

# Financial Mathematics

MATH 5870/6870<sup>1</sup>  
Fall 2021

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Last updated on  
August 30, 2021

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<sup>1</sup>Based 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
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## Nondirectional positions

- ▶ Straddles
- ▶ Strangle
- ▶ Butterfly spread

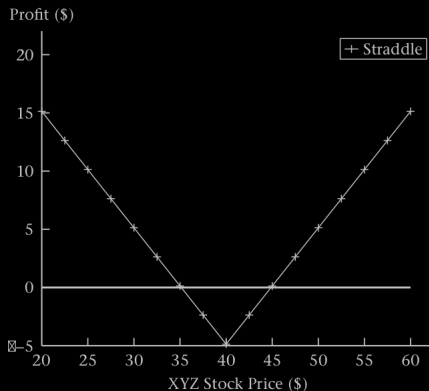
Investors who do not care whether the stock goes up or down,  
but only how much it moves.

Investors are speculating on volatility.

## 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



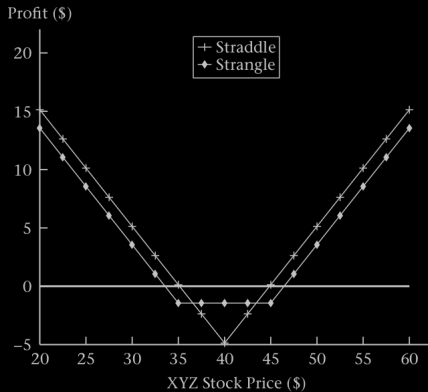
## Strangle

**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.

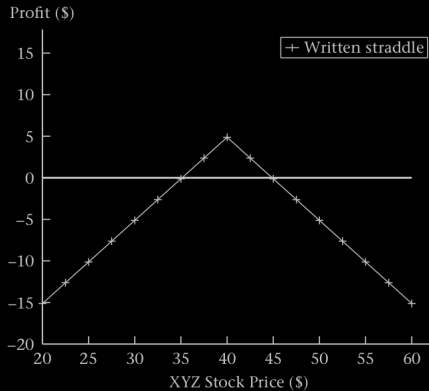




## Written straddles

**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.

