

Commission:

The commission is the fee paid to the broker for making the transaction.

Spread:

The spread is a cost associated with trading with a dealer (ie. in a dealer market).

The Bid Price refers to the price at which a dealer will buy an asset from you. The Ask Price is the price for which a dealer will sell you the asset. The bid-ask spread is the difference between the Ask Price and the Bid Price (ie. $\text{Spread} = \text{Ask Price} - \text{Bid Price}$). Note that the Bid Price is usually higher than the Ask Price.

Market Impact (Price Impact):

The market impact (also known as the price impact) is mainly associated with market orders (ie. in an auction market). The Market/Price Impact is seen when we buy or sell a very large quantity of shares.

For instance, we may want to buy a large amount of shares, but in the order book there is not enough shares being offered for sale at just one price in order to fulfil our order. Therefore, we may have to buy different quantities of shares at different prices in order to complete our order. The market impact (or price impact) is the percentage difference of the average price paid for all the shares we buy, and the price which we would have paid if we bought just one share.

For example, we may want to buy 10 shares, but if the order book shows that we have to buy 2 shares at \$5, 3 shares at \$10 and 5 shares at \$15, then the average price we would have to pay per share is \$11.50. However, if we wanted to buy just one share, we would have to pay just \$5. Thus, the market impact (or price impact) is the percentage difference between the price of just one share and the average price of the 10 shares we buy.

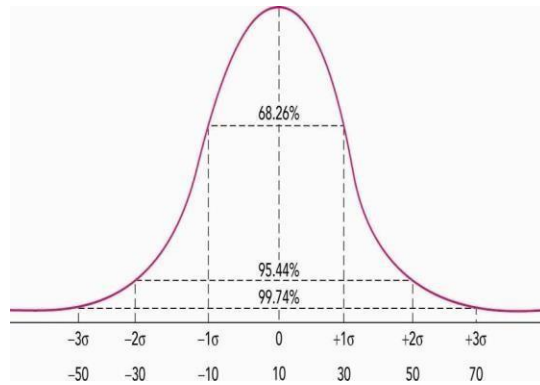
Market impact tends to affect institutional investors more as they tend to have very large order volumes, as opposed to retail investors (eg. households) who tend to have small volume orders.

TYPES OF BROKERS:

There are two different types of brokers:

- **Discount Broker:** They do nothing but help facilitate the trade (eg. CommSec).
- **Full Service Broker:** They not only help facilitate the trade, but they may also provide research advice, as well as access to markets which you would not otherwise be able to access.

The commission fee for a full service broker tends to be higher due to the additional services provided (ie. they charge a premium).

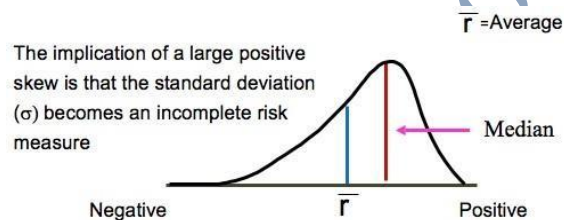


SKEWNESS:

There can be either a positive skew or a negative skew.

Positive Skew:

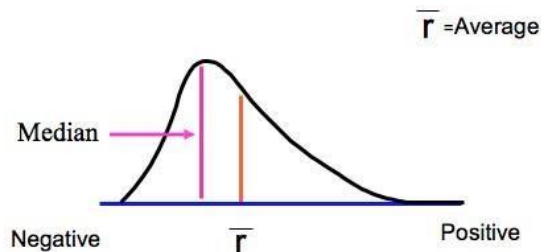
A positive skew means that the median return is larger than the mean (expected) return (\bar{r}).



Negative Skew:

A negative skew means that the median return is smaller than the mean (expected) return (\bar{r}).

This could be compared to the lottery or gambling, where the expected return is negative, but there is a large positive return which could be achieved (as there is a long tail on the right-hand side). As a result, this large positive return makes gambling/lottery attractive.



LEPTOKURTOSIS:

	Returns		Deviation from average		Product of deviations
	ABC	XYZ	ABC	XYZ	
1	0.2515	-0.2255	0.15872	-0.34519	-0.05479
2	0.4322	0.3144	0.33942	0.19471	0.066088
3	-0.2845	-0.0645	-0.37728	-0.18419	0.069491
4	-0.1433	-0.5114	-0.23608	-0.63109	0.148988
5	0.5534	0.3378	0.46062	0.21811	0.100466
6	0.6843	0.3295	0.59152	0.20981	0.124107
7	-0.1514	0.7019	-0.24418	0.58221	-0.14216
8	0.2533	0.2763	0.16052	0.15661	0.025139
9	-0.4432	-0.4879	-0.53598	-0.60759	0.325656
10	-0.2245	0.5263	-0.31728	0.40661	-0.12901
AAR	0.09278	0.11969			
					Sum 0.533973
					Average 0.053397

The formula to calculate the covariance is given below:

$$\text{Cov}(r_1, r_2) = \frac{n}{n-1} \sum_{T=1}^N \frac{(r_{1,T} - \bar{r}_1) \times (r_{2,T} - \bar{r}_2)}{n}$$

Where:

- $\text{Cov}(r_1, r_2)$ = The covariance of the returns between asset 1 and asset 2
- \bar{r}_1 = Expected return on asset 1
- \bar{r}_2 = Expected return on asset 2
- $r_{1,T}$ = Actual return on asset 1 for time period 'T'
- $r_{2,T}$ = Actual return on asset 2 for time period 'T'
- n = Number of observations

We know that the average product of the deviations gives us the value for $(r_{1,T} - \bar{r}_1) \times (r_{2,T} - \bar{r}_2)$. As a result, $(r_{1,T} - \bar{r}_1) \times (r_{2,T} - \bar{r}_2)$ equals 0.0533973.

Thus, the covariance for the combined portfolio is 0.05933:

$$\text{Cov}(r_1, r_2) = \frac{n}{n-1} \sum_{T=1}^N \frac{(r_{1,T} - \bar{r}_1) \times (r_{2,T} - \bar{r}_2)}{n}$$

$$\text{COV}(\text{ABC}, \text{XYZ}) = 0.533973 / (10 - 1) = 0.059330$$

Now, we can find the standard deviation of the portfolio using the formula below: