

**S&P Dow Jones  
Indices**

A Division of **S&P Global**

# **S&P/TSX Derivatives Indices *Methodology***

August 2024

# Table of Contents

Introduction	3
<b>Index Objective</b>	<b>3</b>
<b>Index Family</b>	<b>3</b>
<b>Supporting Documents</b>	<b>4</b>
Index Construction	5
<b>S&amp;P/TSX 60 VIX Index</b>	<b>5</b>
<b>S&amp;P/TSX 60 Delta Hedged Straddle Indices</b>	<b>10</b>
<b>S&amp;P/TSX 60 Covered Call Indices</b>	<b>13</b>
<b>S&amp;P/TSX 60 Put Write Indices</b>	<b>15</b>
<b>S&amp;P/TSX 60 Dynamic Option Income Indices</b>	<b>17</b>
<b>S&amp;P/TSX 60 Futures (CORRA) Index</b>	<b>22</b>
Option Analytics Calculations	23
Index Governance	24
<b>Index Committee</b>	<b>24</b>
Index Policy	25
<b>Announcements</b>	<b>25</b>
<b>Holiday Schedule</b>	<b>25</b>
<b>Unexpected Exchange Closures</b>	<b>25</b>
<b>Currency of Calculation and Additional Index Return Series</b>	<b>25</b>
<b>Recalculation Policy</b>	<b>25</b>
<b>Contact Information</b>	<b>25</b>
Index Dissemination	26
<b>Pricing</b>	<b>26</b>
<b>Index Data</b>	<b>26</b>
<b>Web site</b>	<b>26</b>
Appendix A	27
<b>Adjustment for Corporate Actions</b>	<b>27</b>
<b>Stock Split</b>	<b>27</b>
<b>Consolidation / Reverse Split</b>	<b>27</b>
<b>Special Dividends</b>	<b>27</b>
Appendix B	29
<b>Missing Option Prices</b>	<b>29</b>

Disclaimer	30
<b>Performance Disclosure/Back-Tested Data</b>	<b>30</b>
<b>Intellectual Property Notices/Disclaimer</b>	<b>31</b>
<b>ESG Indices Disclaimer</b>	<b>33</b>

# Introduction

## Index Objective

The S&P/TSX 60 Derivatives Indices measure either derived indicators or the performance of strategies on the derivatives of the S&P/TSX 60.

*For more information on the S&P/TSX 60, please refer to the S&P/TSX Canadian Indices Methodology, available at [www.spglobal.com/spdji](http://www.spglobal.com/spdji).*

## Index Family

**S&P/TSX 60 VIX Index.** The index measures market expectations of near-term volatility and represents the 30-day volatility implied by near-term and next-term call and put options of the Canadian stock market as represented by the iShares S&P/TSX 60 Index ETF (TSX: XIU), using options on the ETF.

**S&P/TSX 60 Delta Hedged Straddle Indices.** The indices measure the performance of a short exposure to three-month at-the-money (ATM) straddle on the iShares S&P/TSX 60 Index ETF (TSX: XIU) with designated Vega Exposure (VX) of index notional. The positions are delta hedged using S&P/TSX 60 index futures (MX: SXF) adjusted once the net delta exposure exceeds the Delta Hedging Threshold (DHT).

**S&P/TSX 60 Covered Call Indices.** The indices measure the performance of a strategy that writes covered calls on the iShares S&P/TSX 60 Index ETF (TSX: XIU).

**S&P/TSX 60 Put Write Indices.** The indices measure the performance of a short position in listed put options on the iShares S&P/TSX 60 Index ETF (TSX: XIU) covered by an equivalent notional index representation in Canadian Treasury bills.

**S&P/TSX 60 Dynamic Option Income Indices.** The indices measure the performance of a covered option writing strategy on the iShares S&P/TSX 60 Index ETF (XIU). The indices measure the performance of a strategy that switches between a covered call strategy and a put write strategy when the current option expires in the money.

**S&P/TSX 60 Futures (CORRA) Index.** The index measures the performance of front-month S&P/TSX 60 index futures (MX: SXF).

## 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' Index Mathematics Methodology	<a href="#">Index Mathematics Methodology</a>
S&P Dow Jones Indices' Options Indices Policies and Practices Methodology	<a href="#">Options Indices Policies &amp; Practices Methodology</a>
S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology	<a href="#">Commodities Indices Policies &amp; Practices</a>

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

TSX is a trademark of TSX, Inc. and has been licensed for use by S&P Dow Jones Indices.

VIX and Cboe are registered trademarks of Cboe Exchange, Inc. and have been licensed for use by S&P Dow Jones Indices.

# Index Construction

## S&P/TSX 60 VIX Index

**Deriving VIX from Near-term and Next-term Options.** The TSX VIX generally uses put and call options in the two nearest-term expiration months in order to bracket a 30-day calendar period.

However, within five (5) business days prior to expiration, the index rolls to the second and third contract months in order to minimize pricing anomalies that might occur close to options expiration. For each maturity, put and call options are used to calculate the implied volatility. The detailed calculation is described below.

S&P Dow Jones Indices (S&P DJI) interpolates the near-term implied volatility,  $\sigma_1$ , and the next-term implied volatility,  $\sigma_2$ , to arrive at a single value,  $\sigma$ , with a constant maturity of 30 days to expiration. The index is derived by taking  $\sigma$  (the square root of  $\sigma^2$ ) and multiplying by 100.

$$VIX = \sigma * 100$$
$$\sigma^2 = \frac{N_y}{N_m} \left\{ T_1 \sigma_1^2 \left[ \frac{N_{T_2} - N_m}{N_{T_2} - N_{T_1}} \right] + T_2 \sigma_2^2 \left[ \frac{N_m - N_{T_1}}{N_{T_2} - N_{T_1}} \right] \right\} \quad (1)$$

where:

$\sigma$  = 30-day implied volatility

$\sigma_1$  = Near-term implied volatility derived from the near-term options (see formula 2)

$\sigma_2$  = Next-term implied volatility derived from the next-term options (see formula 2)

$N_y$  = Number of days in one year

$N_m$  = Number of days in one month

$T_1$  = Time to expiration (in years) of the near-term options

$T_2$  = Time to expiration (in years) of the next-term options

$N_{T_1}$  = Number of days between the current day and the expiration date of the near-term options

$N_{T_2}$  = Number of days between the current day and the expiration date of the next-term options

The index is derived from the near-term and next-term options on the S&P/TSX 60 ETF. The CORRA (Canadian Overnight Repo Rate) and the 1-month, 2-month and 3-month Canadian Treasury Bill rates are used to interpolate the risk-free rates of each maturity.

The index calculates from 9:30AM EST to 4:05PM ET.

For more information on interest rates, please refer to <https://www.bankofcanada.ca/rates/interest-rates/money-market-yields/>.

In cases where the index cannot be calculated, the index will be flatlined with the last valid index value until the index can be properly calculated. Situations where the index cannot be calculated may include:

1. Unexpected Exchange Closure
2. Unavailability of the required call and/or put options that meet the selection criteria in either the near term or next term

3. Unavailability of pricing of required call and/or put options in either the near term or next term used in the calculations
4. Unavailability of the CORRA and Canadian Treasury Bill rates required to calculate the risk-free rate used in the calculations

During periods of extreme market conditions, there may be a reduction in the number of options meeting the selection criteria of the calculation, which may result in a narrow set of options being used to calculate the index. This may reduce the efficiency and reliability of the calculation as a measure of volatility and may increase the likelihood of events such as:

1. Extended flatlines
2. Large price movements

The movement of an underlying price past the available strike range of options can result in a forward level that is significantly above or below the current market price. This could lead to large changes in the S&P/TSX 60 VIX Index's levels when new strikes are listed.

**General Formula to Calculate Implied Volatilities.** For the near-term and next-term, respectively, implied volatilities are calculated using the selected put and call options. The general formula is:

$$\sigma^2 = \frac{2}{T} \sum_i \frac{\Delta K_i}{K_i^2} e^{RT} Q(K_i) - \frac{1}{T} \left[ \frac{F}{K_0} - 1 \right]^2 \quad (2)$$

where:

- $\sigma$  = Implied volatility
- $T$  = Time to expiration (see formula 4)
- $F$  = Forward index level (see formula 7)
- $K_i$  = Strike price of the  $i^{th}$  out-of-the-money option
- $\Delta K_i$  = Interval between strike prices (see formula 3)
- $K_0$  = At-the-money strike
- $R$  = Risk-free interest rate to expiration (see formula 5)
- $Q(K_i)$  = Mid-price of each selected option with strike  $K_i$ ; Use the average mid-price of the put and call options if  $K_i=K_0$

Generally,  $\Delta K_i$  is half the distance between the strike on either side of  $K_i$  and is calculated as

$$\Delta K_i = \frac{K_{i+1} - K_{i-1}}{2} \quad (3)$$

At the upper and lower edges of any given strip of options,  $\Delta K_i$  is simply the difference between  $K_i$  and the adjacent strike price.

**Calculating Time to Maturity.** The time to maturity ( $T$ ) is measured in years. It consists of three parts:

- $N_1$  = Fractional number of days remaining until midnight of the current day
- $N_2$  = Number of days between the current day and the settlement day
- $N_3$  = Fractional number of days from midnight of the day prior to expiry to the settlement time on the expiry date

$$\begin{aligned}
N_1 &= \frac{\text{minutes remaining until midnight of the current day}}{24 * 60} \\
N_3 &= \frac{\text{minutes from midnight to settlement time on expiry}}{24 * 60} \\
N_T &= N_1 + N_2 + N_3 \\
T &= \frac{N_T}{N_y}
\end{aligned} \tag{4}$$

where:

$N_y$  = Number of days in one year

$N_T$  = Number of days until option expiration

Calendar days are used in all day count calculations.

**Interpolating Risk-Free Rates.** S&P DJI uses the CORRA ( $R_{on}$ ), 1-month Canadian Treasury Bill rate ( $R_{1m}$ ), and 2-month Treasury Bill rate ( $R_{2m}$ ) to interpolate the risk-free rates used in the near-term ( $R_1$ ) and next-term ( $R_2$ ).

$$\begin{aligned}
R_1 &= \frac{N_y}{N_{T_1}} \left\{ T_{on} R_{on} \left[ \frac{N_{1m} - N_{T_1}}{N_{1m} - N_{on}} \right] + T_{1m} R_{1m} \left[ \frac{N_{T_1} - N_{on}}{N_{1m} - N_{on}} \right] \right\} \\
R_2 &= \frac{N_y}{N_{T_2}} \left\{ T_{1m} R_{1m} \left[ \frac{N_{2m} - N_{T_2}}{N_{2m} - N_{1m}} \right] + T_{2m} R_{2m} \left[ \frac{N_{T_2} - N_{1m}}{N_{2m} - N_{1m}} \right] \right\}
\end{aligned} \tag{5}$$

where:

$R_1$  = Near-term risk-free rate

$R_2$  = Next-term risk-free rate

$R_{on}$  = CORRA rate

$R_{1m}$  = 1-month Canadian Treasury Bill rate

$R_{2m}$  = 2-month Canadian Treasury Bill rate

$N_{on}$  = Number of days remaining until the midnight of the next business day

$N_{1m}$  = 30 days, as the index uses a one-month Canadian Treasury Bill rate in the interpolation

$N_{2m}$  = 60 days, as the index uses a two-month Canadian Treasury Bill rate in the interpolation

$N_{T_1}$  = Number of days between the current day and the expiration date of the near-term options

$N_{T_2}$  = Number of days between the current day and the expiration date of the next-term options

$N_y$  = Number of days in one year

$$\begin{aligned}
T_{on} &= \frac{N_{on}}{N_y} \\
T_{1m} &= \frac{N_{1m}}{N_y} \\
T_{2m} &= \frac{N_{2m}}{N_y}
\end{aligned} \tag{6}$$

Note that the interpolation works when the near-term and next-term expirations are bracketed by the overnight and 1-month, and the 1-month and 2-month maturities of interest rates, respectively. When the option expirations fall outside of the corresponding interest rate expirations, which will most likely happen

during the roll period, S&P DJI needs to pick the correct interest rates. For example, if the near-term expiration is between one and two months, S&P DJI uses the 1-month and 2-month Canadian Treasury Bill rates to interpolate the near-term risk-free rate,  $R_1$ ; if the next-term expiration is between two and three months, S&P DJI uses 2-month and 3-month Canadian Treasury Bill rates to interpolate the next-term risk-free rate,  $R_2$ .

**Forward Index Level.** For both near-term and next-term, the formula used to calculate the forward index level is:

$$F = K + e^{RT} * (C_K - P_K) \quad (7)$$

where:

$F$  = Forward index level

$K$  = The strike price at which the absolute difference between the mid-price of the call and the put options is the smallest

$T$  = Time to expiration (see formula 4)

$R$  = Risk-free interest rate to expiration (see formula 5)

$C_K$  = Mid-price of calls at strike  $K$

$P_K$  = Mid-price of puts at strike  $K$

**Option Selection Methodology.** To select the options in the volatility calculation for both near-term and next-term:

- Sort all the options in ascending order by strike prices
- Determine at-the-money strike  $K_0$ . It is the strike nearest to the forward index level  $F$ .
- Both put and call options at strike  $K_0$  are selected
- Out-of-the-money call options with strike prices higher than  $K_0$  are selected. Start with the call option with a strike price immediately higher than  $K_0$  and move to successively higher strike prices. After encountering two consecutive calls with bid prices of zero, no calls with higher strikes are considered.
- Out-of-the-money put options with strike prices lower than  $K_0$  are selected. Start with the put option with a strike price immediately lower than  $K_0$  and move to successively lower strike prices. After encountering two consecutive puts with bid prices of zero, no puts with lower strikes are considered.
- Options without a bid price or an ask price or both will be excluded from the calculation

Additionally, all options are eligible where:

- $0 < \text{bid price} \leq \text{ask price}$  (for all options); and
- bid price and ask price of selected call options  $\leq$  bid price and ask price of the call option at  $K_0$  respectively; and
- bid price and ask price of selected put options  $\leq$  bid price and ask price of the put option at  $K_0$  respectively.

**Contract Rebalancing.** Options roll on the fifth (5) business day prior to the expiration of the near-term options when the Montreal Exchange is open, excluding weekends and holidays.

**Corporate Actions.** Due to the underlying asset of the options being an ETF, occasionally, corporate actions such as splits, reverse splits, special dividends, and share issuances may occur. These actions have no effect on the calculation of the index due to its unique structure of only considering current options today, without considering yesterday's value.

*For more information on corporate actions, please refer to Appendix A.*

## S&P/TSX 60 Delta Hedged Straddle Indices

The indices measure the performance of a short exposure in ATM calls and puts with designated Vega Exposure (VX) of index notional. The positions are delta hedged using futures and the futures position is adjusted once the net delta exposure exceeds the Delta Hedging Threshold (DHT).

### Parameters

Index	VX	DHT
S&P/TSX 60 Delta Hedged Straddle Index (0.5 Vega)	0.5%	0.15
S&P/TSX 60 Delta Hedged Straddle Index (1.0 Vega)	1%	0.15

### Index Calculation

On any business day  $t$ , the index value is calculated as the net of the straddle and the futures.

#### If $t$ is not a Roll Day

$$I_t = \max(0, I_{t-1} + (-N_{t-1} * (C_t - C_{t-1})) * SIZE_{opt,t} + (-N_{t-1} * (P_t - P_{t-1})) * SIZE_{opt,t} + F_{(t-1)} * (SXF_{fut,t} - SXF_{fut,t-1}) * SIZE_{fut,t}) \quad (1a)$$

where:

$I_t$  = The index level on  $t$

$N_{t-1}$  = The number of options on the iShares S&P/TSX 60 ETF, adjusted for corporate actions, on  $t-1$

$C_t$  = The call mid-price, adjusted for corporate actions, on  $t$

$P_t$  = The put mid-price, adjusted for corporate actions, on  $t$

$F_{t-1}$  = The number of S&P/TSX 60 futures on  $t-1$

$SXF_{fut,t}$  = The S&P/TSX 60 futures level on  $t$

$SIZE_{opt,t}$  = Option contract size on the iShares S&P/TSX 60 ETF at the end of the current business day, adjusted for corporate actions

$SIZE_{fut,t}$  = Futures contract size at the end of the current business day

*For information on how missing option prices are handled, please refer to Appendix B.*

The number of option contracts, adjusted for corporate actions, remains the same.

$$N_t = N_{t-1} \quad (2a)$$

The number of futures contracts remains the same unless the Dollar Delta of the positions exceeded the threshold on  $t-1$ .

$$\text{If } \text{abs}\left(\frac{\$Delta_{t-1}}{I_{t-1}}\right) > DHT \text{ then}$$

$$F_t = \frac{-\$Delta_{t-1}}{SIZE_{fut,t-1} * SXF_{fut,t-1}} + F_{t-1} \quad (3a)$$

otherwise:

$$F_t = F_{t-1}$$

where:

$$F_t = \text{The number of futures on } t$$

$\$Delta_{t-1}$  = The dollar delta  
 $SXF_{fut_{t-1}}$  = The S&P/TSX 60 futures price on  $t-1$   
 $F_{t-1}$  = The number of futures on  $t-1$

The Dollar Delta is the net delta exposure of the options and futures in U.S. dollars, and is calculated as:

$$\$Delta_t = -N_t * XIU_t * (\Delta_{C_t} + \Delta_{P_t}) * SIZE_{opt,t} + F_t * SXF_{fut_t} * SIZE_{fut,t} \quad (4a)$$

where:

$t$  = Current day  
 $N_t$  = The number of iShares S&P/TSX 60 ETF option contracts  
 $\Delta_C$  = The delta of the call position  
 $\Delta_P$  = The delta of the put position  
 $XIU_t$  = The S&P/TSX 60 ETF level on  $t$   
 $SIZE_{opt,t}$  = The S&P/TSX 60 ETF option multiplier  
 $F_t$  = The number of futures on  $t$   
 $SXF_{fut_t}$  = The S&P/TSX 60 futures price on  $t$

If  $t$  is a Roll Day

$$\begin{aligned}
 I_t = & I_{t-1} + \left(-N_{t-1} * (C_{t,ask}^{old} - C_{t-1}^{old})\right) * SIZE_{opt,t-1} + \left(-N_{t-1} * (P_{t,ask}^{old} - P_{t-1}^{old})\right) * SIZE_{opt,t-1} \\
 & + \left(-N_t * (C_t^{new} - C_{t,bid}^{new})\right) * SIZE_{opt,t} + \left(-N_t * (P_t^{new} - P_{t,bid}^{new})\right) * SIZE_{opt,t} \\
 & + F_{(t-1)} * (SXF_{fut_t}^{old} - SXF_{fut_{t-1}}) * SIZE_{fut,t-1}
 \end{aligned} \quad (1b)$$

where:

$I_t$  = The index level on  $t$   
 $N_{t-1}$  = The number of old iShares S&P/TSX 60 ETF options on  $t-1$   
 $C_{t,ask}^{old}$  = The old call ask price on  $t$   
 $C_{t-1}^{old}$  = The old call mid-price on  $t-1$   
 $P_{t,ask}^{old}$  = The old put ask price on  $t$   
 $P_{t-1}^{old}$  = The old put mid-price on  $t-1$   
 $N_t$  = The number of new iShares S&P/TSX 60 ETF options on  $t$ , calculated as (2b)  
 $C_{t,bid}^{new}$  = The new call bid price on  $t$   
 $C_t^{new}$  = The new call mid-price on  $t$   
 $P_{t,bid}^{new}$  = The new put bid price on  $t$   
 $P_t^{new}$  = The new put mid-price on  $t$   
 $F_{t-1}$  = The number of S&P/TSX 60 futures on  $t-1$   
 $SXF_{fut_t}$  = The S&P/TSX 60 futures level on  $t$

On the rebalancing day, number of new options is calculated as:

$$N_t = \left( \frac{I_{t-1} * VX}{SIZE_{opt,t-1} * (Vega_{C_{t-1}} + Vega_{P_{t-1}})} \right) \quad (2b)$$

where:

- $t$  = Rebalancing date
- $N_t$  = The new number of S&P/TSX 60 ETF calls and puts (each)
- $I_{t-1}$  = The index level at time  $t-1$
- VX = The Vega weighting factor
- $Vega_{C_{t-1}}$  = The Vega of the new call option on  $t-1$
- $Vega_{P_{t-1}}$  = The Vega of the new put option on  $t-1$

Number of futures is set to zero on rebalancing day.

$$F_t = 0 \tag{3b}$$

### Total Return Calculation

A total return version of each index is calculated, which includes interest accrual on the notional value of the index based on the overnight CORRA rate, as follows:

$$TRIV_t = TRIV_{rb} * EReturn_t + TRIV_{rb} * \prod_{rb+1}^t 1 + \left( \frac{CORRA_{t-1} * D_{t-1,t}}{365} \right)$$

where:

- $TRIV_t$  = Total return index value as of the current date,  $t$ .
- $TRIV_{rb}$  = Total return index value as of the last rebalancing date,  $rb$ .
- $EReturn_t$  = Excess Return from the prior rebalancing date to  $t$ ,
- $D_{t-1,t}$  = Count of calendar days from the previous trading date,  $t-1$ , to the current date,  $t$ .
- $CORRA_{t-1}$  = CORRA Overnight Rate as of the last trading date,  $t-1$

*For more information on the index calculation methodology, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.*

*For information on corporate actions, please refer to Appendix A.*

### Strike Selection

On the selection day, which is the index business day prior to the rebalancing date, the nearest at the money strike for both calls and puts are selected based on the S&P/TSX 60 ETF closing level on that date. The higher strike is selected if the spot is equidistant from both strikes.

### Rebalancing

The index rebalances quarterly. Options and Futures roll on the Wednesday of the week prior to the option expiry date (the third Friday of the month). If that date is a holiday, the options and futures roll on the subsequent business day.

### Base Date

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 60 Delta Hedged Straddle 0.5% Vega Index (CAD) ER	4/26/2021	3/11/2009	3/10/2009	100
S&P/TSX 60 Delta Hedged Straddle 1% Vega Index (CAD) ER	4/26/2021	3/11/2009	3/10/2009	100

## S&P/TSX 60 Covered Call Indices

The short exposure to the call option is initiated on the third Friday of each month (a "Roll Day"), or the third Friday of the last month of the quarter and held to maturity. The call option that is immediately above the target strike level is selected and a short exposure to this is added to the index. The long equity component and the short call option component are held in roughly equal notional amounts. The strike and number of option contracts are determined on the business day immediately preceding the roll day. In the case that the third Friday is a holiday, the roll day occurs on the prior business day. Once the strike price is identified, the new call option is added at the last bid price of the roll day. The value of the option premium at the time the new call option is sold is then compounded using the overnight CORRA rate, and the index reinvests the accrued value on the following Roll Day.

### Roll Schedule & Parameters

- **S&P/TSX 60 2% OTM Monthly Covered Call Index.** The index rolls monthly on the expiration date of the call contract.
- **S&P/TSX 60 2% OTM Quarterly Covered Call Index.** The index rolls quarterly in the months of March, June, September, and December.

Index	Rebalancing Frequency	Target Option Moneyness	Moneyness Multiplier (m)
S&P/TSX 60 Covered Call 2% OTM Monthly Index (CAD) TR	Monthly	2% OTM	1.02
S&P/TSX 60 Covered Call 2% OTM Quarterly Index (CAD) TR	Quarterly	2% OTM	1.02

### Index Calculations

On any business day  $t$ , the index is calculated as follows and is floored at zero:

$$Index_t = \text{Max}(0, Equity_t - Call_t + Cash_t) \quad (1)$$

where:

$Equity_t$  = Notional investment in the iShares S&P/TSX 60 Index ETF, as defined in (2a) and (2b)

$Call_t$  = Value of the short call exposure, as defined in (3a) and (3b)

$Cash_t$  = Value of option premium accrued at the USD CORRA overnight rate and is distributed on the next roll day, as defined in (4a) and (4b)

*For information on how missing option prices are handled, please refer to Appendix B.*

#### If $t$ is not a Roll Day

The value of the equity, short call and accrued option premium are calculated as follows:

$$Equity_t = Equity_{t-1} * \frac{XIU_t + Div_t}{XIU_{t-1}} \quad (2a)$$

$$Call_t = N_t * Mid_t * SIZE_t \quad (3a)$$

$$Cash_t = Cash_{t-1} * (1 + \frac{ACT_t}{365} * CORRA_{t-1}) \quad (4a)$$

where:

$XIU_t$  = The iShares S&P/TSX 60 Index ETF closing price, adjusted for corporate actions, as of day  $t$

$Div_t$  = The iShares S&P/TSX 60 Index ETF dividend paid on day  $t$

- $N_t$  = Number of the short call option contracts at the end of the current business day, adjusted for corporate actions, as defined in (5a) and (5b)
- $SIZE_t$  = Option contract size at the end of the current business day, adjusted for corporate actions
- $Mid_t$  = Mid price of the short call option, adjusted for corporate actions, at the end of the business day  $t$
- $Mid_t$  =  $(Bid_t + Ask_t) / 2$
- $CORRA_{t-1}$  = The CORRA overnight rate as of the immediately preceding business day prior to  $t$
- $ACT_t$  = Number of calendar days between  $t-1$  and  $t$

The number ( $N_t$ ) and the strike ( $K_t$ ) of the short call remain the same, after being adjusted for corporate actions.

$$N_t = N_{t-1} \quad (5a)$$

$$K_t = K_{t-1} \quad (6a)$$

If  $t$  is a Roll Day:

The value of the equity, short call and accrued option premium are calculated as follows:

$$Equity_t = Equity_{t-1} * \frac{XIU_t + Div_t}{XIU_{t-1}} - N_{t-1} * \max(0, XIU_t - K_{t-1}) * SIZE_{t-1} + R_t \quad (2b)$$

$$Call_t = N_t * Mid_t * SIZE_t \quad (3b)$$

$$Cash_t = Cash_{t-1} * \left(1 + \frac{ACT_t}{365} * CORRA_{t-1}\right) + N_t * Bid_t * SIZE_t - R_t \quad (4b)$$

The number of new call options is determined by the index value and the iShares S&P/TSX 60 ETF closing on  $t-1$ :

$$N_t = \frac{Index_{t-1} - Cash_{t-1} + R_t}{XIU_{t-1} * SIZE_t} \quad (5b)$$

The strike of the new call option ( $K_t$ ) is the one that is equal to or immediately above the target strike:

$$K_t = \min(K \mid K \geq m * XIU_{t-1}) \quad (6b)$$

where:

$m$  = moneyness multiplier of the call option (see table in the Introduction)

The reinvestment amount is calculated as below:

$$R_t = \begin{cases} Cash_{t-1} * \left(1 + \frac{ACT_t}{365} * CORRA_{t-1}\right) & \text{if } t \text{ is a Roll Day} \\ 0 & \text{otherwise} \end{cases} \quad (8)$$

If a Roll Day occurs on a market holiday, the Roll Day will be changed to be one day prior and the process will otherwise be executed in the same way.

*For information on corporate actions, please refer to Appendix A.*

## S&P/TSX 60 Put Write Indices

A short exposure to a put option is initiated on the roll day (third Friday of the month or third Friday of the last month of the quarter). The option's strike is determined by the option moneyness and the underlying price (formula 6d). The number of options is set so that the cash balance covers the maximum potential loss of the put options (formula 5d). The value of the option is the mid-price of the day. Proceeds from the sale of the option, calculated at the last bid price of the roll day, are held as cash earning Canadian treasury bill rates. The put options are held to the next roll day, when the put option expires. Any losses from the expiring put will be financed by cash.

### Roll Schedule & Parameters.

- S&P/TSX 60 ATM Monthly Put Write Index rolls monthly on the expiration date of the call contract.
- S&P/TSX 60 ATM Quarterly Put Write Index rolls quarterly in the months of March, June, September, and December.

Index	Rebalancing Frequency	Target Option Moneyness	Moneyness Multiplier (m)	Treasury Bills
S&P/TSX 60 Put-Write ATM Monthly Index (CAD) TR	Monthly	ATM	100%	1M Canadian Treasury Bills
S&P/TSX 60 Put-Write ATM Quarterly Index (CAD) TR	Quarterly	ATM	100%	3M Canadian Treasury Bills

### Index Calculations

On any business day  $t$ , the index is calculated as follows and is floored at zero:

$$Index_t = \text{Max}(0, M_t - \text{Put}_t) \quad (1)$$

where:

$M_t$  = Canadian Treasury bill balance, as defined in (2a) and (2b)

$\text{Put}_t$  = Value of the short put position, as defined in (3a) and (3b)

*For information on how missing option prices are handled, please refer to Appendix B.*

#### If $t$ is not a Roll Day

The value of the Canadian Treasury bill account and short put are calculated as follows:

$$M_t = M_{t-1} * (1 + R_{t-1})^{ACT_t} \quad (2a)$$

$$\text{Put}_t = N_t * \text{Mid}_t * \text{SIZE}_t \quad (3a)$$

where:

$N_t$  = Number of the short put option contracts at the end of the current business day, adjusted for corporate actions, as defined in (5a) and (5b)

$\text{SIZE}_t$  = Option contract size at the end of the current business day, adjusted for corporate actions

$\text{Mid}_t$  = Mid price of the short put option at the end of the business day  $t$

$$\text{Mid}_t = (\text{Bid}_t + \text{Ask}_t) / 2$$

$R_{t-1}$  = The daily interest rate as of the immediately preceding business day prior to  $t$

$ACT_t$  = Number of calendar days between  $t-1$  and  $t$

The number and the strike ( $K_i$ ) of the short put, adjusted for corporate actions, remain the same.

$$N_t = N_{t-1} \quad (5a)$$

$$K_t = K_{t-1} \quad (6a)$$

If the premium is invested in 1M Canadian Treasury bills, the daily interest rate is calculated as:

$$R_t = \left[ \frac{1}{1 - \frac{30}{365} * CTR_t} \right]^{\frac{1}{30}} - 1 \quad (7a)$$

If the premium is invested in 3M Canadian Treasury bills, the daily interest rate is calculated as:

$$R_t = \left[ \frac{1}{1 - \frac{91}{365} * CTR_t} \right]^{\frac{1}{91}} - 1 \quad (7b)$$

where:

$CTR_t$  = Canadian Treasury Bill rate

If t is a Roll Day

The value of the treasury bill and short put are calculated as follows:

$$M_t = M_{t-1} * (1 + R_{t-1})^{ACT_t} - N_{t-1} * \text{Max}(0, K_{t-1} - XIU_t) * SIZE_{t-1} + N_t * Bid_t * SIZE_t \quad (2b)$$

$$Put_t = N_t * Mid_t * SIZE_t \quad (3b)$$

where:

$XIU_t$  = iShares S&P/TSX 60 Index ETF (XIU) closing price

On  $t-1$ , the number of new put options is set so that the treasury bill balance covers the maximum put settlement loss:

$$N_t = \frac{M_{t-1} * (1 + R_{t-1})^{ACT_t} - N_{t-1} * \text{Max}(0, K_{t-1} - XIU_{t-1}) * SIZE_{t-1}}{\left[ \frac{K_t}{(1 + R_{t-1})^T} - Bid_{t-1} \right] * SIZE_t} \quad (5b)$$

where:

$T$  = 30 for 1M- and 91 for 3M-Treasury bills.

The strike of the new put option ( $K_t$ ) is the one that is equal to or immediately below the target strike:

$$K_t = \max(K \mid K \leq m * XIU_{t-1}) \quad (6b)$$

where:

$m$  = moneyness multiplier

If a Roll Day occurs on a market holiday, the Roll Day will be changed to be one day prior and the process will otherwise be executed in the same manner.

*For information on corporate actions, please refer to Appendix A.*

## S&P/TSX 60 Dynamic Option Income Indices

The covered call strategy measures the performance of a short call option covered by a long position in XIU. The put-write strategy measures the performance of a short put option covered by a long position in Canadian Treasury Bills. The index begins with the covered call strategy. It switches between the covered call strategy and put write strategy if, on the reference day, the current option in the index is “in the money”. Otherwise, the index continues with the current strategy.

The short option position in the index is initiated on the third Friday of each month, for the monthly index, and the 3rd Friday of the last month of the quarter for the quarterly index (a "Roll Day") and held to expiration. The index may take a call exposure that is equal to or immediately above the target strike level or a put option exposure that is equal to or immediately below the target strike level.

The index continues to write calls or puts on each roll day until the then current option position goes in-the-money. When a call goes in the money, the index sells XIU shares at the strike to close the call and invests the proceeds into a money market account. Then, the index writes a put position that is fully covered by the money market account. When a put goes in the money, the index uses the money market account to buy the XIU shares at the strike and writes a call position that is fully covered. The money market account is invested in Canadian Treasury Bills.

### Parameters

Index	Rebalancing Frequency	Call Moneyness (CallM)	Put Moneyness (PutM)	Money Market Rate
S&P/TSX 60 Put-Write ATM Monthly Index (CAD) TR	Monthly	2% OTM	ATM	1M Canadian Treasury Bills
S&P/TSX 60 Put-Write ATM Quarterly Index (CAD) TR	Quarterly	2% OTM	ATM	3M Canadian Treasury Bills

### Index Calculations

On any business day  $t$ , the index is calculated as follows and is floored at zero:

$$Index_t = E_t + M_t - Call_t - Put_t \quad (1)$$

where:

$E_t$  = Notional investment in the iShares S&P/TSX 60 Index ETF, as defined in (2a) to (2f)

$M_t$  = Canadian Treasury bill balance, as defined in (3a) to (3f)

$Call_t$  = Value of the short call position, as defined in (4)

$Put_t$  = Value of the short put position, as defined in (5)

*For information on how missing option prices are handled, please refer to Appendix B.*

#### If $t$ is not a Roll Day

The value of the Equity, Canadian Treasury bill account and options are calculated as follows:

$$E_t = E_{t-1} * \frac{XIU_t + Div_t}{XIU_{t-1}} \quad (2a)$$

$$M_t = M_{t-1} * (1 + R_{t-1})^{ACT_t} \quad (3a)$$

$$Call_t = CallN_t * CallMid_t * CallSIZE_t \quad (4)$$

$$Put_t = PutN_t * PutMid_t * PutSIZE_t \quad (5)$$

where:

- $XIU_t$  = The iShares S&P/TSX 60 Index ETF closing price, adjusted for corporate actions, as of day t
- $Div_t$  = The iShares S&P/TSX 60 Index ETF dividend paid on day t
- $CallN_t$  = Number of the short call option contracts at the end of the current business day, adjusted for corporate actions, as defined in (6a) and (6b)
- $CallSIZE_t$  = Call option contract size at the end of the current business day, adjusted for corporate actions
- $CallMid_t$  = Mid price of the short call option at the end of the business day t  

$$CallMid_t = (CallBid_t + CallAsk_t) / 2$$
- $PutN_t$  = Number of the short put option contracts at the end of the current business day, adjusted for corporate actions, as defined in (7a) and (7b)
- $PutSIZE_t$  = Put option contract size at the end of the current business day, adjusted for corporate actions
- $PutMid_t$  = Mid price of the short put option at the end of the business day t  

$$PutMid_t = (PutBid_t + PutAsk_t) / 2$$
- $R_{t-1}$  = The daily interest rate as of the immediately business day prior to t
- $ACT_t$  = Number of calendar days between t-1 and t

The number and the strike ( $K_t$ ) of the short options, adjusted for corporate actions, remain the same.

$$CallN_t = CallN_{t-1} \quad (6a)$$

$$PutN_t = PutN_{t-1} \quad (7a)$$

$$K_t = K_{t-1} \quad (8a)$$

If the premium is invested in 1M Canadian Treasury bills, the daily interest rate is calculated as:

$$R_t = \left[ \frac{1}{1 - \frac{30}{365} * CTR_t} \right]^{\frac{1}{30}} - 1$$

where:

$$CTR_t = 1M \text{ Canadian Treasury Bill rate on day } t$$

If the premium is invested in 3M Canadian Treasury bills, the daily interest rate is calculated as:

$$R_t = \left[ \frac{1}{1 - \frac{91}{365} * CTR_t} \right]^{\frac{1}{91}} - 1$$

where:

$$CTR_t = 3M \text{ Canadian Treasury Bill rate on day } t$$

### If t is the first Roll Day

The index is fully invested in equities and takes a short position in calls. The premium is invested in the Canadian Treasury Bills.

$E_t$ ,  $Call_t$  and  $Put_t$  are evaluated as in (2a), (4) and (5).  $M_t$  is evaluated as follows:

$$M_t = CallN_t * CallBid_t * CallSIZE_t \quad (3b)$$

The number of new call options is determined by the index value and the XIU closing on t-1:

$$CallN_t = \frac{Index_{t-1}}{XIU_{t-1} * CallSIZE_t} \quad (6b)$$

$$PutN_t = 0 \quad (7b)$$

The strike of the new call option is the one that is equal to or immediately above the target strike:

$$K_t = \min(K \mid K \geq CallM * XIU_{t-1}) \quad (8b)$$

where:

CallM = moneyness of the call option

*If t is another Roll Day*

On t-1, the index evaluates the current short option position. If it goes into the money, the index will change its option writing strategy. Otherwise, it will continue with the current strategy. There are four scenarios described as below.

Expiring Option Position	Condition on t-1	New Option Position	Index Calculation
Call	ATM or OTM	Call	Scenario 1
	ITM	Put	Scenario 2
Put	ATM or OTM	Put	Scenario 3
	ITM	Call	Scenario 4

**Scenario 1:** *If on t-1, the index holds OTM or ATM calls ( $CallN_{t-1} > 0$  and  $XIU_{t-1} \leq K_{t-1}$ ), the index will continue writing calls on t.*

$Call_t$  and  $Put_t$  are evaluated as in (4) and (5).  $E_t$  and  $M_t$  are evaluated as follows:

$$E_t = E_{t-1} * \frac{XIU_t + Div_t}{XIU_{t-1}} - CallN_{t-1} * \max(0, XIU_t - CallK_{t-1}) * CallSIZE_{t-1} + Reinvest_t \quad (2c)$$

$$M_t = CallN_t * CallBid_t * CallSIZE_t \quad (3c)$$

The number of new call options is determined by the index value and the (TSX:XIU) closing on t-1:

$$CallN_t = \frac{E_{t-1} + Reinvest_t}{XIU_{t-1} * CallSIZE_t} \quad (6c)$$

$$PutN_t = 0 \quad (7c)$$

The strike of the new call option is the one that is equal to or immediately above the target strike:

$$K_t = \min(K \mid K \geq CallM * XIU_{t-1}) \quad (8c)$$

The reinvestment amount is calculated as below:

$$Reinvest_t = \begin{cases} M_{t-1} * (1 + R_{t-1})^{ACT_t} & \text{if } t \text{ is a Roll Day} \\ 0 & \text{otherwise} \end{cases} \quad (9c)$$

**Scenario 2:** *If on t-1, the index holds ITM calls ( $CallN_{t-1} > 0$  and  $XIU_{t-1} > K_{t-1}$ ), the index will drop the equities at the strike and write puts on t.*

$Call_t$  and  $Put_t$  are evaluated as in (4) and (5).  $E_t$  and  $M_t$  are evaluated as follows:

$$E_t = \left( \frac{E_{t-1}}{XIU_{t-1}} - CallN_{t-1} * CallSIZE_{t-1} \right) * XIU_t \quad (2d)$$

$$M_t = M_{t-1} * (1 + R_{t-1})^{ACT_t} + CallN_{t-1} * K_{t-1} * CallSIZE_{t-1} + PutN_t * PutBid_t * PutSIZE_t \quad (3d)$$

The number of new put options is set so that the treasury bill balance covers the maximum put settlement loss:

$$CallN_t = 0 \quad (6d)$$

$$PutN_t = \frac{M_{t-1} * (1 + R_{t-1})^{ACT_t} + CallN_{t-1} * K_{t-1} * CallSIZE_t}{\left[ \frac{K_t}{(1 + R_{t-1})^T} - PutBid_{t-1} \right] * PutSIZE_t} \quad (7d)$$

where:

$$T = 30 \text{ for 1M- and } 91 \text{ for 3M-Treasury bills.}$$

The strike of the new put option ( $K_t$ ) is the one that is equal to or immediately below the target strike:

$$K_t = \max(K \mid K \leq PutM * XIU_{t-1}) \quad (8d)$$

where:

PutM = moneyness of the put option

**Scenario 3:** If on  $t-1$ , the index holds OTM or ATM puts ( $PutN_{t-1} > 0$  and  $XIU_{t-1} \geq K_{t-1}$ ), the index will continue writing puts on  $t$ .

$E_t$ ,  $Call_t$  and  $Put_t$  are evaluated as in (2a), (4) and (5).  $M_t$  is evaluated as follows:

$$M_t = \frac{M_{t-1} * (1 + R_{t-1})^{ACT_t} - PutN_{t-1} * \max(0, K_{t-1} - XIU_t) * PutSIZE_{t-1} + PutN_t * PutBid_t * PutSIZE_t}{PutSIZE_t} \quad (3e)$$

The number of new put options is set so that the treasury bill balance covers the maximum put settlement loss:

$$CallN_t = 0 \quad (6e)$$

$$PutN_t = \frac{M_{t-1} * (1 + R_{t-1})^{ACT_t}}{\left[ \frac{K_t}{(1 + R_{t-1})^T} - PutBid_{t-1} \right] * PutSIZE_t} \quad (7e)$$

where:

$$T = 30 \text{ for 1M- and } 91 \text{ for 3M-Treasury bills.}$$

The strike of the new put option ( $K_t$ ) is the one that is equal to or immediately below the target strike:

$$K_t = \max(K \mid K \leq PutM * XIU_{t-1}) \quad (8e)$$

where:

PutM = moneyness of the put option

**Scenario 4:** If on  $t-1$ , the index holds ITM puts ( $PutN_{t-1} > 0$  and  $XIU_{t-1} < K_{t-1}$ ), the index will add the underlying XIU shares at the strike, and start writing calls on  $t$ .

$Call_t$  and  $Put_t$  are evaluated as in (4) and (5).  $E_t$  and  $M_t$  are evaluated as follows:

$$E_t = E_{t-1} * \frac{XIU_t + Div_t}{XIU_{t-1}} + PutN_{t-1} * XIU_t * PutSIZE_{t-1} \quad (2f)$$

$$M_t = \frac{M_{t-1} * (1 + R_{t-1})^{ACT_t} - PutN_{t-1} * K_{t-1} * PutSIZE_{t-1} + CallN_t * CallBid_t * CallSIZE_t}{CallSIZE_t} \quad (3f)$$

The number of new call options is determined on  $t-1$ :

$$CallN_t = \frac{E_{t-1}}{XIU_{t-1} * CallSIZE_t} + \frac{PutSIZE_{t-1}}{CallSIZE_t} * PutN_{t-1} \quad (6f)$$

$$PutN_t = 0 \tag{7f}$$

The strike of the new call option is the one that is equal to or immediately above the target strike:

$$K_t = \min(K \mid K \geq CallM * XIU_{t-1}) \tag{8f}$$

If a Roll Day occurs on a market holiday, the Roll Day will be changed to be one business day prior and the process will otherwise be executed in the same way.

*For more information on corporate actions, please refer to Appendix A.*

## S&P/TSX 60 Futures (CORRA) Index

The index is constructed from the front month futures contract traded on the Montreal Exchange under the symbol 'SXF'.

### Futures Roll

The indices include a provision for the replacement of the index futures contract as it approaches maturity (also referred to as “rolling” or “the roll”). This replacement occurs over a one-day roll period every quarter, effective at the close of trading five (5) business days prior to expiration.

The near-month futures contract expires on the third Friday of each quarter, provided that date is a business day. If it is not a business day, the contract expires on the immediately preceding business day.

**Calculation of Excess Return Index.** The excess return is calculated from the price change of the underlying futures contract. On any trading date,  $t$ , the level is calculated as follows:

$$IndexER_t = IndexER_{t-1} * (1 + CDR_t)$$

where:

$IndexER_{t-1}$  = Excess Return Index level on the preceding business day, defined as any date on which the index is calculated.

$$CDR_t = \text{Contract Daily return} = \frac{DCRP_t}{DCRP_{t-1}} - 1$$

$DCRP$  = Daily Contract Reference Price of the futures contract. The DCRP is the official close, as designated by the Montréal Exchange.

**Total Return Index Calculation.** The total return is calculated using the risk-free rate of return of the Canadian Overnight Repo Rate Average (CORRA) published by the Bank of Canada.

For a funded investment, the total return between dates  $t-1$  and  $t$  includes the risk-free rate of return for the initial cash outlay:

$$IndexTR_t = IndexTR_{t-1} * \left( \frac{IndexER_t}{IndexER_{t-1}} + RiskFreeRate_t \right)$$

where:

$IndexER_t$  = The Excess Return Index level on day  $t$ , as defined above.

$RiskFreeRate_t$  = The daily-compounding Risk-Free Rate, as determined by the following formula:

$$RiskFreeRate_t = DRFR_{t-1} * \frac{Delta_t}{365}$$

where:

$Delta_t$  = Number of calendar days between the current and previous business days.

$DRFR_{t-1}$  = Simple discount rate for the respective Risk-Free Rate of return of the Canadian Overnight Repo Rate Average (CORRA), effective on the preceding business day, using an ACT/365 day-count convention.

# Option Analytics Calculations

The Black-Scholes Model is used for the calculation of option analytics, using the mid-price of the options, for the following indices

- S&P/TSX 60 Delta Hedged Straddle indices

*For more information on the Black-Scholes Model calculations, please refer to S&P Dow Jones Indices' Options Indices Policies & Practices Methodology.*

The interest rate input used in all option analytics calculations is the latest available overnight CORRA Rate, which is typically from  $t-1$ .

The annual dividend yield is estimated as four times the most recent quarterly dividend payment, divided by the underlier price on the ex-dividend date. This yield estimate is updated every quarter and held constant until the next ex-date.

# Index Governance

## **Index Committee**

An S&P Dow Jones Indices Index Committee maintains the indices. The Index Committee meets regularly. At each meeting, the Index Committee reviews any significant market events. In addition, the Index Committee may revise index policy for timing of rebalancings or other matters.

S&P Dow Jones Indices considers information about changes to its 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 and/or Options Indices Policies & Practices Methodology.*

# Index Policy

## **Announcements**

Announcements of the daily index values are made after the market close each day.

## **Holiday Schedule**

The 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](http://www.tmx.com).*

## **Unexpected Exchange Closures**

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

## **Currency of Calculation and Additional Index Return Series**

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 the [S&P DJI Methodology & Regulatory Status Database](#).

*For information on index calculation, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.*

*For the inputs necessary to calculate certain types of indices, including decrement, dynamic hedged, fair value, and risk control indices, please refer to the Parameters documents available at [www.spglobal.com/spdji](http://www.spglobal.com/spdji).*

## **Recalculation Policy**

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology and Options Indices Policies & Practices Methodology for the underlying indices, respectively.

*For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices and Options Indices Policies & Practices Methodology documents for the underlying indices, respectively.*

## **Contact Information**

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

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 the [S&P DJI Methodology & Regulatory Status Database](#) for a complete list of indices covered by this document.

Index	Launch Date	First Value Date	Base Date	Base Value	BBG	RIC
S&P/TSX 60 VIX Index	04/26/2021	01/04/2017	01/03/2017	13.19	VIXI	.VIXI
S&P/TSX 60 Delta Hedged Straddle 0.5% Vega Index (CAD) ER	04/26/2021	03/11/2009	03/10/2009	100	--	--
S&P/TSX 60 Delta Hedged Straddle 1% Vega Index (CAD) ER	04/26/2021	03/11/2009	03/10/2009	100	--	--
S&P/TSX 60 Covered Call 2% OTM Monthly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Covered Call 2% OTM Quarterly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Put-Write ATM Monthly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Put-Write ATM Quarterly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Dynamic Option Income Monthly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Dynamic Option Income Quarterly Index (CAD) TR	04/26/2021	03/20/2009	03/19/2009	100	--	--
S&P/TSX 60 Futures (CORRA) Index	09/16/2022	09/30/1999	09/30/1999	100	--	--

## Pricing

The S&P/TSX 60 VIX Index calculates on a real-time basis. Options prices for the other indices are provided via vendor feed after market close.

*For further information on pricing, please refer to S&P Dow Jones Indices' Options Indices Policies & Practices Methodology.*

## Index Data

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

*For further information, please refer to the TMX Web site at [www.tmx.com](http://www.tmx.com).*

## Web site

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

# Appendix A

## Adjustment for Corporate Actions

Whenever the terms of an equity option contract have been changed to terms different from its original standardized terms, such as the contract's deliverable (unit of trade) and strike price, those terms will be adjusted to account for this.

The adjusted exercise price is an option contract's strike price after adjustments have been made for corporate actions such as stock splits or special dividends made to its underlying security. Any time that changes occur to the securities on which options are written, the strike price and delivery quantity of the underlying security must be adjusted accordingly in order to ensure that neither the long nor short holder of the options are negatively affected.

These changes can include stock splits, reverse stock splits, special dividends, or dividends paid in stock. Strike prices are not adjusted for the payment of ordinary dividends, ticker symbol changes, or due to a merger or acquisition.

Corporate actions will have no effect on the calculation of the S&P/TSX 60 VIX Index due to its unique structure of only considering current options today, without considering yesterday's value.

## Stock Split

A stock split is a corporate action that increases the number of a company's shares, while simultaneously reducing its per share price, such that the market capitalization of the company remains the same before and after the event.

Stock splits are quoted in terms of shares received to shares held. The shares of a company are increased (multiplied) by the stock split adjustment factor (greater than one), while the price is decreased (divided) by this same factor. In a 5-for-1 stock split the adjustment factor is 5, so the shares outstanding is multiplied by 5 while the price is divided by 5.

Similarly, a stock split will increase the number of shares in each option contract and decrease the strike price. Each option contract typically controls 100 shares of an underlying security at a predetermined strike price. The new share ownership is generated by taking the split ratio and multiplying by 100 while the new strike price is generated by taking the old strike price and dividing by the split ratio. For example, if you buy a call option that controls 100 shares of XYZ with a strike price of \$75, and XYZ announces a 2:1 stock split, the contract would then control 200 shares with a strike price of \$37.50.

## Consolidation / Reverse Split

A consolidation, also referred to as a Reverse Split, is the opposite of a stock split. In a consolidation, the shares of a company are decreased while its per-share-price is increased by the adjustment factor. Also like a stock split, the overall market capitalization of the company remains unchanged by this event.

A reverse split also reverses the adjustment process for options. For example, if you buy a call option that controls 100 shares of XYZ with a strike price of \$5, and XYZ announces a 1:5 stock split, the contract would then control 20 shares with a strike price of \$25.

## Special Dividends

No adjustments to strike prices are made when an underlying stock pays an ordinary, regular cash dividend. When a firm pays a special dividend, that is not paid out on a regular basis, that dividend gets subtracted from the stock price, so options strike prices must adjust for that.

If a stock pays out a special cash dividend, then the strike may be reduced by the dividend amount. If a company pays a special stock dividend -- that is, it pays shareholders in extra shares instead of in cash -- then the strike price must also be reduced by the amount of the dividend's value. Assuming a dividend is special, the value of the dividend must be at least \$12.50 per option contract and then an adjustment will be made to the contract.

# Appendix B

## Missing Option Prices

The index calculation uses the bid and ask prices of the option. In the case of a missing bid and/or ask price, the index processes the option prices as described below.

### S&P/TSX 60 VIX Index:

- options without a bid price or an ask price or both are excluded from the calculation.

### For all the other indices:

- If  $bid < 0$  and  $ask \geq 0$ , the index assumes that there is no bid/ask spread and sets the bid price to the ask price.
- If  $bid \geq 0$  and  $ask < 0$ , the index assumes that there is no bid/ask spread and sets the ask price to the bid price.
- If both bid and ask are missing or negative on day  $t$ , the index assumes that there is no price change since the immediately preceding business day ( $t-1$ ) and uses the bid and ask prices on day  $t-1$ .

The mid-price of the option is calculated as the average of the bid and ask, after the missing prices are processed as above.

# Disclaimer

## Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates (“S&P DJI”) defines various dates to assist our clients by providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company’s public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history

will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

### **Intellectual Property Notices/Disclaimer**

© 2024 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&P COMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI, and SOVX are registered trademarks of S&P Global, Inc. (“S&P Global”) or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC (“Dow Jones”). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P DJI does not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P DJI is impersonal and not tailored to the needs of any person, entity, or group of persons. S&P DJI receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P DJI does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P DJI makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P DJI is not an investment advisor, commodity trading advisor, fiduciary, “promoter” (as defined in the Investment Company Act of 1940, as amended) or “expert” as enumerated within 15 U.S.C. § 77k(a), and S&P DJI makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P DJI is not a tax advisor. Inclusion of a security, commodity, crypto currency, or other asset within an index is not a recommendation by S&P DJI to buy, sell, or hold such security, commodity, crypto currency, or other asset, nor is it considered to be investment or trading advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof (“Content”) may be modified, reverse engineered, reproduced, or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P DJI. The Content shall not be used for any unlawful or unauthorized purposes. S&P DJI and its third-party data providers and licensors (collectively “S&P Dow Jones Indices Parties”) do not guarantee the accuracy, completeness, timeliness, or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN “AS IS” “WHERE IS” BASIS. S&P DOW JONES INDICES PARTIES DISCLAIMS ANY AND ALL

EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special, or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

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

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

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

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

Some indices use the Global Industry Classification Standard (GICS®), which was developed by, and is the exclusive property and a trademark of, S&P Global and MSCI. Neither MSCI, S&P DJI nor any other party involved in making or compiling any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use

thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P DJI, any of their affiliates or any third party involved in making or compiling any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

S&P Dow Jones Indices products are governed by the terms and conditions of the agreements under which they may be provided. A license is required from S&P Dow Jones Indices to display, create derivative works of and/or distribute any product or service that uses, is based upon and/or refers to any S&P Dow Jones Indices and/or index data.

### **ESG Indices Disclaimer**

S&P DJI provides indices that seek to select, exclude, and/or weight index constituents based on, but not limited to, certain environmental, social or governance (ESG) indicators, or a combination of those indicators, including the following: environmental indicators (including the efficient use of natural resources, the production of waste, greenhouse gas emissions, or impact on biodiversity); social indicators (such as, inequality and investment in human capital); governance indicators (such as sound management structures, employee relations, remuneration of staff, tax compliance, respect for human rights, anti-corruption and anti-bribery matters), specific sustainability or values-related company involvement indicators (for example, production/distribution of controversial weapons, tobacco products, or thermal coal), or controversies monitoring (including research of media outlets to identify companies involved in ESG-related incidents).

S&P DJI ESG indices use ESG metrics and scores in the selection and/or weighting of index constituents. ESG scores or ratings seek to measure or evaluate a company's, or an asset's, performance with respect to environmental, social and corporate governance issues.

The ESG scores, ratings, and other data used in S&P DJI ESG indices is supplied directly or indirectly by third parties (note these parties can be independent affiliates of S&P Global or unaffiliated entities) so an S&P DJI ESG index's ability to reflect ESG factors depends on these third parties' data accuracy and availability.

ESG scores, ratings, and other data may be reported (meaning that the data is provided as disclosed by companies, or an asset, or as made publicly available), modelled (meaning that the data is derived using a proprietary modelling process with only proxies used in the creation of the data), or reported and modelled (meaning that the data is either a mix of reported and modelled data or is derived from the vendor using reported data /information in a proprietary scoring or determination process).

ESG scores, ratings, and other data, whether from an external and/or internal source, is based on a qualitative and judgmental assessment, especially in the absence of well-defined market standards, and due to the existence of multiple approaches and methodologies to assess ESG factors and considerations. An element of subjectivity and discretion is therefore inherent in any ESG score, rating, or other data and different ESG scoring, rating, and/or data sources may use different ESG assessment or estimation methodologies. Different persons (including ESG data ratings, or scoring providers, index administrators or users) may arrive at different conclusions regarding the sustainability or impact of a particular company, asset, or index.

Where an index uses ESG scores, ratings or other data supplied directly or indirectly by third parties, S&P DJI does not accept responsibility for the accuracy or completeness of such ESG scores, ratings, or data. No single clear, definitive test or framework (legal, regulatory, or otherwise) exists to determine 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives. In the absence of well-defined market standards and due to the existence of multitude approaches, the exercise of judgment is necessary. Accordingly, different persons may classify the same investment, product and/or strategy differently regarding 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled

objectives. Furthermore, the legal and/or market position on what constitutes an 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives may change over time, especially as further regulatory or industry rules and guidance are issued and the ESG sustainable finance framework becomes more sophisticated.

Prospective users of an S&P DJI ESG Index are encouraged to read the relevant index methodology and related disclosures carefully to determine whether the index is suitable for their potential use case or investment objective.