

Barclays Graduate Analyst Case Study - IIT Madras

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Aurora Ridge Fund: Corporate Bond Investment Case Study

Aurora Ridge evaluates a \$100mn BBB-rated corporate bond and issuer fundamentals with strong US base and global diversification

Repo financing structure evaluated to enhance capital efficiency

Unleveraged, leveraged return scenarios analyzed for performance impact

Key risk factors mapped across credit market and financing dimensions

Default & recovery outcomes modelled with CDS protection considerations

Banking side implications assessed to conclude risk–return trade-offs

Bond Investment Summary¹

\$100mn	Investment Size
BBB (USD-denominated)	Bond Rating
8% Fixed	Coupon
5 Years	Maturity
Consumer Discretionary	Sector
70%	Advance Rate
6% (Repo)	Financing Rate
30%	Haircut

¹ sensitivity to rate shocks analyzed in later sections.

Returns uplift (8% → 12.7%) via repo financing, but leverage amplifies funding, margin and credit risk

Unleveraged Return

- Given the bond price = \$100 (par), annual coupon = 8% ($0.08 * \$100 = \8)

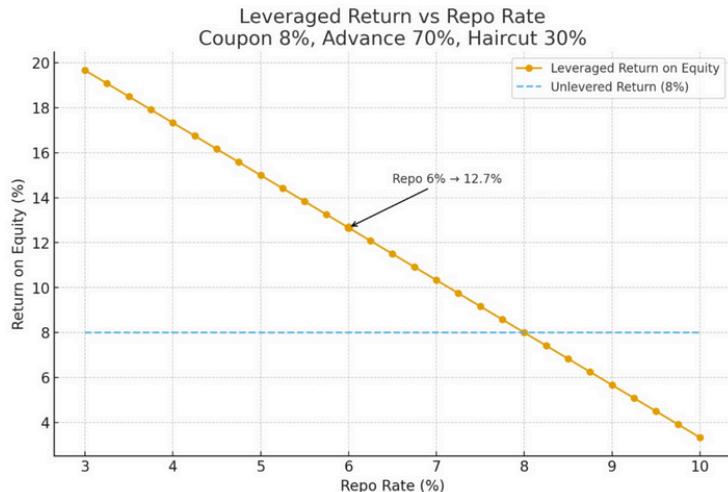
$$\text{Unleveraged return} = \frac{\text{Annual coupon}}{\text{Investment}} = \frac{8}{100} * \$100 = \$8$$

- The unleveraged return for every \$100 dollars invested is thus \$8.

Leveraged Return with Repo Financing (risk, benefit analysis)

- Given the advance rate = 70%, repo rate = 6%, haircut = 30%

$$\text{Leveraged return} = \frac{\text{Coupon} - (\text{Repo rate}) * (\text{Advance Rate})}{\text{Haircut}} = \frac{8 - (6\% * 7\%)}{30\%} = .12.7\%$$



- Table showing risks and benefits associated with repo financing

Benefits	Risks
Higher Returns: Leverage lifts ROE (8% → 12.7%) and adds +2% carry	Market Volatility: Bond value drops or repo rate hikes cut returns
Capital Efficiency: Only 30% equity used; steady 8% coupon income	Credit Risk: Rating cuts or lower advance rates raise funding needs
Liquidity Access: Easy short-term funding via repo	Liquidity Trap: Rollover or market stress can freeze capital

Market, credit & funding risks erode leverage and portfolio stability

Q. How do risks change if collateral is an INR-denominated Indian corporate bond?

A: Adds FX risk (USD-INR volatility reduces USD returns) and liquidity risk.

Example: 8% INR yield – 5% INR depreciation → approx. 3% USD return

Q. What happens if the bond rating drops to CCC?

A: Bond price falls, spreads widen, and repo terms tighten (higher haircut, lower advance rate).

$\Delta\text{Price} = -\text{Duration} \times \Delta\text{Yield} \rightarrow (4 \times 3\%) = -12\%$ price drop

Q. What are the implications if advance rate in a repo falls to 60%?

A: Leverage and ROE shrink; more equity must be posted.

$\text{Leverage} = 1 / (1 - \text{Advance Rate}) \rightarrow 70\% \rightarrow 3.3x \rightarrow 60\% \rightarrow 2.5x$

Q. What if repo financing costs rise to 8%?

A: Positive carry disappears; net return compresses.

$\text{Carry} = \text{Bond Yield} - \text{Repo Cost} = 8\% - 8\% = 0\%$

Q. What are the risks if repo tenor < bond holding period?

A: Creates rollover risk - if repo can't be renewed, forced liquidation may occur.

Maturity mismatch → liquidity and refinancing risk

Q. If Aurora Bridge holds \$100mn in 10 BBB bonds (vs. 1 bond), how do risk and returns change?

A: Diversification lowers idiosyncratic credit risk and stabilises returns.

$\text{Portfolio } \sigma = \sigma_i / \sqrt{n} \rightarrow 1/\sqrt{10} = 68\%$ lower volatility

Also improves repo eligibility and advance rate terms.

Market Risk

FX swings, downgrades, or rate hikes can quickly erase leveraged gains

Credit & Counter-party Risk

Falling advance rates and shorter repo tenors magnify funding stress

Funding & Liquidity Risk

Diversification strengthens repo access and cushions return volatility.

CDS Converts Credit Risk into Predictable Return

Impact of bond default (yr. 3, recovery 40%)

If the bond defaults in Year 3 with a 40% recovery, the impact on investor returns can be measured using recovery, loss, and yield (r) formulas shown below:

$$\text{Recovery (\%)} = \frac{\text{Amount Recovered on Default}}{\text{Face Value}} \times 100$$

$$\text{Investor Loss (\%)} = \left(1 - \frac{\text{Total Cashflows Received}}{\text{Initial Investment}}\right) \times 100$$

$$100 = \sum_{t=1}^T \frac{CF_t}{(1+r)^t} \Rightarrow r = \left(\frac{\text{Final Value}}{\text{Initial Value}} \right)^{1/T} - 1$$

Summary of default impact

Scenario	Recovery	Investor Loss	Yield Impact
Base Case	100%	0%	+8.0%
Default – Start of Year 3	40%	40%	-17.5%
Default – End of Year 3	40%	36%	-11.8%

Credit Default System (CDS)¹

- Without CDS:
 - Face Value: ₹100 Recovery: ₹40
 - Coupons: ₹8 × 2 = ₹16 Total Cashflows: ₹56
 - Loss: 44% | Yield ≈ -17.5% | Effective Annual Return ≈ -6.2%
- With CDS Protection:
 - Assumptions:
 - CDS payout covers default loss = $(1 - 0.40) \times 100 = ₹60$
 - CDS premium = 2% per year × 3 years = ₹6
 - Cashflows under default (Year 3):
 - Year 1 coupon = ₹8
 - Year 2 coupon = ₹8
 - Year 3 = Recovery (₹40) + CDS payout (₹60) - premiums (₹6)
 - Total Cashflows = 8 + 8 + (100 - 6) = ₹110
 - Investor outcome:
 - Receives ₹110 against ₹100 invested over 3 years
 - Yield Impact (r):
 - $r = (110 / 100)^{(1 / 3)} - 1 = 0.0323 = 3.23\%$
 - Effective Annual Return:
 - Ans = 8% (coupon) - 2% (CDS premium) + 1.3% (recovery gain)
 - Effective Annual return = 7.3% per year

CDS covers default loss, restores principal, and stabilizes returns while investor keeps coupons and pays a small premium.

CDS converts a potential -17.5% loss into a +7.3% stable return, replacing default risk with a predictable 2% annual cost. CDS protection stabilizes returns by converting unpredictable default losses into fixed, manageable costs

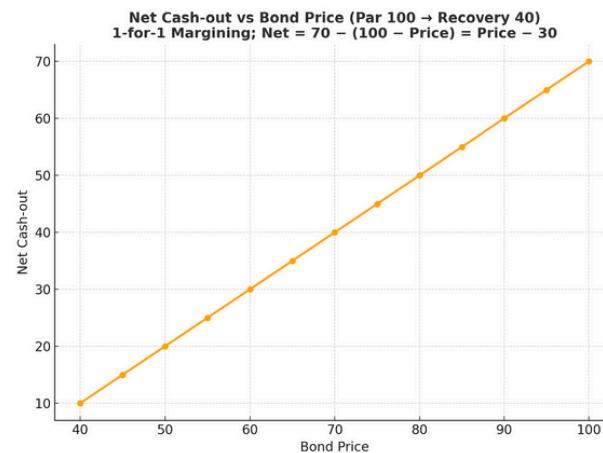
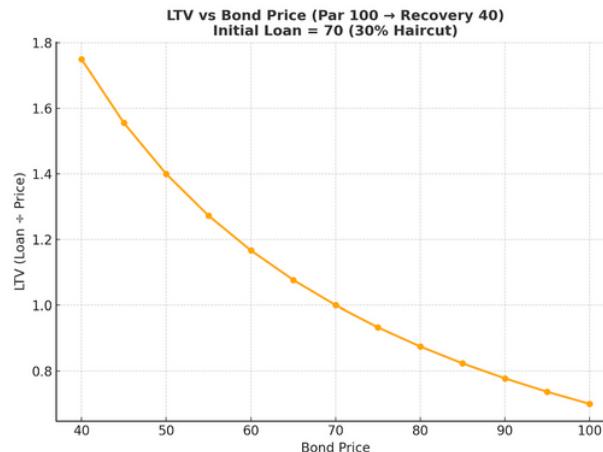
¹ Assumptions: Face value = ₹100; fixed coupon = 8% p.a.; default occurs at end of Year 3 with 40% recovery (₹40); CDS notional = ₹100 with annual premium = 2% for 3 years and payout = ₹60; no discounting, reinvestment, FX, or counterparty risk

Banking Side Overview: Risk, Hedging, and Collateral Strategy

Risks and hedging strategies for the bank

Risk	Description	Hedging Approach
Credit Risk	Borrower or collateral default	Buy CDS to offset credit loss
Market Risk	Bond price volatility impacts LTV	Use swaps or bond futures
Liquidity Risk	Funding pressure from margin calls	Maintain repo lines and high-quality liquid assets
Counterparty Risk	Failure of financing counterparty	Use central clearing and diversify exposures

LTV & Net Cashout Dynamics under Margining



Assumptions:
 Par value (P_0): ₹100, Initial loan (L): ₹70 → implies 30% haircut at par, Margining rule: \$1 margin for each \$1 drop in bond price from ₹100

Conclusions:
 As the bond's value falls from ₹100 to ₹40, LTV rises from 70% to 175%, showing higher leverage. With \$1-for-\$1 margining, each ₹1 drop triggers equal margin posting, so Net Cashout falls linearly from ₹70 to ₹10, indicating rising liquidity stress.

Funding Strategy & Collateral Efficiency

How the Bank Raises Cash:

- Uses **repo funding** against high-quality collateral
- Accesses **interbank and central bank liquidity lines**
- Issues **covered bonds or short-term notes** for funding

Best Collateral for Financing:

- **DM Covered Bond** - lowest haircut, high liquidity, lowest funding cost
- **DM Corporate Bond** - moderate haircut, fair liquidity
- **EM Corporate Bond** - high haircut, volatile, least efficient

Conclusions: The bank raises cash via repo and covered bond issuance. DM Covered Bond is preferred for its low capital cost, high liquidity, and minimal margin risk.

Diversifying globally to balance yield, risk, and liquidity

Geographies / Markets to Explore and the impact of the US

- What other geographies/markets would you suggest?
 - Emerging Markets (Asia, LATAM):
 - Higher yields, strong growth outlook
 - Improving stability and liquidity
 - India, Indonesia, Brazil:
 - India: Expanding bond market, robust demand
 - Indonesia: Solid reserves, credit improvement
 - Brazil: High real yields, infra opportunity
 - Europe (Developed Markets):
 - Stable regulation and deep markets
 - Diversified issuers; growing green bonds
 - Sector Focus:
 - Consumer: Demand recovery
 - Renewables: ESG-driven growth
 - Infrastructure: Stable, inflation-linked returns
- How would recent US interest rate and credit spread trends impact?
 - Rising US Rates:
 - Higher funding costs → tighter liquidity
 - Lower leverage and carry trade appeal
 - Wider Credit Spreads:
 - Better entry yields but higher default risk
 - Demands selective credit positioning
 - Corporate Finance Shift:
 - Move to shorter tenors and floating rates
 - Greater focus on credit quality and collateral
 - Strategic Outlook:
 - Balance yield with risk through diversification
 - Maintain selective, duration-neutral exposure



Geographically, some of the key take-aways include,

- **US & UK/Germany:** Provide liquidity, stability, and benchmark credit pricing
- **India & Indonesia:** Offer higher yields and strong growth outlook
- **Brazil:** Adds inflation-linked, real yield exposure
- **UAE:** Supports ESG and energy-transition financing
- **Overall:** Balanced portfolio - DM for safety, EM for yield & growth