Key:

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Everyone

# 1. Introduction

Task: Pricing a structured bond (and implementing a hedging strategy) with a focus on both valuation and risk management.

We will analyse the bond’s characteristics, market data, pricing models, form a hedging strategy and evaluate its effectiveness.

# 2. Product Description and Market Data

* Product Overview (Task 1):

Bond’s key features (issuer, coupon structure, floor, cap, maturity, etc.).

Replication of coupon payoff using FRN,

* Historical Data and Market Data (Task 2 & Task 3):

Historical coupons diagram/table (noting things like reset dates, coupon periods, reference rates, coupon rates, and amounts).

Discuss the market data sources (e.g., deposit rates, IRS, cap volatilities from MarketData.xlsx) and justify our choices – Deposit rates for short term, we use the swap rates for long term. We have a duplicate for 1 year proxy. We use the depo rate since this is typically more liquid and more reflective of the IR schema.

Explain log-cubic bootstrapping procedure used to construct our term structure. Why this curve? Because it led to the smoothest forward rates – this matters because our variable rate and future cash flows are disounted back using these forward rates so we want the least jumps and most accurate curve. Include the three diagrams for log-cubic and also include the forward rates.

* Assumptions used in Task 1,2,3 (use Report Writing Aid)

# 3. Pricing Procedures and Model Justification

Option Components of Hedge (Task 5):

Explain how we decompose the coupon into basic instruments (using our replication strategy) and how we price these option-like components.

Justify choice of interest rate model and describe its calibration (e.g., using shifted caplet volatilities and Black model – why did we use this model????)

Risk Adjustments (Task 6):

Detail the process of adjusting the risk-free value by incorporating Credit Valuation Adjustment (CVA).

Rationale behind the use of the survival probability approximation and any assumptions.

Rationale:

Clearly state why we chose these pricing models and methods over alternatives.

# 4. Implementation of Pricing Procedure (this is more methodological)

Practical Implementation Details:

Scenario Analysis (Task 4):

What is the best and worst-case scenario for the bond-holder? How did we simulate this? (i.e. always cap / always floor. AND How did we code up the values)

Include details on the construction of tables for coupon components and the computation of the bond’s gross and clean prices (Task 8).

Cash Flow and Fair Value Analysis:

Chart showing expected cash flows and provide commentary (Task 9).

Explain the process of comparing computed fair value with the quoted clean price on EuroTLX and how we derived the market-implied CDS (Task 10).

Sensitivity and Risk Measures:

Calculation of sensitivities to shifts in the term structure (Task 11).

Describe the implementation of hedging strategy using plain vanilla swaps and CDS (Tasks 12–15) (i.e. we hedge 2 things. We hedge the IR risk with a swap. And we hedge the default risk with a CDS).

Detail the Monte Carlo simulation to compute the VaR and Expected Shortfall, and compare these results with analytical approximations (Tasks 16–18).

Summary Tables:

Compile and present tables summarizing fair values, sensitivities, and the performance of the hedging instruments (Task 19).

# 5. Results and Discussion (this is more presenting the big results)

Presentation of Results:

Best/worst-case scenario market values.

Coupon component valuations, bond prices, and cash flow projections.

Fair value comparison with market quotes and the derived market-implied CDS.

Results from sensitivity analysis, hedging strategy performance,

Results from risk measures (VaR/ES).

Discussion for EACH OF OUR PARTS:

Comment on the observed coupon behaviours, any discrepancies between calculated values and market quotes, and issues encountered (e.g., model limitations or data challenges).

What was the effectiveness and failures of the hedging strategy.

*I.e. all the numerical and graphical results from Tasks 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19.*

6. Conclusions

Main insights re. bond’s pricing, effectiveness of pricing models, and hedging strategy.

Provide final recommendations for potential investors based on analysis (Q20).

Discuss the limitations encountered and suggest areas for further research or refinement of the models.