



ASX

AUSTRALIAN SECURITIES EXCHANGE

ASX Clear (Futures) Grains Futures and Options Margins

Fact Sheet

The collection of margins is a fundamental risk management practice undertaken to protect ASX Clear (Futures) and its non-defaulting Clearing Participants in the event of a Clearing Participant default.

The purpose of this document is to provide an overview of ASX Clear (Futures) margining from the perspective of Clearing Participants with positions in Grains futures and options. The following key areas are addressed:

- ASX Clear (Futures) margin obligations and cover
- SPAN margining
 - Margin parameter inputs to SPAN applicable to Grains futures and options
 - SPAN scenarios and risk arrays
 - Initial Margin aggregation in SPAN
- Margining examples

ASX Clear (Futures) Margin Obligations and Cover

ASX Clear (Futures) calls daily Initial Margins and Variation Margins on all open positions¹:

- Initial Margins are monies or non cash collateral paid to ASX Clear (Futures) by Clearing Participants to cover the performance of positions held. Initial Margins are intended to cover the Clearing House for potential future adverse price and volatility movements across the portfolio under normal market conditions;
- Variation Margins are cash settled daily based on realised gains or losses in position value against daily settlement prices. This daily settlement process protects ASX Clear (Futures) by preventing Clearing Participants from accumulating losses over a period greater than one business day.

Initial Margins and Variation Margins are settled by 11.30am on each settlement day via Exigo transfer. In addition, during periods of extreme market volatility, ASX Clear (Futures) may call for Variation Margins intra-day.

Initial Margins may be covered by lodgement of cash, selective non-AUD cash, and selective foreign and AUD securities. The full list of approved cover, associated haircut rates and lodgement conditions may be viewed on the ASX website at http://www.asx.com.au/documents/clearing/approved_securities_and_cover.pdf

SPAN Margining

ASX Clear (Futures) calculates Initial Margin for Grain futures and options (as part of the full Clearing Participant portfolio) using the Standard Portfolio Analysis of Risk (or "SPAN"²) methodology applied by the Secur (Riva SPAN) system.

SPAN adopts a scenario based portfolio approach to calculate Initial Margins for futures and options. The SPAN algorithm calculates the potential gain or loss arising from the Clearing Participant's portfolio under 16 risk scenarios covering a range of movements in futures prices and options volatilities. The highest scenario result determines the Clearing Participant's Initial Margin obligation.

¹ In addition to daily margin calls, ASX Clear (Futures) may require Clearing Participant's to lodge Additional Initial Margins for breaches of stress test or position limits as arise.

² 'SPAN' and 'Standard Portfolio Analysis of Risk' are trademarks of the Chicago Mercantile Exchange. The Chicago Mercantile Exchange assumes no liability with the use of SPAN by any person or entity.

Inputs to SPAN: Initial Margin Parameters Applicable to Grains Futures and Options

The three principle determinants of the Initial Margin calculated in SPAN are:

- The level and volatility of market prices
- Composition of the Clearing Participant portfolio
- Initial Margin parameters which determine the extent of change in market conditions applied in the SPAN scenarios

The Initial Margin parameters applicable to Grains futures and options contracts are set out in Table 1.

TABLE 1

Initial Margin Parameter	Description	Contract Coverage
Price Scanning Range:	The Price Scanning Range (PSR) is a dollar value per contract set to cover the outright risk faced by the Clearing House over a close-out period due to possible adverse movements in price.	All grains futures and options
Volatility Scanning Range:	The Volatility Scanning Range (VSR) is a percentage change in implied volatility that is added to the option's observed implied volatility, independent of the behaviour of the underlying price.	All grains options
Inter Month Spread Range:	An Inter Month Spread Range is a discounted scanning range applied when a portfolio contains positions in more than one expiry in the same underlying. The extent of the discount is set according to the level of correlation between price movements for expiries in the relevant contract.	All grains futures and options
Inter Commodity Concessions:	An Inter-Commodity Concession is a discount applied to the PSR for positions in two correlated underlyings. The extent of the discount is set according to the level of correlation between price movements for the two underlyings.	Spread positions between Eastern Australian Milling Wheat & WA Wheat
Short Option Minimum Charge:	The Short Option Minimum Charge is a minimum margin level applied to short deep-out-of-the-money options. The Short Option Minimum Charge is set to the tick size of the option.	All grains options
Spot Month Isolation Rate:	The Spot Month Isolation Rate is the SPAN term for delivery margin. It covers the risk between last trading day (or tender date in the case of grains futures) and settlement day.	Tendered grains futures (settled morning of auction only)

Initial Margin parameters are reviewed quarterly based on the volatility of the underlying commodity, however all parameters are monitored daily and may be adjusted between quarterly reviews during periods of higher volatility.

Changes to Initial Margin parameters are advised to Participants via an ASX 24 Notice. The full list of ASX Clear (Futures) Initial Margin parameters is available on the ASX website:

<http://www.sfe.com.au/content/clearing/operations/marginrates.pdf>

SPAN Scenarios and Risk Arrays

SPAN applies the Initial Margin parameters as required by each of the 16 SPAN scenarios. As the first step of the process, SPAN scenarios are calculated for each ASX Clear (Futures) futures and (delta adjusted) options contract to form a “risk array” for the contract. The risk arrays are then multiplied out with Clearing Participant positions and aggregated to the portfolio level in accordance with the formula described in the next section.

Table 2 sets out the scenarios applied in SPAN to generate risk arrays. In addition, the table provides an example of futures prices and implied volatilities calculated by SPAN to illustrate the application of PSR and VSR margin parameters under the following assumptions:

Margin Parameters:	PSR	\$600
	VSR	2%
Market Levels:	Settlement Price	\$5,000
	Implied Volatility	15%

TABLE 2

Scenario Id	Futures Shift	Implied Volatility Shift	Futures Price Applied	Implied Volatility Applied
1	Futures price unchanged	Volatility up	\$5,000	17%
2	Futures price unchanged	Volatility down	\$5,000	13%
3	Futures price up 1/3 of PSR	Volatility up	\$5,200	17%
4	Futures price up 1/3 of PSR	Volatility down	\$5,200	13%
5	Futures price down 1/3 of PSR	Volatility up	\$4,800	17%
6	Futures price down 1/3 of PSR	Volatility down	\$4,800	13%
7	Futures price up 2/3 of PSR	Volatility up	\$5,400	17%
8	Futures price up 2/3 of PSR	Volatility down	\$5,400	13%
9	Futures price down 2/3 of PSR	Volatility up	\$4,600	17%
10	Futures price down 2/3 of PSR	Volatility down	\$4,600	13%
11	Futures price up 3/3 of PSR	Volatility up	\$5,600	17%
12	Futures price up 3/3 of PSR	Volatility down	\$5,600	13%
13	Futures price down 3/3 of PSR	Volatility up	\$4,400	17%
14	Futures price down 3/3 of PSR	Volatility down	\$4,400	13%
15*	Futures up extreme move (6/3)	Volatility unchanged	\$6,200	15%
16*	Futures down extreme move (6/3)	Volatility unchanged	\$3,800	15%

*Note: SPAN limits the application of the extreme move scenarios to 35% of the calculated results. These scenarios are intended to capture deep out-of-the-money options.

ASX Clear Futures publishes a SPAN risk parameter file at the end of each day on the ASX website. The risk parameter file contains a risk array for each futures and options contract that is listed on ASX 24. The risk arrays show the dollars gains or losses under each of the SPAN risk scenarios for one long position in each listed futures and option contract. The SPAN risk parameter file may be uploaded to PC-SPAN (a PC-based SPAN calculator developed by the Chicago Mercantile Exchange (CME)) to assist in reconciling ASX Clear Futures margin obligations.

SPAN risk parameter files are available at the following link:

<http://www.asx.com.au/sfe/span.htm>

Further information on SPAN margining may be accessed via the ASX website:

<http://www.asx.com.au/clearing/span-margining.htm>

Initial Margin Aggregation in SPAN

In its final stage of calculation, SPAN aggregates margins for each Clearing Participant portfolio using the following formula:

Scanning Risk + Inter Month Spread Charge – Inter Commodity Concession

Where:

Scanning Risk is the output of SPAN applying PSRs and VSRs based on net positions assuming perfect correlation between the bought and sold positions in different expiry months;

Inter Month Spread Charge is the output of SPAN applying Inter Month Spread Ranges to inter month spread positions;

Inter Commodity Concession is the value of the concession applied between specified pairs of contracts.

Note that the Spot Month Isolation Rate is not included in the formula, rather it is a single margin value applied instead of the calculation above for relevant contracts. The Short Option Minimum Change is not included in the formula as it is used in the calculation of Scanning Risk to provide a floor margin for relevant contracts.

A series of examples is provided in the following section to illustrate the application of the Initial Margin formula.

Margining Examples

Variation Margin Calculation

Variation Margin is calculated by marking-to-market the price of the futures or option contract on each day in the life of the contract. For example, the Variation Margin for a contract credited to a Clearing Participant on day D is calculated as follows:

$$\begin{aligned} &= (\text{Settlement Price D-1} - \text{Settlement Price D-2}) \times \text{Contract Size} \times \text{Position} \\ &= (\$245 - \$240) \times 20 \times 10 \\ &= \$1000 \end{aligned}$$

Initial Margin Calculation

To highlight the margin concepts applied in SPAN, the following examples assume a futures only portfolio which logically will produce margin obligations calculated under scenarios 11/12 or 13/14 dependant on the direction of positions held. The examples should be read in conjunction with the description of SPAN's scenario based methodology provided earlier in this document.

Example 1: Grains Futures Scanning Risk

A Clearing Participant has bought five Eastern Australian (EA) Feed Barley futures contracts, due to expire in January. ASX Clear (Futures) has published a PSR for the contract of \$540. Initial Margin is calculated as follows:

Scanning Risk	=	Position x PSR
		5 x \$540
		\$2,700
Inter Month Spread	=	\$0
Inter Commodity Concession	=	\$0
Initial Margin	=	Scanning Risk + Inter Month Spread - Inter Commodity Concession
		\$2,700 + \$0 - \$0
		\$2,700

Example 2: Grains Futures Inter Month Spreads

A Clearing Participant has written five EA Feed Barley futures contracts, due to expire in January and bought 10 EA Feed Barley futures contracts due to expire in March. The PSR rate from Example 1 still applies, and the current Inter Month Spread Charge is \$360.

SPAN will calculate Scanning Risk on the position assuming perfect correlation between the bought and sold positions in different expiry months, therefore calculating the Scanning Risk on the net position across all expiry months. It will then calculate an Inter Month Spread charge for the netted out spread position in acknowledgement that positions in different expiry months are not perfectly correlated.

Scanning Risk	=	Net Position x PSR
		5 x \$540
		\$2,700
Inter Month Spread		Spread Position x Inter Month Spread charge
		5 x \$360
		\$1,800
Inter Commodity Concession		\$0
Initial Margin	=	Scanning Risk + Inter Month Spread - Inter Commodity Concession
		\$2,700 + \$1,800 - \$0
		\$4,500

Example 3: Grain Futures Inter Month Spreads and Inter Commodity Concessions

Inter Commodity Concessions are available between pairs of commodities with a high level of price correlation. A 'concession' for the commodity pair is determined, and reviewed regularly, by ASX Clear (Futures). This concession is then applied to the Price Scanning Range (PSR) of the respective commodities in calculating Initial Margin.

Note in the following example that offsetting positions are first identified between different expiry months in the same commodity, with any remaining positions offset against opposite positions in paired commodities.

This example highlights the concessions available between the WA Wheat (WVK) and NSW Wheat (VWV) futures contracts.

A Clearing Participant holds the following portfolio:

Bought 20 Jan WA Wheat futures contracts

Sold 10 Mar WA Wheat futures contracts

Sold 5 May NSW Wheat futures contracts

∴ WA Wheat net position	=	10
WA Wheat Inter Month Spread position	=	10
WA Wheat / NSW Wheat Concession position	=	5

ASX Clear (Futures) has published the following margin parameters:

WA Wheat PSR:	\$420	
NSW Wheat PSR:	\$360	
WA Wheat Inter Month Spread Charge:	\$200	
WA Wheat / NSW Wheat Inter Commodity Concession:	60%	
WA Wheat Scanning Risk	=	Net Position x PSR
		10 x \$420
		\$4,200

NSW Wheat Scanning Risk	=	Net Position x PSR 5 x \$360 \$1,800
Inter Month Spread	=	Spread Position x Inter Month Spread charge 10 x \$200 \$2,000
Inter Commodity Concession	=	Concession Position x PSR1 x Inter Commodity Concession + PSR2 x Inter Commodity Concession 5 x \$420 x 60% + 5 x \$360 x 60% \$1,260 + \$1,080 \$2,340
Initial Margin	=	Scanning Risk + Inter Month Spread - Inter Commodity Concession (\$4,200 + \$1,800) + \$2,000 - \$2340 \$5,660

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