# Returns, Pricing and Portfolio Construction

Interview preparation summary · PC track

IN THIS SUMMARY


- Return maths
- The portfolio


INT.CV.1.a · Return maths

**Calculate the all-in yield and the yield to a three-year takeout of a private loan from its margin, base rate, original issue discount, fees and call protection.**

A private loan's return is contractual, so the first skill is turning its terms into one yield. The cash coupon is the base rate plus the margin. Original issue discount (OID) means the lender funds less than par, so a price of 98 earns two points at repayment, and an upfront fee works the same way. Because borrowers usually repay early, on a sale or a refinancing, lenders quote a yield to a takeout, most often three years, rather than to legal maturity: the internal rate of return on the price paid, the coupons and the repayment at par or at a call price. Call protection, such as 102 in year one and 101 in year two, lifts the early repayment. A shorter life means the discount is earned faster, so the yield rises. Common mistakes are quoting the coupon or the current yield, adding the whole discount to one year's coupon, and assuming a flat base rate without saying so. Interviewers ask this to see whether you can price a loan on paper and name the assumptions that drive it.

WORKED EXAMPLE: PRICING A UNITRANCHE FOR FENWICK TOOLING

Fenwick Tooling, a sponsor-backed manufacturer, asks for a 40m unitranche at base rate plus 6.0%, issued at 98 (two points of OID), with call protection of 102 in year one, 101 in year two and par afterwards. Assume the base rate stays at 4.0%, coupons are paid at each year end and quoted per 100 of par, and ignore fees and tax. What is the yield to a three-year takeout, and how does it change if the loan is repaid earlier or later?

**Answer:** Yield to a three-year takeout is 10.8%, against a coupon of 10.0%. It would be 14.3% if repaid after one year with the 102 call price, 11.7% after two years, and 10.5% if the loan ran five years.

> **Interview tip:** Say: assuming a flat 4.0% base rate and a three-year takeout, the loan yields about 10.8%; the OID adds roughly 0.8% to the 10.0% coupon, and the number is higher the sooner we are repaid. Name the takeout assumption before the interviewer asks.

INT.CV.1.b · Return maths

**Compare loans on spread by applying base rate floors and a simple discount margin, and compare a fixed-rate loan with a floating-rate loan on a swapped basis.**

Spread is the cleaner way to compare floating-rate loans because the base rate is common to all of them. The margin is the contractual spread over the base rate, but the lender's true spread also includes the discount. A simple discount margin is the margin plus the discount in points divided by the expected life in years; a full calculation gives a slightly higher answer. A base rate floor sets a minimum base rate in the coupon: when the base rate is below the floor, the effective margin is the margin plus the gap, so a 1.0% floor with a base rate of 0.5% adds 0.5%, and once the base rate is above the floor it is worth nothing. A fixed-rate loan is compared by subtracting the swap rate for the same term, which gives a swapped margin. Common mistakes are comparing a fixed coupon with a floating margin, counting a floor's benefit in years when the base rate will be above it, and ranking loans on spread without looking at risk. Interviewers use this to check that you compare like with like.

WORKED EXAMPLE: TWO LOANS, ONE FLOOR AND ONE DISCOUNT

Loan A is a new-issue term loan to Brightwater Foods: margin 6.5%, issued at 99, base rate floor 3.0%, expected life 3 years. Loan B is a secondary purchase of a term loan to Cresswell Hire: margin 5.5%, bought at 96, no floor, expected life 4 years. The base rate is 2.5% today. Rank them on spread, using the simple discount margin and ignoring credit differences for now.

**Answer:** Loan A is about 7.3% on today's base rate (6.83% plus 0.5% from the floor) and 6.8% once the base rate passes 3.0%; Loan B is about 6.5% on the simple method. A leads by 0.8% now and by about 0.3% later.

> **Interview tip:** Say: Loan A earns about 7.3% while the base rate is below its floor and 6.8% after, against 6.5% for Loan B; the floor gap is temporary, and I would not rank them before comparing credit risk.

INT.CV.1.c · Return maths

**Estimate expected loss as probability of default times loss given default, and compare loans on loss-adjusted spread in a base case and a stressed case.**

A lender's return is capped, so a spread must be judged after losses. Expected loss is the probability of default (PD) multiplied by the loss given default (LGD), where LGD is one minus the recovery rate. A loan with a 3% annual PD and 60% recovery has an expected loss of 1.2% a year. Loss-adjusted spread is the spread, meaning margin plus discount per year, less that expected loss: it is what the lender expects to keep for bearing risk and illiquidity. Recovery depends on enterprise value at default, after costs, against the claims that rank ahead of or equal to the loan, not on a generic percentage. A higher spread usually signals a higher expected loss and a wider range of outcomes, so run a stress case in which PD rises and recovery falls together: a second lien loan can look better on average and worse in a downturn. Common mistakes are treating the average as the worst case, using a recovery rate that ignores the debt ahead, and applying the default rate to interest instead of principal. Interviewers want the number and the stress.

#### WORKED EXAMPLE: SENIOR AGAINST SECOND LIEN AT HARBOURLINE

Harbourline Services can borrow in two ways. A senior loan pays base rate plus 6.0% with an annual PD of 3.0% and 60% recovery. A second lien loan pays base rate plus 9.5% with an annual PD of 6.0% and 25% recovery. The base rate is 4.0%. Ignore discount and fees, and take annual losses as PD times LGD on the principal. Which loan keeps more after expected loss, and which is safer in a downturn?

**Answer:** Senior keeps 4.8% after a 1.2% expected loss; second lien keeps 5.0% after 4.5%. In the downturn the senior loan still keeps 3.0% while the second lien loses 0.7%, so the senior loan is the better risk-adjusted choice.

> **Interview tip:** Say: the second lien pays 3.5% more but costs 3.3% more in expected loss, so the extra reward is only 0.2%, and in a stress it is negative; I would want a much wider spread or a cheaper entry point before taking that risk.

INT.CV.2.a · The portfolio

**Set position sizes, concentration limits and a loss budget so that a loan portfolio can absorb the defaults it should expect, including defaults that are linked within one sector.**

Because each loan can return only par plus interest, a portfolio's result is set by how much it loses when a few borrowers default. A loss budget is the credit loss per year that spread income can absorb while still meeting the target return. It is turned into limits: the size of the largest position, a maximum share for any one sector, sponsor or risk rating, and a minimum number of names. A default costs the position size times LGD, so 25 equal loans at 40% LGD lose 1.6% of the portfolio per default, and a cushion of 2.0% absorbs one default but not two. More names make each loss smaller but do not change expected loss, and diversification fails when defaults are linked, because ten borrowers in one sector behave like one large position in a downturn. Test the book against a sector stress as well as independent defaults. Common mistakes are counting names instead of exposures, ignoring shared sponsors and sectors, and setting limits from the average case. Interviewers ask how you would size and limit positions.

#### WORKED EXAMPLE: A LOSS BUDGET FOR A 25-LOAN BOOK

A direct lending fund holds 25 equal loans of 4.0% each. Average annual PD is 3.0% and LGD is 40%. Spread income after costs is 5.0% of the portfolio a year and the fund's target is to keep at least 3.0% after losses. Treat defaults as independent for the first three steps. How many defaults can the book absorb, how likely is a breach, and how does a smaller book compare?

**Answer:** One default costs 1.6% of the portfolio, so the book absorbs one default a year; the breach probability is about 17% with 25 names, 31% with 12 names, and a 15% default rate in a 10-loan sector costs 2.4%, so I would cap the sector as well as the name.

> **Interview tip:** Say: I size limits from the loss budget, which here covers one default; I would cap any sector so that a severe sector stress still sits inside the budget, because the independent-default maths flatters a book with linked names.

INT.CV.2.b · The portfolio

**Work out a fund's net return after credit losses, fees and fund leverage, and explain how deployment, recycling and facility terms change it.**

Investors earn the portfolio's yield less credit losses, fees and the cost of any fund borrowing. Fund leverage, through a subscription line or a facility secured on the loans, lifts the return on equity only while the asset yield after expected loss exceeds the cost of debt and its fees: at a 10.0% yield, 1.0% loss and 6.25% debt cost, each pound borrowed earns 2.75% more than it costs. It also magnifies losses and brings covenants, such as an advance rate against eligible loans, that can force repayment when values fall. Net return after the management fee, often charged on committed or invested capital, and carry above a hurdle is the figure investors compare, and it lags the gross yield while the fund is still deploying and when repaid loans are not recycled quickly. Common mistakes are quoting the gross portfolio yield as the fund return, leaving expected loss out of the levered calculation, and assuming leverage helps in every scenario. Interviewers listen for the path from gross to net to levered, with the downside.

#### WORKED EXAMPLE: FROM GROSS YIELD TO NET RETURN AT TIDEWATER CREDIT FUND

Tidewater Credit Fund has 100m of investor equity and borrows 50m on a facility at 6.25%, so it holds 150m of loans yielding 10.0%. Expected credit loss is 1.0% of loans a year. The management fee is 1.25% of equity and carry is 10% of profit, assuming the hurdle is met and the manager is fully caught up. Compute the net return to investors with and without leverage, and then with higher losses. Ignore other costs and tax.

**Answer:** Levered, investors earn about 8.2% net (9.1% before carry); unlevered they earn about 7.0%. If losses rise to 3.0% of loans, leverage adds only about 0.4 points before carry, so it helps least when it is needed most.

> **Interview tip:** Say: leverage lifts the net return to about 8.2% from 7.0% because borrowed money earns 2.75% over its cost, but in a stress that margin falls to 0.75% and the facility covenants matter more.

INT.CV.2.c · The portfolio

### Compare a private loan with syndicated loans and bonds on a loss-adjusted basis, and value a loan portfolio using a market yield or a spread duration approach.

Relative value asks whether a private loan pays enough more than the alternatives for the extra risk and illiquidity. Compare loss-adjusted spreads on the same basis: take the margin, or the bond yield less the swap rate, add the discount per year, and subtract expected loss. A private unitranche with a 6.25% margin and 1.8% expected loss keeps 4.45%, against 3.35% for a syndicated loan with a 4.25% margin and 0.9% loss. The 1.1% difference is what you are paid for illiquidity, smaller borrowers, tighter terms and a commitment to hold, and your judgement is whether it is enough. Loan portfolios are valued by discounting expected cash flows at a market yield, or by moving price by spread duration times the change in spread, while impaired loans are valued on expected recovery. A widening of 1.5% on a spread duration of about 2.5 takes roughly 3.7 points off the price. Common mistakes are comparing raw yields, holding performing loans at cost whatever the market does, and ignoring the mark on stressed loans.

#### WORKED EXAMPLE: RELATIVE VALUE AND A MARK FOR ASHGROVE PACKAGING

A fund can lend to Ashgrove Packaging through a private unitranche at base rate plus 6.25% (PD 4.0%, recovery 55%) or buy a larger company's syndicated loan at base rate plus 4.25% (PD 2.0%, recovery 55%). Separately, it holds three-year loans with a 10% coupon that were bought at par, and market yields for that risk have moved from 10.0% to 11.5%. Compare the two loans after loss, then estimate the mark. Ignore discount and fees.

**Answer:** The private loan keeps 4.45% against 3.35%, a pick-up of 1.1% after expected loss; the portfolio of three-year loans is worth about 96.4 per 100 after the 1.5% move, a fall of 3.6 points.

> **Interview tip:** Say: after expected loss the private loan pays about 1.1% more than the syndicated one, and I would judge that against the illiquidity and the smaller borrower; separately, a 1.5% widening takes about 3.6 points off a three-year loan.

Summary of the Charta interview-preparation topic. Companies and figures in the examples are invented. Draft content, not yet expert reviewed.