

Financial Mathematics

MATH 5870/6870¹
Fall 2021

Le Chen

lzc0090@auburn.edu

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Auburn University
Auburn AL

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

Chapter 3. Insurance, Collars, and Other Strategies

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§ 3.1 Basic insurance strategies

§ 3.2 Put-call parity

§ 3.3 Spreads and collars

§ 3.4 Speculating on volatility

§ 3.5 Problems

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Directional positions

- ▶ Bull spread
 - ▶ Bear spread
 - ▶ Collars
 - ▶ Box spreads
-

Nondirectional positions

- ▶ Straddles
- ▶ Strangle
- ▶ Butterfly spread

Investors who do not care whether the stock goes up or down,
but only how much it moves.

Investors are speculating on volatility.

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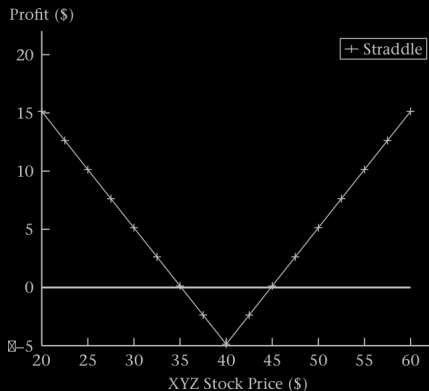
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Straddles

Straddle is the strategy of buying a call and a put with the same strike price and time to expiration.

A straddle is a bet that volatility will be high relative to the market's assessment



Strangle

Straddle is the strategy of buying an out-of-the-money call and put with the same time to expiration.

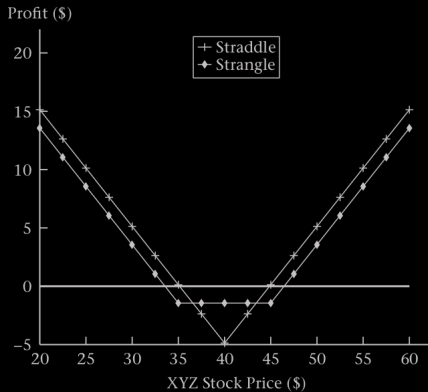
A strangle can be used to reduce the high premium cost, associated with a straddle.

Example 3.4-1 Draw profit diagram for 40-strike straddle and strangle composed of 35-strike put + 45-strike call.

Solution.

Example 3.4-1 Draw profit diagram for 40-strike straddle and strangle composed of 35-strike put + 45-strike call.

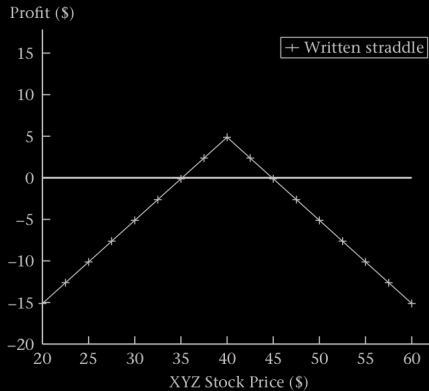
Solution.



Written straddles

Written straddle is the strategy of selling a call and put with the same strike price and time to maturity.

Unlike a purchased straddle, a written straddle is a bet that volatility will be low relative to the market's assessment



Butterfly spreads

Butterfly spreads = Insured wrien straddle
= Write a straddle + add a stragle

A butterfly spread insures against large losses on a straddle.

