Introduction

Long/Short hedge

Basis risk

Minimum variance hedge

Portfolio beta

Short vs. Long Hedge

Short vs. Long Hedge #Question 18

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3.18. Imagine you are the treasurer of a Japanese company exporting electronic equipment to the United States. Discuss how you would design a foreign exchange hedging strategy and the arguments you would use to sell the strategy to your fellow executives.

Arguments for and against Hedging

Arguments for and against Hedging #Question 24

3.24. A corn farmer argues, “I do not use futures contracts for hedging. My real risk is not the price of corn. It is that my whole crop gets wiped out by the weather.” Discuss this viewpoint. Should the farmer estimate his or her expected production of corn and hedge to try to lock in a price for expected production?

Arguments for and against Hedging #Question 28

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3.28. Suppose that the 1-year gold lease rate is 1.5% and the 1-year risk-free rate is 5.0%. Both rates are compounded annually. Use the discussion in Business Snapshot 3.1 to calculate the maximum 1-year gold forward price Goldman Sachs should quote to the gold-mining company when the spot price is $1,200.

Basis Risk

Basis Risk #Question 17

3.17. Explain why a short hedger’s position improves when the basis strengthens unexpectedly and worsens when the basis weakens unexpectedly.

Basis Risk #Question 19

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3.19. Suppose that in Example 3.2 of Section 3.3, the company decides to use a hedge ratio of 0.8. How does the decision affect the way in which the hedge is implemented and the result?

Basis Risk #Question 30

3.30. It is now June. A company knows that it will sell 5,000 barrels of crude oil in September. It uses the October CME Group futures contract to hedge the price it will receive. Each contract is on 1,000 barrels of “light sweet crude.” What position should it take? What price risks is it still exposed to after taking the position?

Basis Risk #Question 31

3.31. Sixty futures contracts are used to hedge an exposure to the price of silver. Each futures contract is on 5,000 ounces of silver. At the time the hedge is closed out, the basis is $0.20 per ounce. What is the effect of the basis on the hedger's financial position (a) if the trader is hedging the purchase of silver and (b) the trader is hedging the sale of silver?

Minimum Variance Hedge

Minimum Variance Hedge #Question 12

3.12. Under what circumstances does a minimum variance hedge portfolio lead to no hedging at all?

Minimum Variance Hedge #Question 13

3.13. Suppose that the standard deviation of quarterly changes in the prices of a commodity is $0.65, the standard deviation of quarterly changes in a futures price on the commodity is $0.81, and the coefficient of correlation between the two changes is 0.8. What is the optimal hedge ratio for a 3-month contract? What does it mean?

Minimum Variance Hedge #Question 20

3.20. “If the minimum variance hedge ratio is calculated as 1.0, the hedge must be perfect.” Is this statement true? Explain your answer.

Minimum Variance Hedge #Question 23

3.23. The standard deviation of monthly changes in the spot price of live cattle is (in cents per pound) 1.2. The standard deviation of monthly changes in the futures price of live cattle for the closest contract is 1.4. The correlation between the futures price changes and the spot price changes is 0.7. It is now October 15. A beef producer is committed to purchasing 200,000 pounds of live cattle on November 15. The producer wants to use the December live cattle futures contracts to hedge its risk. Each contract is for the delivery of 40,000 pounds of cattle. What strategy should the beef producer follow?

Minimum Variance Hedge #Question 32

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3.32. A trader owns 55,000 units of a particular asset and decides to hedge the value of her position with futures contracts on another related asset. Each futures contract is on 5,000 units. The spot price of the asset that is owned is $28, and the standard deviation of the change in this price over the life of the hedge is estimated to be $0.43. The futures price of the related asset is $27, and the standard deviation of the change in this over the life of the hedge is $0.40. The coefficient of correlation between the spot price change and futures price change is 0.95.

(a) What is the minimum variance hedge ratio?

(b) Should the hedger take a long or short futures position?

(c) What is the optimal number of futures contracts when adjustments for daily settlement are not considered?

(d) How can the daily settlement of futures contracts be taken into account?

Minimum Variance Hedge #Question 33

3.33. A company wishes to hedge its exposure to a new fuel whose price changes have a 0.6 correlation with gasoline futures price changes. The company will lose $1 million for each 1 cent increase in the price per gallon of the new fuel over the next three months. The new fuel's price changes have a standard deviation that is 50% greater than price changes in gasoline futures prices. If gasoline futures are used to hedge the exposure, what should the hedge ratio be? What is the company's exposure measured in gallons of the new fuel? What position, measured in gallons, should the company take in gasoline futures? How many gasoline futures contracts should be traded? Each contract is on 42,000 gallons.

Portfolio/Stock Beta

Portfolio/Stock Beta #Question 14

3.14. A company has a $20 million portfolio with a beta of 1.2. It would like to use futures contracts on a stock index to hedge its risk. The index futures price is currently standing at 1080, and each contract is for delivery of $250 times the index. What is the hedge that minimizes risk? What should the company do if it wants to reduce the beta of the portfolio to 0.6?

Portfolio/Stock Beta #Question 25

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3.25. On July 1, an investor holds 50,000 shares of a certain stock. The market price is $30 per share. The investor is interested in hedging against movements in the market over the next month and has decided to use an index futures contract. The index futures price is currently 1,500, and one contract is for delivery of $50 times the index. The beta of the stock is 1.3. What strategy should the investor follow? Under what circumstances will it be profitable?

Portfolio/Stock Beta #Question 29

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3.29. The expected return on the S&P 500 is 12%, and the risk-free rate is 5%. What is the expected return on an investment with a beta of (a) 0.2, (b) 0.5, and (c) 1.4?

Portfolio/Stock Beta #Question 34

3.34. A portfolio manager has maintained an actively managed portfolio with a beta of 0.2. During the last year, the risk-free rate was 5%, and equities performed very badly, providing a return of -30%. The portfolio manager produced a return of -10% and claims that, in the circumstances, it was a good performance. Discuss this claim.

Portfolio/Stock Beta #Question 35

3.35. It is on July 16. A company has a portfolio of stocks worth $100 million. The beta of the portfolio is 1.2. The company would like to use the December futures contract on a stock index to change the beta of the portfolio to 0.5 during the period from July 16 to November 16. The index futures price is currently 2,000, and each contract is $250 times the index.

(a) What position should the company take?

(b) Suppose that the company changes its mind and decides to increase the beta of the portfolio from 1.2 to 1.5. What position in futures contracts should it take?

Stock and Roll #Question 26

3.26. Suppose that in Table 3.5[1)], the company decides to use a hedge ratio of 1.5. How does the decision affect the way the hedge is implemented and the result?

Table 3.5 Data for the example on rolling oil hedge forward.

Date	*Apr. 2021*	*Sept. 2021*	*Feb. 2022*	*June 2022*
Oct. 2021 futures price	48.20	47.40		
Mar. 2022 futures price		47.00	46.50	
July 2022 futures price			46.30	45.90
Spot price	49.00			46.00

1) Hull(2021), Table 3.5

Perfect Hedge #Question 11

3.11. Explain what is meant by a *perfect hedge*. Does a perfect hedge always lead to a better outcome than an imperfect hedge? Explain your answer.

Perfect Hedge #Question 16

3.16. Does a perfect hedge always succeed in locking in the current spot price of an asset for a future transaction? Explain your answer.

Delivery Date #Question 15

3.15. In the corn futures contract traded on an exchange, the following delivery months are available: March, May, July, September, and December. Which of the available contracts should be used for hedging when the expiration of the hedge is in (a) June, (b) July, and (c) January?

Discussions #Question 21

3.21. “If there is no basis risk, the minimum variance hedge ratio is always 1.0.”

Is this statement true? Explain your answer.

Discussions #Question 22

3.22. “When the futures price of an asset is less than the spot price, long hedges are likely to be particularly attractive.” Explain this statement.

Discussions #Question 27

3.27. An airline executive has argued: “There is no point in our using oil futures. There is just as much chance that the price of oil in the future will be less than the futures price as there is that it will be greater than this price.” Discuss the executive’s viewpoint.