

## Foreign Exchange Risk



### Topics

- Foreign Exchange Risk
- Foreign Exchange Exposure
- Financial Derivatives
  - Forwards
  - Futures
  - Options

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## Risks from International Investments



### Additional Risks

- **Political Risk:** Uncertainty about the ability of an investor to convert foreign currency into local currency in the future.
- **Foreign Exchange Rate Risk:** Uncertainty about the rate at which a foreign currency can be exchanged for the investor's local currency in the future.

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## Foreign Exchange Transactions



- There is no specific building or location where traders exchange currencies. Trading also occurs around the clock.
  - **Spot market:** The market for immediate exchange.
  - **Forward market:** It enables an MNC to lock in the exchange rate at which it will buy or sell a certain quantity of currency on a specified future date.
- Hundreds of banks facilitate foreign exchange transactions, though the top 20 handle about 50% of the transactions.

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### Foreign Exchange Quotations



- **Direct quotations** represent the value of a foreign currency in dollars, while **indirect quotations** represent the number of units of a foreign currency per dollar.
- **Cross exchange rate:** Amount of one foreign currency per unit of another foreign currency.

$$\text{Value of 1 unit of currency A in units of currency B} = \frac{\text{value of currency A in \$}}{\text{value of currency B in \$}}$$

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### Foreign Exchange Exposure



- **Foreign Exchange Exposure:** Measure of the potential for a firm's profitability, net cash flow, and market value to change because of a change in exchange rates.
  - These three components are the key financial elements of how we view a firm's success, thus a financial manager must know how to limit the firm's exposure to changes in exchange rates.
  - Although exchange rates cannot be forecasted with perfect accuracy, firms can at least measure their exposure to exchange rate fluctuations.

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### Types of Foreign Exchange Exposure



1. **Transaction Exposure:** The degree to which the value of future cash transactions can be affected by exchange rate fluctuations.
2. **Operating Exposure/Economic Exposure:** The degree to which a firm's present value of future cash flows can be influenced by exchange rate fluctuations.
3. **Translation Exposure/Accounting Exposure:** The exposure of the MNE's consolidated financial statements to exchange rate fluctuations.

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### Transaction Exposure



- Transaction exposure exists when the future cash transactions of a firm are affected by exchange rate fluctuations.
- When transaction exposure exists, the firm faces three major tasks:
  1. Identify its degree of transaction exposure.
  2. Decide whether to hedge its exposure.
  3. Choose among the available hedging techniques if it decides on hedging.

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### Foreign Exchange Rate Risk



- Managing Foreign Exchange Rate Risk: involves using hedge instruments such as
  - Currency forward contracts
  - Currency options
  - Currency futures

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### Financial Derivatives



- Derivatives: Financial instruments whose payoffs and values are derived from/depend upon underlying assets.
  - Forward contracts
  - Future contracts
  - Options
  - Swaps
- Raison d'être for derivatives
  - Hedging: To reduce one's risk exposure
  - Speculating: To increase one's risk exposure

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## Forwards



- **Forward Contract:** An agreement between two parties to exchange a designated amount of a financial asset or a commodity at a prespecified price on a predetermined future date.
- Long and short positions
  - The party agreeing to buy is said to take a long position.
  - The party agreeing to sell is said to take a short position.
- A forward contract is an obligation for each of the contracting parties.
- No money exchanges hands until maturity.

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## Forwards



- Contracting issues
  - Default risk
  - Liquidity risk
- Mitigated by financial intermediaries using customized forward contracts.

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## Foreign exchange forwards: Currency



- The forward exchange rate is a function of the spot exchange rate, the spot domestic interest rate, and the spot foreign interest rate.
  - Interest rate parity: The ratio between the risk free interest rates in two different countries is equal to the ratio between the forward and spot exchange rates.

$$\text{forward} = \text{spot} \times \left( \frac{1 + r_H}{1 + r_F} \right)$$

where,  
 $r_H$  = Home interest rate  
 $r_F$  = Foreign interest rate

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### Forward-Rate Agreements (FRA)



- FRA is an interest rate forward contract between two parties intent on locking in future borrowing costs.
- An FRA does not involve making loans or taking deposits.
- There is a cash settlement at a specified future date, the amount of which is determined by the size of the notional amount, the spread between the contract rate and the settlement rate, and the length of the contract period.
- Most FRA activities are concentrated in London, and, consequently, the "terms and conditions" recommended by the British Bankers' Association (BBA) are widely accepted by market participants.

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### Futures



#### Futures contract

- Similar to forward contract.
- Trades on organized exchanges.
  - Public price auction system
  - Clearing house
    - Initial margin
    - Maintenance margin
    - Marking-to-market
- Carries standardized terms, amounts and maturity dates.
- In both forward/futures contracts, the buyer and the seller have the obligation, not the option, to settle the contract at the future date.

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### Futures



- Foreign exchange futures
- Interest rate futures
  - T-bill futures
  - T-bonds and note futures
  - Eurodollar (deposit) futures
- Commodities futures
- Stock index futures

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## Futures and Hedging



- **Short hedge: Selling a futures contract**
  - Short hedges are used when
    - you will be making delivery at a future date and
    - you wish to minimize the risk of a drop in price.
- **Long hedge: Buying a futures contract**
  - Long hedges are used when
    - you will be making purchase at a future date and
    - you wish to minimize the risk of a rise in price.
- **Duration: The weighted average maturity of a cash flow stream in present value terms.**
  - By matching the duration of financial assets and liabilities, a change in interest rates has the same impact on the value of the assets and liabilities.

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## Options



- **Option:** a type of contract between two investors where one grants the other the right to buy or sell a specific asset in the future.
- **Call Option:** **Right**, not an obligation, to **buy** an asset at a specified exercise price on or before the exercise date.
- **Put Option:** **Right**, not an obligation, to **sell** an asset at a specified exercise price on or before the exercise date.

	Buyer	Seller
Call option	Right to buy asset	Obligation to sell asset
Put option	Right to sell asset	Obligation to buy asset

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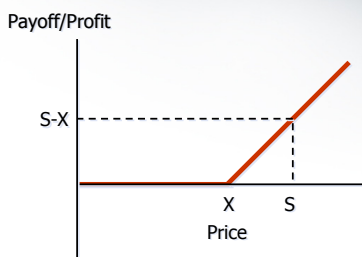
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## Option Value



- Call option value to buyer, given a \$ X exercise price.




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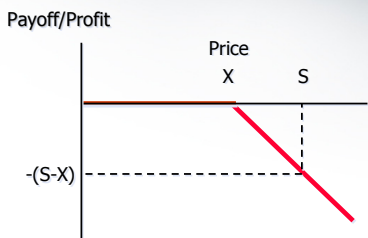
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### Option Value



- Call option payoff to seller, given a \$ X exercise price.



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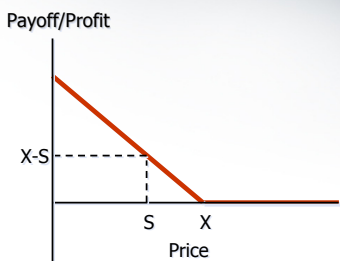
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### Option Value



- Put option value to buyer, given a \$ X exercise price.



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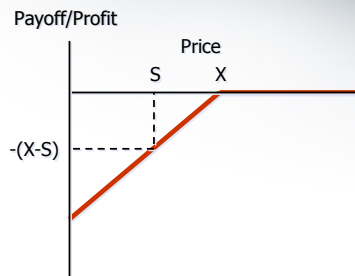
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### Option Value



- Put option value to seller, given a \$ X exercise price.



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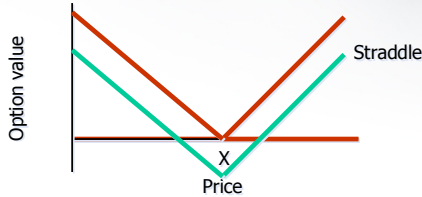
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### Option Value



- Straddle (Long call and long put): Strategy for profiting from high volatility



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### Operating Exposure



- Operating exposure is far more important for the long-run health of a business than changes caused by transaction or translation exposure.
  - Planning for operating exposure is total management responsibility since it depends on the interaction of strategies in finance, marketing, purchasing, and production.
  - An expected change in exchange rates is not included in the definition of operating exposure because management and investors should have factored this into their analysis of anticipated operating results and market value.
- This long term view is the objective of operating exposure analysis.

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### Managing Operating Exposure



- MNEs can then reduce its exposure by restructuring its operations to balance its exchange-rate-sensitive cash flows.
  - Increase/reduce sales in new or existing foreign markets.
  - Increase/reduce dependency on foreign suppliers.
  - Establish or eliminate production facilities in foreign markets.
  - Increase or reduce the level of debt denominated in foreign currencies.
- Caution: Due to the high costs of reversal, MNEs should carefully weigh the long-term potential benefits against costs before they implement the restructuring.

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