



Omnesys Technologies



BSE (Cash) Vs. NSE (Cash) Bidding Strategy

March 28th, 2014

Version 2.0.0.5

Document Information

DOCUMENT CONTROL INFORMATION	
DOCUMENT	Nest Strategy Script.
VERSION	2.0.0.5
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REVIEWER	BRIJESH DAMODAR / ATHUL KUDVA
REVIEW NOTES	
VERSION NOTES 2.0.0.5	This document explains BSE (Cash) Vs. NSE (Cash) Bidding Strategy functionality.
KEYWORDS	

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BSE (Cash) Vs. NSE (Cash) Bidding Strategy:

This strategy allows for quote based arbitrage between BSE equity and NSE equity segments (NSE).

Nest Strategy Client:

Portfolio Tree: Each portfolio comprises of 2 tokens (i.e. one Cash scrip in BSE equity segment and one cash scrip in NSE equity Segment).

Input Parameters:

Portfolio Name: The name of the portfolio.

NSE Scrip Details:

Instrument Name: User needs to enter relevant Instrument name for the NSE token. In this strategy, it will be EQ.

Symbol: User needs to select relevant symbol name in NSE segment

Pro/Cli : It gives user an option to do in PRO or in CLI. When cli is selected, it will give an option to select the relevant **Account id**.

BSE Scrip Details:

Type: User needs to enter relevant group type for the BSE token.

Symbol: User needs to select relevant symbol name in BSE segment

Pro/Cli: It gives user an option to do in PRO or in CLI. When cli is selected, it will give an option to select the relevant **Account id**.

First Leg: This parameter will determine in which exchange the first (bidding) leg be placed. It has two options: BSE or NSE.

BuySell Leg1: Once the first leg is selected using First leg parameter, whether to buy that first leg or Sell that first leg is determined by this parameter.

Calculation Method:

a. **Spread:** The Spread Calculation method formula is given as below:

$$\text{Calc. Diff.} = (\text{Weighted Avg. Sell token}) - (\text{Weighted Avg. Buy token})$$

b. **Buy/Sell:** For this method formula is given as below:

$$\text{Calc. Ratio} = (\text{Weighted Avg. Buy token}) / (\text{Weighted Avg. Sell token})$$

c. **Sell/Buy:** For this method formula is given as below:

$$\text{Calc. Ratio} = (\text{Weighted Avg. Sell token}) / (\text{Weighted Avg. Buy token})$$

Limit: This is the desired spread between equity legs in different exchanges, positive value indicates a profit arbitrage, negative value denotes a loss.

Quote Threshold (Rs.): always lower than or equal to the "Limit". The idea is to start bidding when the Quote threshold is breached. Quote Threshold condition is used in both during placement as well as during modification of orders. At any point during modification, if the quote threshold condition is not satisfied, the open pending orders are cancelled. It is applicable for all calculation method type.

First Leg Type: This parameter is useful in determining how the first leg (bidding leg) will be placed in the market. It has two options:

- a. **Best Bid/Ask:** If user selects Best Bid/Ask, then the strategy will place a single limit day order for the first leg. For placing first leg, our system will calculate the first leg option price based on the set parameters. If the market price is better than calculated price, it will try to become best buyer/seller depending on whether one is buying or selling a given token.
It should be noted that bidding to become best buyer and best seller till the calculated first leg price. So calculated first leg price becomes a floor/ceiling for bidding.
- b. **Sweep/Stand Price:** If user selects Sweep/Stand Price, then the strategy will place a single limit day order at a price calculated based on the limit specified and the price of the second leg. For placing first leg, our system will calculate the first leg price and place the order in the market at the calculated price but will not become best buyer or seller. First leg price will be modified based on the changes in the prices of second leg.

Second Leg Type: This parameter is exclusively for the second leg. Once the first leg gets completed, how should the second leg be placed depends on this parameter. It has two options to place the second leg and is mentioned below:

- a. **Limit:** Once the first leg is completed, second leg is placed as limit order depending on the average first leg price and the limit spread/ratio specified.
- b. **LTP Based MPP%:** Once the first leg is completed, second leg is placed based on the LTP +/- MPP%. In other words, let say, user is selling first leg, and second leg is the buy order, it will take the LTP of that scrip add x% specified in the MPP% parameter and then place the order. If for any reason it is not completed, and there is a change in LTP, it will change the order accordingly. Similarly, let say, user is buying first leg, and second leg is the sell order, it will take the LTP of that scrip subtract x% specified in the MPP% parameter and then place the order. If for any reason it is not completed, and there is a change in LTP, it will change the order accordingly. For any reason, if this option is selected, and user stops the strategy, the pending second leg order will be canceled.

Timer: This is exclusively for second leg. If the Leg type for the second leg selected is Limit, then the timer will become applicable. After timer expiration, any open orders for second converted to limit order with the price based on LTP Based MPP%. Timer starts as soon as the second leg is placed by system.

MPP%: This parameter is provided for second leg. It enables only when Second leg type selected is **LTP Based MPP%** or **Limit**.

For Second Leg **Buy** Orders:

$$\text{Placed Second Leg Buy Price} = \text{LTP} + (\text{LTP} * \text{MPP}\%)$$

For Second Leg **Sell** Orders:

$$\text{Placed Second Leg Sell Price} = \text{LTP} - (\text{LTP} * \text{MPP}\%)$$

Threshold Qty (%): It is used to check whether a mentioned percentage of the order quantity is available for the second leg for the specified market Depth. For example, if order quantity is 6 with market depth as 3 and threshold qty % as 50%, then the system will check whether 3 qty for second leg (50% * 6 qty) is available in the first three depths. If it is available then only it will place/bid for the first leg. If the specified threshold quantity is not available in second leg for the specified depth, no first leg orders will be placed. Even during modification of first leg, quantity checks are done for the second leg. If any time during the modification, if the quantity becomes unavailable for any leg, the existing first leg open order will be cancelled.

Market Depth: The threshold qty % will be checked for the second for the specified market depth. It specifies till how much depth once must check for the quantity. It should be noted that although depth is 5, but if the quantity is available at lower depth (say 3rd depth) itself, it will take weighted average accordingly and then calculate the first leg price. In other words, the strategy will not calculate the weighted average price for the particular leg till the depth specified, but will calculate the weighted average price based on the quantity available and price at which it is available.

Tick Mod: is considered for bidding and is used to decrease the number of modifications. If the difference between current order price and new bidding price is greater than or equal to the Tick Mod then only order is modified with the new bidding price. It is applicable for first leg only. It is applicable for both the option of first leg type: Best Bid/Ask and Sweep/Stand.

Tick Size (BSE): It is a minimum tick for that scrip selected in BSE exchange.

Tick Size (NSE): It is a minimum tick for that scrip selected in NSE exchange.

Modify Times: number of times second leg order can be modified by 1 tick size, provided second leg order type is selected as limit, and it is open prior to the expiration of timer. If modify times is entered as '0', second leg modification will not take place. In other words, system will place the second leg based on the second leg price type and will stand at that price.

Order Quantity: This is the quantity to be placed per opportunity for execution.

Total Quantity: This is the total trade quantity that the user intends to trade.

Qty Check: This parameter has two options: YES and NO. If the QtyCheck is selected as NO, whenever any quantity of the first leg order is executed (even partials), it will be immediately cancel remaining open quantity of the first leg, and place the second leg for the first leg traded quantity. If the QtyCheck is selected as YES, then QtyCheck % and QtyCheck Timer becomes enabled.

Qty Check %: When the QtyCheck is selected as YES, then QtyCheck % is enabled. Whenever any quantity of the first leg order is executed (even partials), second leg quantity will not be placed till atleast QtyCheck % of the order quantity is not completed before the QtyCheck timer expires. If atleast the QtyCheck% quantity of the order quantity is completed before the timer expires, the remaining first leg quantity is cancelled, then it will place the second leg for the first leg traded quantity in the market. If atleast the QtyCheck% quantity of the order quantity is not completed, but timer expires, then the second leg quantity is placed based on the quantity of the first leg.

QtyCheck Timer: When the QtyCheck is selected as YES, then this parameter is enabled. It is used in conjunction with the QtyCheck % parameter. Whenever, the first leg quantity is placed in the system, and partial is executed, the QtyCheck timer starts. It tells the strategy, till how much time it should wait to check whether QtyCheck% of the order quantity is completed for the first leg. After timer expires, the remaining quantity of the first leg is cancelled and second leg is placed by the system in exchange.

It should be noted that when partial quantity of first leg is traded, and that quantity is greater than or equal to the QtyCheck% of the order quantity, **QtyCheck timer is not started**, but the pending first leg quantity is cancelled, and second quantity equal to first leg traded quantity is placed by the strategy.

Working:

1. As soon as user enters the parameters in the front-end, the strategy will calculate the current market difference/ratio based on the limit specified by the user and the market price of the second leg.
2. Before placing any order for the first leg, it will check whether the quantity is available for second leg and the quote threshold condition is satisfied
3. Depending on the first leg type, the strategy will place the first leg order and the price will be modified based on the change in the weightage average price of the second leg. Modification for the first leg can be restricted using parameter tick mod.
4. As soon as the first leg gets hit, the remaining legs are placed in the market depending on the Second order type selected. If the second order type is "Limit" option, timer will be enabled. If the second leg order remains open, depending on the modify times, it will try to become best buyer/seller. After expiration of timer, any pending order for remaining legs will be converted to limit order whose price is based on LTP Based MPP%.
5. In case of partial completion of first leg, rest of the open orders for the first leg is cancelled. After cancel confirmation second leg is placed.
6. The system will stop placing first leg order, if the quantity specified in the order quantity for second leg is unavailable at any given point in time.

7. QtyCheck% parameter is very useful in determining when to place the second leg after the first leg has been partially traded. If this parameter is selected as No, as soon as any quantity of the first leg is traded, remaining quantity of the first leg is cancelled and the second leg is placed based on the traded quantity of the first leg. However, If the QtyCheck% is selected as YES, then:
- First leg quantity is partially traded and is less than the QtyCheck% of the order quantity, and QtyCheck timer starts, before the expiration of the timer, if the atleast QtyCheck% of the order quantity is completed, it will cancel the first leg open quantity and place the second leg based on the traded quantity of the first leg
 - First leg quantity is partially traded and is less than the QtyCheck% of the order quantity, and QtyCheck timer starts, and after the expiration of the timer, if the atleast QtyCheck% of the order quantity is not completed, it will cancel the first leg open quantity and place the second leg based on the traded quantity of the first leg

Front-End Snapshot:

The screenshot shows a software window titled "BSE (Cash) Vs. NSE (Cash) Bidding Strategy Version-2.0.0.5". The window is divided into several sections for configuring a bidding strategy:

- NSE Scrip Details:** Instr Name (EQ), Symbol (20MICRONS).
- BSE Scrip Details:** Type (A), Symbol (ABB).
- NSE Acct Details:** Pro/Cli (PRO), Acct ID (11365).
- BSE Acct Details:** Pro/Cli (PRO), Acct ID (11365).
- First Leg:** BuySellLeg1 (Buy), Calc Method (Spread), Limit (0), Qt Thr (0), FirstLegType (Best Bid/Ask), Thr Qty (%) (100), Depth (5), TickMod (0.05).
- Sec LegType:** Limit, MPP% (0.05), Timer, Modify Times.
- TickSize(NSE):** 0.05, **TickSize(BSE):** 0.05.
- Order Management:** Order Qty (0), Total Qty (0), Traded Qty, Pending Qty, Qty Chk (No), Qty Chk(%), QtyChk Timer.

At the bottom, there are "Save" and "Cancel" buttons.

Risk Management

Risk Management System can be configured to have following checks before the orders are released to the exchange. The checks which are defined by exchange with respect to Algorithms are in place in the system. Below mention rules can be configured in the system to control the risk parameter which is defined by exchange.

Sr.No.	Checks	Rules to set	Remarks
1	Price Check	1) Check Price Range Based on LTP 2) Check Circuit Limit	This rules will create a price range on the basis of Last Traded Priced as per the percentage set in the category window.
2	Quantity Check	a) Order Quantity including Square off Order b) Board Lot Quantity including Square off Order	This rules will restrict per order the number of quantity to be placed in market which is defined the category window. The user can define the number of quantity in Weights and in lots for Futures.
3	Order Value Check	Order Value including Square off Order	This rule will restrict per order the order value which can be placed in the market which is defined in category window
4	Trade Price Protection Check	Check Circuit Limit including square off order	This rule does not allow to place the order which has been placed above the Higher Circuit Limit or Lower circuit limit which id defined for contract/scrip by exchange
5	Market Price Protection	Check Price Range Based on LTP	This rule will create a price range on the basis of Last Traded Priced as per the percentage set in the category window.
6	Cumulative Open Order Value check	Pending order value	This rule will restrict the Open Order with the Value set in the category
7	Automated Execution Check	Turnover Order Level and Turnover Order Level Limit	This rule will calculate the value of all executed/ Unexecuted and un confirm orders and if breach the value set in category then further order will get rejected
8	Automatic stoppage in event of Algo execution leading to a loop or a runaway situation.	Order Throttle	If there number of order per seconds breaches the value which is set in Throttle then further order gets rejected by the system.
9	Net Position Vs. available margin	Gross Exposure, Gross Exposure Derivative, Var Margin Order Level, Span Margin Order	User can set the risk parameter based on Exposure and Margin based on which the margin used will be calculated on the basis of position taken. If the Margin used is equal to Cash margin then further order will be rejected by the

		Level	system
10	RBI Violation checks for FII Restricted stocks.	Restricted Basket or RMS Blocking	User need to create a Restricted basket for the scrip and assign to the category of the user / client. Also RMS blocking can be used.
11	MWPL violation check	RMS Ban Symbol or RMS Blocking	The scrip for which market wide position limit is breach then scrip can be blocked or it needs to be in Ban.
12	Position Limit Checks	Scrip Group / Scrip Margin	User can define the quantity scrip wise in which the position can be taken in scrip group and then it needs to be assign to category at client level
13	Trading Limit Checks	Turnover Order Level Limit/ Gross Exposure Limit	User can define the Turnover or Exposure for a specific Client/User or Branch.
14	Exposure Limit check at individual client level and at overall level	Gross Exposure and Gross Exposure Limit	User can define the Exposure at Branch Level as well as Broker Level
15	Number of orders for the logic	NA	Depends on the user parameter (i.e order qty) set. This can vary from a minimum of a single lot to a maximum of total qty set.
16	Maximum number of scrips / contracts in which the logic will work at a time	NA	At a time, maximum number of scrips/contracts in which logic will work at a time is 2
17	Number of legs		Two