CME Group
A CME/Chicago Board of Trade/NYMEX Company

Advisory Notice

Clearing House

TO: Clearing Member Firms

FROM: CME Clearing

SPAN ADVISORY#: 09-01

DATE: Friday, May 1st, 2009

SUBJECT: **NYMEX and Margining Closely Related Physically-Delivered and Financially-Settled products in SPAN®**

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Introduction

As part of plans to provide a combined SPAN risk parameter file for CME/CBOT/NYMEX/COMEX and DME exchanges, CME Group intends to make changes to the way closely related physically-delivered and financially settled products are margined. To margin such products CME Group plans to use a feature of SPAN® called **super-intercommodity spreading**.

There are number of such products currently trading at NYMEX exchange. An example for **scanning-based** super-intercommodity spread would be NG (Henry Hub Natural Gas) contracts which are physically-delivered and HP (Henry Hub Natural Gas Penultimate) contracts which are financially settled. An example for **delta-based** super-intercommodity spreading would be RM (RBOB Crack Spread) vs. RB (RBOB Gasoline Futures) and CL (Light-Sweet Crude Oil Futures).

Both **scanning-based** and **delta-based** super-intercommodity spreading will be utilized by CME Group files. This feature has been part of SPAN for some time and has been supported in PC-SPAN®, however while **delta-based** super-intercommodity spreads have been in use before (since 2004 by NYBOT, now IntercontinentalExchange Inc.) this will be the first time **scanning-based** super-intercommodity spreads will be used for any listed product (For details please see SPAN advisory #04-12 from November 5, 2004, SUBJECT: **NYBOT and Margining Options on Futures Calendar Spreads in SPAN®** **http://www.cmegroup.com/tools-information/lookups/cmearchive/clearing/10536.html**).

In addition to introducing these spread types in the SPAN file, a small change to the algorithm for processing of **delta-based super-intercommodity spreads** will be made: for this type of spreads **weighted futures price risk (WFPR)** used in calculating credits **will be capped at Scan Risk for Combined Commodity divided by initial delta for the spread leg.**

This advisory outlines how these spreads will be defined in CME Group's daily combined SPAN files and how processing for them will work.

Super-intercommodity Spreading

In SPAN we define **groups** of spreads with the specific spreads in each group processed sequentially according to their assigned priority number:

- **Intracommodity spreads** (also called intermonth spreads) are delta-based spreads in which all legs are contained within the same combined commodity. In SPAN, the scanning process provides perfect credits for calendar spread positions within the same combined commodity. **Intracommodity spreads** are typically used to take away some of that perfect credit (by assessing a charge) for products where the scanning process is too generous.

- **Intercommodity spreads** are evaluated after all intracommodity spreads have been processed, using only position delta left over from intracommodity spreading, and are used to provide credits for offsetting positions between related products within the same exchange or clearing organization. They can be both delta-based and scanning-based.

- **Interexchange spreads** are evaluated after all normal intercommodity spreads have been processed, using only position delta left over after intercommodity processing. They are used to provide credits for offsetting positions on different exchanges or clearing organizations, typically in the absence of any formal cross-margining or risk-sharing agreement between those two organizations.

Super-intercommodity spreads are just like any normal intercommodity spread. The difference is that the spreads in this group are evaluated **first -- before** any normal intracommodity spreads are processed.

Because these spreads are evaluated first, they will use up position delta which, if not used up, could have resulted in other, more expensive spreads being formed.

How Super-Intercommodity Spreads are Represented in the SPAN File

On the type 6 (intercommodity spread) records in the expanded-format SPAN file, byte 110 identifies the **Spread Group**, with blank meaning normal intercommodity spreads, and **S** identifying super-intercommodity spreads.

CME Group will provide the type 6 records for the super-intercommodity spreads in the SPAN file, before all type 6 records for normal intercommodity spreads.

Super-intercommodity spreads can be defined as using intercommodity **spread method 04** (new scanning-based super-intercommodity spreads) or using **spread methods 01 or 20** (i.e. existing delta-based super –intercommodity spreads).

Other than being defined as being in the super-intercommodity spreads group, there is nothing special about these super-intercommodity spreads. They are method 01, 04, or 20, delta-based or scanning-based intercommodity spreads **exactly analogous** to the regular intercommodity spreads currently present in the CBOT-CME combined SPAN files.

How the SPAN Portfolio Performance Bond Calculation is Affected

Scanning

Position Delta and Delta Periods

Aggregation of Delta from Periods to Tiers

Determination of Weighted Price Risk for the specific and overall intercommodity spread tiers

These processes are unaffected. In addition, scanning, delta calculations, determination of WFPR and all other processes prior to spreading are not affected by the change.

Evaluation of Super-Intercommodity Spreads

Here is the key point. **Super intercommodity spreads** are evaluated **before** any intracommodity spreads are processed.

For delta-based spreads:

The actual evaluation process is analogous to that for any tiered intercommodity spreads. For each such spread, you determine whether remaining delta for the particular intercommodity spread tiers referenced in the spread definition is sufficient to form any spreads, and if so, how many such spreads. If any spreads can be formed, then for each leg:

- You determine the amount of delta which has been consumed by the spread for this leg.
- Here is the place where the algorithm is modified slightly from the existing one. When calculating credit for each individual leg of any delta-based intercommodity spread we currently take Weighted Futures Price Risk (WFPR) for this leg, multiply it by number of spreads formed times spread credit rate and delta/spread ratio for this leg:

  Credit = Nspreads * Credit Rate * Delta/Spread Ratio * WFPR

  For **delta-based super-intercommodity spreads only** we change this formula to include a following cap on WFPR used to calculate Credit:

  If Scan Risk for Combined Commodity divided by initial delta for the spread leg is less than WFPR for this leg use Scan Risk for Combined Commodity divided by initial delta in calculation of credit.

  So the formula for Credit will now look like this:

  Credit = Nspreads * Credit Rate * DeltaRatio * **min(WFPR, CC ScanRisk/initial delta)**

- You remove delta consumed by the spread, from the delta period comprising this leg, from the specific intercommodity spread tier comprising this leg, from the overall intercommodity spread tier for this, and from the intracommodity spread tier containing this leg.

This is standard SPAN functionality, operating exactly as for any tiered intercommodity spread.

For Scanning-based spreads:

The actual evaluation process is identical to that for any regular scanning-based intercommodity spreads. For each such spread, you determine whether it can be formed based on the presence of required legs (or number of legs). Once you determine that a spread can be formed you:

- Aggregate risk arrays from all legs into target leg (using appropriate scaling and gain allowance percentage) for all scanning tiers and intercommodity spread tiers
- Aggregate deltas from all legs into target leg using delta per spread ratios for all levels of delta aggregation:
    - Period Deltas
    - Intra Tier Deltas
    - Inter Tier Deltas
- Calculate Scan Risk for target leg
- Calculate WFPR for all intercommodity tiers of the target leg
- Zero out scan risk, risk arrays, and deltas for non-target legs

This is standard SPAN functionality, operating exactly as for any scanning-based intercommodity spread. The key aspect of the process is aggregating deltas and making sure that period deltas, intra tier deltas, and inter tier deltas remain consistent in the target leg.

Intracommodity spread processing

After all super-intercommodity spreads have been evaluated, you perform normal intracommodity spread processing for each combined commodity, without modification.

Normal intercommodity and interexchange spread processing

Similarly, intercommodity spreading and interexchange spreading is then performed without modification.

Finalization of the SPAN performance bond requirement

The finalization of the SPAN performance bond requirement is then done without modification.

Sample SPAN files

The following sample files are available on the Internet at ftp.cmegroup.com/pub/span/data/cme/test:

- **cme.test.20090425.s.pa2.zip** – a sample expanded-format combined SPAN file illustrating scanning-based super-intercommodity spreads, and

- **cme.test.20090425.s.cust.spn.zip** – a sample XML format combined SPAN file illustrating scanning-based super-intercommodity spreads

Organization master file for working with sample files can be found at ftp.cmegroup.com/pub/span/data/cme/test/orgmast.exe

PC-SPAN version 4.5

PC-SPAN version 4.5 is now available to registered users through your normal logon at the PC-SPAN software distribution website at www.cme-ch.com/pcspan. New copies may be purchased at https://usd.swreg.org/soft_shop/47151/shopscr2.shtml.

Examples

Example 1: Spread between NG and HP futures in the same month

1 Short HP 200906 future
1 Long NG 200906 future

The outright risk for both NG and HP futures is equal to the price scan range ($4750).

As a result of scanning spread being formed all requirements and deltas in HP combined commodity will be zeroed out.

Since gain allowance factor for the spread is set to 98% during risk array aggregation gains will be set at 98% of their value resulting in imperfect offset ($4750 loss in NG will be offset by 0.98*4750 = $4655 gain in HP and vice versa). As a result scan risk for NG will be set at 4750 – 4655 = $95.

Deltas in the NG combined commodity will be perfectly offset by deltas from HP.

Deltas in NG:

	200906 Period	0
	Intra Tiers	0
	Inter Tiers	0
NG	Scan Risk	$95
	Intracommodity Spread Charge	$0
	Spot Charge	$0
	Intercommodity Spread Credit	$0
	Super-Inter Spread Credit	$0
	SOM Charge	$0
	SPAN Risk:	**$95**

Example 2: Spread between NG and HP futures in different months

1 Short HP **200909** future
1 Long NG 200906 future

The outright risk for NG 200906 future is $4750
The outright risk for HP 200909 future is $4500.

As a result of scanning spread being formed all requirements and deltas in HP combined commoditywill be zeroed out.

Since gain allowance factor for the spread is set to 98% during risk array aggregation gains will be set at 98% of their value resulting in imperfect offset ($4750 loss in NG will be offset by 0.98*4500 = $4410 gain in HP and $4500 loss in HP will be offset by 0.98*4750 = $4655 gain in NG). As a result scan risk for NG will be set at 4750 – 4410 = $340.

Deltas in the NG combined commodity will not be offset by deltas from HP.

Deltas:

200906 Period	1
200909 Period	-1
Intra Tiers	
Tier 2	1
Tier 3	-1

	Inter Tiers	1 long and 1 short

As a result a delta based intracommodity spread will be formed in NG between tier 2 and tier 3 at the rate of $500

Deltas Remaining:

	200906 Period	0
	200909 Period	0
	Intra Tiers	
	Tier 2	0
	Tier 3	0
	Inter Tiers	0 long and 0 short
NG	Scan Risk	$340
	Intracommodity Spread Charge	$500
	Spot Charge	$0
	Intercommodity Spread Credit	$0
	Super-Inter Spread Credit	$0
	SOM Charge	$0
	SPAN Risk:	**$840**

Example 3: Spread between RM swap and RB and CL futures

1 Long RM 200904 future
1 Short RB 200905 future
1 Short CL 200906 future and 1 Long CL 200905 future

The outright risk for RM 200904 future is $1760.
The outright risk for RB 200905 future is $10000 ($7000 scan risk + $3000 spot charge).
The outright risk for CL portfolio (1 short + 1 long) is $750 (The outright risk for each contract is $5750 which is completely offset, but there is a $750 intracommodity spread charge).

Total Deltas for combined commodities:

RM – 1 (all in tier 1)
RB – (-1) (all in tier 1)
CL – 0 (which is a result of offsetting 1 delta in tier 1 with -1 delta in tier 2)

Consequently one super-intercommodity spread between RM, RB, and CL is formed. Weighted futures price risk (WFPR) for combined commodity is as follows:

RM - $1760
RB - $7000
CL - $5750

According to the new logic when forming a spread WFPRs should be capped at **Scan Risk for Combined Commodity divided by initial delta for the spread leg**. For RM and RB it will result in the same number, but for CL capped WFPR will be 0 since Scan Risk for CL is 0:

RM - $1760
RB - $7000
CL - $0

Since credit is set at 98% level intercommodity spread credits for combined commodities will be:

RM - $1725

RB - $6860
CL - $0

Deltas Remaining:

RM – 0
RB – 0
CL – (-1) (in tier 2)

Please note that since super-intercommodity spread was formed no intracommodity spread was formed in the CL combined commodity.

RM	Scan Risk	$1760
	Intracommodity Spread Charge	$0
	Spot Charge	$0
	Intercommodity Spread Credit	$1725
	Super-Inter Spread Credit	$0
	SOM Charge	$0
	SPAN Risk:	**$35**

RB	Scan Risk	$7000
	Intracommodity Spread Charge	$0
	Spot Charge	$3000
	Intercommodity Spread Credit	$6860
	Super-Inter Spread Credit	$0
	SOM Charge	$0
	SPAN Risk:	**$3140**

CL	Scan Risk	$0
	Intracommodity Spread Charge	$0
	Spot Charge	$0
	Intercommodity Spread Credit	$0
	Super-Inter Spread Credit	$0
	SOM Charge	$0
	SPAN Risk:	**$0**

Total Risk for portfolio: $3175

For more Information

For further information about scanning-based super-intercommodity spreading in SPAN and PC-SPAN, please contact CME Group's Dmitriy Glinberg, 312-648-8680, Dmitriy.Glinberg@cmegroup.com

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