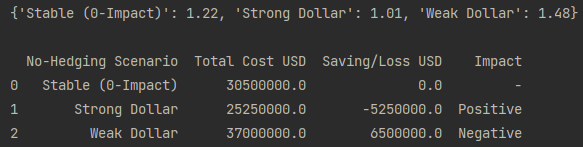
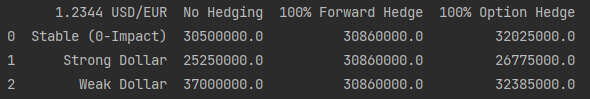
­ Currency exposure at AIFS arises due to its business mode, which involves international educational programs. AIFS must deal with costs (currency exchange rates) in various currencies. AIFS commits to certain prices for their services ahead of time, so any fluctuation in currency can affect their profit margins. This creates exposure to currency risk because the company must pay suppliers in the local currency of the country where the service is provided. The risk is that an adverse change in exchange rates could increase the cost base (bottom-line risk), and since foreign currency is bought based on projected sales volumes, there's a volume risk because actual sales volumes may differ. To manage these risks, AIFS engages in currency hedging activities using forward contracts and options, hedging its future cost commitments up to two years in advance.

If Archer-Lock and Tabaczynski did not hedge at all, they would be fully exposed to currency market fluctuations. Any adverse changes in the exchange rate could significantly increase AIFS's cost base. Since AIFS guarantees prices to its customers and cannot pass on any currency cost increases, any depreciation of the USD would increase the cost of European currency paid in EUR (spend more USD to buy EUR). This could lead to significant financial losses if the dollar weakened. In the case of 1.48 USD/EUR, we have to spend 6,500,000 dollars more for 25,000 participants in total. Conversely, if the dollar strengthened, AIFS would benefit from lower costs (spend less USD to buy GBP). In the case of 1.01 USD/EUR, we can save 5,250,000 dollars for 25,000 participants in total.



(\*\*3-6\*\*I’m so confused with the Excel, thus, I provided my own example\*\*)



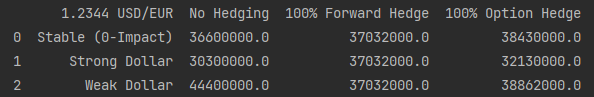
Given 25,000 participants and 1000 EUR cost for each. Assume we make a 2-year forward at the rate of 1.2344 USD/EUR and the option strike is the same as that of the forward rate. Getting the option premium of 0.05 (5%) from the case. Relative to the “zero impact” scenario, when hedging with 100% forwards, the cost is locked at the forward rate (25,000\*1000\*1.2344 = $30,860,000). When hedging with 100% option, we exercise the option only if it's beneficial to exercise the option (buy call option if spot < strike, buy put option if spot > strike). Thus, total option cost will be 25,000\*1000\*(rate) + 30,500,000\*0.05.

At the zero-impact scenario where the exchange rate is 1.22 USD/EUR, both hedging strategies lead to higher costs compared to no hedging. The option hedge is even more expensive due to the payment of option premium.

When the dollar become stronger (1.01 USD/EUR), both hedging lead to higher costs compared to the no-hedging strategy. While the option hedge is cheaper than the forward hedge.

When dollar become weaker (1.48 USD/EUR), the forward hedge strategy offers the most savings and then the option hedge strategy since both hedging strategies make the cost cheaper in total than the non-hedging one.

Higher Sales Volume than Expected: 30,000 Participants

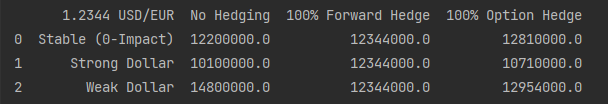


No Hedging: Higher sales volume increases exposure to currency risk. If the currency moves to a weaker dollar, the financial impact is magnified, leading to potentially higher losses (44400000-36600000=7,800,000, which is higher than 6,500,000 loss in 25,000 sales). Conversely, if the currency moves to a strong dollar, there could be some more benefits (30300000-36600000=-6,300,000, which is lower than -5,250,000, much less spending).

Forward: If AIFS has hedged less volumes than the actual sales, a locked forward rate might lead to higher costs in stronger dollar scenarios but provide savings in the weaker dollar scenario.

Options: Similar to forward contracts, if AIFS has options covering less than the actual sales volume, the additional sales would be exposed to spot rates. However, options provide more flexibility, as AIFS would not be obliged to exercise all options.

Lower Sales Volume than Expected: 10,000 Participants



No Hedging: With lower actual sales volume, the risk associated with currency fluctuations decreases. The financial impact of currency movements would be less significant compared to higher volumes scenario.

Forward: If AIFS has hedged for a higher volume, AIFS might end up with excess foreign currency than needed, which could lead to unnecessary costs since the total final costs goes down than expected. The forward hedge has no benefits from a stronger dollar scenario but save costs when the dollar becomes weaker.

Options: Similar results to that of forward hedge, but options provide the right but not the obligation to exchange currency at the strike rate. AIFS can choose not to exercise options, reducing the financial loss.

A mix of forward and option to hedge seems the best. Forward contracts can help ensure the certainty of costs. Option contracts can provide a sort of flexibility and catch chances to get benefits from changing exchange rates since they buy rights. If the market suggests that the USD is likely to weaken, then forward strategy can lock in current rates and hedge against potential losses. Conversely, if the market predicts a stronger USD, then the selection of options might be beneficial to capitalize on favorable rates. For sales volume consideration: If there is high confidence in the sales volume forecast, a forward contract might be appropriate for the expected volume. However, if there's significant uncertainty in the volume forecast, options provide more flexibility as they can be exercised based on the actual need. The mix approach seems keep a balance between risk management of costs and beneficial chances of market exchange rates.

Desai, M. A., Dessain, V., & Sjöman, A. (2007). Hedging Currency Risks at AIFS. *Harvard Business Publishing*. Retrieved on Nov. 15, 2023, from <https://hbsp.harvard.edu/download?url=%2Fcourses%2F1039103%2Fitems%2F205026-PDF-ENG%2Fcontent&metadata=e30%3D>

I felt really uncomfortable with Excel, instead, I create some functions in python and then run it with given data for analyzing strategies.

Coding

import pandas as pd  
  
# Given data  
volume = 10000  
cost\_per\_participant = 1000 # Assuming this is in EUR  
forward\_rate = 1.2344 # 2-year forward rate  
option\_strike = forward\_rate # Assuming the strike price is the same as the forward rate  
option\_premium = 0.05 # Premium for the option  
exchange\_rates = {  
 **'Stable (0-Impact)'**: 1.22, # USD/EUR exchange rate for zero impact scenario  
 **'Strong Dollar'**: 1.01, # USD/EUR exchange rate for strong dollar scenario  
 **'Weak Dollar'**: 1.48 # USD/EUR exchange rate for weak dollar scenario  
}  
  
# If no hedging  
def calculate\_financial\_impact(volume, cost\_per\_participant, exchange\_rates):  
 # Calculate the "zero impact" cost in USD  
 zero\_impact\_cost = volume \* cost\_per\_participant \* exchange\_rates[**'Stable (0-Impact)'**]  
  
 # Calculate the total cost and impact for each scenario  
 outcomes = {}  
 for scenario, rate in exchange\_rates.items():  
 total\_cost\_usd = volume \* cost\_per\_participant \* rate  
 windfall = total\_cost\_usd - zero\_impact\_cost  
 impact = None # Default to None  
 if windfall < 0:  
 impact = **'Positive'** elif windfall > 0:  
 impact = **'Negative'** outcomes[scenario] = {  
 **'Total Cost USD'**: total\_cost\_usd,  
 **'Saving/Loss USD'**: windfall,  
 **'Impact'**: impact  
 }  
 return outcomes  
  
# Calculate the financial impact without hedging  
No\_Hedging = calculate\_financial\_impact(volume, cost\_per\_participant, exchange\_rates)  
  
# Convert the outcomes to a pandas DataFrame for a tabular representation  
df\_outcomes = pd.DataFrame(No\_Hedging).T # Transpose for better formatting  
df\_outcomes.index.name = **'No-Hedging Scenario'**df\_outcomes.reset\_index(inplace=True)  
df\_outcomes.fillna(**'-'**, inplace=True) # Replace NaN with '-' for presentation  
print(**f"**{exchange\_rates}**"**)  
print(df\_outcomes)  
######################################################  
  
# Define the function to calculate the outcomes for hedging with forwards and options.  
def calculate\_hedging\_outcomes(volume, cost\_per\_participant, exchange\_rates, forward\_rate, option\_strike, option\_premium):  
 results = {**'No Hedging'**: {}, **'100% Forward Hedge'**: {}, **'100% Option Hedge'**: {}}  
  
 zero\_impact\_cost = volume \* cost\_per\_participant \* exchange\_rates[**'Stable (0-Impact)'**]  
  
 for scenario, rate in exchange\_rates.items():  
 no\_hedging\_cost = volume \* cost\_per\_participant \* rate  
 results[**'No Hedging'**][scenario] = no\_hedging\_cost  
  
 # Hedging with forwards, the cost is locked at the forward rate.  
 cost\_hedge\_forward = volume \* cost\_per\_participant \* forward\_rate  
 results[**'100% Forward Hedge'**][scenario] = cost\_hedge\_forward  
  
 # Hedging with options, exercise the option only if the spot rate is less than the strike rate.  
 effective\_rate = min(rate, option\_strike)  
 cost\_hedge\_option = volume \* cost\_per\_participant \* effective\_rate  
 option\_total\_cost = cost\_hedge\_option + (zero\_impact\_cost \* option\_premium)  
 results[**'100% Option Hedge'**][scenario] = option\_total\_cost  
  
 return results  
  
# Calculate the hedging outcomes  
hedging\_outcomes = calculate\_hedging\_outcomes(volume, cost\_per\_participant, exchange\_rates, forward\_rate, option\_strike,  
 option\_premium)  
  
# Convert the results to a pandas DataFrame for display  
df = pd.DataFrame.from\_dict(hedging\_outcomes)  
df.index.name = **f"**{forward\_rate} **USD/EUR"**df.reset\_index(inplace=True)  
print(**f"**\n{df}**"**)  
###############################################################################