

Options on Futures: The Exercise and Assignment Process

Open interest	
44	97
40	736
32	94

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INTRODUCTION

This note describes the exercise and assignment process for the options on futures that trade on the CME Group designated contract markets — Chicago Board of Trade (CBOT), Chicago Mercantile Exchange (CME), Commodity Exchange (COMEX), and New York Mercantile Exchange (NYMEX). In all instances CME Clearing is responsible for pairing the long position holders who exercise their options with short position holders.

CME Clearing employs two methods for assigning option exercises: random and pro rata. The pro rata method, described on page 7, applies to all options listed on NYMEX and COMEX and to Flexible Options on CBOT Treasury Note and Bond futures. The random method, described on page 3, applies to all options listed on CME and CBOT (excluding Flexible Options on CBOT Treasury Note and Bond futures).

PRELIMINARIES

Option Series

An option series denotes a specific option type (put or call) with a specified expiry date, a given strike price, and with a given exercise style (either American, which is exercisable at any time prior to expiry, or European, which is exercisable at expiry only), which references a particular underlying futures contract. The exercise and assignment process is applied separately to each option series for which a long position holder has declared intent to exercise, or which is in the money at its expiration.

Importantly, CME Clearing's rules require that any clearing member firm that has been assigned to take an option exercise must be fair and impartial in designating which of its accounts holding short positions in the option will take the exercise assignment. (For more, see "The Role of the Clearing Member Firm" on page 10.)

Clearing Member Firms

Option exercise and assignment always occurs between member firms of the CME Clearing House, acting as agents for their account holders who are the ultimate owners of long or short positions in the option series. It does not occur directly between account holders themselves. Neither the identities of the account holders who own the options being exercised nor the category of origin of the account holders ("customer" or "house") exert any influence on the assignment process.

RANDOM ASSIGNMENT

Random Pairing of Exercisers and Assignees

Random assignment is so called because it entails sequential random draws on both sides of the process — long open interest being taken to exercise, and short open interest to which exercises will be assigned.

Option Exercisers: CME Clearing begins by drawing randomly from a discrete uniform distribution defined across the option exerciser pool, i.e., all individual contracts in the pool of long open interest for a given option series which have been declared for exercise. Each option in the exerciser pool has equal probability of being drawn, irrespective of any other considerations — regardless of the clearing member firm at which the option is held, or the length of time for which the account holder making exercise has held the long position in the option series, or the origin of the account holders (customer or house), etc.

Option Assignees: After an option has been drawn from the exerciser pool, CME Clearing draws randomly from a discrete uniform distribution defined across all individual contracts in the option's pool of short open interest. Here too, each option contract in the short open interest pool has equal probability of being chosen, irrespective of other considerations — regardless of the clearing member firm at which it is held, or the origin of the account in which it is held, or the size or vintage of the short position of which it may be part, etc.

Example: Early Exercise

Consider an option series that permits American-style exercise prior to expiry. Assume that on some day before the option expiration date, open interest is 50,000 contracts. Long open interest is held at five clearing member firms — A, B, C, D, and E — each with 10,000 contracts. Short open interest is held at three clearing member firms — A and Z with 20,000 contracts each, and Y with 10,000 contracts. Four of the five long clearing member firms declare early exercises (in time to meet the daily deadline for option exercise notification prescribed by CME Clearing). Exhibit 1 summarizes.

Exhibit 1

Clearing Member Firm	Short Open Interest	Long Open Interest	Long Options Declared for Exercise
A	20,000	10,000	1,000
B		10,000	2,000
C		10,000	500
D		10,000	
E		10,000	10
Y	10,000		
Z	20,000		
Total	50,000	50,000	3,510

CME Clearing randomly picks one option from the exerciser pool. Each of the 3,510 options being taken to exercise is equally likely to be chosen. Assume the first draw is an option held at clearing member Firm C.

CME Clearing then randomly draws one contract from the 50,000 in the short open interest pool. Each option is equally likely to be selected. Assume the first draw is an option held at clearing member Firm Z.

This process is repeated 3,509 more times. As Exhibit 2 illustrates, at the conclusion each of the 3,510 options being exercised has been assigned to a clearing member firm holding short open interest—in this example 1,617 to Firm A, 928 to Y, and 965 to Z.

Exhibit 2

	Total	Firm A	Firm Y	Firm Z
Initial Short Open Interest	50,000	20,000	10,000	20,000
Firms Exercising Long Open Interest	Short Open Interest	Assignments to Short Open Interest		
A	1,000	244	97	659
B	2,000	1,240	736	24
C	500	132	94	274
E	10	1	1	8
Total Exercises/Assignments	3,510	1,617	928	965
Final Short Open Interest	46,490	18,383	9,072	19,035

Example: Exercise at Option Expiry

Suppose the situation is as shown in the first three columns of Exhibit 1, but that the option series has reached its expiration day.

In-the-money: If the option expires in the money, and if CME Clearing receives no timely counter-instructions from any clearing member firms with long open interest, then it will take all long positions to automatic exercise. The same matching procedure as shown on page 4 will apply, except that the exerciser pool will comprise all long open interest in the option series.

Contrary Instruction at Option Exercise: For most options, contract terms permit the long position holder of an expiring in-the-money option to give “contrary instruction” or “counter-instruction.” That is, CME Clearing allows an interval during which a long position holder in an expiring in-the-money option may decline to exercise — typically from the contract’s termination of trading until 6:00 p.m. Chicago time.

There are exceptions however, including options on foreign exchange futures, for example. In such instances anyone holding a long position in an expiring in-the-money option at its termination of trading is required to exercise the option position.

Traders and brokers dealing in any option should familiarize themselves with that option’s terms and conditions, as defined in the pertinent Rulebook chapter, as to whether the contract does or doesn’t allow contrary instruction.

All examples in this paper deal with options for which counter-instruction is permitted.

Out-of-the-money: Generally, if the option series expires out of the money, longs have no reason to exercise. Nothing happens. But from time to time there may be exceptions...

Pin risk: Suppose the option series is about to expire out of the money, but that it looks likely that the daily settlement price of the underlying futures contract will be very close to the option strike price. In this circumstance some long position holders may elect to exercise, despite the option’s being out of the money, simply because this guarantees they will get filled at the option strike price in acquiring positions in the underlying futures. Accordingly, these elected exercises will not go to automatic non-exercise. Rather, CME Clearing will assign them in the same way as in Section 2.2. A corresponding number of options held in expiring short positions will get assigned even though the option series, strictly speaking, has expired out of the money.

Example: Expiration with Abandonment of Automatic Exercise

Suppose the option series expires in the money. Suppose moreover that two long position owners — an account with 5,000 contracts at Firm A, and an account with 750 contracts at Firm E — indicate they would prefer to let their options expire unexercised.

Firms A and E duly notify CME Clearing of these counter-instructions (prior to CME Clearing’s daily deadline for doing so). CME Clearing then withholds these 5,750 contracts from automatic exercise. Exhibit 3 depicts the balance of short and long open interest that will figure in the automatic exercise and assignment process.

Exhibit 3

Clearing Member Firm	Short Open Interest	Long Open Interest	Long Options Going to Automatic Exercise
A	20,000	10,000	5,000
B		10,000	10,000
C		10,000	10,000
D		10,000	10,000
E		10,000	9,250
Y	10,000		
Z	20,000		
Total	50,000	50,000	44,250

From this point on, CME Clearing proceeds as on pages 4 and 5. It randomly selects one option from the exerciser pool, then randomly selects an option from the short open interest pool to take assignment. It repeats this until all 44,250 long options being taken to exercise have been assigned.

The impact of the counter-instructions from Firms A and E is worth noting. Even though the option series has expired in the money, the exercise assignment process will conclude with 5,750 randomly selected contracts in the short open interest pool expiring unassigned.

PRO RATA ASSIGNMENT

Pro Rata Pairing of Exercisers and Assignees

For each clearing member firm taking a long option position to exercise, the pro rata method distributes that position among **all** clearing members that hold short open interest, deterministically and in proportion to each short clearing firm's share of the total short open interest.

Example: Early Exercise

ExapReturn to Exhibit 1, which shows open interest holdings and exercises in an American-style option series on some day prior to expiration. Assume that the pro rata method applies, rather than the random method.

Exhibit 1 (Again)

Clearing Member Firm	Short Open Interest	Long Open Interest	Long Options Declared for Exercise
A	20,000	10,000	1,000
B		10,000	2,000
C		10,000	500
D		10,000	
E		10,000	10
Y	10,000		
Z	20,000		
Total	50,000	50,000	3,510

Assignments of the 3,510 option exercises will be distributed proportionally across all three clearing member firms that hold short open interest. Firms A and Z each represent 20,000 contracts of the 50,000 total, so each receives 40 percent of assignments from each of the clearing member firms making exercise. Firm Y accounts for 10,000 of the 50,000 total, so it gets 20 percent of exercise assignments. Exhibit 4 summarizes.

Exhibit 4

	Total	Firm A	Firm Y	Firm Z
Initial Short Open Interest	50,000	20,000	10,000	20,000
Firms Exercising Long Open Interest	Short Open Interest	Assignments to Short Open Interest		
A	1,000	400	200	400
B	2,000	800	400	800
C	500	200	100	200
E	10	4	2	4
Total Exercises/Assignments	3,510	1,404	702	1,404
Final Short Open Interest	46,490	18,596	9,298	18,596

Because pro rata assignment is deterministic there can be one and only one outcome, shown in Exhibit 4. This clearly differs from the random assignment method, for which the result shown in Exhibit 2 is one of a multitude of possible random outcomes.

Example: Exercise at Option Expiry

Exercise at option expiry. In automatic assignment at option expiry, the pro rata method works in the same fashion as in assignments of early exercises. As with the random assignment method, the only difference is that the scope of application extends to the entire long open interest pool.

Even for the resolutely deterministic pro rata process, however, assignments at option expiry may produce surprises in at least two ways.

Pin risk: As on page 5, if the option series is about to expire a smidgen out of the money, some long position holders may elect to exercise simply because they will be guaranteed of obtaining a position in the underlying futures at the option strike price. These elected exercises will not pass through automatic non-assignment, but will be assigned instead according to the pro rata method.

To see this, assume that the option series exemplified on page 7 is about to expire slightly out of the money, with 50,000 open interest. As before, clearing member Firms A and Z hold 20,000 each of short open interest, and Firm Y holds the remaining 10,000.

- If all long position holders carry their positions through the termination of trading in the option series, then CME Clearing's automatic assignment process will apply uniformly: The option series has expired out of the money, so no assignments will be made.
- If instead the holder of, say, a 10-contract long position at firm B elects to exercise, then Firm B will duly inform CME Clearing. These contracts will be withheld from automatic non-assignment and will be assigned pro rata to the three firms with short open interest: 4 each to Firms A and Z, and 2 to firm Y.

Abandonment of Automatic Exercise: Recall that long position holders reserve the right to decline automatic exercise, even if the option series they own has expired in the money. To see what this means for pro rata matching, let's revisit the example in Exhibit 3.

Exhibit 3 (Again)

Clearing Member Firm	Short Open Interest	Long Open Interest	Long Options Going to Automatic Exercise
A	20,000	10,000	5,000
B		10,000	10,000
C		10,000	10,000
D		10,000	10,000
E		10,000	9,250
Y	10,000		
Z	20,000		
Total	50,000	50,000	44,250

Assume Firms A and E have duly and timely notified CME Clearing of their respective counter-instructions: Accounts with 5,000 contracts at Firm A and 750 contracts at Firm E wish their options to expire unexercised. CME Clearing accordingly withholds these 5,750 contracts from automatic exercise and applies pro rata assignment to the remaining 44,250 of long open interest. Exhibit 5 shows the only possible outcome.

Given the deterministic nature of pro rata assignment, Firms A and Z each will receive 17,700 assignments. Each will have account holders who own short positions totaling 2,300 contracts who will not get assigned. Similarly, Firm Y will receive only 8,850 assignments to distribute among its accounts who own short positions totaling 10,000 contracts.

Exhibit 5

	Total	Firm A	Firm Y	Firm Z
Initial Short Open Interest	50,000	20,000	10,000	20,000
Firms Exercising Long Open Interest	Short Open Interest	Assignments to Short Open Interest		
A	5,000	2,000	1,000	2,000
B	10,000	4,000	2,000	4,000
C	10,000	4,000	2,000	4,000
D	10,000	4,000	2,000	4,000
E	9,250	3,700	1,850	3,700
Total Exercises/Assignments	44,250	17,700	8,850	17,700
Final Short Open Interest	46,490	2,300	1,150	2,300

THE ROLE OF THE CLEARING MEMBER FIRM

Fair and Equitable Allocation of Assignments

In view of the preceding examples, it is worth emphasizing that option exercises and assignments take place between member firms of CME Clearing, not between the ultimate owners of long and short option positions. Once CME Clearing has matched exercisers and assignees, any clearing member firm designated as an assignee is responsible for determining how it allocates among its accounts the option exercises assigned to it.

The Exchange requires this allocation to be fair and equitable.

Specifically, Rule 955 in Chapter 9 of the CME Rulebook mandates that:

“A. Each clearing member shall adopt written procedures pursuant to which it shall allocate option exercise notices in a fair and non-preferential manner.

B. Upon notification from the Clearing House of assignment of an exercise notice, the clearing member shall promptly notify the option grantor to whom the notice has been allocated.”

Example

Recall in Exhibit 2 on page 4 that Firm Y has been randomly assigned by CME Clearing to accept 928 option exercises: 97 from Firm A, 736 from B, 94 from C, and 1 from E. Firm Y’s customer and/or house accounts hold a total of 10,000 contracts of short open interest in the option series. Firm Y’s method for allocating the 928 exercises among these short open interest holders must be demonstrably fair and impartial.

Only CME Clearing can match exercisers and assignees

Nothing prevents a single clearing member firm from representing both sides of an option exercise. In Exhibit 2 on page 4, for example, accounts holding long positions with Firm A seek to exercise a total of 1,000 options, while Firm A simultaneously holds account positions with short open interest totaling 20,000 contracts. Despite this, Firm A cannot unilaterally assign its 1,000 exercisers to its own short open interest holders. *CME Clearing holds sole authority for making assignments of option exercises to short clearing member firms.*

In Firm A’s case, the outcome of CME Clearing’s random matching process is such that 244 of Firm A’s option exercises are among the total 1,617 exercises that were randomly assigned to its portion of short open interest.

Having received this exercise assignment, Firm A is required to demonstrate fairness and equitability in the means by which it allocates these 1,617 exercises — including the 244 from among its own portion of long open interest — among the 20,000 contracts of short open interest that it holds.

TIMETABLES FOR OPTION EXERCISE AND ASSIGNMENT

This page provides information about online resources from CME Group where you can find current information related to options exercise and assignment procedures.

Clearing Transaction Timeline Tool

CME Group provides detailed information regarding the deadlines for notification and processing of options exercise and assignments as part of the Clearing Transaction Timeline tool posted on our website at <http://www.cmegroup.com/clearing/clearing-transaction-timeline.html>

With this interactive resource, simply roll your cursor over the points on the daily timeline to see explanations of transactions associated with the various time markers. A link to a two-page PDF of the timeline is also available from this page. (Note that the tool includes information on processing of other transactions besides options exercise and assignment.)



Contrary Options Exercise Instructions

This page on the CME Group website provides information on the processing of options contracts that allow “contrary instructions” — the ability for a customer to instruct their clearing firm to exercise an out-of-the money option or, alternatively, to abandon an in-the-money option — instructions that appear to be “contrary” to the action an option holder would typically take.

Here you can access:

- Summary reports of contrary options instructions submitted by the clearing firms (actual exercise and assignment process is run later in the evening Chicago time, and results made available to the clearing firms)
- List of options available at CME Group exchanges that allow contrary instructions
- Submission deadlines clearing firms must adhere to for all contrary options exercise and abandonment instructions

<http://www.cmegroup.com/clearing/contrary-option-exercise-instructions.html>

For more information on clearing in CME Group markets, visit www.cmegroup.com/clearing.



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