ACTEX Learning Flashcards

Learning & Memorizing Key Topics and Formulas

SOA Exam MFE

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Profit of a Position

Profit (of net payoff) of a position is computed as follows:

Value of the final position at T

+ accumulated value of any income received in $(0, T)$

– accumulated cost to set up the position at time 0.

(Section 1.1.2)

Payoffs of *K*-strike *T*-year European Calls and Puts

Call: $(S_T - K)_+ = \max(S_T - K, 0)$

Put: $(K - S_T)_+ = \max(K - S_T, 0)$

(Section 1.1.3)

Forward and Prepaid Forward Prices

Module 1 – 5

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Type of Dividend	Prepaid Forward Price	Forward Price
None	S_t	$S_t e^{r(T-t)}$
Discrete	$S_t - \text{PV}_{t,T}(\text{Div})$	$S_t e^{r(T-t)} - \text{FV}_{t,T}(\text{Div})$
Continuous	$S_t e^{-\delta(T-t)}$	$S_t e^{(r-\delta)(T-t)}$

(Section 1.2)

Put-Call Parity

Module 1 – 7
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$$c(S_0, K, T) - p(S_0, K, T) = F_{0,T}^{P}(S) - Ke^{-rT} = e^{-rT}[F_{0,T}(S) - K]$$

(Section 1.3.1)

Caps and Floors

Module 1 – 9

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Cap = short stock + long call,

Floor = long stock + long put

(Section 1.3.2)

Covered Call and Covered Put

Module 1 – 11

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Covered call = short call + long stock,

Covered put = short put + short stock

(Section 1.3.2)

Spreads, Butterfly Spreads and Box Spread

Spread: created by same type of options

Suppose $K_1 < K_2 < K_3$. Let $\lambda = \dfrac{K_3 - K_2}{K_3 - K_1}$.

Bull Spread	Payoff does not decrease as stock price increases $c(K_1) - c(K_2)$ or $p(K_1) - p(K_2)$
Bear Spread	Payoff does not increase as stock price increases $c(K_2) - c(K_1)$ or $p(K_2) - p(K_1)$
Butterfly Spread	Long λ $c(K_1)$, short 1 $c(K_2)$, long $(1 - \lambda)$ $c(K_3)$ or Long λ $p(K_1)$, short 1 $p(K_2)$, long $(1 - \lambda)$ $p(K_3)$
Box Spread	Constant payoff of $K_2 - K_1$ $c(K_1) - c(K_2) + p(K_2) - p(K_1)$

(Section 1.3.3)

Collar

Long collar = long $p(K_1) - c(K_2)$ where $K_1 < K_2$

A zero-cost collar is a collar with a zero initial cost.

Collared stock = long stock + long collar

(Section 1.3.3)