

## FINA2204 – Derivative Products and Markets

### WEEK 1

#### What are Derivatives?

A derivative is an instrument whose value depends on, or is derived from, the value of another asset, the underlying asset. Examples include forwards, futures, options and swaps. The underlying assets include stocks, currencies, interest rates, commodities, debt instruments, etc.

#### Main types of derivatives

The four main types of derivatives:

1. Forward – an OTC contract to buy or sell an asset at a certain time in the future for a certain price.
2. Futures – an ET contract to buy or sell an asset at a certain time in the future for a certain price.
3. Option – an ET or OTC contract conferring the right but not the obligation to buy or sell an asset by a certain date in the future for a certain price.
4. Swap – an OTC contract to exchange one set of cash flows for another set of cash flows at regular intervals.

#### Uses of derivatives

Main uses of derivatives:

- to hedge risks such as price risks
- to speculate on price movements
- to lock in an arbitrage profit from mispricing
- to change the nature of an investment without incurring the costs of selling one portfolio and buying another
- to change the nature of a liability

#### Types of Traders

Three broad categories of traders:

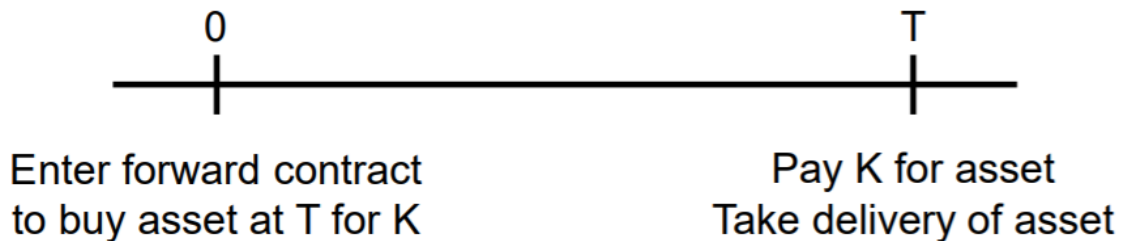
- hedgers – use derivatives to reduce or eliminate price risks they face
- speculators – use derivatives to bet on the future movement of market prices
- arbitrageurs – take offsetting positions in derivatives and the underlying to lock in a riskless profit

#### Two main types of markets

- Exchange-traded markets Examples - ASX, CME Derivatives – option, futures
- Over-the-counter (OTC) markets Examples – Interbank markets Derivatives – forwards, swaps
  - OTC is larger

### Forward Contracts

A forward is an OTC contract to buy or sell an asset at a certain time in the future for a certain price. The price is agreed now but delivery occurs in the future.



The party that has agreed to buy has what is termed a long position The party that has agreed to sell has what is termed a short position

### Grain Forwards

Main benefits:

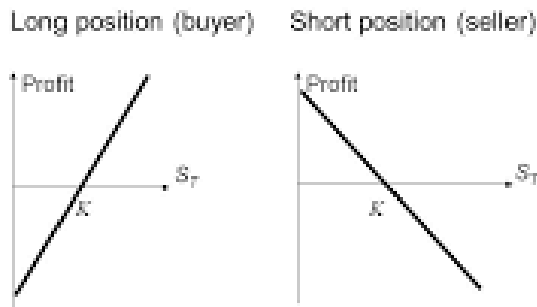
- cash price and quantity are fixed
- improve certainty of income and cash flow
- provides protection against falling prices

Main risks:

- delivery of grain required within the period established in the contract
- no ability to participate in favourable price movements
- deliverable quality risk exists

### Profit Graphs

## Long and short forward position profits



Lisöngumálningar – Fjármálaáæfingur

### Forward Rate Agreements

A FRA is an OTC agreement that a certain interest rate will apply to either borrowing or lending a certain principal during a specified future period of time.

The parties to a FRA agree to make a payment which compensates one party for higher borrowing costs or a lower return from lending.

FRAs used to hedge interest rate risk:

- floating rate borrowers “buy” FRAs to hedge against rising interest rates
- floating rate investors “sell” FRAs to hedge against falling interest rates

Example 3 - Forward Rate Agreements In Australia the settlement amount (value of the FRA) is calculated as the difference between the prices of two bank bills because bank bills are used for funding and investing.

Settlement amount ‘received’ by the borrower (Equation (4.11)):

$$V_{FRA} = L \times \left( \left( \frac{1}{1 + R_K \times \frac{d}{365}} \right) - \left( \frac{1}{1 + R_M \times \frac{d}{365}} \right) \right)$$

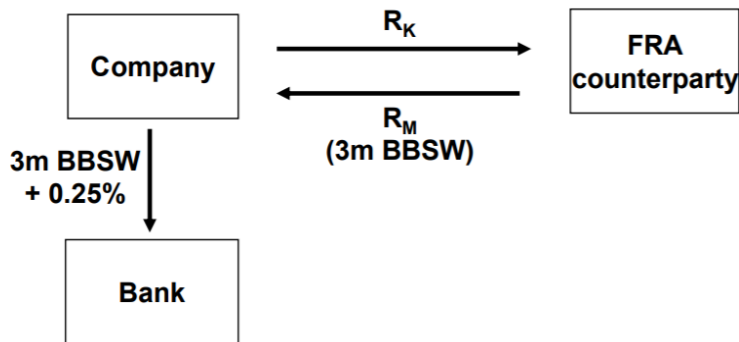
Settlement amount ‘received’ by the lender (Equation (4.12)):

$$V_{FRA} = \left( \left( \frac{L}{1 + R_M \times \frac{d}{365}} \right) - \left( \frac{L}{1 + R_K \times \frac{d}{365}} \right) \right)$$

where L is notional principal, d is the term of borrowing/lending,  $R_K$  is contract rate,  $R_M$  is market rate on settlement date.

### Hedging against rising interest rates

A company with a floating rate loan at 3m BBSW + 0.25% 'buys' a 1x4 FRA to hedge rising 3m BBSW at reset date in one month's time.



$$\begin{aligned} \text{Effective cost of funds} &= (3\text{m BBSW} + 0.25\%) + (R_K - 3\text{m BBSW}) \\ &= R_K + 0.25\% \end{aligned}$$

## WEEK 2

### Futures Contract

A futures contract is an ET contract to buy or sell an asset at a certain time in the future for a certain price.

Examples:

- buy 100 oz. of gold @ US\$1400/oz. in December
- sell £62,500 @ 1.5500 US\$/£ in March
- sell 1,000 bbl. of WTI oil @ US\$90/bbl. in April

Futures contracts are similar to forward contract but:

- are traded on an exchange rather than OTC
- are settled daily via variation margins • obligations can be extinguished via offset

### Contract Specifications

Contract specifications will include:

- what can be delivered (the asset to be delivered)
- the contract size (how much of the asset must be delivered)
- when it can be delivered (the timing of delivery)
- where it can be delivered (the location of delivery point)

### Closing out a futures position

A futures trader has a choice between:

