# Chapter 9: Parity & Other Option Relations

## Finance 6470 - Derivatives Markets

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## Section 9.1: Put-Call Parity

Chapter 9

# Parity and Other Option Relationships

# IBM Option Quotes

TABLE 9.1 IBM option prices, dollars per share, May 6, 2011. The closing price of IBM on that day was $168.89.

| | | Calls | | Puts | |
|---|---|---|---|---|---|
| Strike | Expiration | Bid ($) | Ask ($) | Bid ($) | Ask ($) |
| 160 | June | 10.05 | 10.15 | 1.16 | 1.20 |
| 165 | June | 6.15 | 6.25 | 2.26 | 2.31 |
| 170 | June | 3.20 | 3.30 | 4.25 | 4.35 |
| 175 | June | 1.38 | 1.43 | 7.40 | 7.55 |
| 160 | October | 14.10 | 14.20 | 5.70 | 5.80 |
| 165 | October | 10.85 | 11.00 | 7.45 | 7.60 |
| 170 | October | 8.10 | 8.20 | 9.70 | 9.85 |
| 175 | October | 5.80 | 5.90 | 12.40 | 12.55 |

*Source:* Chicago Board Options Exchange.

# Put-Call Parity

- For European options with the same strike price and time to expiration the parity relationship is

$$\text{Call} - \text{put} = PV(\text{forward price} - \text{strike price})$$

or

$$C(K,T) - P(K,T) = PV_{0,T}(F_{0,T} - K) = e^{-rT}(F_{0,T} - K)$$

- Intuition
  - Buying a call and selling a put with the strike equal to the forward price ($F_{0,T} = K$) creates a synthetic forward contract and hence must have a zero price