

ARBITRAGE OPPURTUNITY IN PUT CALL PARITY THEORY

Just remember this Formula.

Spot Price + Put premium = Call premium + PV of Exercise Price

(Mnemonics : SP=CE)

Whenever the equation fails, there is arbitrage opportunity.

Spot price, Strike Price (Exercise Price), Put premium and Call premium will be given in the question.

How to solve such a question?

- As I have already mentioned that just remember the equation and write it.
- Find Spot Price + Put Premium, let it be say LHS. (LHS= Left hand side).
- Find Call premium + Present Value of Strike Price, let it be say RHS. (Right hand side).
- Whether LHS = RHS?
- If no, there is arbitrage opportunity.
- As we know in order to result profit one should buy at lower price and sell it at higher price.
 - if LHS > RHS, buy RHS and sell LHS
 - if RHS > LHS, buy LHS and sell RHS
- Then book profit.

In these type of problems, it is always assumed that the operator doesn't have money or any share for performing these operations.

Let us see some examples (This will make the above concept more easier)

Example 1

Spot Price	₹ 194
Exercise Price	₹ 200
Put Premium	₹ 9
Call Premium	₹ 7
Period in months	2
Rate	6%

Spot price + put premium = Call premium + PV of Strike price

LHS = Spot price + put premium = ₹ 194 + ₹ 9 = ₹ 203

RHS = Call premium + PV of strike price = ₹ 7 + ₹ 200 × $e^{-0.06 \times 2/12}$ = ₹ 7 + ₹ 198 = ₹ 205

Here

Spot price + put premium = Call premium + PV of Strike price

RHS > LHS...

Buy LHS and sell RHS

Buy LHS → Buy the item in LHS → Buy Put Option and Share at Spot Price

Sell RHS → Sell Call option (here not selling other item which is Strike price)

(Don't write the items in italics as part of answer during examination, just make a rough note so that you could understand what to buy and what to sell)

You can write the following in examination:

In order to avail arbitrage, the operator shall do the following:

Buy put option and sell call option. While selling call, the operator is taking risk of loss in case of rise in share prices. So he shall buy a share at spot price.

Purchase Put option	- ₹ 9
Sell Call Option	+ ₹ 7
Purchase one share	- ₹ 194
Total amount	- ₹ 196
Since the amount is negative it denotes that amount is to be borrowed	

As per assumption, the operator doesn't have any money to perform above steps.

So he will borrow ₹196 @ 6% p.a for 2 months.

He will have to repay ₹ 196 x $e^{0.06 \times 2/12}$ = ₹ 197.98 at the end of two months.

At Maturity	Action on Call	Action on Put	Profit / loss on options	Price at which share is sold	Profit After repayment
Share Price = ₹200	No action	No action	0	200	200 - 197.98 = 2.02
Share Price > Strike Price, say = ₹201	Action is taken	No action	-1 loss on call option	201	201 - 1 - 197.98 = 2.02
Share Price < Strike Price, say = ₹199	No action	Action is taken	+1 profit on put option	199	199 + 1 - 197.98 = 2.02

Example 2

Spot Price	₹ 194
Exercise Price	₹ 198
Put Premium	₹ 9
Call Premium	₹ 2
Period in months	2
Rate	6%

Spot price + put premium = Call premium + PV of Strike price

LHS = Spot price + put premium = ₹ 194 + ₹ 9 = ₹ 203

RHS = Call premium + PV of strike price = ₹ 2 + ₹ 200 x $e^{-0.06 \times 2/12}$ = ₹ 2 + ₹ 198 = ₹ 200

Here

Spot price + put premium = Call premium + PV of Strike price

LHS > RHS...

Buy RHS and sell LHS

Buy RHS → Buy the item in RHS → Buy Call Option

Sell RHS → Sell Put option and Sell one share.

(Don't write the items in italics as part of answer during examination, just make a rough note so that you could understand what to buy and what to sell)

You can write the following in examination:

In order to avail arbitrage, the operator shall do the following:

Buy call option and sell put option. While selling put, the operator is taking risk of loss in case of fall in share prices. So he shall borrow a share at spot price.

Purchase Call option	- ₹ 2
Sell Put Option	+ ₹ 9
Sell one share	₹ 194
Total amount	₹ 203
Since the amount is positive it denotes that amount is to be invested	

As per assumption, the operator doesn't have any share to perform above steps.

So he will borrow share and sell the share and invest the money.

He will have to return the share at the end of two months.

Investment proceeds will be $= ₹ 203 \times e^{0.06 \times 2/12} = ₹ 205.05$

At Maturity	Action on Call	Action on Put	Profit / loss on options	Price at which share is bought	Profit after investment
Share Price = ₹198	No action	No action	0	198	$205.05 - 198 = 7.05$
Share Price > Strike Price, say = ₹199	Action is taken	No action	+1 profit on call option	199	$205.05 + 1 - 199 = 7.05$
Share Price < Strike Price, say = ₹197	No action	Action is taken	-1 loss on put option	197	$205.05 - 1 - 197 = 7.05$

Hoping you enjoyed this please send suggestions or clarifications in this regard to jijuoommen@icai.org.

Don't forget to hit "Thanks" button if you like these @ caclubindia # jijuoommen.