Assignment 2

Team 4

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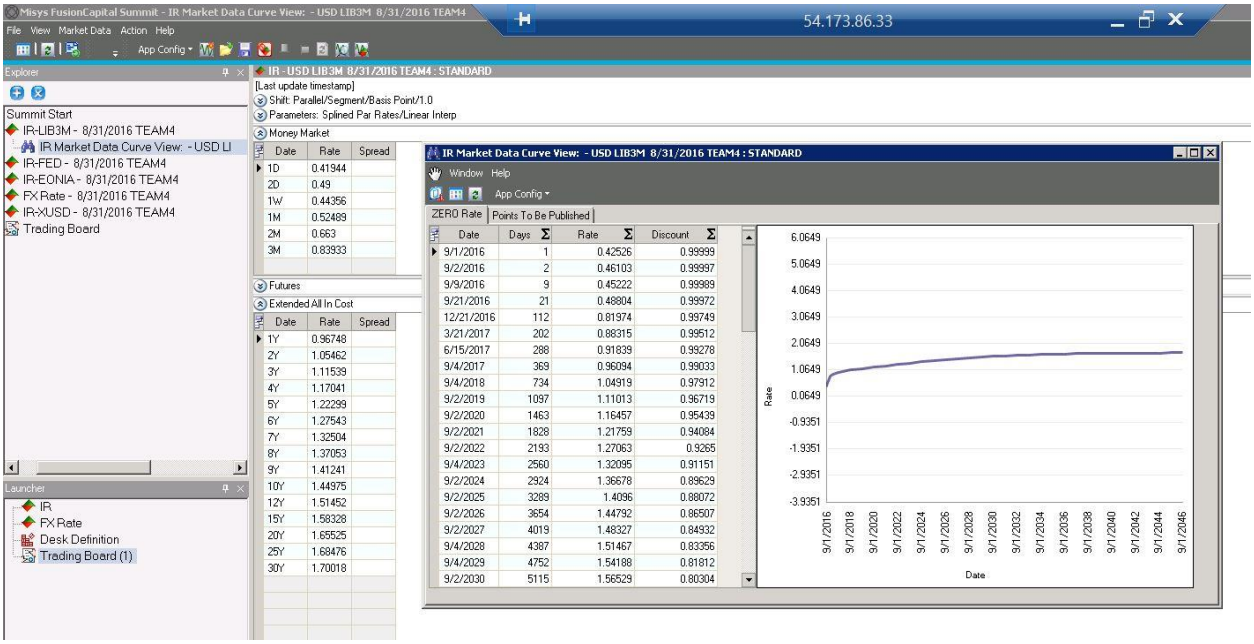
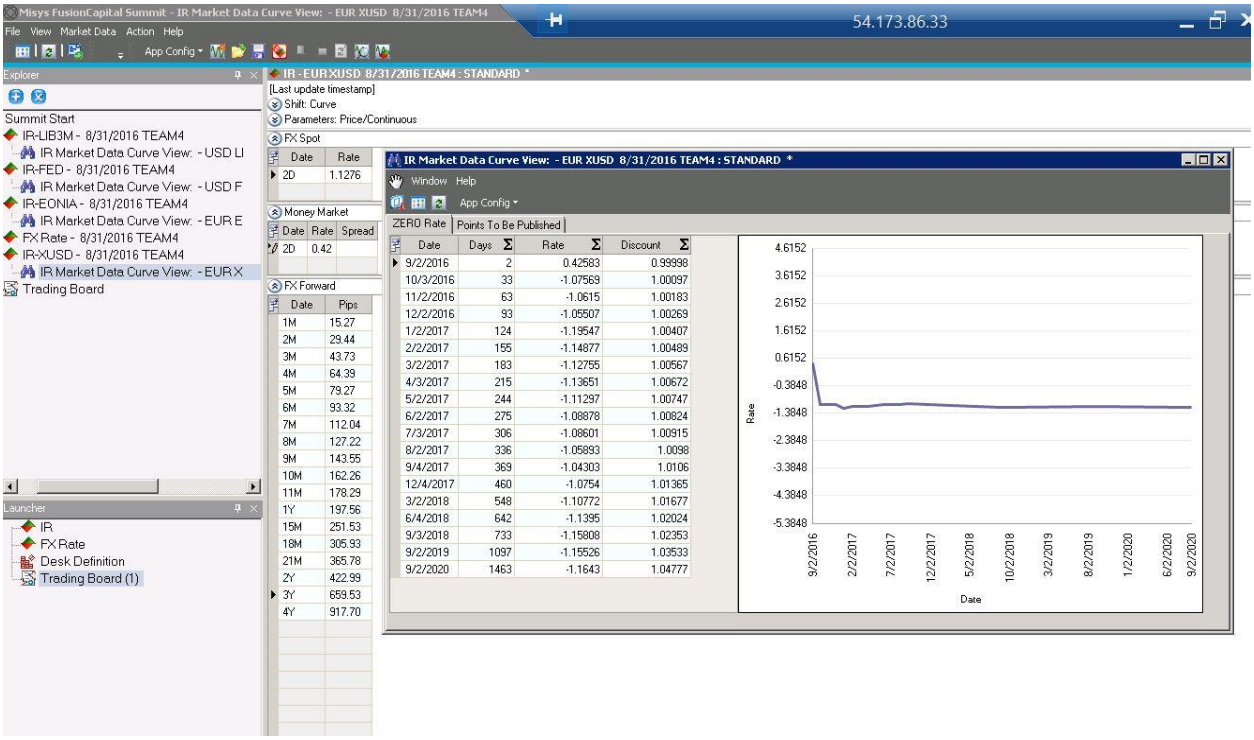
Part 1

Update the market data for curve ID Team4. (All data used for building the curve are in the attachment)

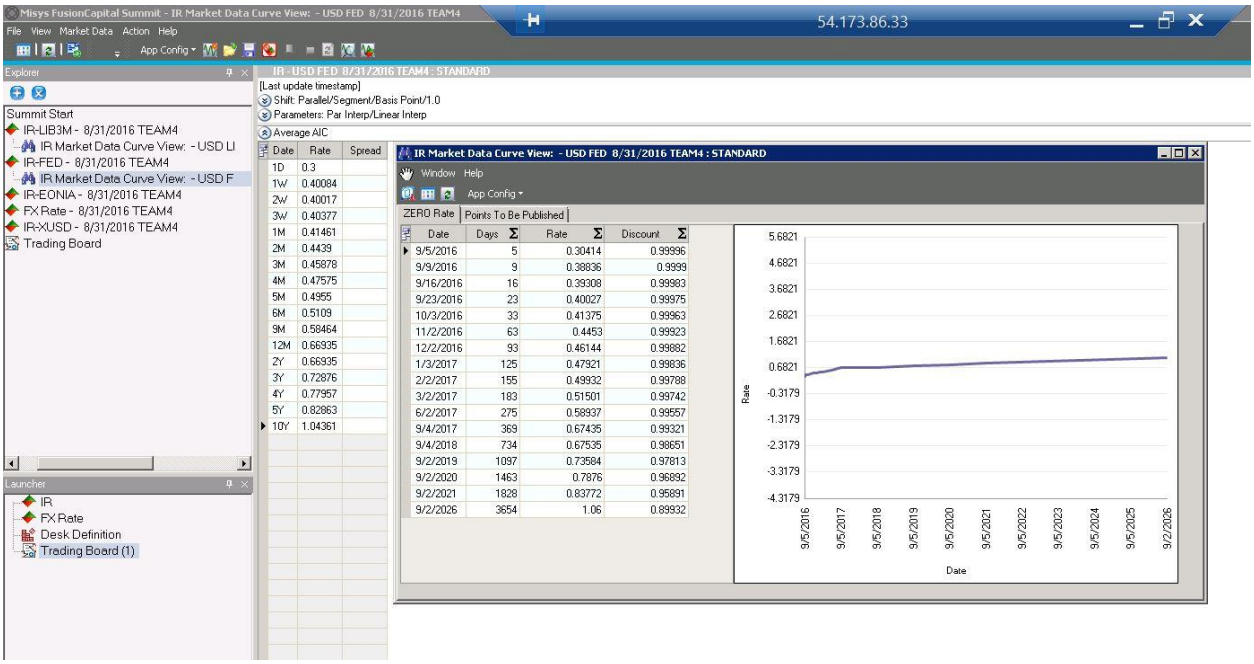
LIB3M:



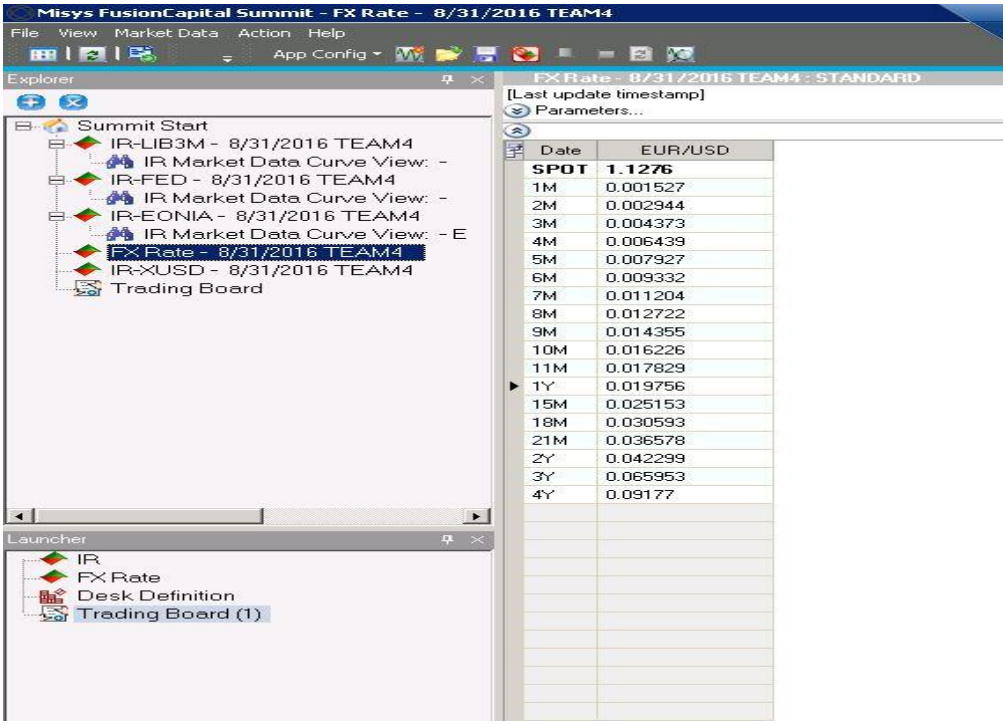
EONIA:



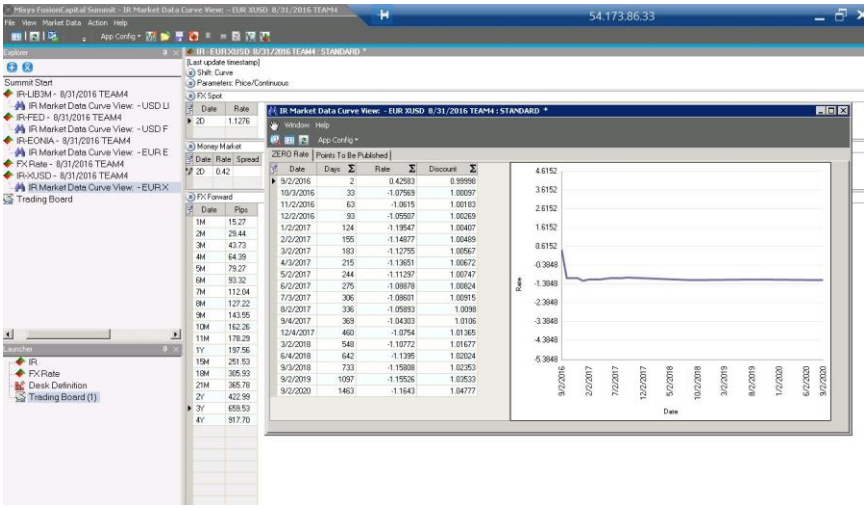
FED:


Misys FusionCapital Summit - IR Market Data Curve View: - USD FED 8/31/2016 TEAM4
54.173.86.33
File View Market Data Action Help
App Config
Explorer
Summit Start
IR-LIB3M - 8/31/2016 TEAM4
IR Market Data Curve View: - USD LI
IR-FED - 8/31/2016 TEAM4
IR Market Data Curve View: - USD F
IR-EONIA - 8/31/2016 TEAM4
FX Rate - 8/31/2016 TEAM4
IR-XUSD - 8/31/2016 TEAM4
Trading Board
Launcher
IR
FX Rate
Desk Definition
Trading Board (1)
IR - USD FED 8/31/2016 TEAM4 : STANDARD
[Last update timestamp]
Shift: Parallel/Segment/Basis Point/1.0
Parameters: Par Interp/Linear Interp
Average AIC
Date Rate Spread
1D 0.3
1W 0.40084
2W 0.40017
3W 0.40377
1M 0.41461
2M 0.4439
3M 0.45878
4M 0.47575
5M 0.4955
6M 0.5109
9M 0.58464
12M 0.66935
2Y 0.66935
3Y 0.72876
4Y 0.77957
5Y 0.82863
10Y 1.04361
IR Market Data Curve View: - USD FED 8/31/2016 TEAM4 : STANDARD
Window Help
App Config
ZERO Rate
Points To Be Published
Date Days Rate Discount
9/5/2016 5 0.30414 0.99996
9/9/2016 9 0.38836 0.9999
9/16/2016 16 0.39308 0.99983
9/23/2016 23 0.40027 0.99975
10/3/2016 33 0.41375 0.99963
11/2/2016 63 0.4453 0.99923
12/2/2016 93 0.46144 0.99882
1/3/2017 125 0.47921 0.99836
2/2/2017 155 0.49932 0.99788
3/2/2017 183 0.51501 0.99742
6/2/2017 275 0.58937 0.99557
9/4/2017 369 0.67435 0.99321
9/4/2018 734 0.67535 0.98651
9/2/2019 1097 0.73584 0.97813
9/2/2020 1463 0.7876 0.96892
9/2/2021 1828 0.83772 0.95891
9/2/2026 3654 1.06 0.89932
5.6821
4.6821
3.6821
2.6821
1.6821
0.6821
-0.3179
-1.3179
-2.3179
-3.3179
-4.3179
Rate
9/5/2016
9/5/2017
9/5/2018
9/5/2019
9/5/2020
9/5/2021
9/5/2022
9/5/2023
9/5/2024
9/5/2025
9/2/2026
Date

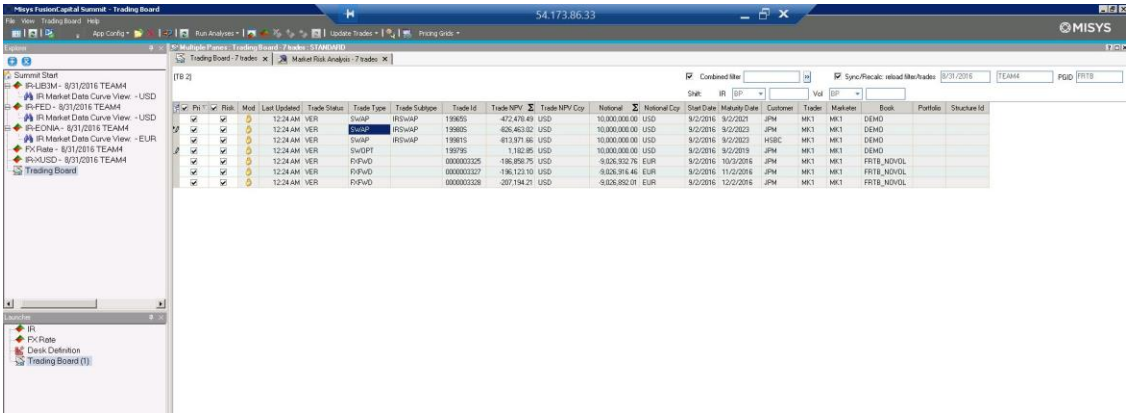
FX:

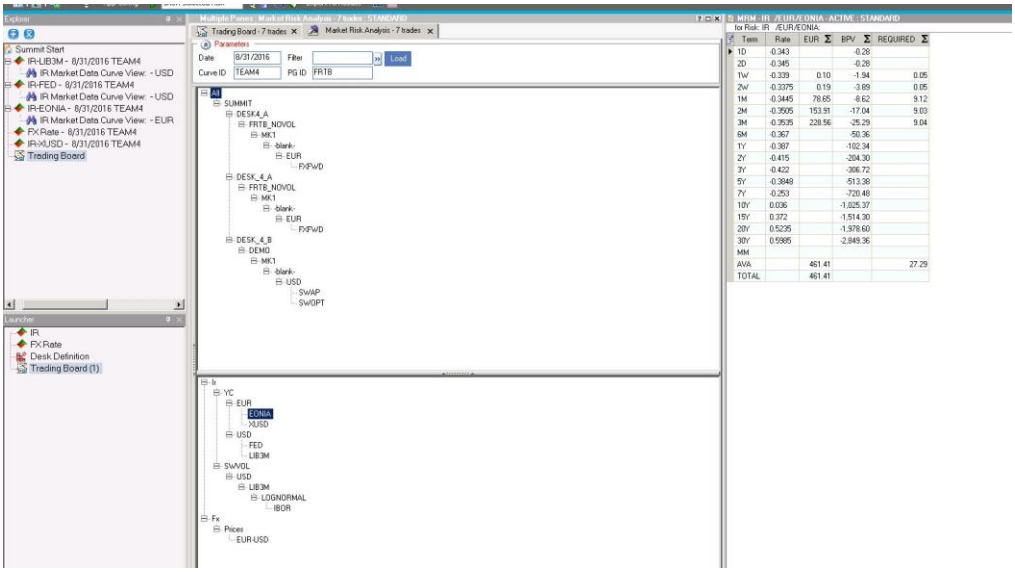

Misys FusionCapital Summit - FX Rate - 8/31/2016 TEAM4
File View Market Data Action Help
App Config
Explorer
Summit Start
IR-LIB3M - 8/31/2016 TEAM4
IR Market Data Curve View: -
IR-FED - 8/31/2016 TEAM4
IR Market Data Curve View: -
IR-EONIA - 8/31/2016 TEAM4
IR Market Data Curve View: - E
FX Rate - 8/31/2016 TEAM4
IR-XUSD - 8/31/2016 TEAM4
Trading Board
Launcher
IR
FX Rate
Desk Definition
Trading Board (1)
FX Rate - 8/31/2016 TEAM4 : STANDARD
[Last update timestamp]
Parameters...
Date EUR/USD
SPOT 1.1276
1M 0.001527
2M 0.002944
3M 0.004373
4M 0.006439
5M 0.007927
6M 0.009332
7M 0.011204
8M 0.012722
9M 0.014355
10M 0.016226
11M 0.017829
1Y 0.019756
15M 0.025153
18M 0.030593
21M 0.036578
2Y 0.042299
3Y 0.065953
4Y 0.09177

EURXUSD:



Price and Hedge using new market data:





Part 2

Based on the information we collected from Bloomberg, We have the data for each yield curve collected in the excel sheet. And we attached the head of the spreadsheet down below. The data started from Sep 2nd 2006, until 2016 with time horizon of 10 years.

	US0003M Index	US00O/N Index	US0001M Index	EURUSD Curncy	EE00O/N Index
	Ask Price	Ask Price	Ask Price	Ask Price	Ask Price
Dates	PX_ASK	PX_ASK	PX_ASK	PX_ASK	PX_ASK
9/4/2006	5.39	5.29938	5.33	1.2874	3.01688
9/5/2006	5.39	5.29188	5.33	1.2817	3.03125
9/6/2006	5.39	5.29438	5.33	1.2806	3.07375
9/7/2006	5.39	5.2875	5.33	1.2732	3.07156
9/8/2006	5.39	5.2825	5.33	1.2675	3.07156
9/11/2006	5.39	5.285	5.33	1.2703	3.07188
9/12/2006	5.39	5.28625	5.33	1.2689	3.07063
9/13/2006	5.39	5.27875	5.33	1.269	3.07219
9/14/2006	5.39	5.2825	5.33	1.2726	3.0675
9/15/2006	5.39	5.31375	5.33	1.2666	3.0675
9/18/2006	5.39	5.28188	5.33	1.2706	3.06438

Part 3

The total IMA capital requirement would be the added sum of ES, default risk charge and SES. The crucial step is to decide the market risk factors that are involved. The risk factors would be classified into two kinds, modelable and non-modelable. For this part of the project, we are going to focus on the modelable factors that can be used to calculate the Expected Shortfall and IMCC.

There are two criteria that modelable risk factors need to satisfy:

- It has conducted a transaction or verifiable price to transaction
- At least 24 continuous observable real price data

Based on the factors that met the criteria, we can match the corresponding liquidity horizon to each of the factors.

Once we are all set with the factors, we can calculate the P&L on each asset using the Fusion portal. And therefore calculate the following three parts:

- ESRS: the most severe 12-month stree over the previous 10 years & reduced the set of risk factors ES greater or equal to 75% full ES model
- ESFC: current(most recent) 12-month observation period with a full set of risk factors
- ESRC: current(most recent) 12-month observation period with a reduced set of risk factors

The expected shortfall can be calculated using these three parts based on the following equation:

$$ES = ES_{R,S} \times \frac{ES_{F,C}}{ES_{R,C}}$$

The IMCC can be calculated as below:

$$IMCC = \rho\big(IMCC(C)\big) + (1-\rho)\left(\sum_{i=1}^{B} IMCC(C_i)\right)$$

where $IMCC(C) = ES_{R,S}\frac{ES_{F,C}}{ES_{R,C}}$ and $IMCC(C_i) = ES_{R,S,i}\frac{ES_{F,C,i}}{ES_{R,C,i}}$