New Warrants & Certificates Market Model

Functional overview

STATUS

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1. Introduction

In order to address the needs of its clients, NYSE Euronext has decided to enhance the current market model for Warrants and Certificates. This model has been developed jointly with market participants, and notably with issuers.

The model presented below has been approved by the NYSE Euronext market authorities. This new market model will be migrated onto the existing trading infrastructure using an enhanced version of Euronext's Universal Trading Platform (UTP) System.

Note that this new infrastructure will also support the current model.

The purpose of this document is to provide:

- A global overview of the application message flow exchanged between SLEs and UTP and the associated broadcast messages for the new model;
- The main rules and particularities associated with this model;
- The enhancements implemented to improve the new market model after two pilot periods.

The objective is to allow all market participants to gain a better understanding of the model in order to develop or adjust their IT applications as appropriate.

As a reminder, the communication protocols used to access the CCG are the current MMTP and FIX protocols for order entry (these protocols are expected to be discontinued at the end of 2009), and UTP–Direct and FIX 4.2 for all the messages including Liquidity Provider (LP) features.

For more information concerning the messages you can consult the following documents on our website:

(i) UTP market data feed customer interface specifications (UTP-MD)
(ii) Universal Trading Platform for Equities UTP-Direct Message Specifications
(iii) Universal Trading Platform for Equities FIX 4.2 API Specifications

2. Market model overview

The main purpose of the new Warrants & Certificates market model is to improve price quality and to develop features adapted to a market that is driven by LP quotes.

The development of the Warrants & Certificates market model will lead to the following main enhancements:

- Development of new dedicated messages for the LP activity (described in chapter 3)
- Increased market transparency through the broadcasting of indicators related to the presence of the LP and the status of an instrument in case of a Bid or Offer Only situation
- Replacement of the former instrument trading thresholds with the LP quotes.

These enhancements are based on the following principles:

- Each instrument is managed by one and only one LP
- The quotes provided by the LP consist of one price and one quantity for each side of an instrument
- No trade can be executed on an instrument without the presence of the LP managing the instrument
- The absence of a LP triggers the reservation of the instrument concerned and the LP is immediately informed
- No trade can be executed outside of the LP quotes (static thresholds are replaced by LP quotes which can be found in the public Quote message 140). As a consequence, the message 537 “Collar” is no longer sent in the new market model
- For the trading groups with Request For Execution (RFE), no trade can be executed without the confirmation of the LP quote before the expiration of a refresh period
- A new Bulk Quote functionality is provided to the LP in order to allow him to update up to 150 instruments in one single message, limited to 50 in a first instance
- The Bid Only and Offer Only situation offers dedicated rules.

The following order attributes are defined for this new market model:

	For Brokers	For Liquidity Providers
Order types available	- Limit order - Market order - Stop on Quote	- Limit order
Order time validities	- Default Dated (Day Order) - Good Till Date	- Default Dated (Day Order)
Iceberg orders	Yes	Yes
Cross order	The cross order is not available for products belonging to trading groups with RFE.	No

2.1. Market model basis

2.1.1. Presence of the Liquidity Provider and reservation of the instrument

The main rule of the new market model is to forbid any matching on an instrument if the LP managing this instrument is not present. An LP is considered to be present when the Bid and Ask quotes are visible for an instrument, or when there is a bid or offer one side only during a Bid or Offer Only period.

To ensure that no price is traded in such a case an automatic reservation is triggered:

- At the Opening of the group or instrument if the LP is not present
- During the Continuous Trading phase as soon as the LP is no longer present following a quote cancellation or the complete matching of a quote.

Immediately after the instrument reservation the LP is informed through a dedicated message.

As soon as the LP enters a new quote, the instrument automatically reopens.

2.1.2. Pre-opening phase description

The market model does not modify the current specificity of the pre-opening phase. However it integrates the developments linked to this model:

Orders are accepted as usual and along with the quotes of the LP make up the Theoretical Opening Price (TOP).

The position of the LP in the ten best limits is broadcasted to the market, except if the LP quote is overridden by the TOP.

If no quotes are provided by the LP, he is informed by the system through a dedicated message, Ask For Quote message (AFQ).

2.1.3. Opening phase description

At the opening of the instrument, several specific cases could occur:

If the LP is not present, the instrument is automatically reserved.

If the LP is present and the calculated TOP is between the LP quotes, the instrument is opened.

If the calculated TOP is outside the LP quotes, the TOP will be readjusted to the crossed LP quote.

Note that the specific behaviour of unfilled market orders currently implemented and which depends on the instrument status will not apply for the new market model. When there is an unfilled Market Order, a TOP is always defined if there is at least one counterpart.

2.1.4. During the session (continuous trading)

As mentioned above, the usual static thresholds are no longer in use and have been replaced by the LP quote.

As a consequence, the basic matching rules of this new market model are the following:

- To accept orders outside the LP quotes
- To forbid trading when the LP is not present
- To inform the LP before each potential trade execution (for leverage products only)
- To avoid any trade outside the LP quotes.

2.1.5. Reopening modalities following a quote entered by the LP

When an instrument is reserved because the LP is not present, it is automatically reopened after the LP enters its quotes.

The reopening process may result in one or more transactions, the prices of which are determined by "uncrossing the limits" following price/time priority.
The best limit orders are matched at balanced (executable) prices inside the LP quotes.

Should the balanced (executable) prices for uncrossing the limits be outside the LP quotes, the orders are matched to the extent possible at the LP limit. If outside the LP quotes the price will be equal to the LP quote.
The reopening price is determined by the price of the order with the earliest timestamp.

This process is repeated until all orders within the LP quote are executed.

2.1.6. Bid, Offer only situation for an instrument

Under certain circumstances relating to the number of shares offered by the LP or the price level of the warrants or certificate, the LP needs to move to a Bid Only or an Offer Only situation for a specific instrument.

This phase change is managed by the LP through dedicated SLE messages described below (3. Dedicated functions and messages for a LP)

As soon as the LP triggers this new phase for a dedicated instrument the market is immediately informed through:

- The current Market Data message **(UTP-MD 505)**
  - The message indicates the status of the One Side period, "Y" for the beginning and "Z" for the end of this period.
  - It also indicates the side, "A" for a Bid Only period and "V" for an Offer Only period.

- A new SLE message Warrant "One Side Only Period Notice" **(UTP-Direct "V" and FIX 4.2 "UV").**
  - The message indicates the status of the One Side period, "B" for the beginning and "E" for the end of this period.
  - It also indicates the side, "A" for a Bid Only period and "V" for an Offer Only period.

  NB: this new SLE message, is sent by the system to all members.

2.1.6.1. Bid Only situation description

During a Bid Only period, a virtual LP offer quote is calculated by the system. The calculation is based on the LP bid and a dedicated reference table.

This quote aims at avoiding any potential deals between clients above the LP price. The price of this quote is then the maximum price authorized for client executions.

The price of the quote is recalculated each time the LP bid quote is changed.

The Market-Data message 537 ("Collars") is not broadcasted on the New Warrant Market Model. But, in the particular case of the bid-only situation, a Market-Data message ("Collars") **(UTP-MD 537)** is sent, giving the customers the virtual price each time it is calculated.

2.1.6.2. Offer Only situation description

When an LP providing liquidity on an instrument values his product at a bid price lower than one tick, he moves to an offer only situation.

As in a Bid Only situation, a virtual LP Bid quote is defined and set to the instrument tick size.

This allows the instrument to remain open for trading.

2.2. Market model specificities for instruments belonging to a trading group with RFE

Regarding the market model and its specificity from a trading point of view there is no major difference between products negotiated in a trading group with or without RFE.

The first main point which is fully supported by the LP, (ref 3.3 Request for execution message) concerns the required confirmation by the LP before each potential trade.

The second point is that the cross order is not allowed for trading groups with RFE.

3. Dedicated functions and messages for a Liquidity Provider

The aim of this chapter is to describe the specificity related to LP activity and the new associated messages.

For a full description of these messages please refer to the following document on the NYSE Euronext website:

- Universal Trading Platform for Equities UTP-Direct Message Specifications
- Universal Trading Platform for Equities FIX 4.2 API Specifications

3.1. Entering multiple orders through Bulk Quotes

A new quote management mechanism is provided to LPs allowing them to update prices and quantities on both sides from 1 up to 150 products.

Important notice:

- **During an initial period, LPs are requested to limit the number of products to be updated in a single bulk quote to 50. After a period of observation as defined by Euronext, LPs will be allowed to use this new function in its full capacity**
- All instrument quotes included in a single Bulk Quote must refer to instruments traded on the same trading group.

This single new message is the “Bulk Quotes entry, modification and cancellation” message, **(UTP-Direct “B” and FIX 4.2 “UB”)**. It is a dedicated message for LP activity only.

The quotes included in the Bulk Quote message are considered as normal orders. The available order type is “limit” and the validity is “session”. Minimum and hidden quantities are not allowed. A consistency check is done in order to verify that the Bid quote is strictly less than the Ask Quote. In order to optimise the general order processing, the Bulk Quote message integrates one unique clearing aggregate for all quotes.

The same Bulk Quote message allows the LP to:

- Enter a Bulk Quote on multiple instruments
- Update quotes within the instrument panel initiated in the first Bulk Quote, or generate new quotes for instruments which were not present in the initial Bulk Quote
- Delete existing quotes or full Bulk Quotes, setting the quantity to zero.

For a single instrument, the system accepts an order from a Bulk Quote (account type always set by default to “6”). As a reminder an LP cannot place more than one Order Quote on each side in the book (Account type equal to LP).

Note that the current standard LP Order (order with account type "6") is not available anymore on the new market model.

In response to this entry a "Bulk Quotes entry, modification and cancellation confirmation" message **(UTP-Direct "J" and FIX 4.2 "UJ")** is sent by the central system to the issuer.

Note that for a given instrument, if an error occurs on one side, both quotes are rejected and an error code is returned for the incorrect quote. The other quotes are accepted.

In a Bid or Offer Only situation triggered by the LP on an instrument he is in charge of, the LP is required to have a quote on the buy or on the sell side only in order to fulfil his obligations. (Ref section "Trigger a Bid or offer only phase").

3.2. Ask For Quote mechanism

In order to help the LP fulfil his obligations under the best conditions, a new message is created to inform him that for a given instrument no quotes are present. An LP is considered present when the Bid and Ask quotes are present for an instrument or One Side Only during the Bid or Offer Only period.

This new dedicated message, automatically sent by the UTP system to the LP concerned, is an "Ask For Quote" **(UTP-Direct "L" and FIX 4.2 "UL")** message, also known as an AFQ message.

The AFQ message includes a flag characterizing the reason for the request as detailed below.

This message is sent in the following cases:

<u>Before the opening of the instrument:</u>

- The LP is not present M minutes before the group opening. M is a NYSE Euronext parameter defined at the instrument group level. This parameter is foreseen to be set to 15 minutes. *AFQ flag "M".*
- The LP is not present S seconds before the group or the instrument opening. S is also an instrument group parameter and foreseen to be set to 2 seconds. *AFQ flag "S*".

<u>During the session:</u>

- The LP is not present following the cancellation of a quote by the LP *AFQ flag "A",* or by the Cash Market Operation *AFQ flag "C*".
- The LP is not present following the complete matching of his quotes, *AFQ flag "X*".

  Note that the Ask For Quote message is sent at the time of the instrument reservation instrument event.

<u>Resending mechanism when the LP is not present:</u>

- Every R minutes a resending mechanism applies at the end of the pre-opening phase and during the session. The *AFQ flag is "R*". "R" is also an instrument group parameter.

Note that for the launch of the new market model, this parameter will be set to "0" for all the trading groups, with or with out RFE. As a consequence no *AFQ with a flag "R" will be sent by the system.*

3.3. Request For Execution message

As detailed above, a specific mechanism allowing the LP to be informed of a potential trade is specifically set up for Leverage Products and dedicated to an LP using the Bulk Quote entry only.

Before completing any trade on an instrument, a “Request For Execution” **(UTP-Direct “M” and FIX 4.2 “UM”)** message is sent by the central system to the LP providing liquidity on the instrument. This RFE message allows him to confirm or adjust his quotes. The main aim of this mechanism is to provide the market with the best and most updated prices.

Please note that the message contains no information linked to the order (price or quantity) to be matched, other than the relevant instrument identification.

Upon reception of the Request For Execution message, the LP has the following choices:

- Confirm his quotes by issuing a Bulk Quotes message with the same prices
- Modify his quotes by issuing a Bulk Quotes message with new prices
- Disregard the Request For Execution message. In this specific case, and after a predetermined period defined by NYSE Euronext, the trade execution will take place.

3.4. Trigger a Bid or Offer Only phase

As mentioned above, in certain circumstances the LP needs to move to a Bid Only or an Offer Only situation for an instrument.

In order for the LP to properly manage this kind of situation, a new dedicated message “Start One Side Only Period” **(UTP-Direct “O” and FIX 4.2 “UO”)** is created.

Before using this function the LP must first cancel its quotes for the instrument concerned.

To trigger this state, the LP has to detail whether it is for a Bid Only period (indicator “A” in the message P) or an Offer Only period (indicator “V”).

In response to this message entry, a confirmation message will be sent by the central system to the issuer. This message is “Start one side Only Period Confirmation” **(UTP-Direct “P” and FIX 4.2 “UP”)**.

At the same time the market is informed through the current UTP-MD message instrument state change and the new SLE message Warrant One Side Only Period Notice.

In order to end a Bid Only or an Offer Only period no dedicated message is required from the LP.
As soon as a valid two-sided quote is provided the phase changes for the instrument and the market is immediately informed through the two messages described above.

To change a Bid Only situation to a “normal” one the LP has to send an offer quote.
To change an Offer Only situation to a “normal” one the LP has to send a bid quote.

3.5. Stop on Quote

3.5.1. At the order entry level

A buy stop on quote has to have a trigger price greater to the LP's sell order limit at the moment of order entry, all others will be rejected.
If the product is reserved due to LP absence, then all stop on quotes should be accepted regardless of the state of the order book.
If the product is bid-only then the trigger price has to be greater than the reservation threshold which is derived from the LP buy order limit and the bid-only table.

A sell stop on quote has to have a trigger price lower than the LP buy order limit at the moment of order entry, all others will be rejected.
If the product is reserved due to LP absence, then all stop on quotes should be accepted regardless of the state of the order book.
If the product is offer-only then the order should be rejected with the message "executable price".

3.5.2. Stop on quote order trigger

A buy stop on quote will be triggered when the stop on quote price is lower or equal to the LP sell order price.
In case of a bid-only situation: the buy stop on quote will be triggered when its price is lower or equal to the reservation threshold derived from the LP buy order price and the bid-only table.

A sell stop on quote will be triggered when the stop on quote price is greater or equal to the LP buy order price.
In case of an offer-only situation: the sell stop on quote will be triggered when its price is greater or equal to the best buy order price in the order book, it is triggered automatically if there are no buy orders in the order book.

3.5.3. Stop on Quote in an Offer Only phase

As in a Bid Only situation, a virtual LP Bid quote is defined and set to the instrument tick size. This involves the triggering of all stop on quote orders on the bid side.

NYSE Euronext strongly recommends that Liquidity Providers use the offer only functionality carefully given the fact that this state triggers ALL sell stop on quote orders.

3.5.4. Other rules

Stop on quote orders can be placed with a limit price.
Stop on quote orders do not participate in the modified TOP calculation at the opening, nor in the modified TOP calculation that could occur during the trading session following a trading halt.

3.6. Valuation price

3.6.1. Principle

Twice a day, at the end of the opening auction and upon closing, the valuation price will be automatically triggered by the trading engine when the following conditions are met:

1) as far as the opening auction is concerned, there is no trade already resulting from that auction phase;
2) following its obligations the LP must be present in the Central Order Book. In an offer-only situation no valuation price will be produced.

The valuation price is generated by sending a valuation instruction for one trading lot. No member shall be involved as counterparty.

The valuation price is equal to the mid-point of the best bid and offer limits of the Central Order Book, except in a bid-only situation where the valuation price will be the LP's bid.

3.6.2. Identification

The resulting price shall be marked with a special indicator.

3.6.3. Legal regime

The trade produces the effects of any trade carried out in the Central Order Book but is not included in the volumes published by Euronext.

4. Annex – Order book examples

The aim of this annex is to provide some examples related to the new market model.

4.1. Opening with IMP outside the LP quotes

Let's assume we have this book:

Order book			IMP = 0.10	Call	Inherit.
Time	Qty	Price	Price	Qty	Time
LP	18	0.12	0.07	5	2
			0.08	5	3
			0.09	5	4
			0.10	5	1
			0.11	5	5
			0.15	5	LP

The calculated IMP is 0.10. This price is outside the LP quote.
UTP proceeds to the matching of orders 2, 3, 4 and 1 at the LP crossed side price 0.12.

executions						
Time	Aggressing	Qty	Price	Qty	Aggressing	Time
LP	No	5	0.12	5	No	2
LP	No	5	0.12	5	No	3
LP	No	5	0.12	5	No	4
LP	No	3	0.12	3/5	No	1

At the end, the book is as follows and the instrument is Halted "No LP".

Order book			OP = 0.12	CT	Halted
Time	Qty	Price	Price	Qty	Time
			0.10	2	1
			0.11	5	5
			0.15	5	LP

4.2. Opening following a reservation: uncrossing algorithm

4.2.1. First example

Order book					.
Time	Qty	Price	Price	Qty	Time
1	10	0.11	0.07	10	6
2	5	0.10	0.08	10	3
LP	10	0.09	0.08	20	5
4	10	0.08	0.10	10	LP

The earliest order executable at the best limit is 1. Order 1 fully matches with 6. The execution price is the LP price from the crossed side: 0.10. The orders which are going to match are highlighted in red in the book. The matching sequence is presented step by step.

Temporary order book					Inherit.
Time	Qty	Price	Price	Qty	Time
1	10	0.11	0.07	10	6
2	5	0.10	0.08	10	3
LP	10	0.09	0.08	20	5
4	10	0.08	0.10	10	LP

executions						
Time	Aggressing	Qty	Price	Qty	Aggressing	Time
1	No	10	0.10	10	Yes	6

The “remaining” order book is

Temporary order book					Inherit.
2	5	0.10	0.08	5/10	3
LP	10	0.09	0.08	20	5
4	10	0.08	0.10	10	LP

The earliest order executable at the best limit is 2. Order 2 fully matches with 3 at a price readjusted to the LP price on the crossed side, 0.10 in our case.

executions						
Time	Aggressing	Qty	Price	Qty	Aggressing	Time
2	No	5	0.10	5/10	Yes	3

The “remaining” order book is

Temporary order book					Inherit.
LP	5/10	0.09	0.08	5/5	3
4	10	0.08	0.08	20	5
			0.10	10	LP

At this moment, the earliest order at the best limit is order 3. Order 3 fully matches with LP at the LP price (0.09).

executions						
Time	Aggressing	Qty	Price	Qty	Aggressing	Time
LP	Yes	5/10	0.09	5/5	No	3

The “remaining” order book is

Temporary order book					Inherit.
LP	5/5	0.09	0.08	5/20	5
4	10	0.08	0.10	10	LP

The earliest order executable at the best limit is order 5. The matching algorithm matches this order 5 with the LP quote at the LP price (0.09);

Trade list						
Time	Aggressing	Qty	Price	Qty	Aggressing	Time
LP	Yes	5	0.09	5/20	No	5

There is no more LP on bid side and the instrument is halted. Finally, the order book and the trade list are as follows:

Final order book					Halted
4	10	0.08	0.08	15	5
			0.10	10	LP

Trade list					
Time	Qty	Price	Qty	Time	Note
1	10	0.10	10	6	Earliest on Bid, Trade Price = LP Offer price
2	5	0.10	5/10	3	Earliest on Bid, Trade Price = LP Offer price
LP	5/10	0.09	5/5	3	Earliest on Ask, Trade Price = LP Bid price
LP	5/5	0.09	5/20	5	Earliest on Ask, Trade Price = LP Bid price

4.2.2. Example with Market Order

Let's assume we have this book:

Order book					
5	20	MO	MO	20	2
LP	10	0.12	0.15	10	LP

The range of possible IMP is:

Range of IMP				
Simulated IMP	Cumul. Buy Qty	Cumul. Sell Qty	Traded Qty	Unfilled Qty
0.12	30	20	20	10
0.12+	20	20	20	0
0.15-	20	20	20	0
0.15	20	30	20	10

In this case, the IMP depends on the Reference Price.

- ✓ If the Reference Price is ≤ 0.12, the IMP = 0.12
- ✓ If 0.12 < Reference Price < 0.15, the IMP = Reference Price
- ✓ If the Reference Price ≥ 0.15, the IMP = 0.15

If the Reference Price is within]0.12 - 0.15[, the trade list is as follows:

Trade list				
Time	Qty	Price	Qty	Time
5	5	Ref Pr.	5	2
6	5	Ref Pr.	5	3
7	5	Ref Pr.	5	4
8	5	Ref Pr.	5	1

And the final order book is:

Order book			IMP = R.P.	CT	Inherit.
Time	Qty	Price	Price	Qty	Time
LP	5	0.12	0.15	5	LP

If the Reference Price is lower than or equal to 0.12, the trade list is as follows:

Trade list				
Time	Qty	Price	Qty	Time
5	5	0.12	5	2
6	5	0.12	5	3
7	5	0.12	5	4
8	5	0.12	5	1

And the final order book is:

Order book			IMP = 0.12+	CT	Inherit.
Time	Qty	Price	Price	Qty	Time
LP	5	0.12	0.15	5	LP

If the Reference Price is greater than or equal to 0.15, the trade list is as follows:

Trade list				
Time	Qty	Price	Qty	Time
5	5	0.15	5	2
6	5	0.15	5	3
7	5	0.15	5	4
8	5	0.15	5	1

And the final order book is:

Order book			IMP = 0.15-	CT	Inherit.
Time	Qty	Price	Price	Qty	Time
LP	5	0.12	0.15	5	LP

4.3. One side only situation

4.3.1. Offer only example

The LP has set an instrument to Offer Only. The instrument is open.

Order Type	Quantity	Bid Price	Ask Price	Quantity	Order Type
	10,000	0.02	0.04	1,000	
			0.05	5,000	
Minimum	tick size	0.01	0.08	10,000	LP

All the trades are possible between the minimum tick size (0.01) and the LP offer at 0.08.

4.3.2. Bid only example

The LP has set an instrument to Bid Only. The instrument is open.

Order Type	Quantity	Bid Price	Ask Price	Quantity	Order Type
	100	0.76	0.79	50	
LP	1000	0.74	*0.80*		*Virtual Offer*
			1.50	1,000	

All the trades are possible between the LP Bid quote @0.74 and the virtual offer (not broadcasted).

The calculation of this virtual Offer is based on the LP bid price and a dedicated reference table.

In this example the virtual offer is 0.74 + 0.06 = 0.80.

With an LP Bid quote at 0.75 the virtual LP offer is 0.75 + 0.08 = 0.83

Bid Price	Thresholds
B< 0.10	0.02
B in [0.10;0.20[	0.04
B in [0.20;0.75[	0.06
B in [0.75;1.25[	0.08
B in [1.25;2.00[	0.10
B in [2.00;5.00[	0.14
B in [5.00;10.00[	0.30
B in [10.00;50.00[	1.50
B in [50.00;100.00[	3.00
B $\geq$ 100.00	5.00