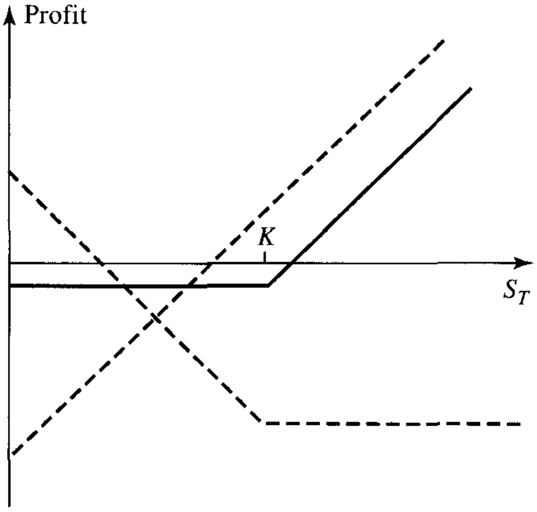
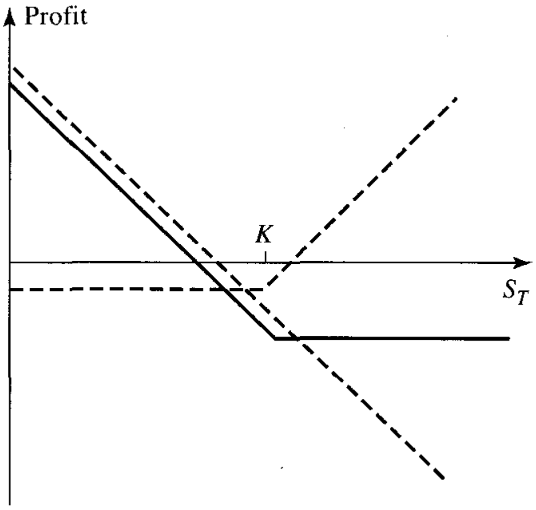
Topic 11. Hedging

Hedging by options



L: Stock, put

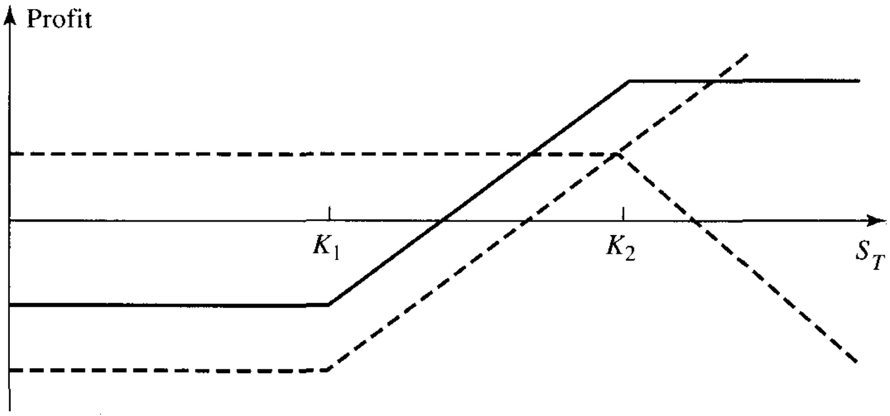


S: Stock, L: call

Portfolios of options

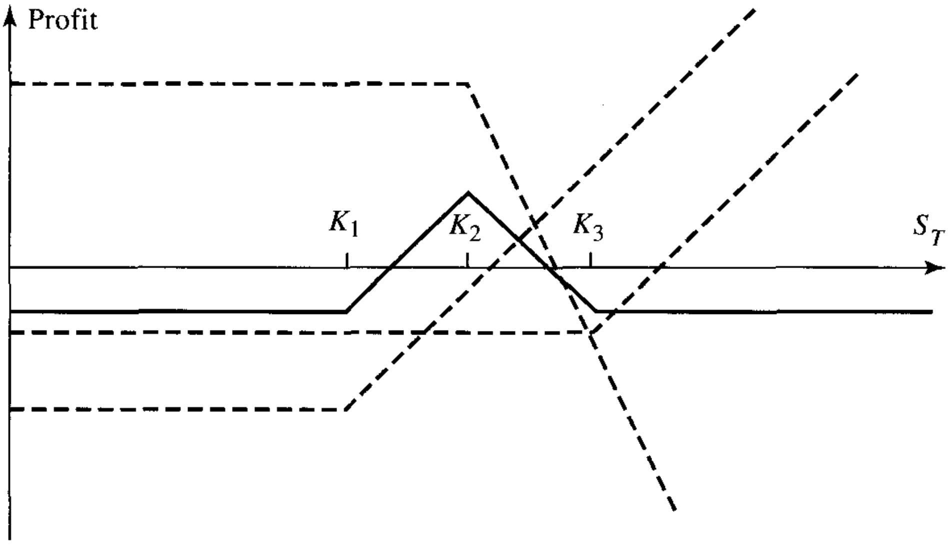
- <u>Spreads</u> – two or more options of the same type (e.g. two calls or two puts)

Bull spread: L: call (K_1), S: call (K_2), K_2>K_1



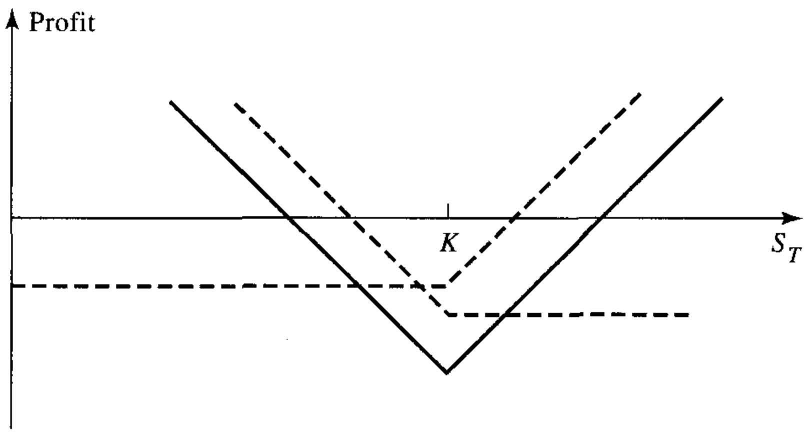
<u>Also:</u> Bull spread using puts, Bear spread using calls or puts

Butterfly spread: L: call(K_1), call(K_3)
S: 2 calls (K_2)

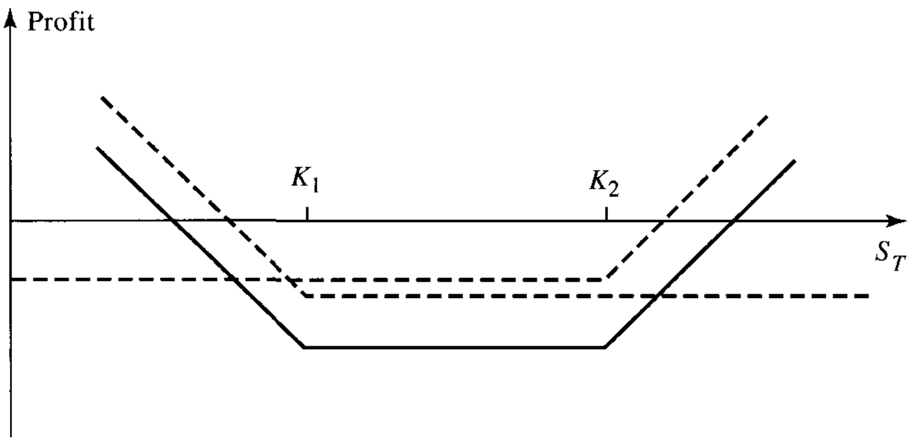


Also: Butterfly spread using puts

- Straddle – a call and a put with the same strike



- Strangle – a call and a put with different strikes



Exotic options

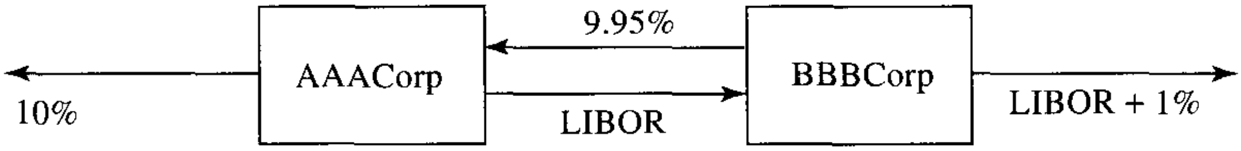
- **Compound** – option on an option
- **Chooser (as you like it)** – the holder may choose at some date whether it is a call or a put
- **Bermudan** – the holder can choose to exercise at a number of dates
- **Shout** – the holder can exercise at maturity or at one date prior to maturity
- **Barrier:**
  - *Knock-out* – ceases to exist when the underlying asset price reaches some level
  - *Knock-in* – comes into existence when the underlying asset price reaches some level
- **Binary:**
  - *Cash-or-nothing* – pays off zero or a fixed amount
- **Lookback** – payoff depends on max and min prices of the asset during the life of the option
- **Asian** – payoff depends on the average price of the asset during the life of the option:
  - *Average price call* – payoff=max[0, S^{av}-X]
  - *Average price put* – payoff=max[0, X-S^{av}]
- **Basket (rainbow)** – option on a portfolio of assets
- **Weather options (and futures)** – payoff depends on an index which reflects weather in a city

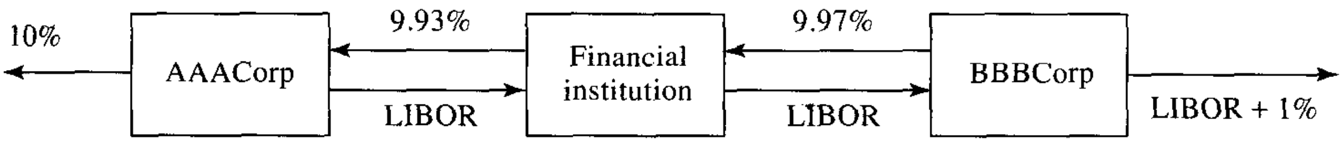
Hedging by swaps

Interest rate swaps

<u>Example:</u>

	Fixed	*Floating*
AAACorp	10.0%	6-month LIBOR + 0.3%
BBBCorp	11.2%	6-month LIBOR + 1.0%





Currency swaps

<u>Example:</u>

	*USD**	*AUD**
General Motors	5.0%	12.6%
Qantas Airways	7.0%	13.0%