Financial Mathematics

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

Chapter 13. Market-Making and Delta-Hedging

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§ 13.1 What do market-makers do?

§ 13.2 Market-maker risk

§ 13.3 Delta-Hedging

§ 13.4 The mathematics of Delta-hedging

§ 13.5 The Black-Scholes analysis

§ 13.6 Market-Making as insurance

§ 13.7 Problems

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- Provide immediacy by standing ready to sell to buyers (at ask price) and to buy from sellers (at bid price)
- Generate inventory as needed by short-selling
- Profit by charging the bid-ask spread
- The position of a market-maker is the result of whatever order flow arrives from customers

- Proprietary trading is conceptually distinct from market-making:

  Proprietary trading: Profit by market goes up or down.

  Market-making: Profit by buying at the bid and selling at the ask.