

91 DAY T BILL
FUTURES % 



- Introduction
- Advantages
- Fundamentals of T-Bill market
- Product Specification
- Trading quotation and Contract Value
- Clearing, Settlement and Risk management
- Know how to hedge and take directional view with treasury bill futures

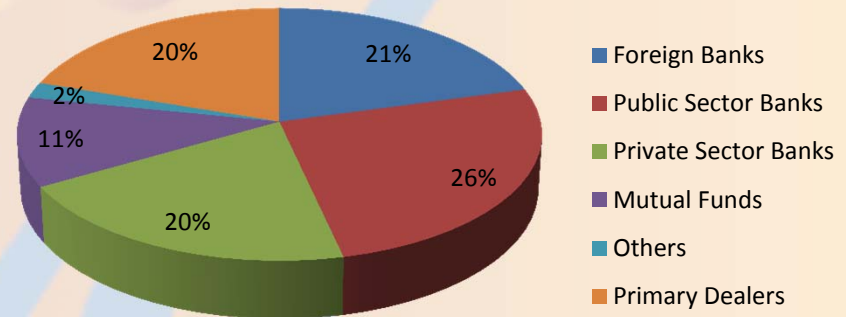
- Announced in RBI Monetary Policy 2010-11 on April 20, 2010
- SEBI Circular on March 07, 2011
 - Product design
 - Risk Management framework
- RBI circulars
 - Amendment direction to incorporate 91 Day GOI T-Bill Futures (March 07, 2011)
 - Computation of weighted average discount yield (March 17, 2011)
- NSE received SEBI approval to launch 91 Day GOI T-Bill Futures
- No separate membership required, existing IRF participants are allowed to trade

- Cash settled futures contract, hence no physical delivery on expiry of the contract
- Existing trading infrastructure can be used
- Existing bank account of currency derivatives segment can be used for settlement
- High on Safety as no counterparty risk
- No Securities Transaction Tax (STT)
- Lower margins as compared to other assets
- Easier and cheaper access to rates trading

- Treasury bills (T-Bill)
 - Money market instruments to finance the short term requirements of the Government of India
 - Issued at a discount to face value (Rs 100)
 - Return = difference between the par value and issue price
 - Primary auction conducted by RBI
- Types of Treasury bills (T-Bill)
 - Different types of T-bills based on the maturity period
 - 91 days, 182 days and 364 days

- Short-term debt instruments issued by Central Govt. to finance their working capital requirements
- Sold through multiple price auction process by RBI at a discount
- 91 days, 182 days and 364 days
- NDS OM trading platform from RBI
- Every week (on Wednesday) an auction of 91-DTB for Rs. 4000 to 8000 Crs
- Auctions of 182 DTB and 364 DTB are conducted on alternate Wednesdays
- T-Bills auctioned worth Rs. 113,000 Crs during the first quarter of 2011
- Daily average volume in T-Bill secondary markets in May 2011 was Rs. 1258 Crs

Participants in T-Bill Markets



Type of T Bill	Periodicity	Day of Auction	Day of Payment
91-day	Weekly	Every Wednesday	Following Friday
182-day	Fortnightly	Alternate Wednesday	Following Friday
364-day	Fortnightly	Alternate Wednesday (with no 182-day Tbill auction)	Following Friday

- Secondary Market & Players
 - NDS OM trading facility from RBI
 - Scheduled banks, financial Institutions, Primary dealers, mutual funds, insurance companies and corporate treasuries
- Yield is the income (return) on an investment usually expressed as a percentage (annual return)

$$\text{Yield to Maturity} = \frac{\text{Par Value} - \text{Market Price}}{\text{Market Price}} \times \frac{365}{\text{Actual Days}}$$

$$\text{Discount Yield} = \frac{\text{Par Value} - \text{Market Price}}{\text{Par Value}} \times \frac{360}{\text{Days (30 days in a month)}}$$

T-Bills Market Watch

Security Description	Maturity Date	Bid Amt. (Cr.)	Bid Price	Bid Yield	Offer Yield	Offer Price	Offer Amt. (Cr.)	LTP	LTY	LTA	TTA (Cr.)
091 DTB 24062011	24/06/2011	0.00	0.0000	0.0000	7.4000	99.5158	40.00	0.0000	0.0000	0.00	0.00
364 DTB 03062011	03/06/2011	25.00	99.9368	7.7000	7.4000	99.9392	25.00	0.0000	0.0000	0.00	0.00
364 DTB 10022012	10/02/2012	0.00	0.0000	0.0000	8.2300	94.5629	5.00	0.0000	0.0000	0.00	0.00
364 DTB 17062011	17/06/2011	0.00	0.0000	0.0000	7.5000	99.6519	80.00	0.0000	0.0000	0.00	0.00
063 DCMB 22062011	22/06/2011	0.00	0.0000	0.0000	7.7000	99.5380	25.00	0.0000	0.0000	0.00	0.00
049 DCMB 13062011	13/06/2011	25.00	99.7283	7.6500	7.4000	99.7371	25.00	0.0000	0.0000	0.00	0.00
091 DTB 12082011	12/08/2011	0.00	0.0000	0.0000	8.0900	98.4078	25.00	0.0000	0.0000	0.00	0.00
091 DTB 26082011	26/08/2011	25.00	98.0715	8.2500	8.1450	98.0956	25.00	0.0000	0.0000	0.00	0.00
364 DTB 19042012	19/04/2012	0.00	0.0000	0.0000	8.2000	93.2150	50.00	0.0000	0.0000	0.00	0.00

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Source: NDS-OM hosted at CCIL

- Assumption – Days to maturity 24
- Yield to Maturity = $((100 - 99.5158)/99.5158) * 365/24$
= **7.40%**
- Discount yield[#] = $((100 - 99.5158)/100) * 360/24$
= **7.26 %**

30/360 day count convention is used

Category	Description
Symbol	91DTB
Market Type	N
Instrument Type	FUTIRT
Unit of trading	One contract denotes 2000 units (Face Value ₹ 2 lacs)
Underlying	91-day Government of India (GOI) Treasury Bill
Tick size	0.25 paise i.e. INR 0.0025
Trading hours	Monday to Friday - 9:00 a.m. to 5:00 p.m.
Contract Months	3 serial monthly contracts followed by 3 quarterly contracts of the cycle
Price operating range	+/-1 % of the base price
Quantity Freeze	7,001 lots or greater
Base price	Theoretical price of the first day of the contract
	On all other days, quote price corresponding to the daily settlement price of the contracts
Last trading day / Expiry day and Time	Last Wednesday of the expiry month at 1.00 pm
	In case last Wednesday of the month is a designated holiday, the expiry day would be the previous working day
Price Quotation	100 minus futures discount yield e.g. for a futures discount yield of 5% p.a. the quote shall be 100 - 5 = Rs 95
Contract Value	₹ 2000 * (100 - 0.25 * y), where y is the futures discount yield e.g. for a futures discount yield of 5% p.a. contract value shall be 2000 * (100 - 0.25 * 5) = ₹ 197500

Category	Description
Mode of settlement	Settled in cash in Indian Rupees
Daily Settlement	Daily settlement MTM: T + 1 in cash
Daily settlement price	$\text{₹} (100 - 0.25 * yw)$ where yw is weighted average futures yield of trades during the time limit as prescribed by NSCCL. In the absence of trading in prescribed time limit, theoretical futures yield shall be considered
Daily Contract Settlement value	$\text{₹} 2000 * \text{daily settlement price}$
Final Contract Settlement value	$\text{₹} 2000 * (100 - 0.25 * yf)$ where yf is weighted average discount yield obtained from weekly auction of 91-day T-Bill conducted by RBI on the day of expiry
Initial margin	SPAN [®] (Standard Portfolio Analysis of Risk) based subject to minimum of 0.1 % of the notional value of the contract on the first day and 0.05 % of the notional value of the contract thereafter
Extreme loss margin	0.03 % of the notional value of the contract for all gross open positions
Calendar Spread margin	$\text{₹} 100/-$ for spread of one month $\text{₹} 150/-$ for spread of two month $\text{₹} 200/-$ for spread of three month $\text{₹} 250/-$ for spread of four month and beyond ELM of 0.01% of far month notional value

Category	Description	
Position limits	Clients	6% of total open interest or ₹ 300 crores whichever is higher
	Trading Members	15% of the total open interest or ₹ 1000 crores whichever is higher
	FII's	<p>Long: the total gross long position in cash and Interest Rate Futures markets taken together should not exceed their individual permissible limit for investment in government securities</p> <p>Short: Total gross short (sold) position, for the purpose of hedging</p>

Futures position
established

91-day T-bill futures
Expiry

T-bill matures

91 Days

Time

How to Quote a Contract

- Annualized quotation in price terms
- Quote Price = 100 minus futures discount yield
 - E.g. for a futures discount yield of 7% p.a.
 - the quote price would be $100 - 7 = ₹ 93.0000$
- No need for complex computation like discount yield or quote price
- Multiple options to ease trading quotation
 - YTM or Valuation Price like underlying market
 - Auto conversion into annualized quote price rounded to nearest 0.0025

B	RL	O	U	FUTIRT	91DTR	29JUN2011	100	YD	7.1443	DAY		
DISCLOSED							PRO	080	080	93.0000	7.1443	98.2500
ORDER ENTRY											Press Enter to Validate the C	

B	RL	O	U	FUTIRT	91DTB	29JUN2011	100	VP	98.25	DAY	
DISCLOSED							PRO		93.0000	7.1443	98.25
ORDER ENTRY											Press Enter to Validate the Order.

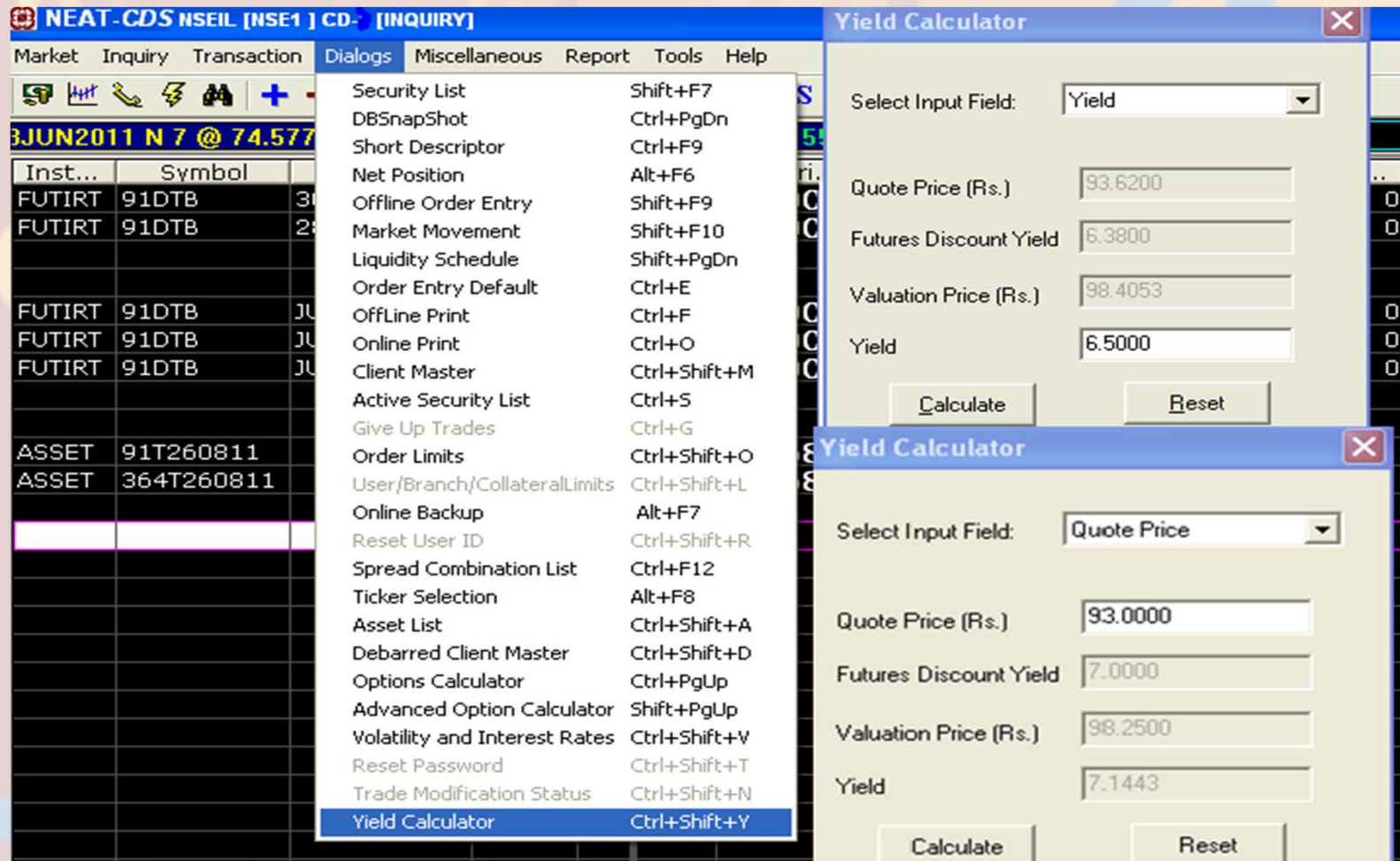
B	RL	O	U	FUTIRT	91DTB	29JUN2011	100	QP	93.0000	DAY	
DISCLOSED							PRO		93.0000	7.1443	98.2500
ORDER ENTRY											Press Enter to Validate the Order.

Money Market Yield (YTM %)	7.1443
T-Bill Price (Valuation price (₹))	98.2500
Discounted Yield (%)	7.0000
Quote price (₹)	93.0000

- To buy / sell futures contract one can input either of the following in the trading screen
 - Quote Price – ₹ 93.0000
 - YTM - 7.144
 - Valuation Price – ₹ 98.2500
- YTM or Valuation Price will be converted in quote price and populates the order book

Yield Calculator

- Facility to compute YTM, Discount yield, Valuation price or Quote price



The screenshot shows the NSE software interface with a menu open and two 'Yield Calculator' dialog boxes overlaid.

Menu Items:

Security List	Shift+F7
DBSnapshot	Ctrl+PgDn
Short Descriptor	Ctrl+F9
Net Position	Alt+F6
Offline Order Entry	Shift+F9
Market Movement	Shift+F10
Liquidity Schedule	Shift+PgDn
Order Entry Default	Ctrl+E
OffLine Print	Ctrl+F
Online Print	Ctrl+O
Client Master	Ctrl+Shift+M
Active Security List	Ctrl+S
Give Up Trades	Ctrl+G
Order Limits	Ctrl+Shift+O
User/Branch/CollateralLimits	Ctrl+Shift+L
Online Backup	Alt+F7
Reset User ID	Ctrl+Shift+R
Spread Combination List	Ctrl+F12
Ticker Selection	Alt+F8
Asset List	Ctrl+Shift+A
Debarred Client Master	Ctrl+Shift+D
Options Calculator	Ctrl+PgUp
Advanced Option Calculator	Shift+PgUp
Volatility and Interest Rates	Ctrl+Shift+V
Reset Password	Ctrl+Shift+T
Trade Modification Status	Ctrl+Shift+N
Yield Calculator	Ctrl+Shift+Y

Yield Calculator Dialog 1 (Top):

- Select Input Field: Yield
- Quote Price (Rs.): 93.6200
- Futures Discount Yield: 6.3800
- Valuation Price (Rs.): 98.4053
- Yield: 6.5000

Yield Calculator Dialog 2 (Bottom):

- Select Input Field: Quote Price
- Quote Price (Rs.): 93.0000
- Futures Discount Yield: 7.0000
- Valuation Price (Rs.): 98.2500
- Yield: 7.1443

Money Market Yield (YTM %)	7.1443
T-Bill Price (Valuation price (₹))	98.2500
Discounted Yield (%)	7.0000
Quote price (₹)	93.0000

- Contract value based on valuation price
- Example – For order executed at quote price of Rs 93.0000
 - Contract value = $2000 * \text{Valuation Price}$
 $= 2000 * (100 - 0.25 * (100 - \text{quote price}))$
 $= ₹ 196500$
- Therefore to compute contract value one can simply multiple traded quantity (no of contract * 2000) by valuation price
- MTM shall be calculated based on contract value

Clearing and Settlement

Sr.	Day / time	Activity
1	9 am – 5 pm	Trading
2	Till 5:30 pm	Trade modification & Give-up approval for CP trades
3	6:30 pm onwards	Reports from NSCCL <ul style="list-style-type: none"> - Trade reports - Margin reports - Position reports - Collateral break-up reports - Pay-in / Pay-out reports
4	T+1 day 8.30 am	Daily MTM pay-in / pay-out
5	Expiry +1 day	Final settlement pay-in / pay-out
6	Till T+2 day	Client margin reporting

$$\text{DSP} = ₹ 100 - 0.25 * yw$$

yw = weighted average futures yield of

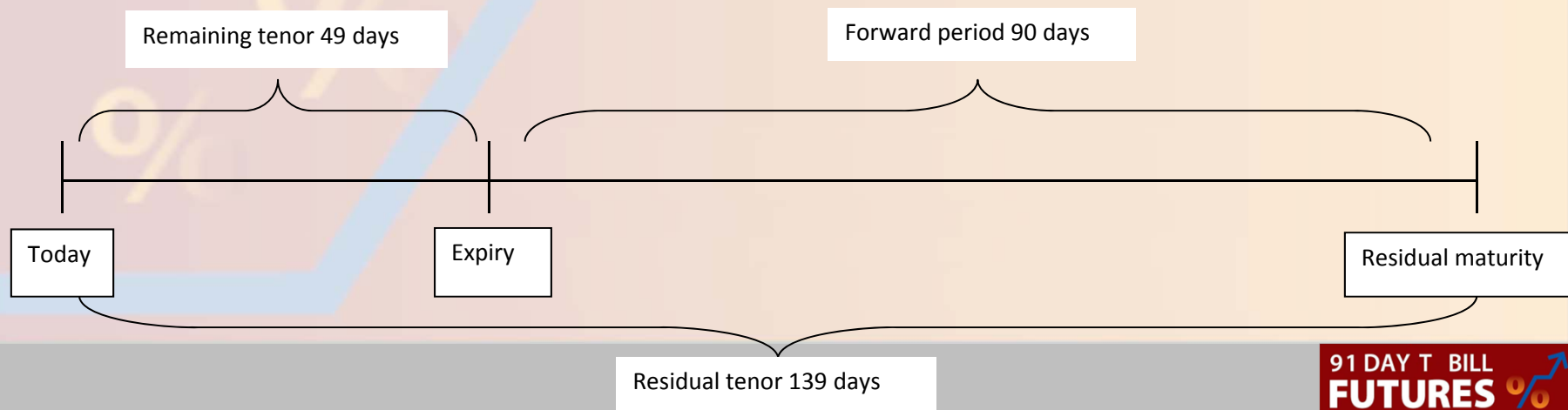
- last ½ hour subject to at-least five trades
- Else, last one hour subject to at-least five trades
- Else, last two hours subject to at-least five trades

Example of DSP computation

Trd discount Yield (A)	Trd Price	Trd Qty (B)	VWA yield (A * B)
5.0000%	95.0000	50	2.5000
4.9075%	95.0925	100	4.9075
4.5000%	95.5000	48	2.1600
5.2500%	94.7500	56	2.9400
5.0125%	94.9875	235	11.7794
4.7525%	95.2475	843	40.0636
5.5000%	94.5000	452	24.8600
Sum		1784	89.2105
WAFY = 89.2105/1784			5.0006%
DSP = 100 - (0.25 * 5.0006)			98.7500

- In the absence of above, theoretical futures yield shall be derived using T-Bill benchmark rates as published by FIMMDA

- Extrapolate / Interpolate yield for residual maturity period and for remaining tenor of contract from FIMMDA T-bill yield curve
- Computation of forward yield from the remaining tenor of contract to residual maturity tenor (i.e. forward rate for 90 days)
- E.g for contract maturing after 49 days
 - Remaining tenor of contract shall be 49 days
 - Residual period shall be 139 days (90+49)
 - Forward yield between 49 days and 139 days i.e.(90 days)



Daily MTM Settlement Example

- Netted settlement with other settlements of currency derivatives
- Daily Market to market (MTM) on T+1 day
- In same example – For order executed at quote price of ₹ 93.0000
 - Contract value = $2000 * \text{Valuation Price}$
 $= 2000 * (100 - 0.25 * (100 - \text{quote price}))$
 $= ₹ 196500$
 - Contract settlement value = $2000 * \text{DSP}$
 $= 2000 * 98.7500$
 $= ₹ 197500$
- MTM profit / loss = Contract settlement value - contract value
 $= 197500 - 196500$
 $= ₹ 1000$
- All open positions shall be daily MTM at contract settlement value

- On Expiry + 1 working day
- Netted with other settlements of currency derivatives segment
- Final settlement value as per the formula specified by SEBI
- Final Settlement Value = ₹ 2000 * (100 – 0.25 * yf)
- yf = Weighted average discount yield obtained from weekly 91 Day T-Bill auction
- RBI specified formula for computation of yf

$$Yf = \frac{(100 - \text{weighted average price})}{100} \times \frac{360}{90}$$

Final Settlement Price

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भारतीय रिज़र्व बैंक

RESERVE BANK OF INDIA

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Website : www.rbi.org.in

ई-मेल email: helpdoc@rbi.org.in

May 25, 2011



91-Days Treasury Bills : Auction Result

Date of Auction : May 25, 2011		
I.	Notified Amount	₹ 8000.00 crore
II.	Underwriting notified amount	N.A.
III.	Competitive Bids received	
	(i) Number	93
	(ii) Amount	₹ 15848.89 crore
IV.	Cut-off price	₹ 98.01 (YTM is 8.1439%)
V.	Competitive bids accepted	
	(i) Number	54
	(ii) Amount	₹ 8000.00 crore
VI.	Partial Allotment Percentage of Competitive Bids	95.97 (30 Bids)
VII.	Weighted Average Price	₹ 98.01
VIII.	Non-competitive bids received	
	(i) Number	4
	(ii) Amount	₹ 7250.00 crore

- Margins
 - As prescribed by SEBI
 - Computed Online, real time, upfront, client level
 - Adjusted from the existing collaterals in currency derivatives segment
- Risk Parameters to be updated intraday six times
 - BOD, 11 am, 12:30 pm, 2 pm, 3.30 pm and EOD
- Monitoring and alerts as currently done in currency derivatives
- Penalties as currently applicable for non compliances of
 - Client margin reporting
 - Margin violations
 - Settlement shortage
 - Position limit violations

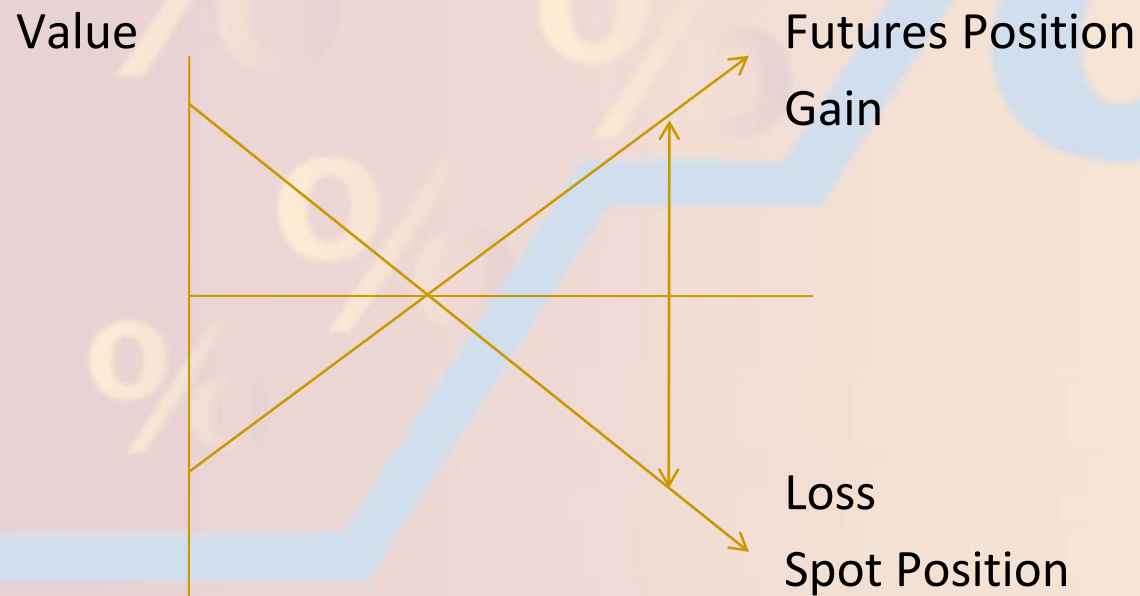
- Underlying data feed on trading screen: NDS OM Prices for T Bills
- No changes in existing report structure
- Valuation price / Settlement price upto six decimals in all reports
- Additional reports from trading
 - Bhavcopy with Yield information – Open, High, Low, Close (ddmm0000.ymd and ddmm0000.yms)
 - New Trade report for 91DTB with Contract Price (Valuation Price) and Contract Value (Y_ddmmyyyy_<member code>.txt.gz)
- Additional reports from clearing
 - New trade report to the members on daily basis - IRT_TR01/TR02
 - Intraday provisional position reports on expiry day - IRT_PS03_P/PS04_P

Enter into an 91 DTB futures contract based on your Interest rates view

Anticipation	Position
Interest Rates 	Short Futures
Interest Rates 	Long Futures

- A Participant could either
 - Square off position before Expiry or
 - Hold position till Expiry

- Against an underlying position of T- Bill
- Anticipates Short term interest rate will increase
 - Loss on underlying portfolio if interest rate increases
 - Short 91 DTB futures contract and minimized the loss
- Profit on hedge helps to offset loss in cash market



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