Profit Profile for a Tandem

DATE	***Nearby Position***	***Deferred Position***
t=0		
Commodity 1	Short Q_1 contracts at *F(0,N)*	Long Q_1 units at *F(0,T)*
Commodity 2	Long Q_2 units at *G(0,N)*	Short Q_2 units at *G(0,T)*
t=1		
Commodity 1	Close out position with Long Q_1 units at *F(1,N)*	Close out position with units Short Q_1 at *F(1,T)*
Commodity 2	Close out position with Short Q_2 units at *G(1,N)*	Close out position with units Long Q_2 at G*F(1,T)*

In this case, the profit function can be specified:

$$\pi(1,T) = Q_1 \{(F(0,N) - F(1,N)) + (F(1,T) - F(0,T))\} + Q_2 \{(G(1,N) - G(0,N)) + (G(0,T) - G(1,T))\}$$
$$= [Q_1 (F(1,T) - F(1,N)) - Q_2 (G(1,T) - G(1,N)] - [Q_1 (F(0,T) - F(0,N)) - Q_2 (G(0,T) - G(0,N)]$$

Example: Currency Tandem –> C$ against £

Let Q_1 be the number of C$ futures contract for C$100,000 and Q_2 be one £ contract for £62,500

Need to set hedge ratio for C$ against £

Assume that the spreads do not need to be tailed (usually OK for currencies) then using the tailed spread profit functions:

$$\pi = Q_1 (F(1,N)\, \Delta ic_F) - Q_2 (G(1,N)\, \Delta ic_G)$$

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

$$\pi(1) = \Delta ic_F - \frac{Q_2\ G(1,N)}{Q_1\ F(1,N)}\ \Delta ic_G \quad \rightarrow \quad \frac{Q_2\ G(1,N)}{Q_1\ F(1,N)} = 1$$

To solve the hedge ratio –> determine the number of £ contracts per C$ 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 FX rates observe that the US$ value of one C$ contract = C$100,000 (.75055) = US$75,055 and one £ contract = £62,500 (1.2661) = US$79,131. It follows that the number of C$ contracts per one £ contract is: (79131/75055) = 1.054 –> 105 to 100