

1.1. When a trader enters into a long forward contract, she is agreeing to buy an asset for a certain price at a certain time in the future. When she enters into a short forward contract, she is agreeing to *sell* the underlying asset at a certain time in the future.

1.2. A trader is *hedging* when she has an exposure to the price of an asset and takes a position in a derivative to offset the exposure. In a *speculative* position, she has an exposure to the price of an asset and takes a position in a derivative to increase her exposure to the price of the asset. *Arbitrage* involves taking a position in two or more different markets to make a profit.

1.3. In the first case the trader is obligated to buy the asset for \$50. In the second case the trader has an option to buy the asset for \$50. (The trader does not have to exercise the option.)

1.4. Writing a call option involves selling an option to someone else.

$$\min(K - S_T, 0)$$

Buying a put option involves buying an option from someone else.

$$\max(K - S_T, 0)$$

In both cases the potential payoff is $K - S_T$. When you write a call option, the payoff is negative or zero. (This is because the counterparty chooses whether to exercise.)

1.5. (a) The trader sells 100 million yen for \$0.0080 per yen when the price is \$0.0074 per yen. The gain is 100×0.0006 millions of dollars or \$60,000.
(b) The trader sells 100 million yen for \$0.0080 per yen when the price is \$0.0091 per yen. The loss is 100×0.0011 millions of dollars or \$110,000.

1.6. (a) The trader sells for 50 cents per pound something that is worth \$0.5000 per pound. Gain = $(\$0.5000 - \$0.4820) \times 50,000 = \900 .
(b) The trader sells for 50 cents per pound something that is worth \$0.5130 per pound. Loss = $(\$0.5130 - \$0.5000) \times 50,000 = \650 .

can happen is that the price of AOL Time Warner declines throughout the period. This highly unlikely event would cost you \$4,000. The future losses you receive the price of the option from the

to buy 200 shares. Another would be to buy 2,000 options. Well the second strategy will give rise to greater gains. For the price goes up to \$40 you gain $[2,000 \times (\$40 - \$30)] - \$5,800 =$ strategy and only $200 \times (\$40 - \$29) = \$2,200$ from the first the share price does badly, the second strategy gives greater the share price goes down to \$25, the first strategy leads to a $(\$25 - \$30) = \$800$, whereas the second strategy leads to a loss of the $(\$25 - \$30) = \$500$. This example shows that options contain built in leverage.

t options (or 50 contracts) with a strike price of \$25 and an months. This provides a type of insurance. If at the end of 4 improves to be less than \$25 you can exercise the options and each. The cost of this strategy is the price you pay for the put

it if the stock price is below \$37 at the maturity of the option. exercised if the stock price is below \$40. See Figure 1.1 for the with the stock price.

it if the stock price is below \$54 at the maturity of the option. exercised by the counterparty if the stock price is above \$50. See tion of the profit with the stock price.

variation of the trader's position with the asset price. We can set prices into three ranges:

e less than \$40, the put option provides a payoff of $40 - S_T$ provides no payoff. The options cost \$7 and so the total profit is ce is between \$40 and \$45, neither option provides a payoff. ; greater than \$45, the call option provides a payoff of $S_T - 45$ provides no payoff. Taking into account the \$7 cost of the options, 52.

fit (ignoring the time value of money) if the stock price is less n \$52. This type of trading strategy is known as a strangle oter 9.

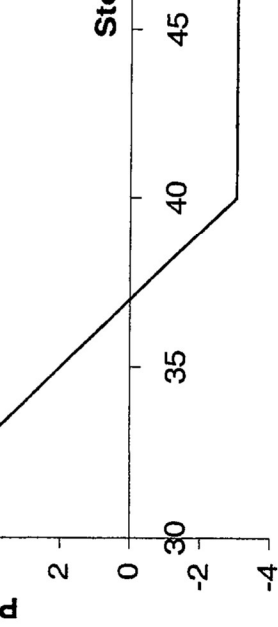


Figure 1.1 Profit from long put position in Profit vs Stock Price

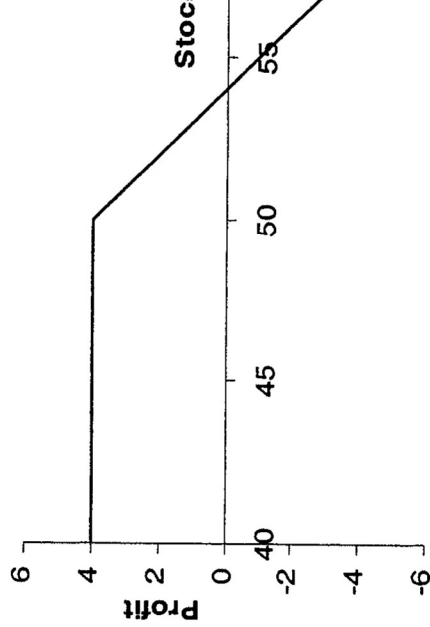


Figure 1.2 Profit from short call position in Profit vs Stock Price

1.13. A stock option provides no funds for the company. It is a security to another. The company is not involved. By contrast, a stock option is a claim sold by the company to investors and does provide

1.14. If a trader has an exposure to the price of an asset, she can