

A

* Rules of forward Cancellation

Cancellation of forward Contract is always done by taking counter position on same currency for same contract or same maturity.

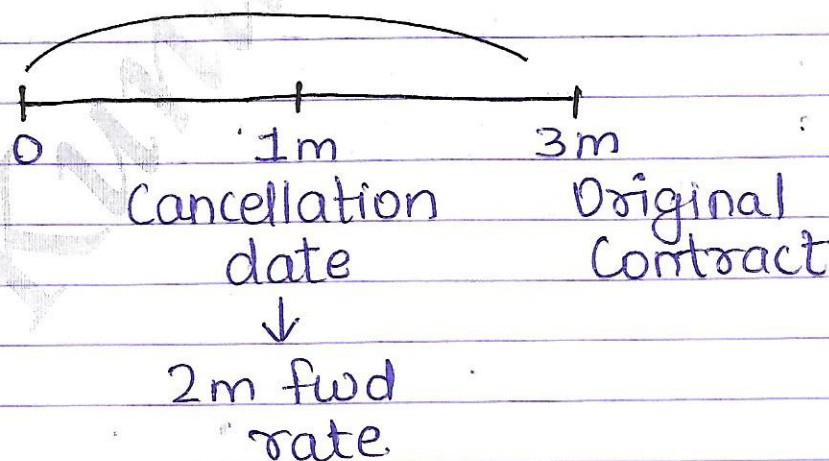
1] If Contract is cancelled on due date

In this case the reverse order / position will be taken on that day's [Cancellation / maturity date] Spot rate itself.

2] If Contract is cancelled before due date

In this case the reverse position is taken for duration b/w the Cancellation period i.e the original due date & the fwd from the date of Cancellation

[i.e for left out maturity)



3] If fwd is extended on due date

Then 2 transaction takes place.

i] Cancellation of Original Contract [ref point]

ii] Booking new fwd for given maturity.

4 Extention of Contract when customer doesn't appear on due date

1) Cancellation Rate :

The date on which customer appears, that days Spot rate + margin will be applicable to the customer.

2) Amount Payable by the customer :

It is the difference between the customer's Original Contract rate and Cancellation rate [Point 1] to be paid to the bank.

3) Swap loss :

It is an amount paid by bank due to Cancellation by customer, to another bank in the Interbank market.

Bank generally does a swap by taking 1 transaction in spot [Buy \$] and taking cover by a reverse position in the immediate forward. All this is done on due date.

4) Interest on outlay of funds :

Bank will charge interest to the customer on the cancellation charges paid by bank by cancelling contract on due date. It is calculated on bank's Original Covered rate and the reverse rate on maturity. Interest is calculated for the duration of

disappearance of customer from the due date

5 Total cost charge to customer:
 $= 2 + 3 + 4$

* Important features of derivatives.

- 1] Derivatives reduces uncertainty
- 2] It has low transaction cost [$\uparrow$ volume]
- 3] It is highly leveraged
- 4] Transaction in derivative is done today but for settlement to be executed on future date.
- 5] In derivative settlement can be done either by delivery of asset or by netting off.

*

FORWARD

FUTURES

- | | |
|--|--|
| 1] It is <u>OTC</u> in nature. | It is traded on <u>Exchanges</u> only. |
| 2] It is <u>customised</u> or tailor made Contract. | It has <u>standardised</u> Contract only. |
| 3] It is <u>less liquid</u> in nature. | <u>High liquidity</u> due to standard Contract. |
| 4] <u>High default risk</u> | <u>No Counter party</u> or default <u>risk</u> . |
| 5] It is <u>less regulated</u> | It is <u>highly regulated</u> . |
| 6] Orders booked are either executed or cancelled. | Orders are traded today & reversed at future date. [Square off] |
| 7] At initial, Buy/sell in forward & on maturity - Sell/Buy in spot. | At initial, Buy/sell in future & On or before maturity - Sell/Buy in future. |

[Spot is however used for Comparison only]

* Imp features of futures.

- ① In India we have stock and Index futures.
- ② Maturity = 1 month, 2 month, 3 month
[In calendar month]
- ③ Future Contract have Standard lot Size.
- ④ Have to be Compulsarily Squared off before maturity.
- ⑤ Contract Expire on last Thursday of Every month.
- ⑥ On Maturity FT should be Equally to ST or else Arbitrage.

* Pricing future's

1] Theoretical future Price

a] Stock $\Rightarrow TFP = S + C - D$

b] Commodity $\Rightarrow TFP = S + C - \text{Storage Cost}$

* 2] Arbitrage in future's [Steps]

① Compare AFP and TFP

② If $AFP < TFP$

Future is Under-Value

∴ Buy

$AFP > TFP$

Future is Over value

∴ Sell

Today	Maturity
long FO	short FO
short SO	long SO
Invest SO	deduct div

$\text{Net gain} = TFP - AFP$

Today	Maturity
short FO	long FO
long SO	short SO
Borrow SO	Add div.

$\text{Net gain} = AFP - TFP$

* 3] Margin's

i] Initial Margin

ii] Maintenance Margin

iii] Margin Call = $\frac{\text{Initial margin} - \text{Balance in margin a/c}}{\text{lot size}}$

$B - E - P = \frac{IM - MM}{\text{lot size}}$

* 4] Hedging with future

Stock v/s stock future's Stock v/s ~~SE~~ Index future's

$$B_P = 1$$

$$B_T = 0$$

$$B_P = ?$$

$$B_T = 0$$

$$\boxed{\text{For future}} \quad \text{No of Contract's} = \frac{(B_T - B_P) \times VP}{FCS}$$

$$\boxed{\text{For Option}} \quad \text{No of Contract's} = \frac{1}{\text{delta}} \times \frac{VP}{OCS}$$

C

* Valuation of options.

1. In the money on immediate exercising of option, the buyer of the option makes gain or profit.
2. Out of the money on immediate exercising an option, it results in loss to the buyer.
3. At the money on immediate exercising of an option it results in no profit or no loss.

$$\text{Option Premium} = \text{Intrinsic Value} + \text{Time Value.}$$

* DELTA (Δ)

$$\Delta = \frac{\% \Delta \text{ in option Premium}}{\% \Delta \text{ in Underlying asset.}}$$

% Δ of Call option is always +ve.

% Δ of put option is always -ve.

Option

*

Features	long call	Short call
1] Option Position [long / short]	Option Buyer	Option Seller
2] Asset Position [call / Put]	Right to Buy the asset on maturity @ 'x'	Obligation to sell the asset on maturity @ 'x'
3] Expectation	Bullish ↑	Bearish ↓
4] Pay off	$\text{Max}[S_t - x, 0]$	$-\text{Max}[S_t - x, 0]$
5] Premium	-CO	+CO
6] P & L	PF - CO	PF + CO
7] Max gain	$S_t - x - \text{CO}$ [unlimited]	CO [limited]
8] Max loss	CO [limited]	$S_t - x - \text{CO}$ [unlimited]
9] B-E-P	$x + \text{CO}$	$x + \text{CO}$

Long Put	Short Put
Option Buyer	Option Seller
Right to Sell the asset on maturity @ 'x'	Obligation to Buy the asset on maturity @ 'x'
Bearish ↓	Bullish ↑
$\max [X - S_t, 0]$	$-\max [X - S_t, 0]$
$- P_0$	$+ P_0$
$P_f - P_0$	$P_f + P_0$
$X - S_t - P_0$ [Unlimited but to $S_t = 0$]	P_0 [limited]
P_0 [limited]	$X - S_t - P_0$ [Unlimited but to $S_t = 0$]
$X - P_0$	$X - P_0$

* Forex with options

Position	Expectation	Risk	fwd	future
Exporter	FC $\uparrow$ DC $\downarrow$	FC $\downarrow$ DC $\uparrow$	sell FC Buy DC	Short FC $\Rightarrow$ long long DC $\Rightarrow$ short
Importer	FC $\downarrow$ DC $\uparrow$	FC $\uparrow$ DC $\downarrow$	Buy FC sell DC	long FC $\Rightarrow$ short Short DC $\Rightarrow$ long

Options

long Put / short call^{FC}
long call / short Put^{DC}

long call / short Put
long Put / short call

D

Interest Rate Derivatives

→ Interest Rate call and put

* Features of Cap and floor.

- 1 Caps and floor are paid in arrears
i.e., 3 month rate today will be used to calculate amt to be paid after 3 months from today.
- 2 This is due to fact that 1st payment is already pre-determined.
- 3 At every pay off date [Reset date], the reference rate is pre-determined at previous settlement itself.
- 4 There is no time value for Caps and floors as we settle them on Completion of duration of VA.
- 5 Caps and floors are OTC contracts, so 2 parties can tailor the agreement to suit their specific needs respectively.

* Generally, Caps & floor agreement terms will include -

- 1) Reference rate [typically LIBOR]
- 2) Cap or floor rate with sets ceiling/floor on interest rate cap.

- 3 length of agreement [Loan period]
- 4 Reset frequency Quarterly, annually etc.
- 5 Notional principal.

→ Interest rate collar

Interest collar is combination of cap & floor where option holder is long in one and short in another.

If premium paid and received through long and short position are equal it is.
"ZERO COST COLLAR"

→ Forward Rate Agreement [FRA]

The buyer of FRA is the borrower party who wants to cover the risk of rising interest rate.

[Reference Rate Increasing]

The Seller of FRA is the lender party who wants to cover the risk of falling Interest Rate.

[Decrease in falling Reference Rate]

- Swap is an ~~any~~ agreement to exchange one set of cash flows for another.
- Swap is a series of forward agreements where the payoff can be 2 way
i.e. gains & losses

* Features of Interest Rate Swap

- 1) It effectively translates a floating rate liability into a fixed rate liability and vice-versa.
- 2) There is no need of exchange of principle amt and interest amount [Payment / Receipt] is also settled on net basis.

Option Pricing

* Formula of Binomial model
Risk Neutral Model [RNM]

As per RNM,

$$(S_u \times P_u) + (S_d \times P_d) = S_0 \times (1+r)^t \text{ or } S_0 \times e^{rt}$$

* Formulas of Black & Scholes

$$C_0 = S_0 \times N(d_1) - X \cdot e^{-rt} \times N(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left[\left(r + \frac{\sigma^2}{2}\right) \times t\right]}{\sigma \times \sqrt{t}}$$

$$d_2 = d_1 - \sigma \times \sqrt{t}$$

$N(d_1)$ = It is a prob. of the expected spot price at maturity i.e. S_t

$N(d_2)$ = Prob. of exercising the option at X

* Put call Parity

$$S_0 + P_0 = C_0 + X \cdot e^{-rt}$$

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OPTION STRATEGY

1] Protective Put

2] Covered Call

3] Collar

4] Straddle

long

short

5] Strangle

long

short

6] Butterfly Spread

with call

with put

7] Bull Call

Bear put

8] Box Spread