## APPENDIX: Position Risk Profiles—Selected Single-Month Positions

<table>
<thead>
<tr>
<th>Positions</th>
<th>Options Positioning</th>
<th>Positions</th>
<th>Options Positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Long Call</td>
<td>Buy 1 100 call</td>
<td>10. Long Call</td>
<td>Short 1 100 call</td>
</tr>
<tr>
<td>2. Short Call</td>
<td>Sell 1 100 call</td>
<td>Ratio Spread</td>
<td>Long 2 105 calls</td>
</tr>
<tr>
<td>3. Long Put</td>
<td>Buy 1 100 put</td>
<td>11. Short Call</td>
<td>Long 1 100 call</td>
</tr>
<tr>
<td>4. Short Put</td>
<td>Sell 1 100 put</td>
<td>Ratio Spread</td>
<td>Short 2 105 calls</td>
</tr>
<tr>
<td>5. Long Straddle</td>
<td>Buy 1 100 call</td>
<td>12. Bear Cartwheel</td>
<td>Long 1 100 call</td>
</tr>
<tr>
<td>6. Short Straddle</td>
<td>Sell 1 100 put</td>
<td></td>
<td>Short 2 105 calls</td>
</tr>
<tr>
<td>7. Bull Spread</td>
<td>Buy 1 95 call</td>
<td>13. Long Butterfly</td>
<td>Short 1 100 put</td>
</tr>
<tr>
<td>8. Bear Spread</td>
<td>Buy 1 105 put</td>
<td></td>
<td>Long 1 100 call</td>
</tr>
<tr>
<td></td>
<td>Sell 1 95 put</td>
<td></td>
<td>Short 1 100 put</td>
</tr>
</tbody>
</table>

### Where
- Futures price = 100
- Day to Expiration = 30
- Implied Volatility = 15
- Interest Rate = 10
- 1 Standard Deviation = 5.7
- 2 SD = 11.4

### Scale Key:
- A. $ = Dollar payoff at expiration (solid line) and at 30 days (light line).
- B. Δ = Delta
- C. Γ = Gamma
- C. Θ = Theta
- C. K = Kappa/Vega*

*Vega, of course, is not a Greek letter and therefore has no direct Greek alphabetical equivalent but in popular usage has become the substitute for kappa.*
The risk determinants we also do not indicate in the above charts, which are very important for position risk management. For detailed analysis, risk indices such as delta (\( \Delta \)), gamma (\( \Gamma \)), and theta (\( \Theta \)) are crucial. Delta is the rate of change of the option price with respect to the change in the underlying asset price. Gamma measures the rate of change of delta with respect to the change in the underlying asset price. Theta represents the rate of change of the option price with respect to the passage of time. The graphs illustrate these concepts for a long call position. A higher delta indicates a more sensitive option to price changes, while gamma shows how delta will change with price. Theta is negative for in-the-money options, indicating a decrease in value over time.
Long Butterfly

\[ A \]

\[ \$5.00 \]

\[ \Delta \]

\[ 0 \]

\[ B \]

\[ 0 \]

\[ C \]

\[ 0 \]

\[ \Gamma \]

\[ K \]

\[ \Theta \]

Futures Price ($)

\[ 80 \quad 90 \quad 100 \quad 110 \quad 120 \]

SD
Synthetic Option Market Making

Propriety executed, synthetic option traders are virtually risk free and, therefore, approach the most risk conservative of all option trading. Synthetic trading is not a form of arbitrage, in which a discrepancy between two prices is exploited. The actual option and its synthetic equivalent are captured as profit. Synthetic trading realizes an arbitrage profit in any one of the same-call or same-put, or long or short in any of the three trading instruments (call, put, and collar). Even if traders are following other option strategies, option traders should be completely familiar with this form of trading.

For synthetic principles will often determine which options are most appropriate for purchase or sale in any specific trading strategy. Trading synthetically does not mean that a single-position long or short in any of the three trading instruments (call, put, or collar) will be successful.
These parity relations are simplified for same-month and same-strike futures options in Table 5.1, disregarding for the moment

| Long call | = Long put and long future |
| Short call | = Short put and short future |
| Long put | = Long call and short future |
| Short put | = Short call and long future |
| Long future | = Long call and short put |
| Short future | = Short call and long put |

Conversion  = Long future, short synthetic future  
             (short call, long put)  
             = Short call, long synthetic call  
             (long put, long future)  
             = Long put, short synthetic put  
             (short call, long future)

Reversal  = Short future, long synthetic future  
            (long call, short put)  
            = Long call, short synthetic call  
            (short put, short future)  
            = Short put, long synthetic put  
            (long call, short future)

Box = Conversion and reversal at different strikes