

Financial Mathematics

MATH 5870/6870¹
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¹Based on Robert L. McDonald's *Derivatives Markets*, 3rd Ed, Pearson, 2013.

Chapter 9. Parity and other option relationships

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§ 9.1 Put-call parity

§ 9.2 Generalized parity and exchange options

§ 9.3 Comparing options with respect to style, maturity, and strike

§ 9.4 Problems

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European versus American options

$$C_{\text{Amer}}(S, K, T) \geq C_{\text{Eur}}(S, K, T)$$

$$P_{\text{Amer}}(S, K, T) \geq P_{\text{Eur}}(S, K, T)$$

Maximum and minimum option prices

$$S \geq C_{\text{Amer}}(S, K, T) \geq C_{\text{Eur}}(S, K, T) \geq \max(0, \text{PV}_{0,T}(F_{0,T}) - \text{PV}_{0,T}(K))$$

$$K \geq P_{\text{Amer}}(S, K, T) \geq P_{\text{Eur}}(S, K, T) \geq \max(0, \text{PV}(K) - \text{PV}_{0,T}(F_{0,T}))$$

Early exercise for American options

$$C_{\text{Amer}} \geq C_{\text{Eur}} > S_t - K$$

$$K - \text{PV}_{t,T}(K) > \text{PV}_{t,T}(\text{Div})$$

See p. 277 for the proof of the first set of inequalities.

Unfinished...