4. Options Markets

4.3. Trading Strategies
Three Types

1. Asset and Option

2. Spread:
   using calls or puts

3. Combination:
   using calls and puts
## Data

<table>
<thead>
<tr>
<th>strike</th>
<th>call</th>
<th>put</th>
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</thead>
<tbody>
<tr>
<td>90</td>
<td>24.81</td>
<td>3.07</td>
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<td>$S = 100$</td>
<td>18.84</td>
<td>5.80</td>
</tr>
<tr>
<td>110</td>
<td>13.97</td>
<td>9.62</td>
</tr>
</tbody>
</table>
1. Covered Call

buy asset
write call
1. Protective Put

buy asset
buy put
2. Bull Spread Using Calls

buy in-the-money call
write out-of-the-money call
2. Bull Spread Using Puts

buy out-of-the-money put
write in-the-money put
2. Bear Spread Using Calls

buy out-of-the-money call
write in-the-money call
2. Bear Spread Using Puts

buy in-the-money put
write out-of-the-money put
2. Butterfly Spread Using Calls

- buy 1 in-the-money call
- write 2 at-the-money calls
- buy 1 out-of-the-money call
2. **Butterfly Spread Using Puts**

    buy 1 in-the-money put
    write 2 at-the-money puts
    buy 1 out-of-the-money put
2. Calendar Spread Using Calls

buy call with $T_2$
write call with $T_1 < T_2$
2. Calendar Spread Using Puts

buy put with $T_2$
write put with $T_1 < T_2$
3. Collar

- buy asset
- write out-of-the-money call
- buy out-of-the-money put
3. Synthetic Forward

buy out-of-the-money call
write in-the-money put
where $c = p$
3. Straddle

buy at-the-money call
buy at-the-money put
3. Strangle

buy out-of-the-money call
buy out-of-the-money put
3. Strip

buy 1 at-the-money call
buy 2 at-the-money puts
3. Strap

buy 2 at-the-money calls
buy 1 at-the-money put
Homework

1. (Hull 10.10) Suppose that put options on a stock with strike prices $30 and $35 cost $4 and $7 respectively. How can the options be used to create (a) a bull spread? (b) a bear spread? Construct a table that shows the profit and payoff for both spreads.

2. (Hull 10.12) A call with a strike price of $60 costs $6. A put with the same strike price and expiration date costs $4. Construct a table that shows the profit from a straddle. For what range of stock prices would the straddle lead to a loss?

3. (Hull 10.19) Three put options on a stock have the same expiration date and strike prices of $55, $60, and $65. The market prices are $3, $5, and $8 respectively. Explain how a butterfly spread can be created. Construct a table showing the profit from the strategy. For what range of stock prices would the butterfly spread lead to a loss?