Lecture 3: 08/04/22

Example 1.14:

Investor owns 1,000 shares

stock price today $S_0 = 28$

2-month put @ $K = 27.5$ : $P_0 = 1$

Investor buys 10 put contracts (each 100 shares):

Total cost of hedging strategy : $10 \cdot 100 \cdot 1 = 1{,}000$

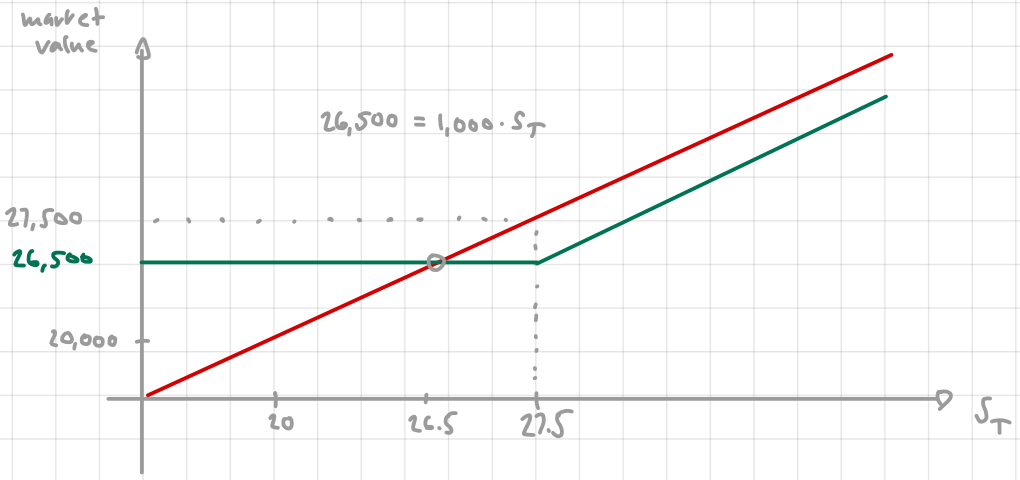
Market value of portfolio in $T = 2$ months with and without hedging:

(i) without puts : $\underbrace{+1{,}000 \cdot S_T}$

long position in stock

(ii) with puts : $\underbrace{+1{,}000 \cdot S_T}_{\text{long stock}} + \underbrace{1{,}000\,(27.5 - S_T)^+}_{\text{P\&L of long position in puts}} - 1{,}000$

$$= \begin{cases} +1{,}000\, S_T - 1{,}000 & S_T \geq 27.5 \\ \cancel{1{,}000\, S_T} + 1{,}000 \cdot 27.5 - \cancel{1{,}000\, S_T} - 1{,}000 & S_T < 27.5 \end{cases}$$



## Example 1.15:

Investor with 2,000 to invest

stock $S_0 = 20$

2-month call @ $K = 22.5$: $C_0 = 1$

Possible investment strategies:

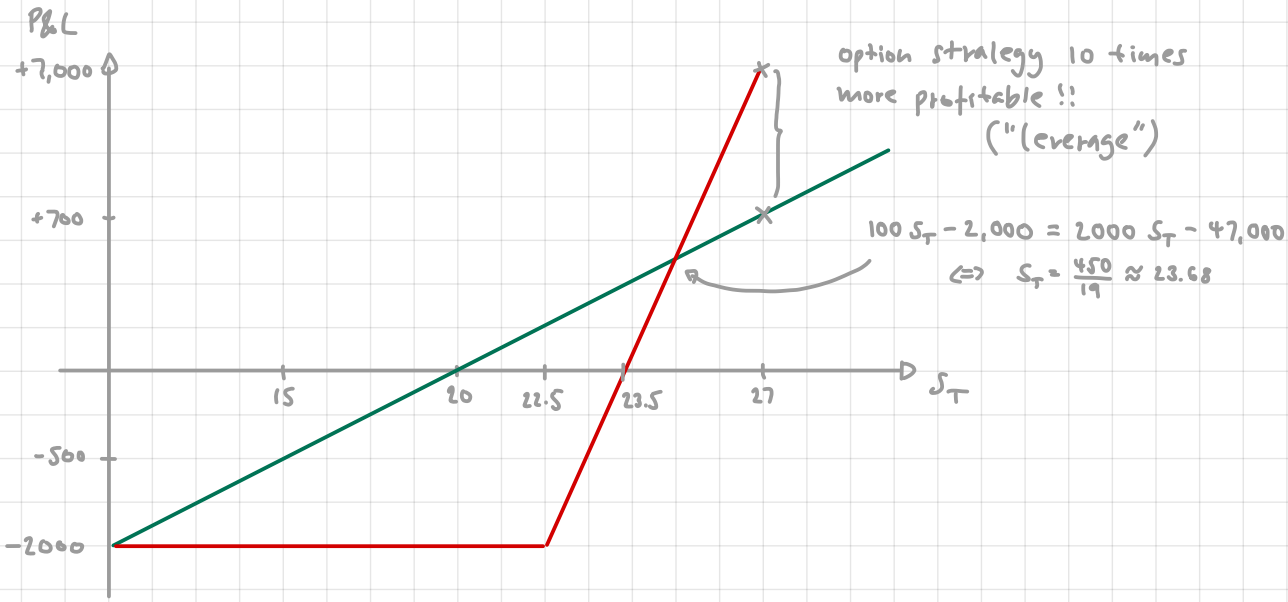
(i) Buy (long pos.) 100 shares: $100 \cdot 20 = 2{,}000$

(ii) Buy (long pos.) 20 call option contracts: $20 \cdot 100 \cdot 1 = 2{,}000$

Investor's net P&L at T = 2 months:

(i) $100\,S_T - 2{,}000$

(ii) $2{,}000\,(S_T - 22.5)^+ - 2{,}000 = \begin{cases} 2000\,S_T - 47{,}000, & S_T > 22.5 \\ -2{,}000, & S_T \le 22.5 \end{cases}$




Net P&L w/ 2 scenarios: $S_T = 15$ $S_T = 27$

Strategy (i) $15 \cdot 100 - 20 \cdot 100 = -500$ $27 \cdot 100 - 20 \cdot 100 = +700$

strategy (ii) $-2{,}000$ $2{,}000 \cdot 27 - 47{,}000 = 7{,}000$