MONTRÉAL EXCHANGE

Index Derivatives

Reference Manual

SXF	S&P/TSX 60 Index Standard Futures
SXM	S&P/TSX 60 Index Mini Futures
SCF	S&P/TSX Composite Index Mini Futures
SXA	S&P/TSX Global Gold Index Futures
SXB	S&P/TSX Capped Financials Index Futures
SXH	S&P/TSX Capped Information Technology Index Futures
SXY	S&P/TSX Capped Energy Index Futures
SXO	S&P/TSX 60 Index Options
SXK	S&P/TSX Composite Index Banks Futures (Industry Group)
SXU	S&P/TSX Capped Utilities Index Futures
SXJ	S&P/TSX Composite Index Banks Options (Industry Group)
SXV	S&P/TSX Capped Utilities Index Options

TMX THE FUTURE IS YOURS TO SEE.

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Introduction

The movement of stock market indices is a key component of financial news. Investors' interest in stock market indices largely results from the increasing popularity of the "index" portfolio management style, which consists in building portfolios that mirror stock market indices. In Canada, for example, there are several Canadian equity mutual funds that reproduce the leading stock market indices such as the S&P/TSX 60 index. Pension fund administrators have also adopted this management method.

In September 1999, the Montréal Exchange (MX) listed futures and options contracts on the headline S&P/TSX 60. Today, MX lists index derivatives on select Canadian indices.

Index futures and options are contracts whose value closely follows the price level of their underlying indices—providing management of equity market risks and trading opportunities for both institutional and retail investors. In partnership with S&P Dow Jones Indices a global leader in index construction and maintenance, the index offering at MX includes:

Broad-based indices

S&P/TSX 60™ Index Standard Futures (SXF)

S&P/TSX 60™ Index Mini Futures (SXM)

S&P/TSX Composite™ Index Mini Futures (SCF)

S&P/TSX 60™ Index Options (SXO)

Sector indices

S&P/TSX Global Gold™ Index Futures (SXA)

S&P/TSX Capped Financials™ Index Futures (SXB)

S&P/TSX Capped Energy™ Index Futures (SXY)

S&P/TSX Capped Information Technology™ Index Futures (SXH)

S&P/TSX Composite Index Banks Futures (Industry Group) (SXK)

S&P/TSX Capped Utilities Index Futures (SXU)

S&P/TSX Composite Index Banks Options (Industry Group) (SXJ)

S&P/TSX Capped Utilities Index Options (SXV)

With these products, investors and traders can enjoy the following benefits:

- broad equity diversification in a single transaction;
- efficient use of capital;
- actively quoted markets with transparent pricing;
- flexibility to enter and exit the market at any time during the trading day;
- no restriction for short-selling the market;
- mitigation of counterparty risk considerations (i.e. daily cash settlements of trading gains and losses);
- liquidity (namely, narrow bid-ask spreads) as a consequence of concentrated trading activity in standardized contracts with broad-based market appeal;
- no replication error when adding or retracting stocks from the index.

Equity Indices: What are they and why are they important?

One of the tenets of modern portfolio theory is that the risk of holding equity positions can be reduced by maintaining a diverse portfolio of stocks, rather than a concentrated position in a limited number of equity issues or in a narrow sector of the market. The challenge to investors is to assemble a portfolio of stocks that will maximize the expected return for a given measure of risk. Portfolios that satisfy this objective are said to be "efficient portfolios".

An efficient portfolio can be constructed by assembling a basket of equities that corresponds to the overall make-up of an economy, weighting each stock so that it reflects its relative share of the total capitalization. The S&P/TSX 60, in fact, represents just such a capitalization-weighted portfolio.

Put another way, the S&P/TSX 60 index is an equity portfolio composed of 60 highly liquid Canadian equities and selected as a representative sampling of sectors of the Canadian market: materials, industrials, telecommunications, consumer discretionary, energy, financials, health care, technology, utilities, and consumer staples. The composition of the index within each sector is specifically engineered to make it easy to replicate the index by actually buying the shares. To do this, the weight of each stock in the index would be determined by that stock capitalization value, relative to the total capital value of the 60 stocks combined.[1]

S&P Dow Jones Indices calculates index prices that reflect the current value of this hypothetical portfolio on an ongoing basis, using the latest traded prices of the component stocks. Analysts can use this index to measure the rate of the stock market appreciation (depreciation) over any historical period by calculating the ratio of the two index prices at the given times. For instance, at the end of 2017, the value of the S&P/TSX 60 was 959.7, and at the end of 2018, it was 859.32. The ratio (859.32/959.7) equals 0.895, reflecting a negative return of 10.5% for 2018.

It is important to note that the index varies only because prices of the underlying component stocks change. In particular, the index is unaffected by payments of dividends and/or any changes in its composition.[2]

In their early days, index portfolios mainly reproduced broad-based indices. But in the past few years, a growing number of sector index portfolios have emerged, modeled after the sector components of broad- based indices. The energy and telecommunications sector indices are two well-known examples. Each sector index (commonly known as "sub-indices") tracks a particular basket of stocks of companies whose primary activities are the index's specific economic sector. These sector indices help to better control the exposure of a portfolio in a specific Canadian economic sector.

1. Capitalization is adjusted to exclude the value of shares held by other index constituents or by other shareholders who control 20 percent or more of the stock.
2. S&P Dow Jones Indices will modify the index following mergers, acquisitions, or other events that make the composition of the index less representative of the overall Canadian market. When the composition of the index is altered, the index value is multiplied by a new factor. This adjustment ensures that users get meaningful results when comparing index values at two different points in time, even though its composition may not be the same on those two occasions.

What is a Futures Contract and How Does it Work?

A futures contract is an exchange-traded contract that is used for both hedging (risk management) and directional trading (income generation). The buyer of a futures contract establishes a long position; the seller establishes a short position. Subsequent to the initiation of a position, futures contracts require a daily cash adjustment to reflect the value of any change in price. With rising prices in the futures market, short position holders must pay cash and long position holders receive cash in their accounts. With falling prices, long position holders pay and short position holders receive.

Investors are not obligated to hold a futures contract until its expiration date. The buyer of a futures contract can close their position by selling, before the expiration date, the contract initially purchased. Conversely, the seller of a futures contract can close their position by buying back the contract sold. If the investor wishes to hold their position beyond the expiration date, the investor can "roll" their initial position by selling the contracts initially purchased or buying what they initially sold and then take the same position on the following contract month.

Hedgers use futures contracts to fix a price for an anticipated purchase or sale. Those exposed to the risk of prices going higher will buy futures or enter into long positions; those exposed to the risk of prices going lower will sell futures or enter into short positions. In either case, gains generated by the futures contracts will compensate for adverse changes in the level of the underlying index; or, alternatively, losses from the futures will be applied against any beneficial price changes in the level of the underlying index. Thus, the hedge serves to eliminate both risk and opportunity.

In a perfect hedge, where the exposure to changes in the level of the hedged portfolio precisely matches the changes in the price of the futures contract, the ultimate outcome is that the hedger will lock in the price of the futures contract. They will therefore not gain or lose on the transaction no matter what happens in the markets.

Before a trade can be executed on MX futures market, customers must post an initial margin or good-faith deposit with their brokers, who in turn will post collateral with the Canadian Derivatives Clearing Corporation (CDCC). Subsequently, futures positions are marked-to-market, based on each day's closing price, with gains and losses settled by a daily cash transfer between the long and short position holders. This exchange of cash is known as variation margin. CDCC acts as an intermediary in this process and guarantees each side's solvency, thereby eliminating the concern of counterparty risk[3].

Buying or selling a futures contract requires transacting through a broker who is an approved participant of the Montréal Exchange. Market orders to buy futures contracts will be executed at the offer price (ask); market orders to sell will be executed at the bid price (bid). However, an investor wishing to buy or sell at a specific price can give a limit order. This order will be registered in SOLA electronic order book and will be executed when a counterparty will be interested at that price. Orders will then be matched and both orders will be filled at the specific price for the smallest quantity posted. Because all of the trading of any specific futures contract is concentrated on one trading platform, participants will always be assured of buying at the lowest offer price or selling to the highest bid.

3. The collateral deposited with the clearing corporation serves as a safeguard to insure that it is able to pay the gains to the deserving counterparties.

What is an Index Futures Contract ?

An index futures contract's price will follow the level of a hypothetical portfolio of stocks (the index). It is a convenient tool that lets investors either increase or decrease their exposure to the Canadian equity

market. For example, given the decision to add to an equity position in an S&P/TSX 60 portfolio, investors have two choices: (1) they could buy the individual stocks of the S&P/TSX 60 directly on the stock market, or (2) they could buy (or go long) the SXF contracts. Similarly, instead of selling stocks from a portfolio, they could continue to hold the stocks and sell SXF contracts (enter a short futures position).

Theoretically, these alternative ways of adjusting equity exposure should offer the same economic result as long as the futures are fairly priced. Put another way, if the futures contract trades at a price equal to its theoretical fair value, the investor should not care whether trading occurs on the stock market or the futures market. This is true only if trading fees, which are generally lower on the futures market, are not taken into account.

Mathematically, this theoretical futures price is expressed, in practice[4], as follows:

$$F = S\left[1 + (i - d) \times \frac{t}{365}\right]$$

Where:

F = theoretical fair value of the futures contract;

S = spot index value;

i = interest rate reflecting the cost of funds;

d = dividend rate;

t = number of days remaining until the expiration of the futures contract.

Importantly, deviations between actual futures prices and theoretical prices are kept in check by the process of arbitrage, which involves simultaneously buying whichever is cheaper (i.e., futures or the underlying) and selling whichever is more expensive, bringing the futures price closer to its theoretical fair value. This activity is the investors' safeguard that the prices in the futures market will be reflective of competitive market forces.

Beyond the pricing issue, a further concern when considering the use of futures contracts is transaction costs. Bearing in mind that (a) any trade on the stock market will require trading 60 separate stocks and a trade on the futures market will entail paying commission on only one trade and (b) the cost of trading includes both commissions and bid/offer spreads, investors quickly realize that trading on the futures market is substantially less expensive than trading on the stock market. This is particularly significant for investors whose objective is to temporarily adjust their equity exposure.

Variation margin for a single index futures contract is calculated by multiplying the daily price change of the futures contract by the contract multiplier. For example, if an investor buys 10 SXF contracts at a price of 967.70 and that day the market closes at 968.70, the variation margin will be:

10 contracts × (968.70 - 967.70) × $200 = $2,000

Given this margining process, it should be evident that holding long stock index futures position is essentially like holding a mutual fund that replicates the S&P/TSX 60, but where gains or losses are settled in cash, daily.

4. In modern financial literature, interest is calculated on a continuous basis. Increasingly, traders and arbitrageurs are opting for this type of calculation rather than the more traditional method of calculating interest on a daily basis. The formula for calculating interest on a continuous basis is $F = S \times e^{(i-d) \times t/365}$ where: F is the theoretical value of the futures contract; S is the spot index level; i is the interest rate representing the cost of money; d is the dividend rate; t is the number of days until the expiration of the futures contract.

S&P/TSX 60 Index Standard Futures (SXF)

SXF is a futures contract on the S&P/TSX 60 Index, which is a benchmark capitalization-weighted equity index of the 60 largest companies in Canada that have the most liquid stocks.

How can I use these futures?

- An investor who anticipates a rise in stock prices and wishes to increase his or her exposure to the Canadian equity market, but lacks the funds for an outright purchase of the shares, could take a long position in SXF futures.
- A holder of a stock portfolio may feel that the market is overvalued with a correction looming. The holder could sell SXF futures in order to protect the portfolio from market risk.
- Futures can be used to rebalance a portfolio. If the stock market has risen and assets are now over-allocated towards equities, as compared to bonds or cash, SXF futures could be sold to bring the portfolio in line with its target allocation. The alternative would be costly since it requires the liquidation and rebalancing of assets, which may entail unfavorable tax consequences.
- Institutional investors will sometimes receive a one- time windfall of cash. This amount could be "parked" by buying SXF futures and risk-free instruments, thereby keeping a certain exposure to the equity market while waiting for a suitable opportunity to use the funds.

S&P/TSX 60 Index Mini Futures (SXM)

SXM futures are also based on the S&P/TSX 60 Index. The SXM futures represents one quarter of the trading unit of its larger sized parent contract, the SXF.

How can I use these futures?

- The miniature sized SXM futures allow market participants to fine tune SXF futures hedges.
- Small investors, including retail traders, sensitive to margin costs could use SXM futures to reduce capital outlays. In fact, compared to SXF futures, SXM margins are reduced by factor of four as well.
- Participants could execute cross-market arbitrage trading between the SXM and SXF futures when their prices are not aligned. This operation is possible since both contracts are identical, except for their size. An arbitrageur could purchase the undervalued contract and sell (for the same notional value) the overvalued contract in order to generate an almost risk-free profit. This operation would bring the prices of both futures to equilibrium.
- The SXM and SXF futures contracts are fungible with a 4:1 ratio (Request for Standard vs Mini Offset). This means that a participant can close out an SXF position with four opposite positions in the SXM contract having the same expiry.

S&P/TSX Composite Index Mini Futures (SCF)

SCF futures are based on the S&P/TSX Composite Index, the headline indicator of market activity and principal broad market measure for Canadian equity markets since 1977. The index covers nearly 93%[5] of the market capitalization for Canadian-based, Toronto Stock Exchange listed companies.

How can I use these futures?

- Portfolio managers benchmarked to the S&P/TSX Composite Index and currently using over-the-counter (OTC) index derivatives based on the S&P/TSX Composite Index could hedge their risk exposure with SCF futures.
- An individual investor with reduced capital and with a diversified stock portfolio that is highly correlated to the S&P/TSX Composite Index could protect his or her portfolio against the impact of a short-term bearish market by selling SCF futures.
- Speculators, proprietary traders and hedge funds could trade SCF futures to manage directional trading and to execute spread trades against other benchmark broad based stock indices and sector indices.
- Market participants could arbitrage the market by trading the spread between the S&P/TSX 60 Index futures and the S&P/TSX Composite Index Mini futures.

5. Toronto Stock Exchange, June 2019

Sector Index Futures (SXA, SXB, SXH, SXY, SXK,SXU)

Sector index futures are contracts that closely follow the level of S&P/TSX indices on select sectors of the Canadian economy, namely:

- S&P/TSX Global Gold Index (SXA)
- S&P/TSX Capped Financials Index (SXB)
- S&P/TSX Capped Information Technology Index (SXH)
- S&P/TSX Composite Index Banks (Industry Group) (SXK)
- S&P/TSX Capped Utilities Index (SXU)
- S&P/TSX Capped Energy Index (SXY)

Each of these indices tracks a particular basket of stocks of companies whose primary activities are in the index's specific economic sector. Capped indices covering sectors are calculated from the S&P/TSX Composite Index.

How can I use these futures?

- To individual investors holding portfolios reflecting an exposure to the overall market, selling sector index futures allows for protection against a downturn in a given market sector.
- Sector index futures offer opportunities to individual investors wishing to target one sector against another. While it is quite onerous to purchase sufficient stocks to represent an entire sector, sector index futures could be purchased and sold quite efficiently and inexpensively.
- While portfolio managers will generally seek an optimal asset allocation between equities, bonds and cash, and will spend a great deal of resources on rebalancing their holdings, they must also seek an optimal allocation of assets within their equity holdings. Sector index futures could accomplish these goals as managers can easily sell one market sector while buying another.
- Futures contracts based on Canadian sector indices provide asset managers and hedgers with a simple, efficient and cost-effective way of implementing trading strategies based upon select sectors of the Canadian economy. Index overlay strategies are increasingly popular as a means of adding value to core portfolios. Sector rotation strategies, as well as position neutral hedge strategies based upon sector selection, also favour the use of index-related investment products. Sector futures could also complement cash-based investment strategies using exchange-traded funds, cash baskets and asset swaps.

Trading Strategies for Index Futures

Although futures contracts are not for everyone, many investors should consider them when determining their investment objectives. You should also make sure you understand the concepts underlying the trading of futures, know the risks and advantages of the investment strategy you choose, and understand how you can manage your portfolio based on changes in the market. The Montréal Exchange recommends that you consult your financial advisor accordingly.

Using futures contracts to protect the value of a portfolio (hedging)

Suppose you have a portfolio of Canadian stocks that matches the composition of the S&P/TSX 60. Currently, the value of this portfolio is $5 million with the SXF contract at a level of 968.70. In addition, the portfolio has a beta (sensitivity to the market) of 1.3 relative to the benchmark S&P/TSX 60 index. In your view, the stock market is due for a temporary correction. In the long run, you remain bullish and you want to keep your shares, but in the short term you want to hedge your risk. You want to cover this exposure by initiating a short futures hedge (by selling SXF contracts) that you will maintain until the expected correction runs its course. During this period, you will continue to earn dividends on your stocks and you will still realize any appreciation or depreciation on these shares, depending on the direction of the market. With an open short hedge in place, however, you will also generate an offsetting loss or profit that should effectively neutralize your equity market exposure.

To achieve this objective, an investor must base the size of the futures position on the size of the exposure, using the following formula:

$$N = \frac{V \times \text{ßeta}}{SXF \times 200\ \$}$$

Where:

N = required number of futures contracts;

V = value of the equity position to hedge;

ßeta = correlation measure of the portfolio in relation to the index;

SXF = value of the S&P/TSX 60 Index Standard Futures contract;

$ 200 = multiplier for the futures contract.

Substituting the appropriate values into the equation, N is calculated as follows:

$$N = \frac{\$5{,}000{,}000 \times 1.3}{968.70 \times \$200} = 33 \text{ contracts}$$

Table 1 generates the prospective outcomes under two alternative scenarios: with the market rising in scenario A and falling in scenario B. These examples show that in both market scenarios, despite significant changes in stock market values, the hedge immunizes the value of the portfolio almost perfectly from the effects of the respective market moves. Of course, if the index value increases contrary to investor's expectations (scenario A), the value of the portfolio would benefit from any appreciation of the index had the investor not hedged the portfolio. By hedging their portfolio with futures contracts, the investor "freezes" the value of the portfolio. The investor does not want to speculate up or down.

TABLE 1
Hedging a Portfolio of S&P/TSX 60 Stocks

STARTING CONDITIONS	
S&P/TSX 60 index value	969.92
SXF contract value	968.70
Portfolio value ($)	5,000,000.00
Futures position (short)	33 contracts

ENDING CONDITIONS: SCENARIO A, THE INDEX APPRECIATES 10%	
S&P/TSX 60 index value	1066.91
SXF contract value	1065.69
Portfolio value ($)	5,650,000.00
Change in portfolio ($)	650,000.00
Futures loss ($) ($SXF_{Int.}$ - SXF_{End})*200*contracts)	(640,134.00)
Net profit ($)	9,866.00
Portfolio + Hedge, combined value ($)	5,009,866.00

ENDING CONDITIONS: SCENARIO B, THE INDEX DEPRECIATES 10%	
S&P/TSX 60 index value	872.93
SXF contract value	871.71
Portfolio value ($)	4,350,000.00
Change in portfolio ($)	(650,000.00)
Futures profit ($) ($SXF_{Int.}$ - SXF_{End})*200*contracts)	640,134.00
Net loss ($)	(9,866.00)
Portfolio + Hedge, combined value ($)	4,990,134.00

As these hypothetical hedges demonstrate, some degree of imperfection should be expected. First, because futures contracts must be traded in whole numbers (half-contracts cannot be traded), some rounding difference in implementing a hedge is virtually unavoidable. Secondly, a perfect hedge requires identical price changes for the futures contract and the portfolio hedged, respectively; but this does not always happen. Before the expiration of the contract, futures prices will differ from the underlying index value by the amount of the basis. However, upon the expiration of the contract (which occurs on the third Friday of the contract month), its value will converge towards the value of the underlying.[6]

Exchanging futures contracts for physical (synthetic strategy)

Through the use of SXF contracts, a manager can outperform the underlying index. To succeed, a strategy would be to integrate an arbitrage model to identify if futures contracts are trading at a discount or at a prime relative to the underlying. This strategy relies on the exchange of futures contracts, a transaction where the investor simultaneously buys (sells) a futures position and sells (buys) a stock position, where the negotiated price is the basis (or the difference between the futures price and the index value). If the futures contracts trade under their theoretical value, the manager can execute a basis trade where they buy futures contracts and sell the shares comprising the S&P/TSX 60 index. In this situation, the manager thinks that the futures contract value will move toward its theoretical value. In other words, without any fluctuation in the index value, the manager believes that the futures contract should increase in value, thus increasing the basis value and generating an arbitrage profit.

Directional trading using sector index futures

Bullish view: How do you profit from a rising stock market using futures?

Buy a futures contract and then sell the contract when the price has risen. This is also known as going long a futures contract.

Suppose an investor buys a futures contract on the S&P/TSX Composite Index Banks (Industry Group) (SXK) expiring in September. If the SXK contract is at 3,355.00, the investor undertakes to pay, at the expiration date of the contract, a price equal to $67,100, that is 3,355.00 × $20 (nominal value of the contract). In return, the investor receives $20 multiplied by the level of the SXK contract on the expiration date.

Investors are not obligated to hold a futures contract until its expiration date. They can reverse their initial position before expiration. In the example above, the buyer of the SXK contract can cancel their position by selling, before the expiration date, all contracts initially purchased. In doing so, the investor will realize (in the sense of "cash in") a capital gain or capital loss corresponding to the difference between the price at which they sold the contracts and that at which they initially purchased them.

Thus, the investor initially undertook to purchase the S&P/TSX Composite Index Banks (Industry Group) (SXK) stocks for an initial monetary commitment of $67,100. If they subsequently sold the futures contracts at the level of 3,600.00, the initial position would then be cancelled, and the investor would pocket a profit of $4,900, namely (3,600.00 - 3,355.00) × $20. This amount would then be deposited in their account, which was opened during the initial purchase so that the investor could make a margin deposit.

6. The final futures settlement price is equal to the official opening level of the S&P/TSX 60 on the expiration date

Bearish view

If an investor anticipates that the value of the sector index will decrease, they can simply sell two futures contracts at 3,255.00 and reverse this position when the anticipated plunge occurs. Table 2 illustrates the details of this example. Note that if the underlying sector index were to rise instead of fall, the investor would then incur a loss.

TABLE 2
Futures Position at Expiry

SCENARIO 1: THE INDEX AND THE CONTRACT ARE WORTH 3,155.00 EACH AT EXPIRATION	
Profit ($) on futures contracts initially sold: [(3,255.00 - 3,155.00) × $20] x 2	4,000.00

SCENARIO 2: THE INDEX AND THE CONTRACT ARE WORTH 3,455.00 EACH AT EXPIRATION	
Loss ($) on futures contracts initially sold: [(3,255.00 - 3,455.00) × $20] x 2	(8,000.00)

Using futures contracts to hedge a portfolio of high dividend paying stocks

An investor holds a portfolio comprised of high dividend paying Canadian financial stocks with a market value of $1,200,000. Since the investor expects considerable uncertainty in the Canadian equity markets in the coming months due to heightened global credit concerns, the investor wants to reduce the risk of the portfolio without having to forego dividend income, incur the transaction costs to sell any part of the portfolio and for tax implications. However, the investor does not want to risk relinquishing the potential for a considerable price appreciation in the portfolio should the market continue to rise. Hence, the investor decides to use a low-cost and efficient strategy by hedging (to insure) 60% of the portfolio using stock index futures. Based on data gathered by the investor showing that the S&P/TSX 60 index will be closest in terms of correlation to a portfolio of high dividend paying Canadian financial stocks, the investor decides to use SXM contracts to hedge the portfolio.

In addition, the investor obtains data confirming that the portfolio of high dividend financial stocks has a beta (sensitivity to the market) of 0.727 relative to the benchmark S&P/TSX 60 index.

The SXM contract is trading at a level of 969 index points and one index point is worth $50 (for example, a move of one index point from 969 to 968 represents $50 per contract).

The investor calculates the number of SXM contracts required to hedge 60% of the portfolio of Canadian financial stocks as follows:

$$\text{Number of futures} = \frac{\text{Value of portfolio exposure} \times \text{ßeta}}{\text{Value of futures contract}}$$

$$\text{Number of futures} = \frac{(-\text{Degree of hedge} \times \text{Portfolio value}) \times \text{ßeta}}{\text{Index futures level} \times \text{Contract multiplier}}$$

$$\text{Number of futures} = \frac{(-0.60 \times \$1{,}200{,}000) \times 0.727}{969 \times 50}$$

$$\text{Number of futures} = -11 \text{ contracts}$$

Hence, the investor needs to sell 11 SXM contracts to hedge 60% of the portfolio of Canadian financial stocks.

Using futures contracts for arbitraging (deviations from fair value)

A trader observes that the level of the S&P/TSX 60 index is at 969.92 index points and calculates that the fair value of the SXM contract is 968.43 index points. Ahead of an important central bank announcement, the SXM contract rises abruptly to 968.70 cutting through several large buy stop orders, while the underlying index remains unchanged at 969.92. As a result, the SXM contract is trading 0.27 point above its theoretical fair value price.

TABLE 3

INITIAL DATA	Spot Index Level	Futures (actual trading price)	Theoretical Futures Price	Difference Between Fair Value and Spot	Dividends (in index points)
S&P/TSX 60	969.92	968.70	968.43	-1.49	3.70

Risk free rate: 2.0%

Days to expiration of the SXM contract: 41 days

To profit from the overpriced futures contract, the trader borrows funds to finance an investment in the underlying stocks of the S&P/TSX 60 index and sells the overpriced futures. The trader decides to take advantage of the mispriced futures by selling 100 SXM contracts at 968.70 and simultaneously buying a basket of stocks that are constituents of the S&P/TSX 60 index with their corresponding index weighting at a cost reflecting the index spot level of 969.92 index points. The trade is carried until the expiration of the SXM contract when the trade is unwound as follows.

Outcome of the transaction

Cash leg of the arbitrage trade

With the index levels of the S&P/TSX 60 spot index and SXM futures converging at 980.20 index points at expiry, the trader sells the S&PTSX 60 index basket at the spot level of 980.20 for a profit of 11.77 index points (980.20 minus the fair value of 968.43). The fair value of the index reflects the cost of buying the basket of S&P/TSX 60 index stocks (at a cost that reflects the original index level of 969.92) less the cost of carrying the stocks until the expiration of the futures contract 41 days later (1.49 index points).

Futures leg of the arbitrage leg

The SXM contract is cash settled at expiry at a level of 980.20 index points, for a loss of 11.50 index points (the price of 968.70 of the SXM contract today minus the price of 980.20 at the expiration of the SXM contract).

Profit/loss of the arbitrage trade

Hence, the realized profit is 0.27 index point, reflecting the gain of 11.77 index points on the cash basket (cash leg of the trade) and a loss of 11.5 index points on the index futures (futures leg of the trade).

TABLE 4
Details of the Arbitrage Transaction

Profit/loss from the combined cash leg and futures leg of the arbitrage trade

CASH-AND-CARRY TRANSACTION	Amount (in index points)	Comments
Gain on the cash leg of the arbitrage trade	11.77 index points	
Loss on the futures leg of the arbitrage trade	11.50 index points	
Net gain on the combined cash leg and futures leg of the arbitrage trade	11.77 - 11.50 = 0.27 index point	Difference between the gain on the cash leg of the arbitrage trade and the loss on the futures leg of the arbitrage trade

Note: Since each index point for a SXM contract is worth $50 and the number of futures contracts transacted as part of the cash-and-carry arbitrage strategy is 100 contracts, the trader realizes a profit of $1,350 (0.27 index point × $50 per index point × 100 contracts) excluding transaction costs.

Cash leg of the arbitrage trade

BASKET OF S&P/TSX 60 STOCKS TRANSACTION	Amount (in index points)	Comments
Purchase basket of S&P/TSX 60 index stocks	969.92 index points	Borrow funds to finance the purchase of the basket of stocks at the spot level of the S&P/TSX 60 index
Financing costs until the expiration of the SXM contract	969.92 × (0.020 × 41/365) = 2.18 index point	Financing costs to fund the purchase of the basket of stocks: Short-term financing rate × Number of days/365
Dividends received	3.70 index points	Dividend income received from the basket of S&P/TSX 60 index stocks during the holding period
Cost of the cash-and-carry trade (theoretical fair value)	969.92 + 2.18 - 3.70 = 968.40 index points	Investment + Financing – Income
Sale of the basket of S&P/TSX 60 stocks 41 days later	980.20 index points	Unwinding of the cash leg of the trade at the spot level of the S&P/TSX 60 index 41 days later
Profit/loss Cash leg of the arbitrage trade	980.20 – 968.43 = 11.77 index points	Proceeds from the sale of the basket of stocks at the expiration of the SXM contract less the costs incurred to purchase the stocks and hold them until the expiration of the SXM contract

Futures leg of the arbitrage trade

INDEX FUTURES TRANSACTION	Amount (in index points)	Comments
Sell SXM contracts	968.70 index points	Sell overpriced SXM contract that is priced at 0.27 index point above its theoretical price
Buy SXM contract	980.20 index points	Unwinding of the futures leg of the arbitrage trade at the cash settlement price of the SXM contract at expiration 41 days later
Profit/loss Futures leg of the arbitrage trade	980.20 – 968.70 = 11.50 index points	Difference between the initial futures position and the offsetting futures position

Spreading one futures contract against another

Market participants trade equity index futures spreads to profit from shifts in relative value among market sectors. A popular strategy that takes advantage of the different index levels and contract multipliers of the S&P/TSX Composite Index Mini Futures and the S&P/TSX 60 Index Standard Futures contracts is to set up a spread trade using the two index futures contracts. The spread strategy uses a convention based on the dollar values of the contracts to price the spread and to determine the optimal ratio of contracts to buy and sell.

Trading convention for spreads dictates that one:

1. buys the spread when it is expected to widen, and
2. sells the spread when it is expected to narrow.

In the following spread strategies presented, buying the spread means buying the SXF contract and selling the SCF contract, and selling the spread means selling the SXF contract and buying the SCF contract.

Strategy 1

An investor believes that Canadian equity markets are due to rally over the next week after a period of prolonged weakness. Specifically, the investor believes that large-cap stocks will outperform the broader market. The investor decides to use index futures contracts to benefit from the high leverage futures contract provide. However, the margin that the investor is required to deposit with a broker to buy or sell one SXF or SCF contract is too high given his risk profile. Therefore, the investor uses a spread strategy to play one index off the other that requires only a fraction of the margin requirement for an outright index futures position. Specifically, the investor buys the spread with the expectations that the spread will widen by simultaneously buying an SXF contract and selling two SCF contracts.

TABLE 5
Strategy 1: Buying the Spread in Anticipation of a Widening Spread (1:2 spread ratio)

	Action	# of Contracts	SXF Contract Level	Contract Multiplier	Contract Value ($)	Action	# of Contracts	SCF Contract Level	SCF Contract Multiplier	Contract Value ($)	Spread Value ($)
			(A)	(B)	(C) = (A) × (B)			(D)	(E)	(F) = (D) × (E)	(C) – (F)
Today	Buy	1	971.80	200	(194,360)	Sell	2	15,805	5	158,050	(36,310)
After 5 days	Sell	1	989.60	200	197,920	Buy	2	16,060	5	(160,600)	37,320
Net spread					3,560					(2,550)	1,010

Both futures contracts rose during the period. However, the spread widened because the contract value of the SXF futures rose more than the contract value of the SCF futures (1.83% compared to 1.61%, respectively).

In this scenario, the spread strategy resulted in a profit of $1,010 on a margin deposit of $17,271 (check Page 16 for details) for a return on capital of 5.8% over the five-day period.

Strategy 2

An investor believes that Canadian equity markets are due to resume their downtrend over the next month after a brief three-week rally. Specifically, the investor believes that large-cap stocks will outperform the broader market. The investor decides to use index futures contracts to benefit from the high leverage futures contracts provide. However, the margin that the investor is required to deposit with a broker to buy or sell one SXF or SCF contract is too high given his risk profile. Therefore, the investor uses a spread strategy to play one index off the other that requires only a fraction of the margin requirement for an outright index futures position. Specifically, the investor sells the spread with the expectations that the spread will narrow by simultaneously selling an SXF contract and buying two SCF contracts.

Both the SCF and the SXF contracts fell during the period—however, the spread narrowed because the contract value of the SXF contract fell more than the contract value of the SCF contract (2.99% compared to 2.74%, respectively).

In this scenario, the spread strategy resulted in a profit of $1,520 on a margin deposit of $17,271 for a return on capital of 8.8% over the 30-day period.

TABLE 6
Strategy 2: Selling the Spread in Anticipation of a Narrowing Spread (1:2 spread ratio)

	Action	# of Contracts	SXF Contract Level	Contract Multiplier	Contract Value ($)	Action	# of Contracts	SCF Contract Level	SCF Contract Multiplier	Contract Value ($)	Spread Value ($)
			(A)	(B)	(C) = (A) × (B)			(D)	(E)	(F) = (D) × (E)	(C) – (F)
Today	Sell	1	989.90	200	197,980	Buy	2	16,050	5	(160,500)	37,480
After 30 days	Buy	1	960.30	200	(192,060)	Sell	2	15,610	5	156,100	(35,960)
Net spread					5,920					(4,400)	1,520

Structuring the spread using a spread ratio

Depending on the trader's risk profile, a trader can trade different quantities of each index futures contract when executing a spread strategy. Specifically, a trader must decide on how many contracts of the respective index futures contract to buy and sell. A spread ratio provides a convenient way to track the spread between the respective indices.

When trading the spread between the SXF and the SCF contracts, different contract values must be considered when structuring a spread trade. Ideally, a trader will structure a spread at the outset using a ratio that reflects contract values that are very similar for both index futures—that is, a spread that is structured at the outset as dollar neutral. This results in a spread with a difference in the contract values between the two indices that is close to zero.

To determine an appropriate spread ratio when initiating a spread trade one divides the contract value of the SXF contract by the contract value of the SCF contract.

TABLE 7
How to Determine a Dollar Neutral Spread Ratio when Executing a Spread Trade

SXF Contract Value ($) (A)	SCF Contract Value ($) (B)	Spread Ratio (A)/(B)
197,980	80,250	2.47 contracts

Table 7 indicates that a trader needs 2.47 SCF contracts for every one SXF contract in order to structure a spread trade that is dollar neutral at the outset. The spread ratio can be scaled down or up depending on a trader's risk profile. However, scaling down the spread trade using a spread ratio of less than 2.47 will result in a spread that is established at a level that is substantially different from being dollar neutral at the outset.

Of note, since fractional parts of a futures contract cannot be traded (that is, one cannot buy or sell 0.41 of a futures contract), the spread must be structured in whole contract numbers.

Traders can consider the following ratio alternatives to structure spread trades between the SXF and SCF contracts.

a. 1:2 ratio = One SXF contract to two SCF contract
b. 2:5 ratio = Two SXF contracts to five SCF contracts
c. 5:12 ratio = Five SXF contracts to twelve SCF contracts

Spread margin requirements

MX's clearinghouse, the Canadian Derivatives Clearing Corporation doesn't offer investors any margin relief for SXF/ SCF.

Therefore, the margin required to be deposited by an investor for a spread would be the sum of the Outright Margin for each index futures contract.

How to calculate margins on spreads

For indicative purposes, here are estimated required margin values.

Spread strategy with a 1:2 spread ratio*

CONTRACTS	# of Futures Contracts	Outright Margin (per contract, $)	Total Margins ($)
SXF	1	8,329	8,329
SCF	2	4,471	8,942
Total outright margins			17,271

Spread strategy with a 2:5 spread ratio

CONTRACTS	# of Futures Contracts	Outright Margin (per contract, $)	Total Margins ($)
SXF	2	8,329	16,658
SCF	5	4,471	22,355
Total outright margins			39,013

Spread strategy with a 5:12 spread ratio

CONTRACTS	# of Futures Contracts	Outright Margin (per contract, $)	Total Margins ($)
SXF	5	8,329	41,645
SCF	12	4,471	53,652
Total outright margins			95,297

* Margins taken from the Margin Requirements for Futures Contracts 2019-05-14 for speculators, available at https://reg.m-x.ca/en/regulatory/futures_margins.

What is an Option and How Does it Work?

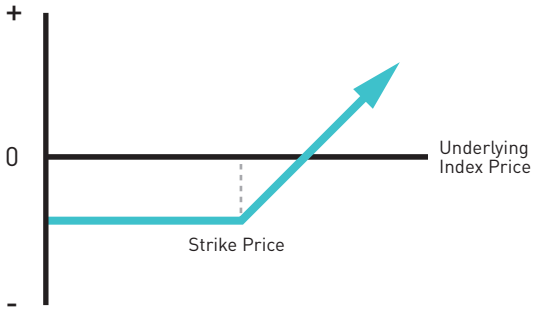
Options come in two types: calls and puts. A call is the right, not the obligation, to buy a specific amount of an underlying at a pre-determined price (the strike or exercise price) within a specified time period. A put is the right, not the obligation, to sell a specific amount of an underlying at the strike price within a specified time period.

Unlike futures contracts, when an option is traded, option buyers actually pay (and sellers receive) the price (or premium) of the option. Subsequently, option buyers have the right, but not the obligation, to exercise their option on the expiration date. This means that if a buyer of the September 970.00 SXO call option wishes to exercise their option on the third Friday of September, when the opening level of the index is 989.00, a holder of a short position on this option will be required to pay out the difference of 19 to the option holder. Similarly, if a buyer of the September 970.00 SXO put option wishes to exercise his option on the third Friday of September, when the opening level of the index is 951.00, a holder of a short position on this option will be required to pay out the difference of 19 to the option holder.

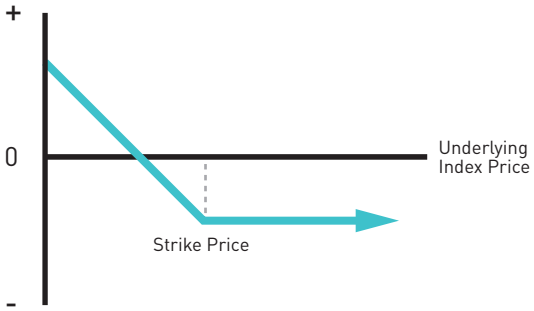
The most attractive feature about options is that they afford the buyer the opportunity to participate in market moves without risking more than what the purchase price. This feature is illustrated in the accompanying profit payoff diagrams for calls and puts, respectively. Both diagrams presume that the option positions are maintained until they expire, when their values are equal to their intrinsic value. For calls, the intrinsic value equals the price of the level of the index minus the strike price; for puts, the intrinsic value is the strike price minus the level of the index.

Payoff Diagrams at Expiry

Long Call Option



Long Put Option

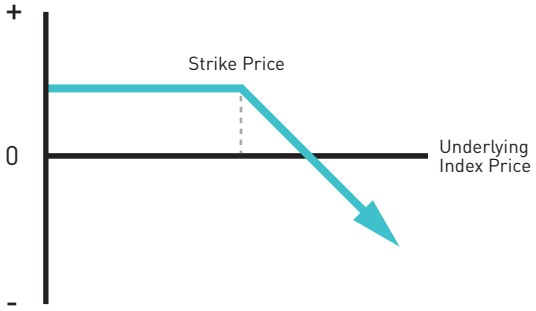


As these diagrams show, call option buyers stand to gain if the market goes up, while put option buyers profit if the market goes down. In either case, however, the market must move sufficiently to compensate the option buyer for the premium he paid out to hold the option.

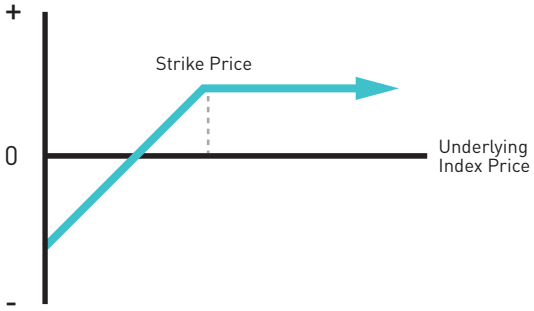
No discussion of option contracts would be complete without considering the concept of short option positions (i.e. initiating a trade by selling option contracts). While buying options offers the opportunity for virtually unlimited gains and limited risk, selling options offers the reverse: a limited gain potential equal to the premium received with unlimited risk. The profit/loss payoff outcomes for short option positions are presented in the diagrams below.

Payoff Diagrams at Expiry

Short Call Options



Short Put Options



Essentially, option sellers wish to make money by selling the option at a high enough price and hoping that the underlying does not move sufficiently to bring the option into the money. An additional consideration for option sellers is that these positions require the posting of margin with their brokers because of the high-risk exposure. As the market fluctuates, the clearing corporation will recalculate the margin requirement, calling for additional collateral from option sellers if its price goes up, but also possibly returning a part of the posted margin if the option's price goes down.

What is an Equity Index Option?

Besides futures contracts, MX also lists S&P/TSX 60 index options (SXO). At any point in time, a host of option contracts may be listed for trading, given the five expiration months and strike prices in each of these months from which to choose. SXO options are European style, meaning that they can only be exercised on their expiration date, the third Friday of the contract month. Listed months include the nearest three months plus the next two months in the March, June, September, December quarterly cycle.

An annual expiration of December the following year is also listed. This long-term option is appropriate for any option-based hedging or trading strategy. With long-term options, the number of available option expirations is expanded, which allows traders to take positions designed to profit from anticipated changes in implied volatility of options, not only of different strike prices but also of different expiration horizons.

Index options are cash-settled, where the final settlement price is the official opening level of the underlying index on the expiration date (i.e. the same final settlement price procedure as for the index futures contracts).

S&P/TSX 60 Index Options (SXO)

SXO options on the S&P/TSX 60 Index provide investors a wide array of alternatives to protect their equity portfolios and to enhance returns.

SXO index option prices are also used to compute the S&P/TSX 60 VIX® Index (VIXC), which seeks to measure the 30-day volatility of the Canadian stock market derived from SXO option prices.

How can I use these options?

- The holder of a stock portfolio could minimize his or her exposure to the market by buying SXO puts, which will act as an insurance policy to compensate for a drop in stock prices.
- Institutional portfolio managers may find that continuously buying puts to reduce risk is too expensive over the long term as they must offer competitive returns to their clients. To offset this cost, they could sell SXO calls while buying SXO puts, essentially creating a "collar". The advantage of this strategy is to reduce the cost of buying puts with the premium collected by selling calls.
- Holders of stock portfolios could also generate additional income and enhance returns by writing SXO calls.
- Investors could profit from changes in the volatility of options prices by trading the expected (implied) volatility against the realized volatility.
- Investors may also wish to trade options in anticipation of future directional changes in stock prices instead of the shares themselves (use of leverage).

Trading Strategies for Index Options

Directional trading using options contracts

Suppose you are bullish about the Canadian stock market. You decide to buy SXO call options and you choose an expiration month that covers the time period in which you expect this market appreciation to take place. The choice of strike price reflects a basic trade-off: for the same expiry month, calls with lower strike prices are in-the- money and are more expensive than calls with higher strike prices.

For example, if you expected the market to rise before the middle of September, you would choose a call option that expires in September. Let's consider two such options, one with a strike price of 970.00 and the other with a strike price of 980.00. Suppose the quoted market prices for these two calls are 18.00 and 13.00, respectively. Each option contract will cost $100 (the multiplier) times the posted premium, therefore the 18.00 index point price translates into a cash requirement of $1,800 and the 13.00 index price translates to $1,300.

Which of these two alternatives is the better choice depends on where the market goes and how fast. Ultimately, however, we can identify the break-even prices for the two options. For the 970-strike call, the index has to rise above a level of 988.00 by the option's expiration date in order to be profitable, whereas the break-even level for the 980-strike option is 993.00. In both cases, we arrive at the break-even level by adding the option's premium to the strike price[7].

Call buyers should understand that their potential loss is limited to the option premium and that this loss would in fact be realized if the index level were below the strike price of the option at expiration. Alternatively, given the same holding period, if the level of the index were to rise above the strike price, the profit would be equal to the final intrinsic value of the option (i.e. the difference between the index level and the strike price), less the original premium. Hypothetical results for these two options are shown in Table 9.

TABLE 9
Operations Results on SXO Call Options

	970 Call	980 Call
Initial premium (index points)	18.00	13.00
Initial premium ($)	1,800.00	1,300.00
Break-even price	988.00	993.00
Final index value	995.00	995.00
Option price at expiry (index points)	25.00	15.00
Option price at expiry ($)	2,500.00	1,500.00
Profit (index points)	7.00	2.00
Profit ($)	700.00	200.00

It should be clear that the trader who had a bearish view (i.e. that the stock market would decline) would have bought put options, rather than calls. In this case, the strategy would be profitable if the index would drop below the put strike price, with limited risk if equity prices were to rise.

Using options contracts to hedge

Equity portfolio managers who are bearish may want to consider the strategy of buying put options as a form of insurance. The idea is straightforward: for the price of the premium, the investor can protect his portfolio against the risk associated with a drop in the S&P/TSX 60 below the level of the strike price. If the index remains above this strike price, however, the exposure to the market remains intact, but the premium paid for the put will not be recovered.

7. In assessing the break-even prices for a put option, the option premium is subtracted from the strike price.

When employing this strategy, the number of option contracts must be determined. To achieve this objective, the hedger must base the size of the option position on the size of the exposure, using the following formula:

$$N = \frac{V \times \text{ßeta}}{\text{S\&P/TSX 60} \times \$100}$$

Where :

N = the required number of options contracts;

V = the value of the equity position to hedge;

ßeta = the correlation measure of the portfolio in relation to the index;

S&P/TSX 60 = the level of the S&P/TSX 60 index; and

$100 = the multiplier for the options contract.

The choice of the strike price is determined by the point from which protection is desired. Suppose, for example that you were prepared to assume the risk of a 5% decline in the value of the portfolio, where your portfolio exhibited a beta of 1.2 (that is, if the S&P/TSX 60 index were to change by 10%, your portfolio would be expected to change by 12%). Under these conditions, a 5% decline in your portfolio value would be associated with a 4.17% decline of the S&P/TSX 60 index (5%/1.2). Assuming a current index value of 965.00, the appropriate break-even price for the put option would be 965.00 × (100% - 4.17%) = 924.76. For the sake of this example, assume the 955-strike put could be purchased for a price of 22.25, generating a break-even price equal to 932.75. Table 10 illustrates the performance of this hedge assuming a market decline of 20%.

TABLE 10
Hedging a Portfolio with a Long Put, where Beta = 1.2

STARTING CONDITIONS	
S&P/TSX 60 index value	965.00
Portfolio value ($)	1,000,000.00
Portfolio beta	1.2
SXO 955-strike put	12 options
Option price (index points)	22.25

ENDING CONDITIONS: MARKET DEPRECIATES 20%	
S&P/TSX 60 index value	772.00
SXO put value at expiry (965.00 – 772.00)	193.00
Loss in portfolio ($) (20% x 1.2)	(240,000.00)
Portfolio value ($)	760,000.00
Profit from the hedge ($) [(193.00 – 22.25) × 100 × 12]	204,900.00
Combined outcome (240,000.00 – 204,900.00) ($)	(35,100.00)
Portfolio + Hedge, combined value ($)	964,900.00

Given this hedging strategy, we can see that the hedge in place has allowed us to limit the loss at 3.51% unlike the underlying market that dropped by 20%.

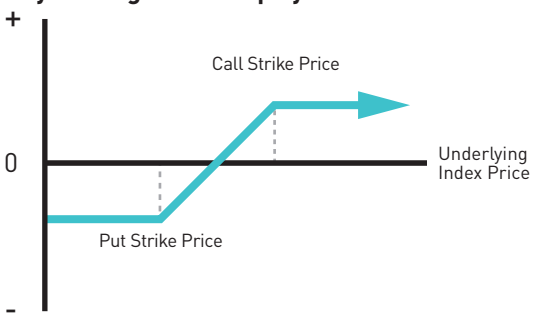
Executing the collar strategy

For many investors who seek price protection for an equity position, the up-front cost of a put option may seem to be expensive. For these investors, a collar offers an interesting alternative. A collar entails the purchase of a put option with a simultaneous sale of a call option with the same expiry for a total cost near zero. This is possible by choosing call and put strike prices that are more or less equidistant of the spot value of the index when the transaction was initiated.

Consider the case where the index is at a price of 965.00 and assume the collar is constructed with a long 955-put and a short 975-call. Assume, further, that the option positions are maintained until the options' expiration. The premium received from the sale of the call will partially finance the premium paid for the purchase of the put. The put option will be in-the-money if the level of the index falls below 965.00. If this happens, the call option will expire worthless. In the opposite market scenario, with the level of the index ending up above 975.00, the call will end up being in-the-money while the put will end up worthless. Thus, the loss incurred by the call option sold will limit the portfolio's potential profit in the event the index is above 975.00.

Payoff Diagram at Expiry

Payoff Diagram at Expiry



The collar will thus have the effect of limiting the market exposure to a range bounded by the strike price of the put at the lower end and the strike price of the call at the higher end (as shown in the diagram above). By the choice of strike prices, investors can decide how much risk they want to take in the event of market depreciation, based on the potential returns.

Executing Large-Sized Transactions on Index Derivatives - Wholesale Facilities

Institutional clients and investors have access to a range of execution possibilities for large transactions (wholesale facilities) on index derivatives.

Cross Transactions

A cross transaction occurs when two orders of opposite sides originating from the same approved participant are intentionally executed against each other, in the context of the market, in whole or in part as a result of pretrade discussions. Participants must respect time delay and chronology of orders.

Benefits of cross transactions

- Ability to execute two opposite orders intentionally against each other at a pre-negotiated price (transactions allowed between two customer accounts or the firm and a customer account).
- Quick execution of matching orders.
- Zero-second crossing facility for index options.

Exchange for Physical (EFP)

An EFP involves simultaneous transactions in the cash and futures markets. In an EFP, one party buys an acceptable cash market position and simultaneously sells the futures contract while the other party sells this acceptable cash market position and simultaneously buys this futures contract. The parties to an EFP privately negotiate the price of the futures position and the value of the cash commodity to be exchanged. Once the price and quantity of the futures have been set by the parties and an EFP has been accepted for clearing, the futures margin and delivery or settlement obligations of the parties arising from an EFP are not distinguishable from those executed competitively on the trading platform.

Benefits of EFPs

- Exchange a futures market exposure for an offsetting underlying cash market exposure.
- Allow choice of counterparty, thereby reducing risk of non-performance by the opposite party.
- Limit risk by doing a transaction after the regular trading hours of the futures market.
- May free up capital allowing parties to benefit from other opportunities while maintaining equity market exposure.
- Allow your clients to avoid additional margin obligations or can be used as a vehicle to cover market position against overnight price changes.

Exchange for Risk (EFR)

An EFR is a transaction whereby two parties enter into an agreement in which one party purchases (sells) an over-the-counter ("OTC") derivative instrument and simultaneously sells (buys) a corresponding futures contract and the other party sells (buys) the OTC derivative instrument and simultaneously purchases (sells) the corresponding futures contract.

Benefits of EFRs

- Exchange a futures market position for an OTC market position.
- Quick and efficient execution of a futures transaction.
- Facilitation of varying size futures transactions at a single price.
- Improved effectiveness of non-traditional hedging program.
- Enhanced financial integrity of OTC hedging program.

Riskless Basis Cross

Benefits of riskless basis cross

- A good alternative for clients who cannot or do not want to hold cash securities in their accounts but who wish to acquire market exposure in the most efficient way possible (either on the cash or ETF markets).
- Allows participants to use the attributes of the underlying cash market to take the market position requested by a client and then to replicate it through the use of index futures contracts – leaving participants with no resulting market position and the client with an index futures position.
- All these transactions are privately negotiated trades and are executed outside the competitive electronic order book, but submitted for clearing through CDCC. They represent an efficient way to reduce and control risks, costs and margins—without disrupting the marketplace.

BTC

BTC is a functionality that allows participants to trade the future at a price equivalent to the official close of its underlying cash market plus a predetermined agreed-upon price differential (positive or negative) known as "the basis". The basis of an equity trade is a function of the expected dividends, carry cost, and time to maturity. Because BTC is quoted as the price differential between the future's price and the spot price (either the index constituent basket or the single-share), this price differential can be either positive or negative.

Benefits of BTC

BTC combines the advantages of a market on close type of order with the hedging capacity of index futures or share futures contracts in a unique functionality.

BIC

Approved Participants may mutually agree to price a block Trade at a positive or negative increment ("basis") to the price at which the Index underlying an eligible contract will close ("BIC"), for any Trading Day except the last Trading Day of an expiring contract month. The Approved Participants shall report the basis along with other Trade details and shall submit to the Bourse's Market Operations Department a second Block Trade Reporting Form which includes the agreed-upon basis, the closing level of the Underlying Index and the price of the block trade to the nearest 0.01 Index point increment within the time required. (See Montreal Exchange Rules for more detail, Page 89).

Settlement of Index Derivatives

For index futures, the accounts of the buyer and the seller are credited and debited every day according to the variation between the current day's settlement price and the previous day's settlement price (or the original trade price in the case of the first day's settlement). If the current day's settlement price is higher than the previous day's, the buyer of the futures will see his account credited with the amount of the variation times the multiplier of the futures, and the seller's account will be debited this amount. The opposite is true if the price of the futures drops.

In the case of an index option, the cash amount resulting from the difference between the index level of the contract at the expiration and the in-the-money option's strike price will be delivered by the seller of the contract (the short position holder) to the buyer of the contract (the long position holder).

All trades are cleared by a central entity, the Canadian Derivatives Clearing Corporation (CDCC). CDCC is a financially solid institution, which takes on the responsibility of buying from sellers and selling to buyers of index futures and options traded on MX, which eliminates the risk of a defaulting counterparty.

Conclusion

To broaden the investment possibilities relating to Canadian stock portfolios, MX has introduced futures and options contracts on broad-based and sector indices.

These contracts on Canadian economic sectors are very efficient tools in risk management and allow asset allocation, especially for portfolio adjustments.

These contracts can also be used to hedge the profit realized on an investment or to freeze a loss incurred. In the portfolio management context, they can serve to hedge a portfolio from the effect of fluctuations in stocks of companies operating in an economic sector.

For institutional investors with very low transactions costs, futures contracts allow arbitrage strategies intended to restore a balance between the spot market of the underlying asset and the futures market (or within a futures market, between expiration dates), or between the various futures contracts available.

Lastly, these contracts enable investors to profit from short-term fluctuations in the stock market. This type of operation carries important risks, but it generates important potential profit; only well-informed investors should consider it.

Canadian Derivatives Clearing Corporation (CDCC)

The Canadian Derivatives Clearing Corporation is the clearing house of exchange-traded derivative contracts listed on the Montréal Exchange. CDCC also clears over-the-counter (OTC) products through its Converge clearing service.

CDCC requires each clearing member to maintain margin deposits with the clearing house in order to cover the market risk associated with each participant's position. The assessment of this risk is based on a set of well-defined criteria established by the clearing house. Margins are collected daily or more frequently during periods of market volatility.

As a clearing house for exchange-traded derivative instruments and Converge products, CDCC ensures the integrity and stability of the derivatives market. CDCC provides stability to the market place by assuming the derivative related obligations of a defaulting clearing member towards counterparty clearing members. To ensure its ability to fulfill its obligations, the Corporation maintains a rigorous risk management process.

Appendix 1

SXF
S&P/TSX 60 Index Standard Futures

Underlying	The S&P/TSX 60 index is a capitalization-weighted index of the 60 largest and most liquid stocks listed on the Toronto Stock Exchange.
Contract Size	C$200 × the S&P/TSX 60 Index Standard Futures value
Contract Months	March, June, September and December.
Price Quotation	The contract is quoted in index points, expressed to two decimals.
Minimum Price Fluctuation	• 0.10 index point for outright positions • 0.01 index point for calendar spreads • 0.05 index points for outright Basis Trades on Close
Last Trading Day	The trading day prior to the Final Settlement Day.
Final Settlement Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	Cash settlement. The final settlement price is the Official Opening Level of the underlying index to the Final Settlement Day.
Reporting Limit	1,000 futures contracts (standard and mini combined) on the S&P/TSX 60 index gross long and short in all contract months combined.
Position Limits	Information on Position Limits can be obtained from the Bourse as they are subject to periodical changes.
Minimum Margin Requirements	Information on Minimum Margin Requirements can be obtained from the Bourse as they are subject to periodical changes.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	Early session*: 2:00 a.m. to 9:15 a.m. ET Regular session: 9:30 a.m. to 4:30 p.m. ET Basis Trades on Close: Regular session 9:30 a.m. to 3:30 p.m. ET
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)
Ticker Symbol	SXF Basis Trade on Close: BSF

* A trading range of -5% to +5% (based on previous day's settlement price) has been established only for this session.

Appendix 2

SXM
S&P/TSX 60 Index Mini Futures

Underlying	The S&P/TSX 60 index is a capitalization-weighted index of the 60 largest and most liquid stocks listed on the Toronto Stock Exchange.
Contract Size	C$50 × the S&P/TSX 60 Index Mini Futures value
Contract Months	March, June, September and December.
Price Quotation	The contract is quoted in index points, expressed to two decimals.
Minimum Price Fluctuation	• 0.10 index point for outright positions • 0.01 index point for calendar spreads
Last Trading Day	The trading day prior to the Final Settlement Day.
Final Settlement Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	Cash settlement. The final settlement price is the Official Opening Level of the underlying index to the Final Settlement Day.
Reporting Limit	1,000 futures contracts (standard and mini combined) on the S&P/TSX 60 index gross long and short in all contract months combined.
Position Limits	Information on Position Limits can be obtained from the Bourse as they are subject to periodical changes.
Minimum Margin Requirements	Information on Minimum Margin Requirements can be obtained from the Bourse as they are subject to periodical changes.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	Early session*: 2:00 a.m. to 9:15 a.m. ET Regular session: 9:30 a.m. to 4:30 p.m. ET
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)
Ticker Symbol	SXM

* A trading range of -5% to +5% (based on previous day's settlement price) has been established only for this session.

Appendix 3

SCF
S&P/TSX Composite Index Mini Futures

Underlying	The S&P/TSX Composite index is a capitalization-weighted index designed to measure the market activity of stocks listed on the Toronto Stock Exchange.
Contract Size	C$5 × the S&P/TSX Composite Index Mini Futures value
Contract Months	March, June, September and December.
Price Quotation	The contract is quoted in index points.
Minimum Price Fluctuation	• 5 index points for outright positions • 1 index point for calendar spreads
Last Trading Day	The trading day prior to the Final Settlement Day.
Final Settlement Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	Cash settlement. The final settlement price is the Official Opening Level of the underlying index to the Final Settlement Day.
Reporting Limit	1,000 futures contracts gross long and short in all contract months combined.
Position Limits	Information on Position Limits can be obtained from the Bourse as they are subject to periodical changes.
Minimum Margin Requirements	Information on Minimum Margin Requirements can be obtained from the Bourse as they are subject to periodical changes.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	Early session*: 2:00 a.m. to 9:15 a.m. ET Regular session: 9:30 a.m. to 4:30 p.m. ET
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)
Ticker Symbol	SCF

* A trading range of -5% to +5% (based on previous day's settlement price) has been established only for this session.

Appendix 4

SXA - SXB - SXH - SXY - SXK - SXU
Sector Index Futures

Ticker and Underlying	The designated S&P/TSX Sector Index: • SXA - S&P/TSX Global Gold Index • SXB - S&P/TSX Capped Financials Index • SXH - S&P/TSX Capped Information Technology Index • SXY - S&P/TSX Capped Energy Index • SXK - S&P/TSX Composite Index Banks • SXU - S&P/TSX Capped Utilities Index
Contract Size	• C$200 × the S&P/TSX Global Gold Index Futures value • C$200 × the S&P/TSX Capped Financials Index Futures value • C$500 × the S&P/TSX Capped Information Technology Index Futures value • C$200 × the S&P/TSX Capped Energy Index Futures value • C$20 times the S&P/TSX Composite Index Banks (Industry Group) futures value • C$200 times the S&P/TSX Capped Utilities Index futures value
Contract Months	March, June, September and December
Price Quotation	Quoted in index points, expressed to two decimals
Minimum Price Fluctuation	• 0.10 index points for the S&P/TSX Global Gold Index • 0.10 index points for the S&P/TSX Capped Financials Index • 0.05 index points for the S&P/TSX Capped Information Technology Index • 0.10 index points for the S&P/TSX Capped Energy Index • 0.10 index point for the S&P/TSX Composite Index Banks (Industry Group) • 0.10 index point for the S&P/TSX Capped Utilities Index
Last Trading Day	The trading day prior to the Final Settlement Day.
Final Settlement Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	Cash settlement. The final settlement price is the Official Opening Level of the underlying sectorial index on the Final Settlement Day.
Reporting Limit	500 net long or short in all contract months combined.
Position Limits	Information on Position Limits can be obtained from the Bourse as they are subject to periodical changes.
Minimum Margin Requirements	Information on Minimum Margin Requirements can be obtained from the Bourse as they are subject to periodical changes.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	Early session*: 2:00 a.m. to 9:15 a.m. Regular session: 9:30 a.m. to 4 :30 p.m.
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)

* A trading range of -5% to +5% (based on previous day's settlement price) has been established only for this session

Appendix 5

SXJ - SXV
Sector Index Options

Ticker and Underlying	The designated S&P/TSX Sector Index: • SXJ - S&P/TSX Composite Index Banks • SXV - S&P/TSX Capped Utilities Index
Contract Size	• C$10 per S&P/TSX Composite Index Banks (Industry Group) point • C$100 per S&P/TSX Capped Utilities Index point
Contract Months	March, June, September and December
Strike prices	• SXJ: Set at a minimum interval of 10 index points • SXV: Set at a minimum interval of 5 index points
Minimum Price Fluctuation	For premiums of less than 0.10 index points: • SXJ: 0.01 index point = C$0.10 per contract • SXV: 0.01 index point = C$1.00 per contract For premiums of 0.10 index points or more: • SXJ: 0.05 index points = C$0.50 per contract • SXV: 0.05 index points = C$5.00 per contract
Last Trading Day	The business day prior to expiration.
Final Settlement Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	European style. Cash-settled. The final settlement price is the official opening level of the underlying index at expiration.
Reporting Limit	1,000 contracts gross long and short in all contract months combined.
Position Limits	Information on Position Limits can be obtained from the Bourse as they are subject to periodical changes.
Minimum Margin Requirements	Information on Minimum Margin Requirements can be obtained from the Bourse as they are subject to periodical changes.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	9:31 a.m. to 4:00 p.m
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)

Appendix 6

SXO
S&P/TSX 60 Index Options

Underlying	The S&P/TSX 60 index is a capitalization-weighted index of the 60 largest and most liquid stocks listed on the Toronto Stock Exchange.
Multiplier	C$100 per S&P/TSX 60 index point
Contract Months	The nearest three months plus the next two months in the designated quarterly March, June, September and December cycle. Annual expiry of December (long term).
Price Quotation	Quoted in index points, expressed to two decimals.
Minimum Price Fluctuation	• 0.01 index point = C$1 per contract, for premiums of less than 0.10 index point • 0.05 index point = C$5 per contract, for premiums of 0.10 index point and up
Expiration Day	The 3rd Friday of the contract month, providing it be a business day; if not, the 1st preceding business day.
Contract Type	European style. Cash settlement. The final settlement price is the Official Opening Level of the underlying index on the expiration day.
Strike Prices	• Set at a minimum of 2.5 index points. • Set at a minimum of 5 index points (long term options)
Reporting Limit	1,500 contracts on the same side of the market in all options contract months combined.
Price Limits	A trading halt will be invoked in conjunction with the triggering of "circuit breaker" in the underlying stocks.
Trading Hours (Montréal time)	9:31 a.m. to 4:00 p.m.
Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC)
Ticker Symbol	SXO

For more information

Please contact Montréal Exchange if you have any additional questions or require further clarification.

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