GENERAL MANAGER
DERIVATIVES AND NEW PRODUCTS DEPARTMENT

SEBI/DNPD/Cir- 46 /2009
August 28, 2009

To,
Recognized Stock Exchanges
and their Clearing Corporations / Clearing Houses, Clearing Members and Trading Members

Dear Sir/s,

SUB: EXCHANGE TRADED INTEREST RATE FUTURES

It has been decided to introduce Exchange traded 10-Year Notional coupon bearing GoI security futures as per the following details in terms of product design, risk management measures and other related issues:

A. For trading in Exchange Traded Interest Rate Futures, Recognized Stock Exchanges and their Clearing Corporations / Clearing Houses, Clearing Members and Trading Members have to comply with the following:

1. **Exchange**: The Currency Derivative Segment of a recognized Stock Exchange may apply to SEBI for grant of approval for starting trading in Interest Rate Futures. The application shall be accompanied by the details pertaining to the derivative product proposed to be introduced and the proposed amendments to the Bye-laws of the Exchange/ Clearing Corporation / Clearing House.

   Further, a Recognized Stock Exchange shall ensure that;

a. Product design, margins and position limits as laid down in Annexure I are complied with.

b. Risk management measures as mentioned in Annexure II are complied with.

2. **Clearing Corporation / Clearing House**: The Clearing Corporation / Clearing House of Interest Rate Futures shall be the same as for currency derivatives segment.

3. **Clearing Member and Trading Member**: The members registered by SEBI for trading in Currency/Equity Derivative Segment shall be eligible to trade in Interest Rate Derivatives also, subject to fulfilling the requirements mentioned in Annexure III.

B. To operationalise 10-Year Notional Coupon-bearing GoI security Futures, the following is clarified:

1. **Deliverable Grade Securities**: Exchanges shall select their own basket of securities from the eligible Deliverable Grade Securities, viz., GoI securities maturing at least 7.5 years but not more than 15 years from the first day of the delivery month with a minimum total outstanding stock of Rs 10,000 crore. Exchanges shall disclose upfront to the market participants the composition of the basket of deliverable grade securities and the associated conversion factors for each of the quarterly contracts.

2. **Revision of Basket of Deliverable Grade Securities**: To the basket of deliverable grade securities disclosed upfront by the Exchange for each of the quarterly contracts, additions, if any,

shall be made not later than 10 business days before the first business day of the delivery month.

3. **Daily Settlement Price**: The daily settlement price (DSP) shall be determined in the following manner:

Step 1: The DSP is the volume weighted average price (VWAP) of the trades in the last 30 minute of trading, provided there are at least 5 trades for a minimum aggregate notional value of Rs. 10 crore. Failing which, trades during the last 60 minutes shall be used for the calculation of VWAP, subject to at least 5 trades for Rs.10 crore. Failing which trades during the last 120 minutes shall be used for the calculation of VWAP, subject to at least 5 trades for Rs.10 crore.

Step 2: If the DSP cannot be calculated as above, a theoretical price shall be used. This theoretical price shall be the minimum of the theoretical futures prices of all the securities in the delivery basket chosen by the Exchange. The theoretical futures price of each security is the weighted average cash price of outright trades of that security during the day on the NDS Order Matching platform, adjusted for cost of carry, subject to at least 5 trades for Rs.10 crore. If there are not enough trades as required above or there is a material market event during the trading hours, the theoretical futures price of each security shall be the FIMMDA / PDAI / Bloomberg revaluation price(s) (published on the FIMMDA website on a daily basis: URL http://www.fimmda.org/default.asp?access=na), adjusted for cost of carry. The cost of carry shall be computed for the period upto the last business day of the delivery month.

If, however, the near quarter contract is liquid (5 trades for Rs. 10 crore during the last 30 minutes, 60 minutes or 120 minutes, as the case may be), the VWAP of the near quarter contract shall be adjusted for cost of carry to arrive at the theoretical price for subsequent quarter contracts. Further, if near quarter contract is illiquid while the next quarter contract is liquid, then the VWAP of the nearest liquid quarter contract shall be used to derive the prices of the illiquid previous as well as the subsequent quarter contracts.

The cost of carry for the above purpose shall include the financing cost @ 91-day treasury bill rate and the coupon of the particular security.

4. **Delivery Schedule and Delivery Process/Mechanism**: Buyer and seller in Interest rate Futures on 10-year Notional Coupon bearing GoI security shall take and give securities respectively in the demat mode through the depository system. The delivery schedule shall be as follows:

T +0 day

Delivery notice: It is the day when the selling Clearing Member (CM) sends a notice to the Clearing Corporation (CC) expressing his intention to deliver along with details of the security to be delivered. CM shall send the notice before 6:00 pm IST on the second business day prior to the day he wishes to deliver. For example, if he wishes to deliver on 4th September 2009 and 2nd and 3rd are business days, he shall give notice before 6 PM on 2nd September 2009. He can deliver on any business day during the delivery month of the contract. Along with the notice, he shall

provide the notional face value (equal to its short position in the expiring contract), security ISIN, coupon, maturity date, issuance date, coupon convention, and other details as may be sought by the CC. Based on these details, the CC shall calculate the invoice price.

Allocation: The CC shall identify the eligible long positions for allocation and assign the deliveries to long position holders at client level starting with the highest vintage till the allocation is over. Vintage data shall be computed and maintained at client level for every contract and shall be tracked by the CC on end of day basis. For a given vintage, if the contracts to be allocated (Short) are less than the total long positions, the allocation to such long position holders shall be done on a 'random' basis.

Based on the client level allocations as above, CC shall compute CM level deliverable/receivable obligations using multilateral netting and intimate the identified long position holders, by 8 pm IST on the date of receipt of notice, the details of the securities that they would be receiving and the invoice price.

The seller CM shall not be permitted to fulfill an individual futures contract by delivering a mixed portfolio of deliverable security (for example, Rs.1,20,000 face value of one issue and Rs. 80,000 face value of another issue is not permissible). However, a selling CM making delivery for more than one futures contract, say two contracts, may deliver two deliverable securities for two different contracts (Rs.2,00,000 face value of one issue for one contract and Rs.2,00,000 face value of another issue for the other contract).

T + 2 day

On the second business day following the receipt of the delivery notice, the CMs shall discharge their obligations and the CC shall complete the settlement accordingly.

5. **Initial Margin**: Methodology, as specified in the Annexure IV, shall be adopted for computation of initial margin. For this purpose, the yield for 10-Year benchmark GoI security, as published by FIMMDA, shall be used. In respect of FIIs, margin shall be collected either in cash or foreign sovereign securities rated AAA.

   For the purpose of intra-day updation of VaR, the Exchanges shall use the yield of the benchmark 10-Year bond, from the NDS Order Matching platform.

6. **Delivery Month**: The delivery month shall be the last month of the expiring contract, i.e., March, June, September and December

7. In case there is a failure to honour the settlement obligation by the CM, the following action shall be followed:

i **Selling CM fails to deliver the securities**

T +0 day: Selling CM gives intention to deliver the securities

T+2 day: Buying CM pays-in funds and the selling CM fails to deliver the securities

T+2 or T+3 day: CC shall conduct buy-in auction of the securities. In case of successful auction, the defaulting CM shall be debited by:

the actual auction price,
difference in invoice price and auction price, if the auction price is less than the invoice price, and
a penalty of 2% of the face value of security short delivered.

In case of unsuccessful auction, transaction shall be closed out wherein the defaulting CM shall be debited by:
invoice price, and
a penalty of 5% of the face value of security short delivered.

In respect of the seller in an auction failing to honour the auction obligations, he shall be debited by:
invoice price, and
a penalty of 3% of the face value of security short delivered

These penalties shall be passed on to the buying CM, who shall pass it on to the buying client.

ii **Buying CM fails to pay-in funds**

T +0 day: Selling CM gives intention to deliver the securities

T+2 day: Selling CM delivers securities and the buying CM fails to pay-in funds.

The CC shall pay-out funds to the selling CM on T+2 day

Further,

- In case of a settlement shortage of Rs. 5 lakh or more, the trading facility of all trading members clearing through the buying CM shall be withdrawn in the Currency Derivatives Segment and the securities pay-out to the buying CM shall be withheld.
- If the buying CM is short for an amount of Rs. 2 lakh or more on six or more occasions in the preceding three months, the trading

facility of all the trading members clearing through the buying CM shall be withdrawn in the Currency Derivatives Segment and the securities pay-out to the buying CM shall be withheld.

- A penalty of 0.07% per day shall be levied on the amount of the shortage.

The trading facility shall be restored and securities withheld shall be released on the buying CM making good the shortage amount in all the above cases.

Regulatory Penalty: In case a selling CM defaults in delivering securities 5 times during a period of preceding 6 months, the trading facility of all the trading members clearing through the CM shall be withdrawn for 7 days.

8. **Margins and action on deliverable positions**

i **Margins on physical delivery positions**: For positions marked for delivery, a margin equal to VaR of the futures on the invoice price plus 5% of face value along with mark to market adjustments shall be charged both to the buying client and selling client. The margins shall be levied from the intention day and shall be released on the completion of the settlement.

ii **Margins from last trading day to last intention day**: For positions from last trading date till date of intention in cases where no intention is provided, a margin amount equal to VaR of the futures on the invoice price of the costliest security from the deliverable basket plus 5% of face value along with mark to

market adjustments based on the underlying closing prices of the costliest security from the deliverable basket shall be charged on both buying client and selling client. The margins shall be levied from the last trading day till the day of receipt of intention to deliver.

iii **Action in case no intent to deliver is provided**: In case no intent is provided by the selling CM till two business days prior to the last delivery date, it shall be presumed that selling CM has failed to deliver the security and the auction mechanism, as specified for security shortages, shall be activated. The auction shall take place one business day prior to the last delivery date.

This Circular is being issued in exercise of the powers conferred under Section 11 (1) of the Securities and Exchange Board of India Act 1992, read with Section 10 of the Securities Contracts (Regulation) Act, 1956 to protect the interests of investors in securities and to promote the development of, and to regulate the securities market.

This Circular is available on SEBI website at www.sebi.gov.in., under the category “Derivatives- Circulars”.

Yours faithfully,

SUJIT PRASAD

ANNEXURE I

Product Design, Margins and Position Limits for 10-Year Notional Coupon-bearing Government of India (GoI) Security Futures

1 Underlying

10-Year Notional Coupon-bearing GoI security

2 Coupon

The notional coupon would be 7% with semi-annual compounding.

3 Trading Hours

The Trading Hours would be from 9 a.m. to 5.00 p.m on all working days from Monday to Friday.

4 Size of the Contract

The Contract Size would be Rs. 2 lakh.

5 Quotation

The Quotation would be similar to the quoted price of the GoI security. The day count convention for interest payments would be on the basis of a 360-day year, consisting of 12 months of 30 days each and half yearly coupon payment.

6 Tenor of the Contract

The maximum maturity of the contract would be 12 months.

7 Available Contracts

The Contract Cycle would consist of four fixed quarterly contracts for entire year, expiring in March, June, September and December.

8 Daily Settlement Price

The Daily Settlement Price would be the closing price of the 10-year Notional Coupon-bearing GoI security futures contract on the trading day. (Closing price = Weighted Average price of the futures for last half an hour). In the absence of last half an hour trading the theoretical price, to be determined by the exchanges, would be considered as Daily Settlement Price. The exchanges will be required to disclose the model/methodology used for arriving at the theoretical price.

9 Settlement Mechanism

The contract would be settled by physical delivery of deliverable grade securities using the electronic book entry system of the existing Depositories (NSDL and CDSL) and Public Debt Office (PDO) of the RBI. The delivery of the deliverable grade securities shall take place from the first business day of the delivery month till the last business day of the delivery month. The owner of a short position in an expiring futures contract shall hold the right to decide when to initiate delivery. However, the short position holder shall have to give intimation, to the Clearing Corporation, of his intention to deliver two business days prior to the actual delivery date.

10 Deliverable Grade Securities

GoI securities maturing at least 7.5 years but not more than 15 years from the first day of the delivery month with a minimum total outstanding stock of Rs 10,000 crore.

11 Conversion Factor

The Conversion Factor for deliverable grade security would be equal to the price of the deliverable security (per rupee of the

principal), on the first day (calendar day) of the delivery month, to yield 7% with semiannual compounding.

For deliveries into 10-Year Notional Coupon-bearing GoI security futures, the deliverable security's remaining term to maturity shall be calculated in complete three-month quarters, always rounded down to the nearest quarter. If, after rounding, the deliverable security lasts for an exact number of 6-month periods, the first coupon shall be assumed to be paid after 6 months. If, after rounding, the deliverable security does not last for an exact number of 6-month periods (i.e. there are an extra 3 months), the first coupon would be assumed to be paid after 3 months and accrued interest would be subtracted.

12 Invoice Price

Invoice Price of the respective deliverable grade security would be the futures settlement price times a conversion factor plus accrued interest.

13 Last Trading Day

Seventh business day preceding the last business day of the delivery month.

14 Last Delivery Day

Last business day of the delivery month.

15 Initial Margin

Initial Margin requirement shall be based on a worst case loss of a portfolio of an individual client across various scenarios of price changes. The various scenarios of price changes would be so computed so as to cover a more than 99% VaR over a one day

horizon. In order to achieve this, the price scan range may initially be fixed at 3.5 standard deviation[1]. The initial margin so computed would be subject to a minimum of 2.33% of the value of the futures contract on the first day of trading in 10-year Notional Coupon-bearing GoI security futures and 1.6% of the value of the futures contract thereafter. The initial margin shall be deducted from the liquid net worth of the clearing member on an online, real time basis.

16 Extreme Loss Margin

Extreme loss margin of 0.3% of the value of the gross open positions of the futures contract shall be deducted from the liquid assets of the clearing member on an on line, real time basis.

17 Calendar Spread Margin

Interest rate futures position at one maturity hedged by an offsetting position at a different maturity would be treated as a calendar spread. The calendar spread margin shall be at a value of Rs.2000/- per month of spread. The benefit for a calendar spread would continue till expiry of the near month contract.

18 Model for Determining Standard Deviation

The Committee examined the results of empirical tests carried out using different risk management models in the Value at Risk (VaR) framework in the 10-year GoI security yields. Data for the period January 3, 2000 to September 16, 2008 was analyzed. GARCH (1,1)-normal and GARCH (1,1)-GED (Generalized Auto-Regressive Conditional Heteroskedasticity) at 3 and 3.5 sigma levels were not found to perform well at 1% risk level, as the actual number of

[1] One tailed standard normal variate corresponding to 99 % confidence interval is 2.33. However, simulation on the historical data showed that 99 % of data could be covered only with 3.5 times standard.deviation.

violations were found to be statistically much higher than the expected number of violations. The EWMA (Exponentially weighted moving average) model used by J.P.Morgan's Risk Metrics methodology was found to work well at 3 and 3.5 sigma levels at 5% risk level and not at 1% risk level.

Given the computational ease of the EWMA model and given the familiarity of the Exchanges with this particular model (it is currently being used in the equity derivatives market), the Committee, after considering the various aspects of the different models, decided that EWMA method would be used to obtain the volatility estimate every day fixing the price scan range at 3.5 standard deviation. During the first time-period on the first day of trading in 10-year Notional Coupon-bearing GoI security futures, the sigma would be equal to 0.8 %.

19 Formula for Determining Standard Deviation

The EWMA method would be used to obtain the volatility estimate every day. The estimate at the end of time period t (σ_{yt}) is arrived at using the volatility estimate at the end of the previous time period i.e. as at the end of t-1 time period (σ_{yt-1}), and the return (r_{yt}) observed in the futures market during the time period t. The formula would be as under:

$$(\sigma_{yt})^2 = \lambda (\sigma_{yt-1})^2 + (1 - \lambda) (r_{yt})^2$$

Where

λ(lambda) is a parameter which determines how rapidly volatility estimates changes. The value of λ is fixed at 0.94.

i. σ_{yt} (sigma) is the standard deviation of daily logarithmic returns of yield of 10-year Notional Coupon-bearing GoI security futures at time t.

ii. The "return" is defined as the logarithmic return: $r_t = \ln(Y_t/Y_{t-1})$ where Y_t is the yield of 10-year Notional Coupon-bearing GoI security futures at time t.

iii. The volatility estimation and margin fixation methodology should be clearly made known to all market participants so that they can compute the margin for any given closing level of the interest rate futures price. Further, the trading software itself should provide this information on a real time basis on the trading workstation screen.

20 Position Limits

i. **Client level:** The gross open positions of the client across all contracts should not exceed 6% of the total open interest or Rs 300 crores whichever is higher. The Exchange will disseminate alerts whenever the gross open position of the client exceeds 3% of the total open interest at the end of the previous day's trade.

ii. **Trading Member level:** The gross open positions of the trading member across all contracts should not exceed 15% of the total open interest or Rs. 1000 crores whichever is higher.

iii. **Clearing Member level:** No separate position limit is prescribed at the level of clearing member. However, the clearing member shall ensure that his own trading position and the positions of each trading member clearing through him is within the limits specified above.

iv. **FIIs:** In case of Foreign Institutional Investors registered with Securities and Exchange Board of India the total gross long

(bought) position in cash and Interest Rate Futures markets taken together should not exceed their individual permissible limit for investment in government securities and the total gross short (sold) position, for the purpose of hedging only, should not exceed their long position in the government securities and in Interest Rate Futures, at any point in time.

ANNEXURE II

Risk Management Measures

1 Portfolio Based Margining

The Standard Portfolio Analysis of Risk (SPAN) methodology shall be adopted to take an integrated view of the risk involved in the portfolio of each individual client comprising his positions in futures contracts across different maturities. The client-wise margins would be grossed across various clients at the Trading / Clearing Member level. The proprietary positions of the Trading / Clearing Member would be treated as that of a client.

2 Real-Time Computation

The computation of worst scenario loss would have two components. The first is the valuation of the portfolio under the various scenarios of price changes. At the second stage, these scenario contract values would be applied to the actual portfolio positions to compute the portfolio values and the initial margin. The exchanges shall update the scenario contract values at least 6 times in the day, which may be carried out by taking the closing price of the previous day at the start of trading and the prices at 11:00 a.m., 12:30 p.m., 2:00 p.m., 3.30 p.m. and at the end of the trading session. The latest available scenario contract values would be applied to member/client portfolios on a real time basis.

3 Liquid Networth

The initial margin and the extreme loss margin shall be deducted from the liquid assets of the clearing member. The clearing member’s liquid net worth after adjusting for the initial margin and extreme loss margin requirements must be at least Rs. 50 Lakhs at

all points in time. The minimum liquid networth shall be treated as a capital cushion for days of unforeseen market volatility.

4 Liquid Assets

The liquid assets for trading in Interest Rate Futures would have to be provided separately and maintained with the Clearing Corporation. However, the permissible liquid assets, the applicable haircuts and minimum cash equivalent norms would be mutatis mutandis applicable from the equity/currency derivatives segment.

5 Mark-to-Market (MTM) Settlement

The MTM gains and losses shall be settled in cash before the start of trading on T+1 day. If MTM obligations are not collected before start of the next day's trading, the Clearing Corporation shall collect correspondingly higher initial margin to cover the potential for losses over the time elapsed in the collection of margins.

The daily closing price of interest rate futures contract for mark to market settlement would be calculated on the basis of the last half an hour weighted average price of the futures contract. In the absence of trading in the last half an hour the theoretical price would be taken. The eligible exchanges shall define the methodology for calculating the 'theoretical price' at the time of making an application for approval of the interest rate futures contract to SEBI. The methodology for calculating the 'theoretical price' would also be disclosed to the market.

6 Margin Collection and Enforcement

The client margins (initial margin, extreme loss margin, calendar spread margin and mark to market settlements) have to be compulsorily collected and reported to the Exchange by the members. The Exchange shall impose stringent penalty on

members who do not collect margins from their clients. The Exchange shall also conduct regular inspections to ensure margin collection from clients.

7 Safeguarding Client's Money

The Clearing Corporation should segregate the margins deposited by the Clearing Members for trades on their own account from the margins deposited with it on client account. The margins deposited on client account shall not be utilized for fulfilling the dues which a Clearing Member may owe the Clearing Corporation in respect of trades on the member's own account. The client's money is to be held in trust for client purpose only. The following process is to be adopted for segregating the client's money vis-à-vis the clearing member's money:

i. At the time of opening a position, the member should indicate whether it is a client or proprietary position.
ii. Margins across the various clients of a member should be collected on a gross basis and should not be netted off.
iii. When a position is closed, the member should indicate whether it was a client or his own position which is being closed.
iv. In the case of default, the margins paid on the proprietary position would only be used by the Clearing Corporation for realizing its dues from the member.

8 Periodic Risk Evaluation Report

The Clearing Corporation of the Exchange shall on an ongoing basis and atleast once in every six months, conduct back testing of the margins collected vis-à-vis the actual price changes. A copy of

the study shall be submitted to SEBI along with suggestions on changes to the risk containment measures, if any.

ANNEXURE III

The Interest Rate Derivative contracts shall be traded on the Currency Derivative Segment of a recognized Stock Exchange. The members registered by SEBI for trading in Currency/Equity Derivative Segment shall be eligible to trade in Interest Rate Derivatives also, subject to meeting the Balance Sheet networth requirement of Rs 1 crore for a trading member and Rs 10 crores for a clearing member. Before the start of trading, the Exchange shall submit the proposal for approval of the contract to SEBI giving:

i The details of the proposed interest rate futures contract to be traded in the exchange;
ii The economic purposes it is intended to serve;
iii Its likely contribution to market development;
iv The safeguards and the risk protection mechanisms adopted by the exchange to ensure market integrity, protection of investors and smooth and orderly trading;
v The infrastructure of the exchange and surveillance system to effectively monitor trading in such contracts.

ANNEXURE IV

Methodology

The plus/minus 3.5 sigma limits[2] for a 99% VAR based on logarithmic returns on yield of 10-year Notional Coupon-bearing GoI security futures would have to be converted into price volatility through the following formula :

$$\sigma_{pt}=D^*\sigma_{yt}^* Y_t$$

where

σ_{pt} is the standard deviation of percentage change in price at time t;

D is Modified Duration[3];

Y^4_t is the yield of 10-year Notional Coupon-bearing GoI security futures at time t; and

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[2] The one-tailed standard normal variate corresponding to 99% confidence interval is 2.33. However, since 3.5 standard deviations cover 99 % of the historical data, σ has been taken as 3.5 in all computations. .

[3] Modified Duration = $\frac{D^*}{1+y/m}$, where D* (Macaulay's duration) = $\frac{\sum_{i=1}^{n} t_i c_i /(1+y/m)^i}{B}$

C_i is coupon at time t_i, y is the annually compounded yield, m is the frequency of coupon payments, B is the price of the bond. Modified duration essentially measures percentage change in price due to change in yield by 100 bps.

[4] Yield of security is its YTM (Yield to maturity) calculated as $B=(\sum_{t=1}^{n}\frac{C_t}{(1+Y/m)^t})+\frac{P}{(1+Y/m)^n}$ where Y is the YTM of the security, B is the price of the security, P is the par value of the bond, n is the number of periods for coupon payment, m is the frequency of coupon payments and C is the coupon payment per period.

σ_{yt} (sigma) is the standard deviation of daily logarithmic returns of yield of 10-year Notional Coupon-bearing GoI security futures at time t.

The percentage margin on long position would be equal to 100 ($D*3.5\sigma_{yt}* Y_t$) and the percentage margin on short position would be equal to 100 ($D*(-3.5\sigma_{yt)}* Y_t$). The Modified Duration for 10-Year Notional Coupon-bearing GoI security futures shall be 10.