Profit Profile for a Stereo

DATE	Nearby Position	Deferred Position
t=0		
Commodity 1	Short Q_{NI} contracts at F(0,N)	Long Q_{TI} units at F(0,T)
Commodity 2	Long Q_{N2} units at G(0,N)	Short Q_{T2} units at G(0,T)
t=1		
Commodity 1	Close out position with Long Q_{NI} units at F(1,N)	Close out position with Short Q_{TI} at F(1,T)
Commodity 2	Close out position with Short Q_{N2} units at G(1,N)	Close out position with Long Q_{T2} at GF(1,T)

In this case, the profit function can be specified:

$$\Pi(1,T) = \{Q_{NI}\ (F(0,N) - F(1,N)) + Q_{TI}\ (F(1,T) - F(0,T))\} +$$
$$\{Q_{N2}\ (G(1,N) - G(0,N)) + Q_{T2}(G(0,T) - G(1,T))\}$$

Example: Metal Stereo $\to$ Gold (G) for commodity 1 against Silver (S) for commodity 2

Need to set tails in both commodities AND to also set hedge ratio for commodity 1 versus commodity 2

Step 1: Set the tail hedge ratios for each of the spreads using $Q_{NI} = Q_1(1 + ic_G(0))$ and $Q_{N2} = Q_2\ (1 + ic_S(0))$, where Q_1 and Q_2 are the number of spreads in commodities 1 and 2:

$$\pi = Q_1\ (G(1,N)\ \Delta ic_G) - Q_2\ (S(1,N)\ \Delta ic_S)$$

Dividing through by $Q_1\ G(1,N)$ gives:

$$\pi(1) = \Delta ic_G - \frac{Q_2\ S(1,N)}{Q_1\ G(1,N)}\ \Delta ic_S \quad \to \quad \frac{Q_2\ S(1,N)}{Q_1\ G(1,N)} = 1$$

Step 2: To solve the hedge ratio for the number of silver contracts per gold contracts, observe that the denominator and numerators are the US\$ value of each contract. Assume that F(0,N) and G(0,N) can be used as proxies for the unknown F(1,N) and G(1,N).

Using current (11-6-17) June 17 COMEX/CME metal contracts observe that the US\$ value of one gold contract = 100 oz. (1266.1) = US\$126,610 and one silver contract = 5000 oz. (16.914) = US\$84,570. It follows that the number of silver contracts per one gold contract is: (126,610/84,570) = 1.497 –> 15 tailed silver contracts to 10 tailed gold contracts.