# Assignment 3 by Group 7

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| swap | cva | dva |
| task 2 | -29.3874 | 7.7588 |

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| fx | cva | fca |
| base (task 3)  correlation : uncorrelated | -0.189643 | -0.010910 |
| fx vol from 0.1 to 0.15 | -0.331930 | -0.018805 |
| dom HW vol from 0.01 to 0.015 | -0.191155 | -0.011058 |
| for HW vol from 0.01 to 0.015 | -0.190632 | -0.011026 |
| correlation matrix 1 | -0.157979 | -0.008588 |
| correlation matrix 2 | -0.195099 | -0.011722 |

Q1: Compare and discuss the impact of FX vol vs IR vol (task 4) to CVA

Solution:

**An increase in the volatility** of FX rates, domestic interest rates, and foreign interest rates **leads to a rise in the absolute values of both Credit Valuation Adjustment (CVA) and Funding Cost Adjustment (FCA)**.

However, **the impact** on CVA and FCA resulting **from** changes in **FX volatility is more pronounced** compared to the changes stemming from alterations in interest rate volatilities.

The reason can be explained by the formula below:

From the formula, we find that an increase in the volatility of FX rates, domestic interest rates, or foreign interest rates will result in a larger volatility of . This heightened volatility in consequently increases Expected Discounted Positive Exposure (EDPE), thereby increasing both Credit Valuation Adjustment (CVA) and Funding Cost Adjustment (FCA).

Moreover, the volatility of FX rates is significantly larger than that of domestic and foreign interest rates. This disparity results in a larger impact of FX volatility changes on CVA and FCA.

Q2: Discuss the impact of risk factor correlation to CVA

Solution:

An increase in the correlation **between foreign interest rates and domestic interest rates decrease** the absolute values of both Credit Valuation Adjustment (CVA) and Funding Cost Adjustment (FCA).

An increase in the correlation **between foreign interest rates and FX rates decrease** the absolute values of both Credit Valuation Adjustment (CVA) and Funding Cost Adjustment (FCA).

An increase in the correlation **between domestic interest rates and FX rates increase** the absolute values of both Credit Valuation Adjustment (CVA) and Funding Cost Adjustment (FCA).

The reason can be explained by the formula below:

Since the coefficient of and is the same, an increase in the correlation will result in a higher volatility of , which results in higher EDPE.

However, the coefficient of is different from and , so an increase in the correlation will result in a lower volatility of , which results in lower EDPE.