



Omnesys Technologies



Cash To Future Bidding Strategy

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AUTHOR	RUSHABH DOSHI
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Cash To Future Bidding Strategy:

This strategy allows for quote based arbitrage between BSE equity and BSE future segments (BFO). It can quote on either equity or future for both sides (i.e buy cash (BSE) sell future (BFO) and buy future (BFO) sell cash (BSE).

Nest Strategy Client:

Portfolio Tree: Each portfolio comprises of 2 tokens (i.e. one Cash scrip and one Future scrip).

Input Parameters:

Exchange Seg: User needs to select relevant exchange segment.

Symbol: User needs to select relevant symbol for that particular exchange.

Expiry Date: To select the expiry date for a particular future token.

Quote Side: Arbitrage side (i.e. buy cash sell future, buy future sell cash). User has the choice to select either of them.

PRO/CLI: It gives user an option to do in **PRO** or in **CLI** for cash and future segment. When cli is selected will give an option to select **Account id** and **Participant id** for cash and future segment.

Following user parameters need to be entered separately for each Quote side:

Limit(in Rs): This is the desired spread between equity and future legs, positive value indicates a profit arbitrage, negative value denotes a loss. The formula is: **Sell - Buy**

Quote Threshold (Rs.): **always lower than or equal to the "Limit"**. The idea is to start bidding when the Quote threshold is breached.

Order Lots: This is the quantity in lots to be placed per opportunity for execution.

Total Lots: This is the total trade quantity in lots that the user intends to trade for the execution side.

Following parameters are common for both quote side, for a particular scrip token:

First Leg: Cash based or Future based. Selection of this leg determines whether first leg (bidding leg) will be Cash (BSE) or Futures (BFO).

First Leg Type: There are two categories in the first leg type: Best Bid/Ask and Sweep/Stand Price.

- 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 day order with first leg token, after the trade confirmation of first leg, second leg order is placed

according to the Second leg Type selected. 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.

LTP % Check: This parameter is applicable for first leg placement. It has two option Yes or No. If 'Yes' option is selected, then LTP (%) parameter will be enabled. The percentage value entered in this parameter is used to create a band with respect to LTP. If the bidding first leg price is beyond this band, the orders will not be placed. If 'No' option is selected, then the LTP % band will not be formed.

LTP (%): This parameter is used in conjunction with the LTP % Check. The percentage value entered in this field determines the band that needs to be formed taking LTP As reference. It is enabled only when LTP % Check parameter is selected as Yes.

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

1. **Traded +/- Limit:** If this option is selected, the placement of second leg price depends on the desired limit specified by the user and the traded price of the first leg for that given round.
2. **Same:** Once the first leg is completed, second leg is placed as limit orders with the same side rate. For example, if one is second leg buying, then bid rate will be taken as price for limit order and if one is selling then ask rate will be taken as price for the limit order.
3. **Opposite:** Once the first leg is completed, second leg is placed as limit orders with the Opposite side rate. For example, if one is buying, then ask rate will be taken as price for limit order and if one is selling, then bid rate will be taken as price for the limit order.
4. **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 second leg 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 modify the order price accordingly. Similarly, let say, user is buying first leg, and second leg is the sell order, it will take the LTP of that second leg 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 modify the order price for that leg accordingly. For any reason, if this option is selected, and user stops the strategy, then any open pending order (first leg or second leg) will be canceled.

MPP%: This parameter is enabled only when Second leg type selected is **LTP Based MPP%**.

For Placing **Buy** Orders:

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

For Placing **Sell** Orders:

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

Threshold Quantity (%): varies based on which leg is the first leg. If the first leg is Cash, then the threshold Quantity is for the second leg i.e. Future and vice versa. If first leg is cash, then by default, the threshold Quantity value is **100%** for future leg. **This is because** the lot comes in the size of 1, 2,

and so on. If first leg is future, threshold Quantity % parameter is applicable for Cash side. This means that before executing the first future leg it will check whether the given Quantity percentage based on order lot specified is available in the market depth on the Cash side that satisfies the limit condition. Threshold quantity parameter is used in conjunction with the depth specified by the user. It is used to check whether a mentioned percentage of the order lot/quantity (depending on which is the second leg) is available for the specified market Depth. If it is available then only it will place/bid for the first leg. If the specified threshold quantity is not available 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 second leg, the existing first leg open order will be cancelled.

Absolute Threshold (%): will only be useful if first leg is Cash. If other conditions match, the first leg bidding will start if and only if absolute threshold (%) matches. In other words, if the absolute threshold Quantity (%) is available on Cash side, then only the first leg (cash) is executed. In other words, it will check whether Absolute Threshold % of the order lot is available on the side opposite to the bidding side of the first leg before putting on any bids.

Cash Threshold Quantity (%): is relevant if and only if Cash is the first leg. If the other condition matches, and absolute Threshold Qty (%) is also available in the market depth, the execution of first leg (cash) starts. As soon as, a single quantity in cash side is traded, timer for leg 1 starts. At the expiration of timer 1, if the Cash Threshold Quantity % is not bought or sold (depending on the leg), the strategy will square-off the cash leg. If Cash threshold Quantity percentage is breached at or before the expiration of timer 1, it will complete the remaining first leg (cash), if open, after second leg is traded.

Modify Factor (in ticks): It is applicable for second leg only. It is a price to be added to second leg best modify price for the second leg. For second leg, the goal of this option (modify factor) is to make the best possible bid while buying the stock/futures or to make best possible offer while selling the stock/futures. The best possible bid/offer for second leg is determined by the modify factor. Even after providing best bid or offer price (depending on the position), the position is not settled, it will get settled at the limit price based on LTP Based MPP% at the expiry time specified in the timer leg 2. This parameter is not applicable when second leg type is LTP Based MPP%.

Tick Mod (in ticks): 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.

Modify Times: number of times second leg order can be modified.

Modify times depends on the tick. Hence, if the modify time is more than 1 and the trader receives tick more than once in 2 seconds, the modify factor will come into picture more than once in 2 seconds.

If Modify times = 0, Second leg hit to the limit order based on LTP Based MPP% after timer expires. If Modify times = 1, Second leg order price will be placed as per second leg order type and will be modified once to become best buyer/seller and modified to limit order based on LTP Based MPP% on timer lapse.

If Modify times > 1, Second leg will be modified as many times as specified against modify times and converted to limit order based on LTP Based MPP% on timer lapse.

If second leg order type is selected as LTP Based MPP%, modify times parameter is not relevant.

Timer (in seconds): It is used for the first leg cash side only. It dictates the time at which the first leg should be completed till the Cash Threshold (%) of the order lot quantity. For Cash as first leg, it can be time in which at least the Cash Threshold (%) quantity of the order lots specified should be traded. After timer1 expires, if the cash threshold (%) of the specified order lot quantity is not breached, the first leg cash position will be reversed. At any instance, before the timer expires, Cash Threshold Quantity (%) is breached, the timer becomes irrelevant as second leg is placed immediately depending on the Second leg order type. It is only applicable when first leg selected is cash.

TimerLeg2 (in seconds): to modify the order to limit order based on LTP Based MPP% after timer seconds for leg 2. At this point, once the second leg is traded, any open pending orders for the first leg, if cash, will be either converted to Limit Order Based on LTP Based MPP%. This parameter is not applicable for second leg type selected as LTP Based MPP%.

Depth: User has the choice to select the relevant depth. Selection of depth is vital for both weighted average price calculation, first leg quantity check if its cash, as well as for quantity checks for second leg quantity.

Cash Tick Size (Rs.): It is a minimum tick for that scrip in Cash Segment

Future Tick Size (Rs.): It is a minimum tick for that scrip in Future Segment

The above parameters need to be updated from the front-end. Once the parameters are updated, the user needs to start the Nest Strategy from the front end so that the Nest Strategy engine starts running at backend. The execution of the script happens in the Nest Strategy engine running at backend.

Execution/Working:

1. When the market spread breaches quote threshold, based on the first leg type selected, it will place the order. If future is the first leg, and Best Bid Ask is the first leg order type, first leg limit order is placed in future segment based on the BID type set taking into consideration relevant price and limit. For example, one is buying Cash and selling in Futures leg, with multiple lot and depth more than 1 with Sell Futures as the bidding leg, then the price of the bidding leg will be calculated as: **Limit + Weighted Average of Buy Cash i.e. Limit + Weighted Average of Ask rate of Cash leg**. If the market rate of the first leg is better than the user calculated derived price for the first leg (based on limit and weighted average of the second leg price) then it will try to become a best buyer/seller depending on whether one is buying first leg or selling the first leg. For example, If the user is buying the first leg and the calculated first leg derived price is greater than the market rate of the first leg, then it will modify the current bid rate by 1 tick size to become best buyer. Similarly, if the user is selling first leg and calculated first leg price is less than the market rate of the first leg, it will modify the current first leg price (ask rate) by 1 tick size to become best seller.
2. Modify BID order (limit day order) based on price (weighted average) change in relevant second leg's price. First leg modification is continuous till it gets traded. Any change in the second leg price, will ensure that first leg price is changed irrespective of the first leg type selected.
3. On trade of first leg, Place second leg limit day order for the trade quantity taking into consideration Second Leg Type.
4. On confirmation of second leg, trigger timer for duration as specified in parameter.

- On timer lapse, Modify second leg pending limit Day order to limit order based on LTP Based MPP% if the second leg type is other than LTP Based MPP%.
- Second leg pending limit day order to be modified taking into consideration the best price, modify factor, modify times as specified as parameter or till timer. On timer lapse, modify the pending order to limit order based on LTP Based MPP% if the second leg type is other than LTP Based MPP%. BID order (First leg Limit Day Order) to be cancelled if quantity not available at any point in time.

Portfolios and Parameters (Screenshot):

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Scrip Details				Cash Account Details			Future Account Details		
Exch-Seg	Symbol	Expiry Date	Lot Size	PRO/CLI	Account ID	Participant ID	PRO/CLI	Account ID	Participant ID
BSE	JPPWFUT	24Apr2014	13000	PRO	11365		PRO	11365	

☒ Buy Cash :: Sell Future
 ☐ Buy Future :: Sell Cash

Limit (Rs)	Quote Th (Rs)	Order Lots	Total Lots	Pending Qty	Traded Qty
5	3.75	1	100	100	

First Leg:	First Leg Type:	LTP % Check	LTP %	SecLegType:	MPP(%)	ThrQty(%)	CashThrQty(%)	Abs.Thr(%)	CashTickSize	FutTickSize
future	Best Bid/Ask	Yes	1	Traded +/- Limit	0.05	100	75	70	0.01	0.05

Pending Order

TickMod(Tick)	Mod(times)	ModFact(Tick)	Time(Sec)	Depth	TimeLeg2(Sec)
1	1	1	1	4	1

Portfolio added successfully

Save Cancel

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 Level	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 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 1 or 2.
17	Number of legs		Two