

Created by: Trustan Kekauoha

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Problem statement: The company faces foreign exchange exposure from a €8,000,000 receivable due in one year. USD proceeds are at risk if the euro weakens against the dollar. The primary risk is that a declining EUR/USD spot rate will reduce the USD cash inflow, potentially impacting profit and cash flow planning. This analysis evaluates hedging strategies to mitigate this FX risk.

1. Objective

- To model USD proceeds from a €8,000,000 receivable under three hedging strategies: forward contract, money-market hedge, and EUR put option as well as identify which hedge best protects revenue and exchange rate fluctuations.

2. Scope

- In Scope:
 - One-year hedging analysis
 - Forward, money-market, and EUR put option
 - Sensitivity analysis using different future EUR/USD spot rates
- Out-of-scope:
 - Multi-year hedges or swaps
 - Forecasting foreign exchange rates or interest rates
 - Transaction costs

3. Inputs

Input	Value	Description
Receivable	8,000,000	Amount in EUR
Spot EUR/USD (S)	1.17	Current spot rate
Forward EUR/USD (F)	1.0890	One-year forward rate
USD 1-year interest rate ($i_{\{USD\}}$)	0.0425	From memo
EUR 1-year interest rate ($i_{\{EUR\}}$)	0.0215	From memo

Option strike (K)	1.17	Set near current spot
Option premium (P)	0.021	Per euro
Scenario future spot rates (S_{future})	Various	For sensitivity analysis

- Forward rate formula: $\text{SpotRate} * (1 + \text{USD_Rate}) / (1 + \text{EUR_Rate})$

4. Assumptions & Constraints

- Interest rates are based on annualized simple rates (USD 4.25%, EUR 2.15%).
- Transaction costs, bid-ask spreads, and taxes are ignored.
- Hedging strategies assume access to standard market instruments (forwards, money-market loans, options).
- The option is European style and can only be exercised at maturity.
- Future spot rates are hypothetical for sensitivity analysis; actual market movements may vary.

5. Workflow/Steps

- a. Set up Inputs section in Excel
- b. Forward hedge: $8000000 * \text{ForwardRate}$
- c. Money-market hedge: $(8000000 / (1 + \text{EUR_Rate})) * \text{SpotRate} * (1 + \text{USD_Rate})$
- d. Option hedge: $= \text{MAX}(\text{Strike} - \text{FutureSpot}, 0) * 8000000 - (\text{Premium} * 8000000)$
- e. Unhedged position: $= 8000000 * \text{FutureSpot}$
- f. Build a summary table comparing USD proceeds for all hedge options.
- g. Run sensitivity analysis using multiple FutureSpot values (e.g., 1.05, 1.10, 1.20).
- h. Perform sensitivity analysis by varying future EUR/USD spot rates (e.g., 1.05, 1.10, 1.20) to observe the impact on USD proceeds for each hedge strategy. Results should be visualized in a chart to highlight the effectiveness of each hedge across different exchange-rate scenarios.

6. Expected outputs

Hedge	USD Proceeds	Excel Formula
Forward	8000000×1.0890	$=8000000*\text{ForwardRate}$

Money	$(8,000,000 \div (1+0.0215)) \times 1.17 \times$	$= (8000000 / (1 + \text{EUR_Rate})) * \text{SpotRate} * (1 +$
Market	$(1+0.0425)$	$\text{USD_Rate})$
Option	$\max(1.17 - S_{\{\text{future}\}}, 0) \times 8,000,000 -$ $0.021 \times 8,000,000$	$= \text{MAX}(\text{Strike} - \text{FutureSpot}, 0) * 8000000 - (\text{Premium} * 8000000)$
Unhedged	$8,000,000 \times S_{\{\text{future}\}}$	$= 8000000 * \text{FutureSpot}$

7. Evaluation Criteria

- Accuracy: Formulas produce correct USD proceeds
- Clarity: Inputs, calculations, and tables are clearly labeled
- Reproducibility: Results can be replicated using the same inputs
- Visualization: Tables/charts are labeled and readable
- Alignment: Model follows class examples and defines hedge types correctly

8. AI Prompts

- “Create an Excel spreadsheet that calculates USD proceeds from a €8,000,000 receivable using forward, money-market, and EUR put option hedges, with editable inputs and a summary table.”
- “Explain the difference between forward, money-market, and option hedges in simple terms for MBA students.”
- “Generate Excel formulas to calculate net USD proceeds for each hedge given spot, forward, interest rates, strike, and premium inputs.”