

**P R I S T I N E**

# Derivatives I

## Agenda for Forward Markets and Contracts

---

- Characteristics
- Settlement of a Forward contract
- Dealer versus end user
- Forwards on Equity and bonds
- Eurodollar Time Deposit market
- Forward Rate Agreement(FRA)
- Payoff of an FRA
- Currency Forward contracts

© Pristine [www.edupristine.com](http://www.edupristine.com)  
Sample Material

## Characteristics of Forward Markets

- Contract whereby parties are committed:
  - To buy (sell)
  - An underlying asset
  - At some future date (maturity)
  - At a delivery price (forward price) set in advance
- When contract is initiated: No cash flow
- **Forward price** such that PV of the contract zero.
- The party which agrees to buy the specified asset is said to take a **long** position, and the party which agrees to sell the specified asset is said to take a **short** position.
- “Customization”, difficulty of “closing out” positions, low liquidity
- The risk of contract default, credit risk.

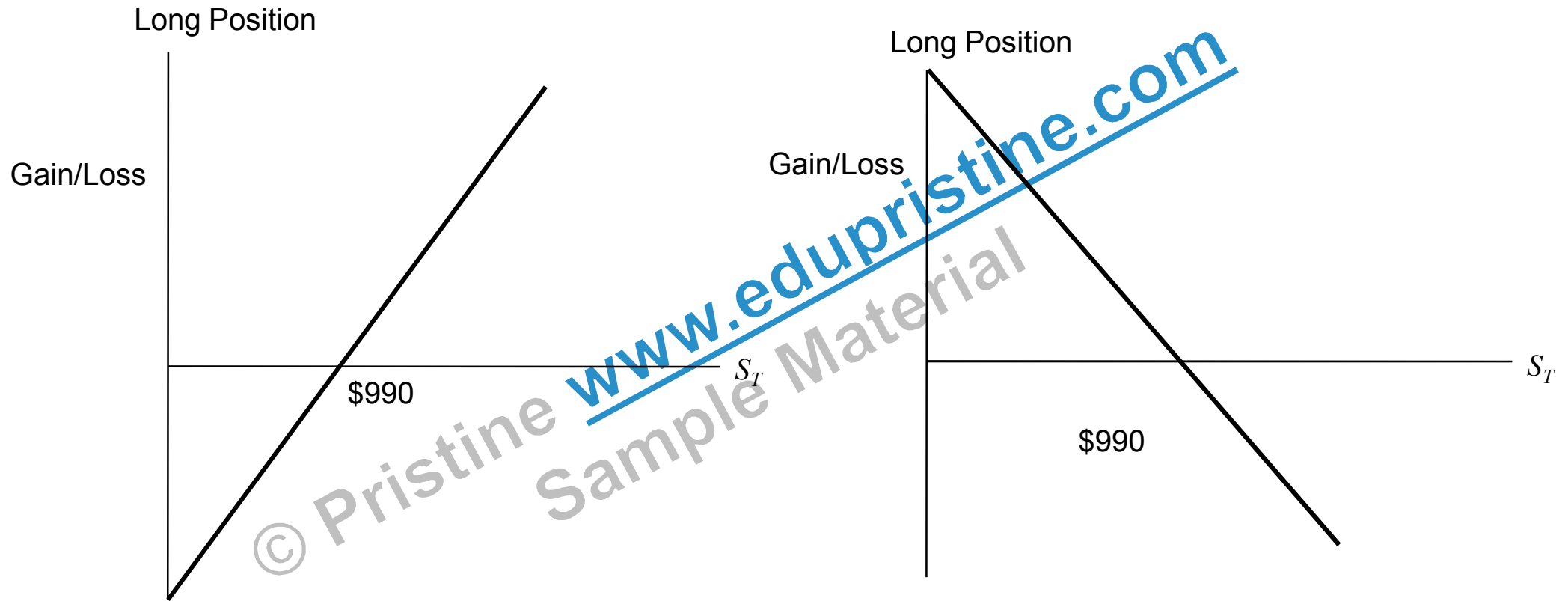
## Forward Contract: Example

- Underlying asset: Gold
- Spot price: \$980 / ounce
- Maturity: 6-month
- Size of contract: 100 ounces
- Forward price: \$990 / troy ounce

**Profit/Loss at maturity**

Spot price	950	970	990	1010	1030
Buyer (long)	-4,000	-2,000	0	+2,000	+4,000
Seller (short)	+4,000	+2,000	0	-2,000	-4,000

# Forward Contract: Example



## Settlement of a Forward contract

A position in a forward contract can be settled depending on the type of contract:

- Deliverable forward contract - Such contracts are settled by delivering the underlying asset on expiry of the contract.
- Cash settlement - Under this method the party which is on the loss side of the contract pays the amount of the loss to the other party terminate the contract.

The person who has a obligation to purchase the asset as per the contract(long position) pays the person who has a obligation to sell the asset(short position) if the prevailing price is lower than the contracted price.

- Terminating the position before expiration – This can be done by entering into another contract which is opposite to the current contract. The time period of the new contract should be equal to the time left till expiration of the current contract.

### Dealer versus End User

- The end users are typically corporations who want to hedge their risks.
- Dealers are like the market makers for forward contracts and include banks and other Non banking financial companies. Dealers may enter into contracts with other dealers to hedge their own outstanding positions.

## Forwards on Equity and bonds

- For Equity Forward Contracts the underlying asset is a stock. Such contracts can be settled by physical delivery or by delivery of the stock.
- One can also have a forward contract whose underlying is the stock index. Such contracts are settled in cash.
- Forward on zero coupon bonds or coupon paying bonds are the same as Equity Forward contracts. But as bonds have a fixed life, the forward contract on bonds must expire before the underlying bonds mature.
- T-bills are usually quoted at a discount to face value. This discount is annualised to arrive at the settlement price.
- Example:  
\$10 million face value T-bills with 100 days to maturity, priced at 2% discount.  
Compute the dollar amount to be paid by long to settle the T-bill
  - $2\% * (100/360) = 0.556\%$
  - \$ settlement price =  $(1 - 0.556\%) * 10 \text{ million} = \$9,944,444$

## Eurodollar Time Deposit market

- Euro Dollar time deposit refers to Dollar denominated deposits outside US.
- The rate of interest at which banks borrow funds from other banks in the London interbank market is called **LIBOR**(London Interbank Offered Rate).
- Quoted as annualized rate based on a 360 day year.
- LIBOR is published by the British Banker's Association on a daily basis.
- LIBOR is the most popular benchmark for short term interest rates.
- Equivalent Euro rate is called **Euribor**.

© Pristine [www.edupristine.com](http://www.edupristine.com)  
Sample Material

## Forward Rate Agreement(FRA)

- A forward rate agreement (FRA) is an agreement that a certain rate will apply to a certain principal during a certain future time period.
- Forward contract to borrow (long) or lend (short) at a pre-specified rate.
- A typical FRA is where interest at a predetermined rate,  $R_K$  is exchanged for interest at the market rate.
- A 3-by-7 FRA means a 120 day LIBOR starting 90 days from now.
- Payment to the long at settlement:

$$= \text{Notional Principal X } \frac{(\text{Rate at settlement} - \text{FRA Rate}) (\text{days}/360)}{1 + (\text{Rate at settlement}) (\text{days} / 360)}$$

## FRA Example

- FRA that
  - Settles in 30 days
  - \$1 million notional
  - Based on 90-day LIBOR
  - Forward rate of 5%
  - Actual 90-day LIBOR at settlement is 6%
- $(6\% - 5\%) * (90/360) * \$1\text{m} = \$2,500$
- $\text{PV: } 2,500 / (1 + (90/360)*6\%) = \$2,463$

© Pristine [www.edupristine.com](http://www.edupristine.com)  
Sample Material

## Currency Forward contracts

---

- A currency forward contract is a contract to exchange one currency for another at some future date at a per-specified rate.
- These contracts can be settled in cash or by actual exchange of the currencies.

© Pristine [www.edupristine.com](http://www.edupristine.com)  
Sample Material