ReWISE

Arbitrage

What is arbitrage?

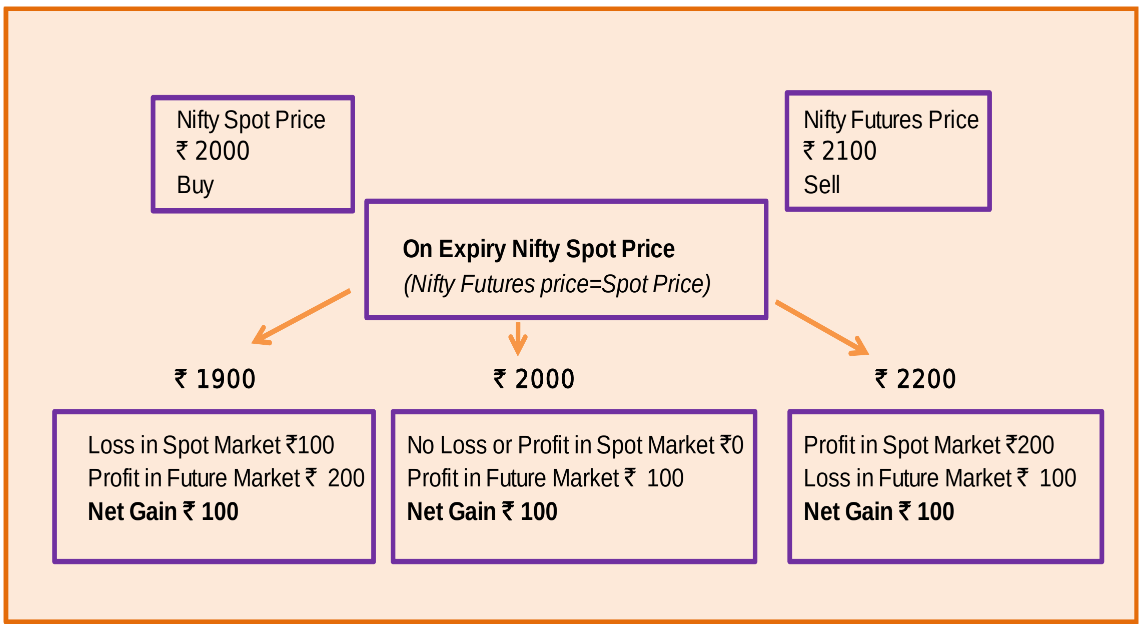
- Price discrepancy of same asset class in two different markets provides opportunity to make risk free profit by buying in the cheap market and selling in the overpriced market. This opportunity to make risk free profit is known as arbitrage.
- Arbitrage opportunity to make risk free profit also takes place between a cash market and derivative markets (forward, future or option market).
- Derivative is referred to contracts whose price is derived from its underlying assets like equities, debt, currencies, commodities etc.
- Cash market or spot market is where securities are sold for cash and delivery happens immediately after settlement date. Price of the security traded in cash market is known as spot price.
- NSE cash market is known as capital market segment and settlement date is on T+2 basis.
- Future market (contract) is a exchange traded standardized contract where settlement date is fixed by the exchange. Price at which the security will be delivered at a specified future date (expiry date of the contract) is known as future price.
- Futures contract's expiry takes place on last Thursday of the month.

How arbitrage opportunity arises?

- In general, fair value of future price of the underlying asset should equal to spot price of the underlying asset + cost of carry. When there is mispricing in cost of carry and future price of the underlying asset is at premium or discount to its fair value, arbitrage opportunity arises.
- Cost of carry (CoC) is the cost of holding the asset till expiry. It includes storage cost, interest cost etc and excludes any income earned on the asset.
- For equity derivatives, cost of carry is the interest cost incurred on holding the security till expiry minus any dividends on the security and is calculated as difference between future and spot price of the underlying security (spread).
- Spreads are determined by market sentiments, interest rate levels in the economy, FII holdings.

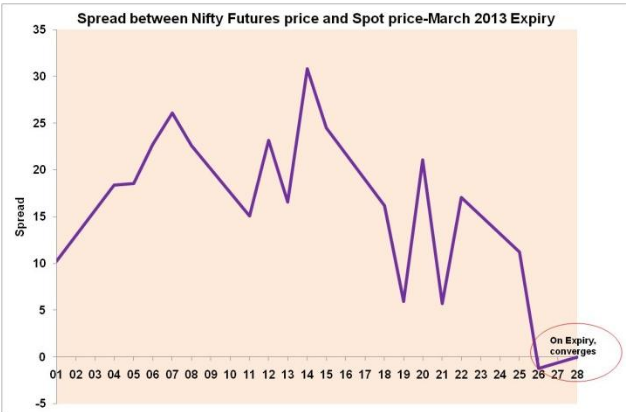
How will you make risk free profit?

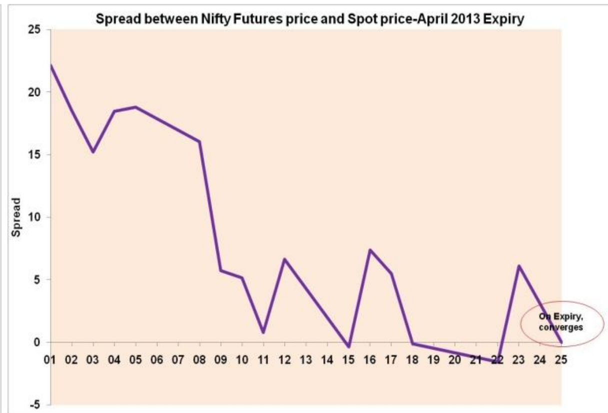
- As mentioned above, we know how arbitrage opportuniy arises. Now lets see how can one make a risk free profit from the mispricing opportunity.
- Suppose on 1st May 2013, Nifty is trading at ₹ 2000 in cash market and one month Nifty futures contract is trading at ₹ 2100.There is an arbitrage opportunity of ₹ 100 to gain.
- To gain, you will buy Nifty for ₹ 2000 in the cash market and simultaneously sell in futures market for ₹ 2100 and lock the gain of ₹ 100.
- At expiry, you will offset your position i.e. sell Nifty in cash market and buy Nifty futures contract in order to make gain.
- Also at expiry, spot price and future price converge i.e. future price of Nifty will equal spot price of Nifty.
- On expiry 30th May 2013 (last Thursday of the month) irrespective of prevailing Nifty price, you will make ₹ 100 risk free profit.
- Chart below shows 3 different Nifty closing prices on expiry and how the risk free profit made.

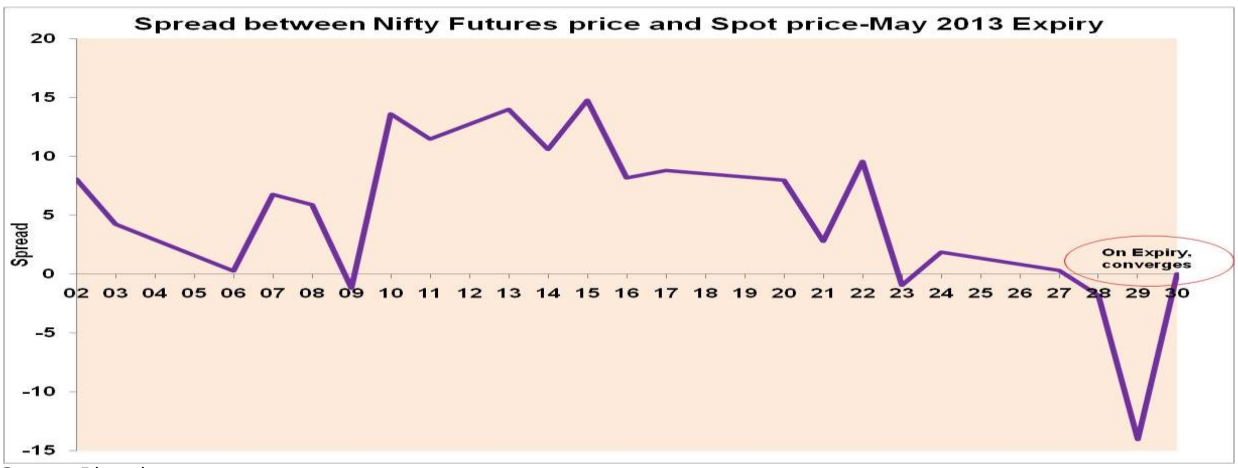


- From above, we can see that you can make risk free profit irrespective of the direction of the closing price of the security on expiry date.
- For the above example, you make annualized return of 5.04%.
- Same holds true, when arbitrage opportunity arises when future price is below spot price but transaction will be vice versa.

- Charts below show the spread between Nifty 1 month futures price and spot price for March, April and May expiry showing that on expiry futures price converges with spot price.







Source: Bloomberg

What is rollover of futures contract?

- At expiry, investors square off their positions and let futures contract expire. However investors can also carry forward their position by entering into a similar contract at a future date. This is known as rollover of futures contract.
- It is a process where investors carry forward their futures contract from one expiry date to another.
- For example, investor has Nifty long futures (buy) which expires in May, if investor decides to rollover his contract means he will square off his position on expiry date and buy Nifty futures expiring in June i.e. carry forward his Nifty futures contract.