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Hedging Your U.S. Dollar Investments with Currency Options



Hedging with USX Options



- Many Canadian investors hold U.S. securities in their portfolio.
- Exposure to two types of risk:
 - Market
 - Currency

What is a Currency Option?



- Based on a currency pair value.
- Reflects an exchange rate.
- USX reflects USD/CAD.
- The value of US\$1.00 in Canadian dollars.
- U.S. dollar is considered the base currency.

Currency Risk



- The value of a U.S. dollar equity portfolio will drop as the USD/CAD depreciates.
- Purchase of a put option as a hedging strategy.
- As the USD/CAD decreases, the put should increase in value.

How Many USX Options To Buy?



- Formula

$$\text{Number of option contracts} = \frac{\left\{ \frac{\text{U.S. dollar amount to hedge}}{\text{Contract size of the option}} \right\}}{\text{Delta of the option}}$$

Portfolio Hedging Example



- Investors wishes to hedge US\$50,000.00.
- USD/CAD is at 1.0600.
- USX value is $1.0600 \times 100 = 106.00$.
- 2-month at-the-money 106-strike put option has a delta of 0.50.

Portfolio Hedging Example



$$\begin{aligned} \text{Number of put contracts} &= \frac{\left\{ \begin{array}{c} 50,000 \\ 10,000 \end{array} \right\}}{0.50} \\ &= \frac{5}{0.50} \\ &= 10 \text{ contracts} \end{aligned}$$

Portfolio Hedging Example



- Investor would buy 10 2-month 106 strike put.
- 2-month 106-strike put is trading at \$2.10 per contract.
- Cost of one contract is $\$2.10 \times 100 = \210.00
- Investor pays $\$210 \times 10 = \$2,100.00$

Consider a U.S. Dollar Drop



- Starting value of portfolio is US\$50,000.00, which corresponds to C\$53,000.00.
 - $\text{US\$}50,000.00 \times 1.06$
- If the exchange rate drops to 1.01, the portfolio would be worth C\$50,500.00.
 - $\text{US\$}50,000.00 \times 1.01$
- The loss is C\$2,500.00.

USX Put Option Settlement Value



- Difference between the strike price and the BoC noon rate at expiration, multiplied by the trading unit of the contract.

Settlement Value

$$\begin{aligned} &= \frac{(\text{Strike price} - \text{BoC noon rate})}{1 \text{ USD}} \times 10,000 \text{ USD} \times \frac{1 \text{ CAD}}{100 \text{ cents CAN}} \\ &= (\text{Strike price} - \text{BoC noon rate}) \times 100 \end{aligned}$$

USX Put Option Settlement Value



Settlement Value

$$= (\text{Strike price} - \text{BoC noon rate}) \times 100$$

$$= (106 - 101) \times 100$$

$$= \$500.00$$

- $\$500.00 \times 10 \text{ contracts} = \$5,000.00$
- $\$5,000.00 - \$2,100.00 = \$2,900.00$
- The position is cash settled in Canadian dollars.

Result of the Hedge



- Initial portfolio value was US\$50,000.00 or C\$53,000.00.
- The drop in the exchange rate causes the portfolio to decrease by an amount of C\$2,500.00.
- Portfolio is now worth C\$50,500.00.
- Profit on USX put options is C\$2,900.00.
- Portfolio net value is C\$53,400.00.

Consider a U.S. Dollar Increase



- Starting value of portfolio US\$50,000.00, which corresponds to C\$53,000.00
 - $\text{US\$}50,000.00 \times 1.06$
- If the exchange rate increases to 1.12, the portfolio would be worth C\$56,000.00
 - $\text{US\$}50,000.00 \times 1.12$
- The profit is C\$3,000.00

Results of the Hedge



- Initial portfolio value was US\$50,000.00 or C\$53,000.00.
- The increase in the exchange rate causes the portfolio to increase by an amount of C\$3,000.00.
- Portfolio is now worth C\$56,000.00.
- Put options expire worthless and create a loss corresponding to the premium paid of \$2,100.00.
- Portfolio is now worth C\$53,900.00.

