1 Credits


2 Contracts

Players may buy/sell one of the following types of contracts: forward, call option, put option.

Forward: an obligation to buy a security at a specified time (called the delivery date) in the future for a price (called the forward price) agreed upon now. There is no initial cost. The payoff of a forward is $S - K$ where $S$ is the security price on the delivery date (unknown at $t = 0$) and $K$ is the agreed upon future price (known at $t = 0$).

For example if the forward price is 15, the payoff from the transaction as a function of the value of the underlying security would be:

![Payoff diagram](image)
**Call:** the right to buy a security at a specified time in the future (called expiry) for a price (called the strike price) agreed upon now. Calls have an up-front cost. The payoff of a call is \((S - K)^+\) where \(S\) is the security price at expiry (unknown at \(t = 0\)) and \(K\) is the strike price (known at \(t = 0\)).

For example if the strike price is 15, the payoff from owning a call as a function of the value of the underlying security would be:

![Call Payoff Graph](image)

**Put:** the right to sell a security at a specified time in the future (called expiry) for a price (called the strike price) agreed upon now. Puts have an up-front cost. The payoff of a put is \((K - S)^+\) where \(S\) is the security price at expiry (unknown at \(t = 0\)) and \(K\) is the strike price (known at \(t = 0\)).

For example if the strike price is 15, the payoff from owning a put as a function of the value of the underlying security would be:

![Put Payoff Graph](image)
3 Rules

The objective of the game is to earn the highest profit, of which, 100% will be donated to higher education.

1. A game will consist of 20 rounds.

2. Players must buy or sell contracts during each round. If a trade is made, the parties must record the strike price, type of contract, quantity traded, and cost of the contract.

3. For calls and puts players will decide on the cost of the contracts. Forwards are free.

4. Players choose the forward price. Strike prices of calls and puts will be decided by me at first. After we have some experience players may decide these as well.

5. All contracts expire at the end of the 20th round.

6. At the end of each round a random number from sample space \{1, 2, 3, 4, 5, 6\} will be chosen. The security price at expiry will be the sum of these 20 random numbers.

4 Sample Round

Suppose during a round of the game a player

- buys 7 call options with a strike price of 19 at a cost of 1.5 each,
- sells 3 put options with a strike price of 16 at a cost of 2 each, and
- buys 6 forwards with a forward price of 18.

The player’s trading sheet should show a record of transactions like the following.

<table>
<thead>
<tr>
<th>Contract</th>
<th>Buy/Sell</th>
<th>Cost per Contract</th>
<th>Total Cost</th>
<th>Settlement Value</th>
<th>Profit/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call (K=19)</td>
<td>Buy 7</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Put (K=16)</td>
<td>Sell 3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward (K=18)</td>
<td>Buy 6</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At the end of round 5 the security price is 20. The player may calculate the profit/loss as follows.

<table>
<thead>
<tr>
<th>Contract</th>
<th>Buy/Sell</th>
<th>Cost per Contract</th>
<th>Total Cost</th>
<th>Settlement Value</th>
<th>Profit/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call (K=19)</td>
<td>Buy 7</td>
<td>1.5</td>
<td>((20 - 19)^+ = 1)</td>
<td>1 - 1.5 = -0.5</td>
<td>-0.5 * 7 = -3.5</td>
</tr>
<tr>
<td>Put (K=16)</td>
<td>Sell 3</td>
<td>2</td>
<td>((16 - 20)^+ = 0)</td>
<td>2 - 0 = 2</td>
<td>2 * 3 = 6</td>
</tr>
<tr>
<td>Forward (K=18)</td>
<td>Buy 6</td>
<td>—</td>
<td>((20 - 18) = 2)</td>
<td>2</td>
<td>2 * 6 = 12</td>
</tr>
</tbody>
</table>

Total profit \(-3.5 + 6 + 12 = 14.5\).