

Types of Orders:

- **Market order:** a trade be carried out immediately at the best price available in the market.
- **Limit order:** The order can be executed only at this price or at one more favourable to the investor.
- **Stop/stop-loss order:** The order is executed at the best available price once a bid or offer is made at that particular price or a less favourable price.
- **Stop-limit order:** combination of a stop order and a limit order.

Hedging Strategies using Futures – perfect hedges, eliminates risk.

- A long futures hedge is appropriate when you know you will purchase an asset in the future and want to lock in the price.
- A short futures hedge is appropriate when you know you will sell an asset in the future & want to lock in the price.

Arguments in Favour of Hedging	Arguments Against Hedging
<ul style="list-style-type: none"> - Most companies are in the business of manufacturing, or retailing or wholesaling, or providing a service. - They have no particular skills or expertise in predicting variables such as interest rates, exchange rates, and commodity prices. - Companies should focus on the main business they are in and take steps to minimize risks arising from interest rates, exchange rates, and other market variables. 	<ul style="list-style-type: none"> - Shareholders are usually well diversified and can make their own hedging decisions. - It may increase risk to hedge when competitors do not. - Explaining a situation where there is a loss on the hedge and a gain on the underlying can be difficult.

Basis Risk - the difference between spot & futures prices. Basis risk arises because of the uncertainty about the basis when the hedge is closed out.

- When there is no futures contract on the asset being hedged, choose the contract whose future rice is most highly correlated with that asset price – Cross Hedging

Cross Hedging – Hedge Ratio = Size of the Futures Position/Size of Exposure

<p><u>Optimal Hedge Ratio:</u> σ_s = Standard Deviation of the change in the spot price during the holding period. σ_f = Standard Deviation of the change in the futures price during the holding period. ρ = coefficient of correlation between the both.</p>	$\rho \frac{\sigma_s}{\sigma_f}$
<p><u>Hedging using Index Futures:</u> Beta P = Value of the portfolio A = the value of the assets underlying one futures contract.</p>	$\beta \frac{P}{A}$

Reasons for Hedging an Equity Portfolio:

1. Desire to hedge systematic risk. (Appropriate when you feel that you have picked stocks that will outperform the market.)
2. Desire to be out of the market for a short period of time. (Hedging may be cheaper than selling the portfolio and buying it back.)

Hedging the Price of an Individual Stock – only the systematic risk is hedged, the unsystematic risk that is unique to the stock is not hedged.

Week 3 – Determination of Forward and Future Prices

Investment Assets	Consumption Assets
<ul style="list-style-type: none"> Investment assets: assets held by significant numbers of people purely for investment purposes. Examples: stock, bonds, gold, silver. Do not have to be held exclusively for investment. Silver, for example, has a number of industrial uses. 	<ul style="list-style-type: none"> Consumption assets: assets held primarily for consumption. Examples: copper, oil, corn, pork bellies. Use arbitrage arguments to determine the forward and futures prices of an investment asset but not for consumption assets

Short Selling – involves selling assets you do not own, your broker borrows the securities from another client and sells them in the market,

- Later you must buy the securities back, to replace them in the clients account.
- The investors take the profit or loss depending on the change in the stock price.
- Dividends and other benefits are pay to the owner of the securities.
- Margin account is kept the broke to guarantee that there is no default risk.

<u>Calculating Forward Price</u> S_0 = Spot price today F_0 = Futures or Forward Price today T = Time until Delivery date R = Risk free interest rate for T	$F = S(1+r)^T$
<u>Continuous Compounding</u> - investment asset that provides no income and has no storage costs.	$F_0 = S_0 e^{rT}$
<u>Investment Asset that Provides an Known Income</u> – I is the present value of the income during the life of the forward contract (I.e. dividends and coupon payments).	$F_0 = S_0 e^{(r-q)T}$

<u>Valuing a Forward Contract</u> – when a forward contract is first entered, its value is zero.	
The Value of a Long Forward Contract: $f = (F_0 - K)e^{-rT}$	The Value of a Short Forward Contract: $(K - F_0)e^{-rT}$

Index Arbitrage

- When $F_0 > S_0 e^{(r-q)T}$ an arbitrageur buys the stocks underlying the index and sells futures.
- When $F_0 < S_0 e^{(r-q)T}$ an arbitrageur buys futures and shorts or sells the stocks underlying the index.

Futures on Investment Commodities (Storage costs are seen as a negative yield).

Gold and silver: can provide income, but have storage costs	$F_0 = (S_0 + U)e^{rT}$
If storage costs u , net of income, are proportional to commodity price:	$F_0 = S_0 e^{(r+u)T}$

Futures on Consumption Assets - Consumption assets: high storage costs (U) and no income, but consumption value. At the expiration, the riskless profit =	$F_0 - (S_0 + U)e^{rT} > 0$
<ul style="list-style-type: none"> • When the futures price is lower: the commodity is used for consumption, and the arbitrage strategy will not work. 	

Convenience Yield – benefit derived from owning the asset. Only exists for consumption assets and usually low inventories lead to higher convenience yields	$F_0 = S_0 e^{(r+u-y)T}$
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The Cost of Carry - The cost of carry for an asset, c , is the storage cost plus the interest costs less the income earned.

For an Investment Asset	$F_0 = S_0 e^{cT}$
For a Consumption Asset	$F_0 = S_0 e^{(c-y)T}$

Week 4 – Swaps

A swap is an OTC agreement between two companies to exchange cash flows in the future. At specified futures times and specified rules on how the cash flows are calculated. (Common swaps: Interest and Currency).

‘Plain Vanilla’ Interest Rate Swap – companies swap interest rates (fixed and floating) for a fixed period.

- Floating rate is commonly based on London Interbank Offer Rate (LIBOR).
- Principal payments are not exchanged only the interest payments.

Reasons for Swaps – comparative advantages between companies and their rates can benefit both companies.

Valuation of Interest Rate Swaps – swaps are worth zero when they are set up (with time the value of the swap may increase or decrease).

$V_{swap} = B_{fix} - B_{fl}$	<ul style="list-style-type: none"> • For the floating rate payer (pay floating rate, receive fixed rate) • Consider as a long position in a fixed-rate bond and a short position in a floating-rate bond.
$V_{swap} = B_{fl} - B_{fix}$	<ul style="list-style-type: none"> • Fixed rate payer (pay fixed rate, receive floating rate) holds the opposite position • Consider as a long position in a floating-rate bond and a short position in a fixed-rate bond.

Currency Swaps – an agreement to exchange principal and interest payments in one currency for principal and interest payments in another.

- Principal amounts are usually exchanged twice: at the beginning and at the end of the Swap.

Week 5 & 6 – Mechanics of Options

Option is an agreement which gives the holder the right, but not the obligation, to buy or sell an asset at a fixed exercise price, up to a specified expiry date, in exchange for a non-returnable premium.

- o Expiry date: the latest date on which an option can be exercised.
- o Exercise price: the price at which a share is bought or sold.
- o Underlying: the asset involved in an option contract.
 - o **American option**: can be exercised before as well as on the expiry date.
 - o **European option**: can be exercised only on the expiry date.

	Buyer (Holder)	Seller (Writer)
Call	Right to BUY for a specified price Pays the Premium	Obligation to SELL for a specified price Receives the Premium
Put	Right to SELL for a specified price Pays the Premium	Obligation to BUY for a specified price Receives the Premium