



NOTICE TO MEMBERS

No. 2013 – 278

November 14, 2013

REQUEST FOR COMMENTS

AMENDMENT TO THE RISK MANUAL MODIFICATION TO THE FIXED INCOME TRANSACTIONS OUTRIGHT MARGIN METHODOLOGY FOR THE 3-MONTHS AND 6-MONTHS BUCKET

Summary

The Board of Directors of Canadian Derivatives Clearing Corporation (CDCC) approved amendments to the Risks Manual. The purpose of the proposed amendment is to update the Initial Margin model for Fixed Income Transactions by increasing the duration for all the Fixed Income Securities assigned to the 3-month Bucket from 0.25 to 1 and for the 6-months Bucket from 0.5 to 1.

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).

The Board of Directors of CDCC has the power to approve the adoption or amendment of Rules and Operations Manual of CDCC. Amendments are submitted to the AMF in accordance with the self-certification process.

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Comments on the proposed amendments must be submitted within 30 days following the date of publication of the present notice. Please submit your comments to:

Pauline Ascoli
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Canadian Derivatives Clearing Corporation
Tour de la Bourse
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A copy of these comments shall also be forwarded to the AMF to:

Anne-Marie Beaudoin
Corporate Secretary
Autorité des marchés financiers
Tour de la Bourse, P.O. Box 246
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For any question or clarification, Clearing Members may contact the CDCC Member Services.

Glenn Goucher
President and Chief Clearing Officer



AMENDMENT TO THE OPERATIONS MANUAL OF CDCC

Modification to the Fixed Income Transactions outright margin methodology for the 3-months and 6-months bucket

A. Overview

CDCC proposes amendment to the Operations Manual. The proposed change will increase the transparency of our processes while keeping in place our conservative risk management framework.

CDCC hereby proposes to amend its Operations Manual in order to increase the pre-selected durations associated to the 3-month and 6-month Buckets applicable for the margining of the Fixed Income Transactions. The term Buckets is defined in the Risk Manual.

B. Analysis

Nature and Purpose of Proposed Changes:

The proposed change is an update of the section related to Initial Margin for Fixed Income Transactions which is part of the Margin Fund section which describes the methodology of the Margin fund. The Initial Margin covers the potential losses and market risk that may occur as a result of future adverse price movements across the portfolio of each Clearing Member under normal market conditions.

According to CDCC's internal backtesting governance, if a coverage ratio goes below 95%, a recalibration of the risk parameter is required. This situation occurred during the months of April and May 2013 for the backtesting at the outright level for the 3-month Government of Canada (GoC) Bucket for Fixed Income Transactions.

Hence, CDCC proposes to increase the duration for all the Fixed Income Securities assigned to the 3-month Bucket from 0.25 to 1 and the duration of the 6-month Bucket from 0.5 to 1. This change will effectively ensure that the required Initial Margin calculated for all bonds in the 3-month and 6-month Buckets will be increased respectively by a factor of 4 and 2 to cover more than 99% of the potential Profit and Loss (P&L) of each eligible Fixed Income Security.

CDCC hereby proposes to modify its Operations Manual in order to amend the fixed duration for the 3-month and 6-month Buckets.

Description and Analysis of Impacts:

In light of the backtesting results obtained since the launch of the Fixed Income Transactions, the current Initial Margin model, which allows the calculation of the Initial Margin amount related to the security's price of a Repurchase Transaction on one security belonging to a Bucket, was correctly calibrated to take into account security price risk due to market events. However, as demonstrated by the recent backtesting results at the outright level (particularly for the 3-month Bucket), the current model does not fully capture the price variation of bonds near maturity (less than a year) with maturity at issuance of more than 2 years and a relatively high coupon payment. More specifically, these high coupon and long-term maturity bonds have migrated to the first Buckets (3-month and 6-month) during the remaining maturities with a different price dynamic than Treasury bills with similar remaining time to maturity. Hence, as maturity approaches, these bonds prices converge towards their face value at an increasing rate and, other things held constant, these bonds exhibit significantly higher price change in dollar amount than other Treasury Bills in the same Bucket.

Accordingly, CDCC proposes to increase the duration risk parameter for all the fixed income securities of the 3-month Bucket from 0.25 to 1 and the duration of the 6-month Bucket from 0.5 to 1. This adjustment will reflect more accurately the price variation observed on bonds which are causing problems in the 3-month and 6-month Buckets. Moreover, market events will still be correctly captured by keeping intact the other elements of the current model.

With the proposed modification, backtesting results for a period of 260 days show that the total coverage is raised to 99.5% as of May 31 2013 compared to 98.8% without the proposed duration change. More specifically, results for the 3-month Bucket, which was the most problematic, increased from 92.3 % to 100%.

CDCC does not anticipate any adverse impacts with this proposed change.

A Risk Analysis Grid is available for consulting upon request. The Risk Analysis Grid is aimed to capture and summarize the major risks related to the proposed changes. In summary, the proposed change of the duration for the 3 month and 6 month Bucket has little, if none, impact on the overall market risk, credit risk and liquidity risk since this change is overall a limited increase in the margin requirement for fixed income securities. Finally, this change has no significant operational impact.

Drafting Process:

The proposed changes are proposed by the Risk Management department without market consultation.

Impacts on Technological Systems:

In order to correctly implement the proposed solution, the duration values for the 3-month and 6-month Buckets, which are hard coded in SOLA Clearing ® system, must be modified accordingly (duration is fixed to 1).

Apart from this change, it is not anticipated that the proposed modification will have any other impact on the technological systems of CDCC, Clearing Members or other market participants.

Benchmarking:

Since this amendment aims to recalibrate the risk parameters of the current Fixed Income Transactions Initial Margin model, no benchmarking has been done. By changing the fixed duration values of the 3-month and 6-month Buckets to 1, CDCC would increase the Initial Margin requirement and therefore ensure adequate financial resources in the Margin Fund.



Risk Manual

INITIAL MARGIN FOR FIXED INCOME TRANSACTIONS

At the Corporation, a Fixed Income Transaction can be either a Repurchase Transaction or a Cash Buy or Sell Trade. A Cash Buy or Sell Trade is the sale of a security from one party to another. Depending on its maturity, the Fixed Income Security can be delivered one, two or three days after the Fixed Income Transaction is completed. Between the Fixed Income Transaction novation date and the delivery date, the Corporation has to cover the counterparty risk.

A Repurchase Transaction is a transaction whereby the seller (the Repo Party) agrees to sell a security to a buyer (the Reverse Repo Party) on a given date (the purchase date) and simultaneously agrees to buy the same security back from the Reverse Repo Party at a later date (the repurchase date) at a fixed price (the repurchase price). Thus, a Repo is equivalent to a cash transaction combined with a forward contract. The cash transaction results in a transfer of money from the buyer to the seller in exchange for a legal transfer of the security from the seller to the buyer, while the forward contract ensures repayment by the seller to the buyer and return of the securities from the buyer to the seller. The difference between the repurchase price and the purchase price is the Price Differential calculated with the agreed Repo Rate, while the settlement date of the forward contract (i.e. the repurchase date) is the maturity date of the transaction.

In such Repurchase Transaction, there are two sources of risk that the Corporation needs to consider and cover. The potential Purchased Security's price fluctuation and the Floating Price Rate fluctuation over the life of the Repurchase Transaction. However, in a Cash Buy or Sell Trade, there is only one source of risk that the Corporation needs to consider and cover, namely, the Purchased Security's price fluctuation.

SECURITY PRICE RISK

The price of the Purchased Security changes continuously during the life of a Repurchase Transaction. On one hand, if the price decreases and the Repo Party defaults, the Corporation, as a central counterparty, incurs market risk for the price difference. The position may be transferred to any Fixed Income Clearing Member who agrees to buy the security at the expiry date with the new market conditions (new security's market price and interest rate). In this case, the Corporation has to cover the potential decrease in the security's value (negative variation for the seller) that could arise during the next specific period. On the other hand, if the security's price increases and the Reverse Repo Party defaults, the Corporation, as a central counterparty, incurs market risk for the price difference. The position may be transferred to any Fixed Income Clearing Member who agrees to sell the same security at the expiry date with the new market conditions (new security's market price and interest rate). In that case, the Corporation has to cover the potential increase in the security's value (negative variation for the buyer) that could arise during the next specific period.

The methodology to calculate the Initial Margin for Fixed Income Transactions is slightly different from the Options contracts and Futures contracts. Indeed, the

different types of securities that are accepted by the Corporation for clearing of a Repurchase Transaction are separated in different Buckets depending on their remaining time to maturities and issuers. In addition, in its risk model, the Corporation assumes that all securities belonging to the same Bucket have the same yield volatility expressed in terms of Margin Interval (same concept of Margin Interval as described before) which is calculated using the yield-to-maturity (YTM) of the on-the-run security of the Bucket. The Margin Interval is calculated as follows:

$$MI = 3 \times \sqrt{n} \times \text{Max}[\sigma_{20 \text{ days}}, \sigma_{90 \text{ days}}, \sigma_{260 \text{ days}}]$$

Where 'n' is the number of liquidation days (see footnote 3), σ is the standard deviation of the YTM's daily variation of the on-the-run security over the reference period and 3 is to allow a confidence level over 99% under the normal distribution's assumption.

It's important to note that for some particular Buckets, there may not be any on-the-run security. In this particular situation, a linear interpolation between the MIs of the two closest Buckets is performed to determine the MI of the particular bucket.

Each Bucket is considered as a Combined Commodity. Since the bond's convexity effect is very small with respect to its duration, the Initial Margin is calculated for a physical cash trade exactly the same way as for Futures contracts. The first part of the example # 2 of the section on **Error! Reference source not found.** shows how the Scanning Risk is calculated for a Futures contract. As for a Futures contract, the Initial Margin for a physical security can also be obtained straightforwardly by calculating its Price Scan Range (PSR).

Therefore, the Initial Margin amount related to the security's price of a Repurchase Transaction on one security belonging to a Bucket is calculated as follows:

$$\text{Initial Margin 1} = \text{Security's Price} \times MI \times D \times \text{Contract Size}$$

Where D is the duration of the security and the contract size is the transaction's Nominal Value divided by 100. However, for all securities that belong to the 3-month, 6-month and 1-year buckets, CDCC uses a fixed duration which is set at 1 to 0.25, 0.5 and 1 respectively.

Thus, all Repo related Fixed Income Securities belonging to the same Bucket have the same Margin Interval but each specific Repo related security of the same Bucket has a different Initial Margin driven by its own price and its own duration.

In the above formula of the Price Scan Range, only the first part of the Initial Margin of a Repurchase Transaction is calculated, namely, the Initial Margin 1. As mentioned above, there are two sources of risk for a Repurchase Transaction. This is the Initial Margin of the first source of risk, the security's price. In the next section, the second part of the Initial Margin of a Repurchase Transaction which covers the second source of risk, the Floating Price Rate, is described. Finally, both Initial Margins are added up to get the total Initial Margin of a Repurchase Transaction. However, the Initial Margin 1 corresponds to the total Initial Margin for a Cash Buy or Sell Trade.