Financial Derivatives (DS4F)

Dr. David Duarte

dduarte@novaims.unl.pt

Homework nº1

To be handed in until the 30th of January 2020

Year 2019 / 2020

Use the market data provided in the spreadsheet available on moodle.

Today's date is January 15th 2019 and, to finance an investment project, a company entered into a floating rate loan agreement with the following details:

Notional:	EUR 38,000,000
Start:	17-01-2019
Maturity:	17-01-2029
Interest:	Euribor 6M, half-yearly, act/360, modified following, adjusted

1. **What are the estimated cash flows of this loan on the 15th of January of 2019**
2. **Consider that company wants to hedge its' interest rate risk with an Interest Rate Swap.**
   a. Describe both legs of an interest rate swap that would allow the Company to perfectly hedge its interest rate exposure
   b. What would be the price of this swap considering that the counterparty charges 5bps running?
   c. At the trade date, what is the market value of this swap?
   d. Calculate the daily historic market value of the swap from 15.01.2019 to 25.11.2019.
   e. Make a plot of the Market Value of this swap and the market rate for the 10y swap (market value in Euros on the left axis and swap rate in % in the right axis)
   f. Show a table for each of the swap legs with the future cashflows considering that today is the 26th of November 2019
3. **Another alternative would be to enter into an Interest Rate Swap that is cancellable once (european) after 5 years. (For this answer, assume that you can interpolate linearly the volatility for the available expiries)**
   a. What would the rate of the cancellable swap (also taking into account the 5bps charge)?
   b. Calculate the monthly historic market value of the cancellable swap from 15.01.2019 to 25.11.2019.