NOTICE TO MEMBERS

N° 020-23

February 3rd, 2023

REQUEST FOR COMMENTS

AMENDMENTS TO THE RISK MANUAL OF THE CANADIAN DERIVATIVES CLEARING CORPORATION REGARDING THE BASE INITIAL MARGIN MODEL USED TO CALIBRATE MARGIN RELIEFS FOR EXCHANGE TRADED DERIVATIVES

On February 2, 2023, the Board of Directors of Canadian Derivatives Clearing Corporation ("CDCC") approved certain amendments to the Risk Manual of CDCC to allow the modification of the methodology used by CDCC to calibrate margin reliefs between Futures products listed at the Montréal Exchange (the "Bourse") and cleared by CDCC.

Please find enclosed an analysis document as well as the proposed amendments.

Process for Changes to the Rules

CDCC is recognized as a clearing house under section 12 of the *Derivatives Act* (Québec) by the Autorité des marchés financiers ("AMF") and as a recognized clearing agency under section 21.2 of the *Securities Act* (Ontario) by the Ontario Securities Commission ("OSC").

The Board of Directors of CDCC has the power to approve the adoption or amendment of the Risk Manual of CDCC. Amendments are submitted to the AMF in accordance with the self-certification process and to the OSC in accordance with the process provided in the Recognition Order.

Comments on the proposed amendments must be submitted before March 3rd, 2023. Please submit your comments to:

Maxime Rousseau-Turenne
Legal Counsel
Canadian Derivatives Clearing Corporation
1800-1190 av. des Canadiens-de-Montréal, P.O. Box 37
Montreal, Quebec H3B 0G7
Email: legal@tmx.com

A copy of these comments shall also be forwarded to the AMF and to the OSC to:

Me Philippe Lebel
Corporate Secretary and
Executive Director, Legal Affairs
Autorité des marchés financiers
Place de la Cité, tour Cominar
2640 Laurier boulevard, suite 400
Québec (Québec) G1V 5C1
Fax : (514) 864-8381
E-mail:consultation-en-cours@lautorite.qc.ca

Manager, Market Regulation
Market Regulation Branch
Ontario Securities Commission
Suite 2200,
20 Queen Street West
Toronto, Ontario, M5H 3S8
Fax: 416-595-8940
Email: marketregulation@osc.gov.on.ca

For any question or clarification, Clearing Members may contact Maxime Rousseau-Turenne, Legal Counsel, at maxime.rousseauturenne@tmx.com

George Kormas
President

AMENDMENTS TO THE RISK MANUAL OF THE CANADIAN DERIVATIVES CLEARING CORPORATION REGARDING THE BASE INITIAL MARGIN MODEL USED TO CALIBRATE MARGIN RELIEFS FOR EXCHANGE TRADED DERIVATIVES

I. DESCRIPTION

Canadian Derivatives Clearing Corporation ("**CDCC**") wishes to amend its Risk Manual (the "**Manual**") to allow for the modification of the methodology used by CDCC to calibrate margin reliefs between Futures products listed at the Montréal Exchange (the "**Bourse**") and cleared by CDCC, for the purpose of extending the offering of margin reliefs to a larger group of Futures products, while continuing to ensure appropriate levels of margin coverage. The additional margin reliefs that CDCC wishes to offer would involve most of the CDCC-cleared Futures product suite as selected pairs of eligible combinations, namely essentially combinations of Index Futures and their constituents, as well as of different maturities of the Government of Canada Bond Futures[1].

Unless otherwise defined herein, any defined term used in this analysis will have the meaning described in the Manual, or the rules of CDCC (the "**Rules**").

II. PROPOSED AMENDMENTS

CDCC hereby proposes amendments to Section 6.1 of the Manual to modify its margin model. More specifically, a minor adjustment is required in the Inter-Commodity section of the Manual in order to align the description of the margin model with the proposed change in the methodology used to calibrate the margin reliefs. Another minor adjustment is required in order to erase the footnote stipulating that the Inter-Commodity is not applicable for Share Futures. The changes proposed by the CDCC have no impact on the Rules or the Operations and Default Manuals of CDCC.

The proposed amendments are provided herein in Appendix "A".

III. ANALYSIS

[1] Pairs of Futures products selected as combinations eligible for margin efficiencies are listed in the Eligibility section hereafter in greater detail.

a. Background

Further to the implementation of the Gross Client Margining ("**GCM**") initiative, CDCC will be collecting margins on a gross basis value for all client Futures positions (rather than on a net basis), and Canadian clients will have the possibility to use the margin file issued by CDCC under the standard SPAN format (the "**SPAN file**") as an alternative to the margin file issued by the Bourse's regulatory division (the "**MXR file**"). Moving to the SPAN file for Futures and Options on Futures positions will be an optional but highly recommended move for accuracy of margins, while also allowing Clearing Members' clients to benefit from the current margin reliefs offered by CDCC, as well as from the proposed additional margin reliefs[2].

It is in this context of margin harmonization between CDCC margin requirements towards Clearing Members, and Clearing Members' margin requirements towards their clients, that CDCC wishes to optimize the level of margins by providing additional margin efficiencies between Futures products.

Risk model

As defined in the Manual, the Base Initial Margin for Futures and Options on Futures is calibrated using a SPAN-based methodology composed of the Scanning Risk and Intra-Commodity, as well as the Inter-Commodity. In accordance with CDCC's portfolio margining standards, the Base Initial Margin is first evaluated independently for each group of products sharing identical risk factors (i.e. at the risk group level; e.g. the S&P/TSX 60 Index Standard Futures (SXF) Combined Commodity), and the Inter-Commodity is then considered for risk groups sharing similar risk factors (e.g. SXF versus S&P/TSX 60 ESG Index Futures (SEG)). Under the Inter-Commodity model, margin reliefs are calibrated for each eligible product pair as a single percentage amount, from 0% to 100%, and then used to reduce the Base Initial Margin of the corresponding eligible hedge positions.

In order to allow for the expansion of margin reliefs to a larger sample of products, CDCC is proposing key enhancements to the calibration methodology. More specifically, the proposed methodology is based on the profit and loss distribution of the combination's positions using optimal hedge ratios, while using an additional anti-procyclicality measure (i.e. dynamic 10-year margin relief cap, in addition to the current flat 90% cap[3]).

Product eligibility

[2] Margin reliefs are not available in the MXR file, with the exception of fungible contracts (e.g. S&P/TSX 60 Index Standard Futures (SXF) versus the S&P/TSX 60 Index Mini Futures (SXM).

[3] With the exception of fungible contracts for which a margin relief of 100% is considered on the corresponding hedge ratio position.

Margin reliefs are currently available for a limited list of Futures products sharing strong economic relations and exhibiting high correlation dynamics, such as Index Futures combinations (e.g. SXF versus SEG), and Short Term Interest Rate (STIR) Futures combinations (e.g. Three-month Canadian Bankers' Acceptance Futures (BAX) versus Three-Month CORRA Futures (CRA)).

The proposed changes would fully support the generalization of the margin model to the entire Futures product suite cleared by CDCC (including Options on Futures). Considering the economic relation between products and their underlying risk factors, the following combinations (each, a "**Set of combinations**") have been selected as eligible pairs for margin efficiencies:

Leg A		Leg B
STIR Futures	***i***	**STIR Futures**
Government of Canada Bond Futures	***ii***	**Government of Canada Bond Futures**
Index Futures (market index[4])	***iii***	**Index Futures** (market index)
	iv	**Index Futures** (sector index)
	v	**Share Futures**[5]
Index Futures (sector index)	***vi***	**Share Futures** (index constituents)
Share Futures (same sector[6])	***vii***	**Share Futures** (same sector)

Therefore, in addition to the combinations currently offered between STIR Futures (Set of combinations "***i***"), margin reliefs would be activated between long term interest rate Futures products (Set of combinations "***ii***"[7]). Also, in addition to the combinations currently offered between Index Futures (Set of combinations "***iii***"), margin reliefs would be offered with the Sector Index Futures (Set of combinations "***iv***"[8]), as well as Share Futures (Set of combinations "***v***" and

[4] E.g. S&P/TSX 60 Index Standard Futures (SXF), S&P/TSX 60 ESG Index Futures (SEG), etc.

[5] Share Futures exposed to cryptocurrencies are excluded.

[6] Sectors initially in scope for eligible Share Futures combinations are the bank sector and the energy sector.

[7] E.g. Ten-year Government of Canada Bond Futures (CGB) versus Thirty-year Government of Canada Bond Futures (LGB).

[8] E.g. SXF versus Composite Index Banks Futures (SXK).

"***vi***"[9]). Lastly, combinations would also be offered between a limited set of Share Futures sharing meaningful economic relationships (Set of combinations "***vii***"[10]).

b. Objectives

The objective of the proposed amendments is to increase the robustness of CDCC's margin relief calibration methodology in order to allow for the extension of margin reliefs to a larger group of Futures products while maintaining appropriate levels of coverage, at a juncture when the harmonization of margins requirements resulting from the GCM initiative will be completed.

c. Comparative Analysis

CDCC conducted a comparative analysis of publicly available information on the offering of margin reliefs for Futures products. The combinations eligibility for margin reliefs of other traditional clearing houses such as the CME Clearing and the ICE Clear Europe far surpasses that of the combinations currently eligible at CDCC. The new selection of eligible pairs hereby proposed is much more in line with the current offering for the Futures market.

d. Analysis of Impacts

i. Impacts on Market

With the proposed extension of margin reliefs to other Futures products, margin levels will be more optimized, while making sure that margin coverage remains appropriate. Moreover, the proposed addition of the 10-year margin relief cap is expected to control rapid changes in the level of margin relief provided, especially in stressed market conditions when the correlation between products sharing similar risk factors typically tends to increase.

The amount of relief currently provided by CDCC is heavily concentrated on the SXF versus its smaller sized and fungible contract, the S&P/TSX 60 Index Mini Futures (SXM), altogether representing less than 1% of CDCC's Base Initial Margin. The overall amount of relief is expected to increase from less than 1% to less than 5% of the Base Initial Margin. This margin impact analysis has been evaluated using the constitution of the portfolios cleared by CDCC over the past two years.

Furthermore, given CDCC's intention to provide additional margin efficiencies in a time when the harmonization of margins resulting from the GCM initiative will be completed, a margin impact analysis has also been conducted using the gross client Futures positions data that are available

[9] E.g. SXF or SXK versus Royal Bank of Canada Futures (FRY).
[10] E.g. FRY versus Bank of Montreal Futures (FBO).

at CDCC. The results are in line with the impact evaluated using the positions on a net basis at less than 5% of CDCC's Base Initial Margin.

Lastly, CDCC expects the level of other margin components, such as the Additional Margin for Capital Risk, or the Clearing Fund and the Supplemental Liquidity Fund, to be indirectly impacted since the level of the Base Initial Margin is used in the calibration of their size.

ii. Impacts on Technology

The proposed amendments have no impact on the clearing system (SOLA). Indeed, the clearing system makes external use of the information to be processed (the calibration of margin reliefs). User acceptance testing is planned prior to implementation to ensure that the updated calibration process is appropriate, as well as to make sure that the extension to a larger set of products is appropriately handled by all relevant technological systems.

iii. Impacts on Trading Functions

The proposed amendments will have no impact on the Bourse trading systems or rules.

iv. Public Interest

CDCC is of the view that the proposed amendments are not contrary to the public interest. In fact, the public and Clearing Members are generally requesting clear rules that are consistent with the best practices of other clearing houses and are PFMI compliant.

Moreover, CDCC considers these amendments to be in the interest of the public as they would allow for the performance of CDCC's Base Initial Margin models to be optimized without adversely impacting its Clearing Members in times of stress, which should benefit and strengthen the entire marketplace. CDCC is also of the view that optimizing the level of margins will increase the efficiency and attractiveness of Canadian markets.

IV. PROCESS

The proposed amendments, including this analysis, must be approved by CDCC's board of directors and submitted to the Autorité des marchés financiers, in accordance with the regulatory self-certification process, and to the Ontario Securities Commission in accordance with the rules stated in Appendix "A" of Schedule "C" of CDCC Recognition Order dated April 8, 2014 (as amended from time to time). The proposed amendments and analysis will also be submitted to the Bank of Canada in accordance with the Oversight Agreement. Subject to public comments, the proposed amendments are expected to take effect during March of 2023, at the same time or shortly after the implementation of the GCM initiative.

APPENDIX A
PROPOSED AMENDMENTS TO THE MANUAL
BLACKLINED VERSION

[…]

Section 6: Appendix

6.1 BASE INITIAL MARGIN CALCULATION FOR OPTIONS, FUTURES AND UNSETTLED ITEMS[1]

For greater certainty, this sections only applies to Options, Futures and Unsettled Items.

To calculate the Base Initial Margin the risk methodology is based on the PSR and the VSR which are then converted into the Scanning Risk parameter. The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price[2]. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others.

The Scanning Risk is calculated at the Combined Commodity level and is denominated in the same currency as the contract. For contracts belonging to the same Combined Commodity, the Risk Array results are added up for all contracts under the same scenario. The highest loss represents the Scanning Risk.

The other variables influencing the value of the Base Initial Margin are the Intra-Commodity, the Inter-Commodity and the Short Option Minimum. The following table summarizes the variables used in the calculation.

Input variables to calculate the Base Initial Margin	**Options**	**Futures**	**Unsettled Items**
Scanning Risk	●	●	●
Intra-Commodity		●	
Inter-Commodity[3]		●	
Short Option Minimum	●		

[1] Unsettled Items resulting of a physical delivery of Government of Canada Bond Futures are margined under the VaR methodology.

[2] The initial reference price is the market price or the theoretical price derived from market observations.

[3] ~~Not applicable for Share Futures.~~

6.1.1 Scanning Risk

The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The table at the end of this section shows all the risk scenarios. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others. If the largest loss is negative, the Scanning Risk is set to zero. The Scanning Risk is then compared to the Short Option Minimum. This amount is required if the Short Option Minimum is higher than the result of the Risk Arrays.

6.1.1.1 Price Scan Range

The term PSR represents the potential variation of the contract value and it is calculated through the following formula:

$$\text{PSR} = \text{Price} \times \text{MI} \times \text{Contract Size}$$

The methodology for the MI is detailed in Section 6.5.

6.1.1.2 Volatility Scan Range

The term VSR represents the potential variation of the implied volatility and it is calculated through the following formula:

$$\text{VSR} = \text{Volatility Shock} \times \text{n}$$

Where 'n' is the MPOR, and 'Volatility Shock' represents the 95% confidence level of the historical daily fluctuations for the series volatility over a one year look-back period. The daily fluctuations are scaled up with the use of MPOR. VSR values are subject to a floor value and a cap value.

Risk Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Underlying Price Variation *	0	0	1/3	1/3	-1/3	-1/3	2/3	2/3	-2/3	-2/3	1	1	-1	-1	2	-2
Volatility Variation *	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	0	0
Weight Fraction Considered	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	35%	35%

* Expressed in scan range

The MI, MPOR and Volatility Shocks values are updated by the Corporation from time to time.

6.1.2 Intra-Commodity

Long positions on Futures maturing in one month are automatically matched with short positions on Futures maturing in another month. The resulting Base Initial

Margin on these two Futures belonging to the same Combined Commodity, could be lower than the real risk associated with the combination of the two contracts. In order to cover this inter-month spread risk, a charge is included in the Base Initial Margin.

For the Futures, the Intra-Commodity which is an additional dollar amount charge applied to each combination of a minimum of two different Futures, is determined by applying the MI methodololy on the Futures combination's daily profit and loss over the reference period. The methodology for the MI is detailed in Section 6.5.

With respect to the BAX, the CORRA Futures (COA & CRA), the S&P/TSX 60 Index Standard Futures (SXF) and the S&P/TSX 60 Dividend Index Futures, CDCC calculates the Intra-Commodity for combinations of spreads and/or butterfly strategies and applies a same charge for a same group of combinations with close maturities. If multiple Intra-Commodity are defined, the Corporation will prioritize the ones providing the lowest Base Initial Margin.

The combinations and the spread priorities for the Intra-Commodity are updated by CDCC from time to time.

6.1.3 Inter-Commodity

The Corporation may consider the correlation that exists between different Futures when calculating the Base Initial Margin. The Corporation will grant a credit according to the historical correlation of the Futures combination profit and loss~~returns of the two Futures~~. If multiple Inter-Commodity are defined, the Corporation will prioritize the ones with the highest correlation.

The Inter-Commodity and the spread priorities are updated by CDCC from time to time.

[…]

APPENDIX A
PROPOSED AMENDMENTS TO THE MANUAL
CLEAN VERSION

[…]

Section 6: Appendix

6.1 BASE INITIAL MARGIN CALCULATION FOR OPTIONS, FUTURES AND UNSETTLED ITEMS[4]

For greater certainty, this sections only applies to Options, Futures and Unsettled Items.

To calculate the Base Initial Margin the risk methodology is based on the PSR and the VSR which are then converted into the Scanning Risk parameter. The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price[5]. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others.

The Scanning Risk is calculated at the Combined Commodity level and is denominated in the same currency as the contract. For contracts belonging to the same Combined Commodity, the Risk Array results are added up for all contracts under the same scenario. The highest loss represents the Scanning Risk.

The other variables influencing the value of the Base Initial Margin are the Intra-Commodity, the Inter-Commodity and the Short Option Minimum. The following table summarizes the variables used in the calculation.

Input variables to calculate the Base Initial Margin	Options	Futures	Unsettled Items
Scanning Risk	●	●	●
Intra-Commodity		●	
Inter-Commodity		●	
Short Option Minimum	●		

6.1.1 Scanning Risk

[4] Unsettled Items resulting of a physical delivery of Government of Canada Bond Futures are margined under the VaR methodology.

[5] The initial reference price is the market price or the theoretical price derived from market observations.

The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The table at the end of this section shows all the risk scenarios. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others. If the largest loss is negative, the Scanning Risk is set to zero. The Scanning Risk is then compared to the Short Option Minimum. This amount is required if the Short Option Minimum is higher than the result of the Risk Arrays.

6.1.1.1 Price Scan Range

The term PSR represents the potential variation of the contract value and it is calculated through the following formula:

$$\text{PSR} = \text{Price} \times \text{MI} \times \text{Contract Size}$$

The methodology for the MI is detailed in Section 6.5.

6.1.1.2 Volatility Scan Range

The term VSR represents the potential variation of the implied volatility and it is calculated through the following formula:

$$\text{VSR} = \text{Volatility Shock} \times \text{n}$$

Where 'n' is the MPOR, and 'Volatility Shock' represents the 95% confidence level of the historical daily fluctuations for the series volatility over a one year look-back period. The daily fluctuations are scaled up with the use of MPOR. VSR values are subject to a floor value and a cap value.

Risk Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Underlying Price Variation *	0	0	1/3	1/3	-1/3	-1/3	2/3	2/3	-2/3	-2/3	1	1	-1	-1	2	-2
Volatility Variation *	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	0	0
Weight Fraction Considered	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	35%	35%

* Expressed in scan range

The MI, MPOR and Volatility Shocks values are updated by the Corporation from time to time.

6.1.2 Intra-Commodity

Long positions on Futures maturing in one month are automatically matched with short positions on Futures maturing in another month. The resulting Base Initial Margin on these two Futures belonging to the same Combined Commodity, could

be lower than the real risk associated with the combination of the two contracts. In order to cover this inter-month spread risk, a charge is included in the Base Initial Margin.

For the Futures, the Intra-Commodity which is an additional dollar amount charge applied to each combination of a minimum of two different Futures, is determined by applying the MI methodololy on the Futures combination's daily profit and loss over the reference period. The methodology for the MI is detailed in Section 6.5.

With respect to the BAX, the CORRA Futures (COA & CRA), the S&P/TSX 60 Index Standard Futures (SXF) and the S&P/TSX 60 Dividend Index Futures, CDCC calculates the Intra-Commodity for combinations of spreads and/or butterfly strategies and applies a same charge for a same group of combinations with close maturities. If multiple Intra-Commodity are defined, the Corporation will prioritize the ones providing the lowest Base Initial Margin.

The combinations and the spread priorities for the Intra-Commodity are updated by CDCC from time to time.

6.1.3 Inter-Commodity

The Corporation may consider the correlation that exists between different Futures when calculating the Base Initial Margin. The Corporation will grant a credit according to the historical correlation of the Futures combination profit and loss. If multiple Inter-Commodity are defined, the Corporation will prioritize the ones with the highest correlation.

The Inter-Commodity and the spread priorities are updated by CDCC from time to time.

[…]