

CLO Waterfall Simulation: Base vs Stress Scenario

Objective

This project simulates the interest waterfall and compliance test mechanics of a simplified Collateralized Loan Obligation (CLO). The goal was to understand how cash flows are allocated across seniority tiers, and how Overcollateralization (OC) test results affect Mezzanine and Equity tranches.

Structure

- **Asset Pool:** Hypothetical loan portfolio generating £8M in annual interest income.
- **Tranches:**
 - Senior: £50M at 5% (highest priority)
 - Mezzanine: £30M at 7%
 - Equity: £20M residual (lowest priority)
- **Compliance Test:** Overcollateralization (OC)

Scenarios Simulated

Base Case – OC Test Passes

- **Collateral:** £100M
- **OC Ratio:** 2.00x (above 1.25x threshold)
- **Results:**
 - Senior Paid: £2.5M
 - Mezzanine Paid: £2.1M
 - Equity Paid: £3.4M (residual)

Stress Case – OC Test Fails

- **Collateral:** £55M
- **OC Ratio:** 1.10x (below 1.25x threshold)
- **Results:**

- Senior Paid: £2.5M
- Mezzanine Paid: £0
- Equity Paid: £0
- Unallocated Cash: £5.5M retained or redirected

Key Insights

- OC tests are essential for senior investor protection; small collateral changes can fully block junior tranches.
- The waterfall logic in Python mirrors real-world CLO payment structures.
- Python's `pandas` and `matplotlib` libraries were used for modeling and visualization.

Conclusion

This simulation improved my understanding of structured credit mechanics and risk allocation. It demonstrated the practical use of compliance tests in portfolio-level cash flow control, and highlighted the power of programmatic finance modeling for investment analysis.