



CHICAGO MERCANTILE EXCHANGE

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Understanding Banding Practices on the CME Globex[®] Trading Platform

“Price banding” or simply “banding” represents a function of the CME Globex electronic trading platform which may be applied to filter errant price-based orders before acceptance on the system. Specifically, banding is a routine which scans price-based orders, rejecting any buy orders above the “CME Last Price” PLUS a fixed band value or, any sell orders below the CME Last Price LESS a fixed band value. The CME Last Price represents the last transaction or best bid or offer through the last transaction.

How Banding Works - Banding does not prevent traders from entering bids below the market; or, offers above the market – no matter how far below or above the market one may wish to trade. In other words, banding does not hinder the market’s depth in any way. It only prevents one from bidding or offering THROUGH the book. Although banding does not prevent order entry, for products with price limits or circuit breakers, order entry may be prevented by price limits or circuit breakers which take precedence over price banding.

Banding will not prevent the entry of market orders at the host level. To show how market orders are treated, consider the entry of a 100-lot market order (with stop protection) to buy when the book is configured as shown below.

Price	Bid	Offer
1,155.00		50
1,150.50		25
1,150.25		25
1,150.00		25
1,150.00		Last
1,149.75	35	
1,149.25	60	
1,149.00	75	

Understanding Price Banding

November 9, 2006

Page 2 of 4

The effect of the 100-lot market order to buy is that the buyer will be filled for 25 contracts at a price of 1,150.00, 25 contracts at a price of 1,150.25 and 25 contracts at a price of 1,150.50. The unfilled 25 buy orders are converted by the CME Globex system into a limit bid at 1,153.50. This is because the protected range is the current best bid or offer, plus/minus 50% of the no bust range. With a no bust range of 6 index points in this example, the unfilled quantity of 25 buy orders becomes a limit order at 1,150.50 (last traded price) + 3 index points (50% of the no bust range) or 1,153.50. Therefore, stop protection prevents the market order from trading all the way up to the next offer at 1,155.00.

Banding will protect the market from the conversion of market orders into limit orders outside of the host at prices that would run through the book. Stop orders are handled in an intelligent fashion - if the buy (sell) price is farther from the trigger price than the banding parameter then the order is rejected. Therefore, if the stop price is hit, the limit order will be at a price within the band.

Banding should not “lock-up” the market in the event of a precipitous decline or advance. Consider that the band is based upon the CME Last Price, *i.e.*, the last traded price or the best bid or offer. As such, one may move the band simply by entering bids or offers beyond the most recent CME Last Price.

Banding ...	Banding Does NOT ...
<ul style="list-style-type: none">• Prevents traders from entering limit bids ABOVE the CME Last Price PLUS an arbitrary fixed BAND.• Prevents traders from entering limit offers BELOW the CME Last Price LESS an arbitrary fixed BAND.	<ul style="list-style-type: none">• Prevent traders from entering limit bids BELOW the CME Last Price; or, limit offers ABOVE the CME Last Price.• Prevent traders from entering market orders.• “Lock up” the market to the extent that one may enter a bid or offer up to the banded level – that bid or offer becomes the “CME Last Price” and the banded level is thereupon adjusted by reference to the new CME Last Price \pm the band.

Banding Levels - CME first deployed banding functionality on May 13, 2001 with the adoption of a $\pm 2.5\%$ “band” applied in the context of domestic stock index futures. These bands restricted the CME Globex operator from entering bids greater than the CME Last Price plus 2.5%; or, entering offers less than the CME Last Price less 2.5%. Since then, bands have been established with respect to almost all CME Globex traded contracts. Most bands were established at fixed levels – subject to periodic review – with the exception of bands applied to stock index futures – which were recalculated quarterly as a percentage of prevailing price levels.

Effective September 15, 2003, banding levels were changed to equal 2 times (2x) the no bust range for outright CME futures and options products traded on CME Globex and 1 times (1x) the no bust range for spreads on CME products. However, the band for interest rate spreads

Understanding Price Banding

November 9, 2006

Page 3 of 4

equals 2 times the no bust range (the same band as for outright rate products) and the band for equity spreads was not changed. Specific market requirements, such as volatility, may necessitate different bands on some products. For band levels, please see www.cme.com/files/PriceBanding.pdf

Dynamic Price Banding- A dynamic price banding scheme will be deployed on selected options and options combinations trading on CME Globex. Possible options include:

- The banding reference price is determined as follows:
 - a) The more recent of a Theoretical Options price (as calculated by CME) or a Trade price (as determined by the electronic marketplace) is used as the banding reference price.
 - b) In the absence of either reference prices as detailed in (1), the settlement price is used as banding reference price.
 - c) Bid or Ask prices through any of the aforementioned three reference prices will establish a new banding reference price. If a bid or ask established a new reference price and then gets subsequently cancelled, the reference price it established still remains absent the introduction of any other new reference prices.
- The width of the price bands shall be established pursuant to any of the following options:
 - a) fixed width, e.g. 6 index points, for the entire option series, regardless of the strike price in relation to the current futures price, or other characteristics of the options. This is the current price banding practice;
 - b) a fixed width based on the delta¹ of the option. The delta of the option shall be estimated by the TOP calculation. Based the range of values the estimated delta falls under, the width of the price band shall be established. E.g. for options with estimated delta between 0 and .10, the band shall be 3 index points; for options with estimated delta between .10 and .25, the width of the price band shall be 6 index points; for options with estimated delta of .25 and higher, the width of the price band shall be 9 index points. As the price of the underlying futures contract changes, the delta of a specific option may fall in different ranges. The applicable width of the price band becomes dynamic in nature;
 - c) a band based on a certain percentage of the TOP, with the percentage assigned according to the estimated delta of the option. E.g. if the estimated delta of the option

¹ Delta of an option is the “first order” sensitivity of the price of the options to a unitary change in the price of its underlying futures. For example, the value of a 20 delta option will increase or decrease by 0.20 with a 1-point move in the futures contract, ceteris paribus.

Understanding Price Banding

November 9, 2006

Page 4 of 4

falls between .10 and .25, a 20% band is assigned. Thus, the width of the band shall be $20\% \times \text{TOP}$ of the option instrument. Please note that the percentage band for an option series may vary, depending on the delta of the specific instrument; or

- d) a combination of (b) and (c), i.e. the larger of the price band based on a fixed, delta-based, schedule and a percentage band. E.g. for a specific option, the fixed schedule call for a 4 index point band while the percentage banding calls for a 5 index point band. The larger of the two bands applies.

To the extent that the prevailing market condition dictates a wider price band, e.g. in a (temporarily) volatile market in which prices fluctuate quickly, the Exchange may elect to temporarily relax or suspend the price banding restriction.

As price banding levels are subject to change, please see www.cme.com/files/PriceBanding.pdf for updated price banding levels.

If you have any questions, please contact Mr. Maz Chadid, Managing Director, Trading Operations at (312) 930-8246 or the Globex Control Center (GCC) at (312) 456-2391.