variable within the index universe.

- **Return on Equity.** The z-score is calculated as follows:

$$z_\alpha = \frac{(x_\alpha - \mu_\alpha)}{\sigma_\alpha}$$

- **Accruals and Financial Leverage Ratios.** The z-score is calculated as follows:

$$z_\alpha = -\frac{(x_\alpha - \mu_\alpha)}{\sigma_\alpha}$$

where:

z_α = Z-score for a given security

x_α = Winsorized variable for a given security

μ_α = Arithmetic mean of the winsorized variable in the index universe, excluding any missing values

σ_α = Standard deviation of the winsorized variable in the index universe

Average Z-score Computation. For each security, the average z-score is computed by taking a simple average of the three scores. Where there is a missing value, the average z-score is computed by taking a simple average of the remaining two scores. A security must have at least one z-score for it to be included in the index.

Outlier Handling and Winsorization. Outlier average z-scores are winsorized to ensure that the overall quality scores are less distorted by extreme values. To do this, for a given average z-score, the values for all securities are first ranked in ascending order. Then, for securities that lie above 4 or below -4, their value is set as equal to 4 or -4, whichever is applicable.

Quality Score Computation. Using the winsorized average z-scores, a quality score is computed for each of the securities. For a given security, if its winsorized average z-score is above 0, then its quality score will be the addition of 1 and the average z-score. On the other hand, if its winsorized average score is below 0, then its quality score will be the result of the reciprocal of 1 subtracted by its average z-score.

If average Z > 0, Quality Score = 1 + Z

If average Z < 0, Quality Score = (1 / (1 – Z))

If average Z = 0, Quality Score = 1

Appendix E – Methodology Changes

Methodology Changes

Methodology changes since January 1, 2015 are as follows:

Change	Effective Date (After Close)	Methodology Previous	Updated
Trading Volume for Liquidity Calculation	31-Jul-18	Canadian trading volume includes trading volume at the TSX, Aequitas (Lit and Neo), Alpha, CSE (Pure Trading), Lynx, Nasdaq CXC, Nasdaq CX2 and Omega. U.S. trading volume is determined using the composite volume.	Canadian and U.S. trading volume is determined using the composite volume. Canadian trading volume includes trading on the TSX, Aequitas (Lit and Neo), Alpha, CSE (Pure Trading), Instinet Canada, Liquidnet Canada, Lynx, Nasdaq CXC, Nasdaq CXD, Nasdaq CX2, Omega and TriAct Match Now.

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