



**nairobi  
securities  
exchange**  
*Discover Opportunity*

# **NSE Clear Backtesting Policy**

**June 2017**

# BACKTESTING POLICY

---

## 1. Background

Backtesting, in the context of clearing house margining, is a technique used to compare the margin collected against a portfolio of positions to the realised losses at the end of the liquidation period (margin period of risk, MPOR) had a default occurred. This process identifies instances where margins have been underestimated, meaning that a portfolio has experienced a loss greater than the original margin collected. The results of backtesting can be used to refine the margining models, making them more accurate and reducing the risk of losses.

## 2. Testing Frequency

Back tests will be carried out daily.

## 3. Parameters Tested

- i. Backtesting will be carried out on every single client portfolio; and
- ii. Backtesting will also be carried out on every single contract (underlying and expiry date combination).

## 4. Backtesting Process

Backtesting for the parameters in 3 i (Individual Client Portfolios):

- i. Isolate each client portfolio alongside the margin collected for the portfolio;
- ii. Using the MPOR that determined the Initial Margin Parameters, determine what the actual (realised) profit/loss was for each portfolio. For example, if the MPOR is 2 days, then compute the realised profit/loss at the end of day 2 for such a portfolio.  
Note that the date of last margin collection on the portfolio of trades preceding a default is known as the *risk-cover date*. The date that the liquidation process is complete is known as the *close-out date*. The period in between the risk-cover date and close-out date should ideally be equal to MPOR.
- iii. Compare the profit/loss in step ii to the margin collected (in step i) for each client Record any portfolio where the collected margin is less than the realised loss. Also record the extent of the margin shortfall in these cases.

Backtesting for the parameters in 3 ii. (Individual Contracts):

- i. Identify the initial margin (excluding the Extreme Loss Margin parameter, ELM) for a notional position of 1 contract for each expiry date for all the underlyings
- ii. Identify the high and low price for the contracts as of the risk-cover date.
- iii. Identify the closing price for the contract after MPOR days (close-out date)
- iv. Compute the notional profit/loss over the MPOR period using the prices in ii and iii above
- v. Compare the profit/loss in step iv to the initial margin set for the contract (in step i)
- vi. Record any contract where the collected margin is less than the realised profit/loss. Also record the extent (magnitude) of the margin shortfall in these cases.

For both 3 i. and 3 ii., the number of events of loss are compared to the total number the historical cases investigated, and this gives the rate of margin shortfalls. This rate is then compared to the expected rate of margin shortfall as defined by the confidence interval in the initial margin model.

## **5. Governance**

The back tests will be carried out by the NSE Derivatives Risk Management Team. Results of the tests will be shared in a report to the NSE Clear Management team. Any exceptional results that may necessitate updates to the margin model or parameters will be provided within the same report.

On a quarterly basis, the Derivatives Risk Management Committee will be informed by NSE Clear Management of the exceptions and actions taken as a result of the exceptions. These exception reports will also be presented to the Derivatives Market Oversight Committee, also on a quarterly basis.

## **6. Review of Backtesting Methodology**

An annual (or ad hoc if required) review will be carried out by the Risk Management Team to ensure that the methodology is still suitable. The results of the review will be put to the Risk Management Committee for their guidance.

## **7. Supporting Documentation**

In order to get a full understanding of backtesting at the NSE Clear, this document should be read together with the following document(s):

- NSE Clear Initial Margin Calculation Methodology.