**Hedging Financial Risk Using Derivatives**

Learning Problems

**Foreign Exchange Transactions at Haskell**

Haskell Enterprises is a cheese spread manufacturer based in Toronto, Canada. The company purchased USD 1,200,000 in cheese from a U.S. supplier in Wisconsin, and payment is due immediately in USD. It also received USD 800,000 in cash from selling its cheese spread in the U.S.

Haskell banks with RBC, which is a reporting dealer. The current forex quotation is:

|  |  |  |
| --- | --- | --- |
| **CAD/USD** | | |
| **Sell** | **4** | **Buy** |
| 1.32**06** |  | 1.32**02** |
| **USD:** 100,000 | | |

**REQUIRED:**

1. What is the cost of the cheese purchase in CAD?
2. What is the revenue from the cheese spread sales in CAD?
3. How much did the reporting dealer make on each transaction in CAD?
4. Is the quote provided a direct or indirect quote?

**Foreign Exchange Transactions at Knight**

Patriot Industries is a Canadian subsidiary of an American equipment manufacturer. The subsidiary is repatriating profits of CAD 30,500,000 to its U.S. parent.

Patriot banks with the WCB, which is not a reporting dealer. The bank charges a CAD 2 fee on every CAD 100,000 traded. The current forex quotation is:

|  |  |  |
| --- | --- | --- |
| **USD/CAN** | | |
| **Sell** | **4** | **Buy** |
| 0.73**72** |  | 0.72**68** |
| **USD:** 100,000 | | |

**REQUIRED:**

1. What profits will be repatriated to the U.S. parent in USD?

**Foreign Exchange Transactions at Koala**

Koala Inc. is an Australian subsidiary of a Canadian mining company. The subsidiary paid a quarterly dividend of AUD 25,000,000 to its Canadian parent. The CAD/AUD was not available, but the Bank of Canada did quote the CAD/USD at 1.2486 and the AUD/USD at 1.2915.

**REQUIRED:**

1. Calculate the CAD/USD using the cross rates provided.

**Foreign Exchange Transaction Risk at Mattingly**

Mattingly Enterprises purchased inventory for USD 125,000 from a U.S. supplier on November 1, 2022, with payment on February 1, 2023. The ask price was CAD/USD 1.32405 on November 1, CAD/USD 1.32110 on December 31, and CAD/USD 1.32509 on February 1.

**REQUIRED:**

1. Make the required journal entries.

**Hedging Exchange Rate Risk Using Forwards**

Hartley Ltd. is headquartered in Winnipeg, Canada and expects to receive USD 4,500,000 in six months from a U.S. customer. It plans to convert the USD into CAD at that time and wants to hedge any potential exchange rate risk using forward contracts. Hartley negotiates a forward contract to exchange USD 4,500,000 for CAD in six months at a delivery rate of CAD/USD 1.2578. The spot rate was CAD/USD 1.2470 on the settlement date.

**REQUIRED:**

1. What would the counterparties each receive on the settlement date in six months if they agreed to deliver the currency to each other?
2. What would the counterparties each receive on the settlement date in six months if they agreed to exchange the difference between the delivery rate and the spot rate when the contract is settled?

How would this change if the spot rate were CAD/USD 1.2605 on the settlement date?

**Hedging Exchange Rate Risk Using Swaps**

Wiley Inc. needs to raise USD to finance its proposed U.S. expansion, but it is unfamiliar with that country’s financial markets. It can borrow at a lower rate in Canada with fewer lending restrictions because of its longstanding banking relationships. Wiley needs to borrow USD 2,750,000 for three months, so it negotiated a 3-month currency swap contract at a spot rate of CAD/USD 1.5223 and a forward rate of CAD/USD 1.5378.

**REQUIRED:**

1. How should Wiley proceed?
2. What are the advantages of a currency swap?

**Hedging Exchange Rate Risk Using Call Options**

Cranston Enterprises, based in Toronto, Ontario, purchased land costing USD 25,000,000 for a new golf development in Las Vegas, Nevada, but the transaction will not close for three months. Cranston is concerned the CAD will depreciate during this time, so it bought a call option to buy USD 25,000,000 at a strike price of CAD/USD 1.2503 that expires in three months. The spot rate is currently CAD/USD 1.2503.

**REQUIRED:**

1. What is the net cost of purchasing the land if the spot rate rises to CAD/USD 1.2575 in three months?
2. What is the net cost of purchasing the land if the spot rate falls to CAD/USD 1.2456 in three months?

**Hedging Exchange Rate Risk Using Put Options**

Superior Ltd., based in Calgary, Alberta, sold land costing USD 50,000,000 in Seattle, Washington, but the transaction will not close for three months. Superior is concerned that the CAD will appreciate during this time, so it bought a put option to sell USD 50,000,000 at a strike price of CAD/USD 1.2643 that expires in three months. The spot rate is currently CAD/USD 1.2643.

**REQUIRED:**

1. What are the net proceeds from selling the land if the spot rate rises to CAD/USD 1.2610 in three months?
2. What are the net proceeds from selling the land if the spot rate falls to CAD/USD 1.2730 in three months?

**Hedging Exchange Risk Using a Natural Hedge**

Delisle Industries is based in Canada but has U.S. sales of approximately USD 5,500,000 each year, which is about 10.0% of the company’s total sales. The exchange rate is currently CAD/USD 1.2521, but Delisle expects it to fall to CAD/USD 1.2444 over the next year. Delisle buys all its inputs in CAD in Canada. Sales and costs are incurred uniformly throughout the year.

**REQUIRED:**

1. Is the CAD appreciating or depreciating against the USD?
2. Will Delisle's sales fall by not hedging its USD sales?
3. How could Delisle hedge its yearly USD sales without using derivatives?

**Hedging Interest Rate Risk Using Swaps**

Whitley Enterprises has a 2-year, CAD 600,000 floating-rate loan at the banker’s acceptance rate plus 25 bps. The company is concerned that interest rates will rise over the next two years, so it negotiated a 2-year interest rate swap. The dealer quoted a swap rate of 3.5% with a notional value of CAD 600,000, annual settlement, and a floating rate equal to the current banker’s acceptance rate plus 25 bps.

**REQUIRED:**

1. What are Whitley’s net swap payments and net interest payments if the banker’s acceptance rates were 3.1% and 3.7% in the first and second years?

**Market to Market of Futures Contracts**

Haskel Industries went “short” and agreed to sell 400 troy ounces of gold by entering four futures contracts for 100 troy ounces each at a final settlement price of USD 1,912.2 per troy ounce. The initial margin is 6.0% of the settlement value of the contract, and the maintenance margin is 75.0% of the initial margin. The spot prices of gold over the first four days were CAD 1,910.1, CAD 1,915.9, CAD 1,958.2, and CAD 1,925.3.

**REQUIRED:**

1. Calculate the margin account balance for the first four days of trading.

**Hedging Commodity Risk Using Short Hedges**

Ponderosa Lumber Ltd. has 1,375,000 board feet of lumber that it plans to sell in three months, but it is concerned that the spot price will fall. It went “short” and purchased fifty 27,500 board feet lumber futures contracts with delivery in three months at a final settlement price of USD 516.50 per 1,000 board feet. The spot price was USD 535.50 per 1,000 board feet on the final settlement date.

**REQUIRED:**

1. What was the outcome of the hedge?

**Hedging Commodity Risk Using Long Hedges**

Delicious Meats expects to use 4,000,000 pounds of live cattle for processing in three months, but it is concerned that the spot price may rise. It went “long” and purchased 100, 40,000-pound live cattle futures contracts with delivery in three months at a final settlement price of USD 179.30 cents per pound. The spot price was USD 159.30 cents per pound on the final settlement date.

**REQUIRED:**

1. What was the outcome of the hedge?

**Optimal Hedge Ratio**

Penguin Airways needs 15 million gallons of jet fuel over the next year and is concerned about rising prices as the economy recovers from a recession. There is no futures contract for jet fuel, so Penguin decided to cross-hedge using the NYMEX WTI Crude Oil futures contract. The contract size is 1,000 barrels or 42,000 gallons. The standard deviation of the futures contract and the spot price of jet fuel are 6.0% and 3.0%. The correlation coefficient between the crude future price and the spot price of jet fuel is 0.95.

**REQUIRED:**

1. How many NYMEX WTI Crude Oil futures contracts are required to minimize the variability of the value of the hedged position?

**Hedging Commodity Risk Using Call Options**

Mosaic Inc. designs high-end jewelry and will need 1,250 troy ounces of platinum in three months, but worries that the price may rise. It purchased twenty-five 50-ounce platinum call options contracts with a premium of USD 35.5 per troy ounce. Delivery is in three months at a strike price of USD 870.0 per troy ounce. The spot price was USD 1,150.0 per troy ounce on the expiry date.

**REQUIRED:**

1. What was the outcome of the hedge?
2. What if the spot price fell to USD 805.0 per troy ounce on the expiry date?

**Hedging Commodity Risk Using Put Options**

Hughes Oil expects to produce 500,000 barrels of oil in three months but worries that the price may fall. It purchased five hundred 1,000-ounce put options contracts with a premium of USD 2.12 per barrel. Delivery is in three months at a strike price of USD 82.52 per barrel. The spot price was 68.21 on the expiry date.

**REQUIRED:**

1. What was the outcome of the hedge?
2. What if the spot price rose to USD 96.75 on the expiry date?