CHARTA LEARNING · LESSON NOTES

Hedge Fund Investment Strategies

FRM Part II

1 A story: two sleeves that both said hedged

- Two sleeves both say they are hedged
- Market falls: one loses almost as much as the market
- The other loses as crowded trades unwind
- Ask: what is it really betting on?
- And how much market risk has it kept?

IN THE LESSON

- Imagine two Larkspur sleeves that both tell investors they are hedged.
- In a quiet year both make money.
- Then the market falls sharply.
- One sleeve loses almost as much as the market, because its hedge was smaller than it looked.
- The other loses money even though the market barely matters to it, because many other funds held the same trades and all rushed out at once.
- The word hedged told investors very little.
- To understand a hedge fund you must ask two questions.
- What is it really betting on?
- And how much market risk has it kept?

2 Long/short equity

- Longs: expected to rise. Shorts: borrowed and sold
- Return: stock selection plus chosen net market exposure
- Gross exposure = longs + shorts (leverage)
- Net exposure = longs − shorts
- Beta: how much a stock moves with the market

IN THE LESSON

- Start with the most common strategy, long short equity.
- The fund holds longs, stocks it expects to rise, and shorts, stocks it has borrowed and sold because it expects them to fall.
- It earns from stock selection, plus whatever net market exposure it chooses to keep.
- Two measures describe the book.
- Gross exposure is longs plus shorts, which shows how much leverage is in use.
- Net exposure is longs minus shorts.
- Beta measures how much a stock moves with the market; a beta of one point one means it tends to move one point one per cent for each one per cent move in the market.

3 Example 1: sizing up the long/short book

Capital $100m. Longs $120m (beta 1.1); shorts $80m (beta 0.9)

Gross exposure	120 + 80	**$200m = 200%**
Net exposure	120 − 80	**$40m = 40%**
Long beta dollars	120 × 1.1	**$132m**
Short beta dollars	80 × 0.9	**$72m**
Net beta on capital	(132 − 72) ÷ 100	**0.6**

IN THE LESSON

- Larkspur's equity sleeve has capital of one hundred million dollars.
- It holds longs of one hundred and twenty million, with an average beta of one point one, and shorts of eighty million, with an average beta of point nine.
- Gross exposure is one hundred and twenty plus eighty, two hundred million, or two hundred per cent of capital.
- Net exposure is one hundred and twenty minus eighty, forty million.
- Now weight by beta.
- The longs carry one hundred and twenty times one point one, one hundred and thirty two million of beta dollars.
- The shorts offset eighty times point nine, seventy two million.
- Net beta dollars are sixty million, so the sleeve has a beta of point six on its capital, more market risk than the forty per cent net figure suggests.

4 Example 2: where the return came from

Market +10%. Beta 0.6; longs $120m, shorts $80m, capital $100m

Market part	0.6 × 10%	**6.0%**
Longs beat their beta return	120 × 3%	**$3.6m**
Shorts lag their beta return	80 × 2%	**$1.6m**
Selection on capital	(3.6 + 1.6) ÷ 100	**5.2%**
Total before costs and fees	6.0% + 5.2%	**11.2%**

If the market fell 10%: 5.2% − 6.0% = −0.8%

IN THE LESSON

- Suppose the market rises ten per cent this year, with the same book: a beta of point six, longs of one hundred and twenty million, shorts of eighty million and capital of one hundred million.
- The market part of the return is point six times ten per cent, six per cent.
- Now selection.
- The longs beat the return their betas predict by three per cent, which on one hundred and twenty million is three point six million dollars.
- The shorts lag their predicted return by two per cent, and since Larkspur is short, that earns eighty times two per cent, one point six million.
- Selection adds five point two million, or five point two per cent of capital.
- The total, before costs and fees, is eleven point two per cent.
- If the market had fallen ten per cent instead, the same picks would leave minus point eight per cent.

5 Equity market neutral

- Net beta near zero; often sector and factor neutral too
- Return: a modest long-minus-short spread
- Leverage must scale the spread up
- Trap: dollar neutral is not beta neutral
- Trap: crowded factor exposure and leverage

IN THE LESSON

- An equity market neutral fund goes further.
- It sizes its positions so that net beta is close to zero, and often its sector and factor exposures too.
- A factor is a common driver of many stocks, such as value, size or momentum.
- What is left is a modest spread, the return of the longs minus the return of the shorts.
- That spread is small, so leverage must scale it up to an attractive return.
- Two traps follow.
- First, dollar neutral, equal dollars long and short, is not the same as beta neutral.
- Second, a neutral book can still hold crowded factor exposure and heavy leverage, which bite together when many funds sell the same positions at once.

6 Example 3: dollar neutral is not beta neutral

Capital $50m. Longs $100m (beta 1.3); shorts $100m (beta 0.8)

Net dollars	100 − 100	**$0**
Net beta dollars	130 − 80	**$50m**
Beta on capital	50 ÷ 50	**1.0**
Market falls 10%	−10% × 50	**−$5m = −10%**
Beta-neutral short book	130 ÷ 0.8	**$162.5m**

IN THE LESSON

- Larkspur's market neutral sleeve has capital of fifty million dollars.
- It holds one hundred million of longs with a beta of one point three, and one hundred million of shorts with a beta of point eight.
- Net dollars are one hundred minus one hundred, zero, so the book looks neutral.
- But net beta dollars are one hundred and thirty minus eighty, fifty million.
- On fifty million of capital that is a beta of one.
- If the market falls ten per cent, a ten per cent market fall costs ten per cent times fifty million, five million dollars, a full ten per cent of capital, exactly like an unhedged fund.
- To be beta neutral, the shorts must carry one hundred and thirty million of beta dollars, so the short book must be one hundred and thirty divided by point eight, one hundred and sixty two point five million.

7 Example 4: leverage scales the spread both ways

Betas matched. Longs $100m, shorts $100m, capital $50m

Gross leverage	200 ÷ 50	**4 times**
Normal year: spread 1.5%	100 × 1.5%	**$1.5m**
Return on capital	1.5 ÷ 50	**3.0%**
Crowded unwind: spread −4%	100 × −4%	**−$4.0m**
Loss on capital	−4 ÷ 50	**−8.0%**

IN THE LESSON

- Now suppose Larkspur fixes the betas, keeping one hundred million long and one hundred million short on fifty million of capital.
- Gross leverage is two hundred divided by fifty, four times.
- In a normal year the longs beat the shorts by one and a half per cent.
- That earns one hundred times one and a half per cent, one point five million dollars, which is one point five divided by fifty, three per cent on capital.
- Leverage turned a thin spread into a respectable return.
- Now a crowded unwind.
- Many funds hold the same factor bets and sell at once, and the spread runs minus four per cent in a few days.
- The loss is one hundred times four per cent, four million dollars, minus eight per cent of capital.

8 Dedicated short bias

- Net short: negative beta
- Profits when the market or targeted stocks fall
- Loses when markets rise: a long-run headwind
- Example: beta −0.6, market +20%: −0.6 × 20% = −12%
- Used as a diversifier for long portfolios

IN THE LESSON

- At the other end sits the dedicated short bias fund.
- It is net short, so its beta is negative.
- It profits when the market, or the particular stocks it targets, fall.
- It loses when markets rise, and that is a steady headwind, because over long periods markets have tended to rise.
- Here is a quick example.
- A fund with a beta of minus point six, in a year when the market rises twenty per cent, multiplying minus point six by twenty per cent gives a loss of twelve per cent from the market alone, before any stock picking.
- Investors hold such funds as a diversifier, because they tend to do well when long portfolios do badly.

9 Global macro

- Discretionary directional views, top down
- Currencies, rates, commodities, equity indices
- Usually with leverage: futures, forwards, swaps
- Positions $300m, capital $100m: a 4% move costs 12%
- Main risk: a big wrong call, magnified by leverage

IN THE LESSON

- Global macro funds look at the whole economy rather than single companies.
- They take discretionary directional positions, meaning the manager's own judgement, not a fixed rule, in currencies, interest rates, commodities and equity indices.
- They usually use leverage, mostly through futures, forwards and swaps, which need little cash up front.
- Here is the effect of that leverage.
- Say Larkspur's macro sleeve holds positions of three hundred million dollars on one hundred million of capital.
- An adverse move of four per cent costs three hundred times four per cent, twelve million, which is twelve per cent of capital.
- So the main risk is a large directional call that proves wrong, magnified by leverage.

10 Managed futures

- Systematic rules, not judgement
- Mostly trend following across futures markets
- Gain in sustained moves, up or down
- Lose in whipsaw markets: signals arrive late
- Choppy years: a long string of small losses

IN THE LESSON

- Managed futures funds also trade futures across many markets, but systematically.
- They follow rules, not judgement, and most of them follow trends: they buy what has been rising and sell what has been falling.
- They gain in sustained moves, whether up or down.
- They lose in whipsaw markets, where prices jump back and forth, because each signal arrives after the move has already turned.
- So a choppy, trendless year can produce a long string of small losses.

11 Example 5: a trend rule in two kinds of market

Rule: buy after a 5-point rise; sell after a 5-point fall from the high

Trend: buy 105, peak 125, sell 120	120 − 105	**+15 points**
Lags: entry and exit	5 + 5 of the 25-point move	**10 points**
Whipsaw: buy 105, high 106	sell 101; 101 − 105	**−4 points**
Whipsaw: four false signals	4 × −4	**−16 points**

IN THE LESSON

- Here is a simple trend rule.
- Buy after a five point rise, and sell after a five point fall from the high.
- Start with a price of one hundred.
- In a trending market, the price rises to one hundred and five, so the fund buys.
- The price peaks at one hundred and twenty five, then falls to one hundred and twenty, so the fund sells.
- The gain is one hundred and twenty minus one hundred and five, fifteen points.
- Of the twenty five point move, the two lags cost five plus five, ten points.
- Now a whipsaw market.
- The fund buys at one hundred and five, the price edges up to one hundred and six and falls back to one hundred and one, a five point fall from the high, so it sells: a loss of four points.
- Four false signals like that lose sixteen points.

12 Equity and macro approaches side by side

Match each approach to its return source and its main risk

Approach	Return source	Main risk
Long/short equity	Selection + net exposure	Net exposure, wrong picks
Market neutral	Spread × leverage	Crowding, leverage
Dedicated short	Falling prices of shorts	Rising markets
Global macro	Directional macro views	Big wrong call, leverage
Managed futures	Sustained trends	Whipsaw markets

IN THE LESSON

- The table matches each approach to its return source and its main risk, which is exactly what the exam asks.
- Long short equity earns from selection plus the net exposure it chooses, and its risks are that net market exposure and wrong picks.
- Equity market neutral earns the long minus short spread times leverage, and its risks are crowded factors and leverage.
- Dedicated short bias earns from falling prices of its shorts, and its risk is rising markets.
- Global macro earns from directional macro views, and its risk is a big wrong call with leverage.
- Managed futures earn from sustained trends, and their risk is whipsaw markets.

13 Arbitrage: the idea, and why it is not riskless

- Exploit relative mispricing between related instruments
- Buy the cheap one, sell the rich one, hedge the market
- Profit if prices converge
- Rarely riskless: gaps can widen, hedges are imperfect
- Small spreads mean leverage, and forced selling

IN THE LESSON

- Now Larkspur's arbitrage sleeves.
- In textbooks, arbitrage is a riskless profit.
- In hedge funds it means something looser.
- The fund exploits a relative mispricing between related instruments, buying the cheap one and selling the rich one, while hedging out broad market risk.
- It profits if the prices converge.
- But the trades are rarely riskless.
- The gap can widen before it closes.
- The hedge may be imperfect.
- And because the mispricings are small, the positions are usually leveraged, so a temporary widening can force the fund to sell before convergence ever arrives.

14 The arbitrage strategies side by side

Four arbitrage strategies: what each trades, and its main risk

Strategy	What it trades	Main risk
Fixed income arb	Swap spreads, curves, MBS	Spread widens; leverage
Statistical arb	Many short-horizon model bets	Model breaks down
Capital structure arb	One issuer's securities	Prices diverge further
Convertible arb	Long convertible, short shares	Credit, vol, deleveraging

IN THE LESSON

- Here are four of them side by side, with what each trades and its main risk.
- Fixed income arbitrage bets on the convergence of spreads, such as swap spreads, yield curve shapes, and mortgage securities against Treasuries.
- Its risk is that the spread widens while the position is heavily leveraged.
- Statistical arbitrage uses models to hold many short horizon positions at once; its risk is that the model's relationships break down.
- Capital structure arbitrage trades different securities of one issuer, such as its bonds against its shares; its risk is that the prices diverge further.
- Convertible arbitrage is long a convertible bond and short the shares, and its risks are credit, implied volatility and forced deleveraging.

15 Example 6: fixed income arbitrage and leverage

Bond A cheap to Bond B by 0.30 per 100. $500m each side. Capital $50m

Gross leverage	(500 + 500) ÷ 50	**20 times**
Gap closes: gain	500 × 0.30%	**$1.5m**
Return on capital	1.5 ÷ 50	**3.0%**
Gap widens to 0.80: loss	500 × 0.50%	**−$2.5m**
Loss on capital	−2.5 ÷ 50	**−5.0%**

Margin calls can force a sale before convergence

IN THE LESSON

- Larkspur's fixed income sleeve spots two nearly identical government bonds.
- Bond A is cheap to Bond B by thirty cents per hundred dollars of face value.
- It buys five hundred million of Bond A and shorts five hundred million of Bond B, on capital of fifty million.
- Gross leverage is five hundred plus five hundred, divided by fifty, twenty times.
- If the gap closes, the gain is five hundred million times point three per cent, one and a half million dollars, which is three per cent of capital.
- But suppose the gap first widens to eighty cents.
- The loss is five hundred million times the extra point five per cent, two and a half million dollars, or minus five per cent of capital.
- Lenders may then call for more margin and force a sale at the worst moment.

16 How convertible arbitrage works

- Convertible: a bond that converts into shares
- Value: bond floor plus an option on the shares
- Buy the cheap convertible, short shares by delta
- Delta hedged, but long volatility and long gamma
- Earns coupon and gamma; pays borrow and financing

IN THE LESSON

- Convertible arbitrage deserves a closer look.
- A convertible bond is a bond the holder may swap for a fixed number of the issuer's shares.
- That number is the conversion ratio.
- So the bond is worth a straight bond, its floor, plus an option on the shares.
- The arbitrageur buys a convertible it thinks is undervalued and shorts shares against it.
- The short is sized by delta, which is how much the convertible's value moves for a small move in the share price.
- The result is delta hedged: small share moves cancel out.
- But the position is long volatility and long gamma, so it gains when the stock moves sharply.
- It earns the coupon and these gamma profits, and pays the cost of borrowing shares and of financing.

17 Sizing the convertible hedge

Shares short = Bonds × CR × Δ

Convertible bonds held	The size of the long position
Conversion ratio	Shares each bond converts into
Delta of the convertible	Fraction it acts like, 0 to 1

IN THE LESSON

- The size of the hedge depends on three things.
- The number of shares to short equals the number of convertible bonds held, times the conversion ratio, times the delta.
- The bonds held are the size of the long position.
- The conversion ratio turns each bond into the number of shares it could become.
- And the delta, between zero and one, says what fraction of those shares the convertible behaves like right now.
- A convertible deep out of the money, far from conversion, has a low delta and acts like a bond.
- One deep in the money has a delta near one and acts like the shares.
- The exam point is to use all three, not the conversion ratio alone.

18 Example 7: setting the hedge

10,000 bonds at $1,100. Conversion ratio 25, delta 0.60, share price $40

Convertibles bought	10,000 × $1,100	**$11.0m**
Shares if all converted	10,000 × 25	**250,000**
Shares to short	250,000 × 0.60	**150,000**
Value of the short	150,000 × $40	**$6.0m**

Shorting all 250,000 would over-hedge

IN THE LESSON

- Larkspur buys ten thousand convertible bonds of Corvo Systems, each with one thousand dollars of face value, at a price of one thousand one hundred dollars.
- That costs ten thousand times one thousand one hundred, eleven million dollars.
- Each bond converts into twenty five shares, so if every bond were converted, Larkspur would hold ten thousand times twenty five, two hundred and fifty thousand shares.
- The delta is point six, so the hedge is two hundred and fifty thousand times point six, one hundred and fifty thousand shares short.
- The share price is forty dollars, so the short is worth one hundred and fifty thousand times forty, six million dollars.
- Shorting all two hundred and fifty thousand shares would over hedge, leaving Larkspur net short the stock.

19 Example 8: earning from gamma

Shares jump $40 to $44, delta 0.60 to 0.68, then fall back to $40

Shares needed after the jump	250,000 × 0.68	**170,000**
Sell more at $44	170,000 − 150,000	**20,000**
Shares fall back: buy back at $40	delta back to 0.60	**20,000**
Gamma profit	20,000 × ($44 − $40)	**$80,000**

Sell high, buy low: long gamma, long volatility

IN THE LESSON

- Now watch the long gamma at work.
- Corvo's shares jump from forty to forty four dollars, and the convertible's delta rises from point six to point six eight.
- To stay hedged, Larkspur now needs two hundred and fifty thousand times point six eight, one hundred and seventy thousand shares short.
- So it sells one hundred and seventy thousand minus one hundred and fifty thousand, twenty thousand more shares at forty four dollars.
- Then the shares fall back to forty and delta returns to point six.
- Larkspur buys the twenty thousand back at forty.
- The gain is twenty thousand times four dollars, eighty thousand dollars.
- The hedge forces it to sell high and buy low, which is why bigger and more frequent moves mean more profit: the position is long volatility.

20 Example 9: coupon, borrow and financing

Face $10m, coupon 4%. Borrow fee 1% on $6.0m short. $5m borrowed at 4%

Coupon earned	4% × $10m	**$400,000**
Stock borrow fee	1% × $6.0m	**−$60,000**
Financing cost	4% × $5m	**−$200,000**
Net carry	400,000 − 60,000 − 200,000	**$140,000**
Plus gamma profit (one swing)	140,000 + 80,000	**$220,000**

IN THE LESSON

- Gamma is not the only source of return.
- Over a year, Larkspur collects the coupon of four per cent on ten million dollars of face value, four hundred thousand dollars.
- It pays a stock borrow fee of one per cent on the six million dollar short, sixty thousand dollars.
- It financed part of the purchase by borrowing five million dollars at four per cent, which costs two hundred thousand.
- Net carry is four hundred thousand minus sixty thousand minus two hundred thousand, one hundred and forty thousand dollars.
- For simplicity we ignore the interest earned on the short sale proceeds.
- Add the gamma profit of eighty thousand from one swing like the last example, and the carry plus that swing comes to two hundred and twenty thousand dollars.

21 What can go wrong in convertible arbitrage

- Credit spreads widen: bond floor falls, shares do not offset
- Implied volatility falls: the embedded option loses value
- Example: price −3%: 3% × $11.0m = −$330,000
- Forced deleveraging in illiquid markets
- The delta hedge does not remove these risks

IN THE LESSON

- The delta hedge removes small share price moves, but three main risks remain.
- First, credit spreads can widen.
- The bond floor falls, and the short shares do not fully offset it.
- Second, implied volatility can fall.
- The option inside the convertible loses value even if the share price is unchanged.
- If that knocks three per cent off the price of Larkspur's convertibles, the loss is three per cent of eleven million, three hundred and thirty thousand dollars, more than the whole year's carry.
- Third, forced deleveraging.
- When many leveraged holders must sell the same bonds in an illiquid market, prices fall further, and the hedge does not help.

22 Event-driven strategies and merger arbitrage

- Returns from corporate events, not market direction
- Merger arbitrage: buy the target below the offer
- Cash deal: hold the target
- Stock deal: also short the acquirer at the exchange ratio
- Spread rewards completion risk; wider: riskier or longer

IN THE LESSON

- Next, event driven funds.
- They earn returns from corporate events, such as mergers, spin offs and restructurings, rather than from the direction of the market.
- The best known is merger arbitrage.
- When a takeover is announced, the target company's shares usually trade below the offer price, because the deal might fail or take a long time.
- The fund buys the target after the announcement.
- In a cash deal it simply holds the target.
- In a stock deal, where the acquirer pays in its own shares, it also shorts the acquirer at the exchange ratio.
- The spread between the offer and the price is the reward for bearing completion risk.
- A wider spread signals more perceived risk, or a longer wait.

23 The spread and the implied probability

Spread = A − P
Prob = (P − B) ÷ (A − B)

Offer price	Price per target share offered
Target's price now	Where the target trades today
Break price	Its price if the deal failed

IN THE LESSON

- Here are two formulas.
- Write ay for the offer price, P for the target's price now, and B for the break price, which is where the target would trade if the deal failed.
- The spread is ay minus P.
- The implied probability that the deal completes is P minus B, divided by ay minus B.
- This is a rough, market implied figure that ignores interest and costs.
- The idea is simple.
- The current price sits somewhere between the break price and the offer.
- The further it has climbed from the break price toward the offer, the more confident the market is that the deal will close.
- Estimating the break price is the hard part, and it is often taken from where the target traded before the announcement.

24 Example 10: a cash deal

Offer $50 cash. Teal trades at $47. Break price $35. Close in 6 months

Spread	50 − 47	**$3**
Return if it closes	3 ÷ 47	**6.38%**
Simple annualised	6.38% × 2	**12.77%**
Loss if it breaks	35 − 47	**−$12**
Implied probability	(47 − 35) ÷ (50 − 35)	**80%**

Check: 80% × $3 − 20% × $12 = 0

IN THE LESSON

- Aldwick Foods offers fifty dollars cash for each share of Teal Brands.
- Teal trades at forty seven, its break price is thirty five, and the deal should close in six months.
- The spread is fifty minus forty seven, three dollars.
- As a return that is three divided by forty seven, six point three eight per cent if the deal closes.
- Over six months, the simple annualised return is six point three eight per cent times two, twelve point seven seven per cent.
- If the deal breaks, Teal falls from forty seven to thirty five, a loss of twelve dollars.
- The implied probability is forty seven minus thirty five, divided by fifty minus thirty five, eighty per cent.
- Check it: eighty per cent of three, minus twenty per cent of twelve, is zero.

25 Example 11: a stock deal

0.5 Aldwick share per Teal share. Aldwick $90, Teal $42

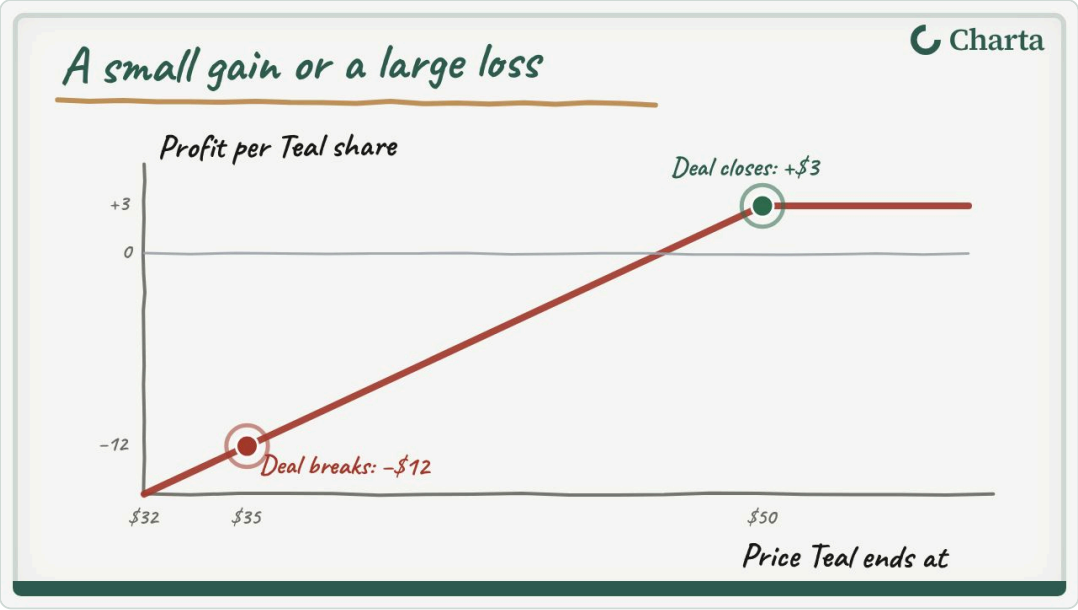
Offer value per Teal share	0.5 × $90	**$45**
Spread per Teal share	45 − 42	**$3**
Long 100,000 Teal; short	0.5 × 100,000 Aldwick	**50,000**
Aldwick at $80: Teal at close	0.5 × $80	**$40**
Long −2 × 100k; short +10 × 50k	−200,000 + 500,000	**+$300,000**

Equals the spread: $3 × 100,000 = $300,000

IN THE LESSON

- Now suppose Aldwick pays in shares instead: half an Aldwick share for each Teal share.
- Aldwick trades at ninety dollars, so the offer is worth point five times ninety, forty five dollars.
- Teal trades at forty two, so the spread is three dollars.
- Larkspur buys one hundred thousand Teal shares and shorts point five times one hundred thousand, fifty thousand Aldwick shares, the exchange ratio for each target share.
- Why the short?
- Suppose Aldwick falls to eighty.
- At closing, Teal is then worth point five times eighty, forty dollars.
- The long loses two dollars on one hundred thousand shares, minus two hundred thousand, but the short gains ten dollars on fifty thousand, plus five hundred thousand.
- The net is three hundred thousand dollars, which equals the spread of three dollars times one hundred thousand shares: the spread is locked in.

26 A small gain or a large loss



IN THE LESSON

- This chart shows why merger arbitrage is lopsided.
- Along the bottom is the price Teal ends at.
- Up the side is Larkspur's profit per share from the cash deal.
- The red line is the payoff of selling a put option struck at fifty dollars for a premium of three.
- It is flat at plus three above fifty, and falls one for one below it.
- The grey line marks zero profit.
- Then the two outcomes.
- If the deal closes, Teal ends at fifty and the gain is three dollars.
- If it breaks, Teal ends at thirty five and the loss is twelve dollars.
- Both sit on the short put line.
- Merger arbitrage is like selling an out of the money put: you collect a small premium most of the time and occasionally suffer a large loss.

27 The risks of merger arbitrage

- Asymmetric: small gain if it closes, large loss if it breaks
- Breaks cluster in market stress
- Correlation with equities rises just when it hurts
- Delay: a 1-year wait halves 12.77% to 6.38% a year

IN THE LESSON

- So what are the risks?
- The payoff is asymmetric: a small gain if the deal closes, and a large loss if it breaks.
- Worse, breaks cluster in market stress.
- Financing dries up, buyers walk away and regulators take longer, so many deals fail together.
- That means the strategy's correlation with equities rises just when it hurts, and a portfolio of deals is less diversified than it looks.
- Delay matters too.
- If our six month deal took a full year, the same three dollar spread would earn only six point three eight per cent a year instead of twelve point seven seven.

28 Distressed securities and absolute priority

- Buy debt, sometimes equity, of firms near bankruptcy
- Profit if the restructuring pays more than the price
- Absolute priority: secured, unsecured, subordinated, equity
- Fulcrum security: the class where value runs out
- It usually gets the new equity and shapes the plan

IN THE LESSON

- The last strategy is distressed securities.
- These funds buy the debt, and sometimes the equity, of companies in or near bankruptcy, at deep discounts.
- They profit if the restructuring pays more than the price they paid.
- In a reorganisation, value is allocated by the absolute priority rule.
- Secured creditors are paid first, then unsecured creditors, then subordinated creditors, and only then equity.
- Each class must be paid in full before the next receives anything.
- The fulcrum security is the class where the value runs out: it is paid only in part.
- It usually receives the equity of the reorganised firm, and so its holders shape the restructuring plan.

29 Example 12: the waterfall, class by class

EV $500m; costs $40m. Claims: secured $250m, unsecured $300m, sub $150m

Value to distribute	500 − 40	**$460m**
Secured: claim $250m	paid in full	**$250m (100%)**
Unsecured: claim $300m	460 − 250 = 210; 210 ÷ 300	**$210m (70%)**
Subordinated: claim $150m	nothing left	**$0 (0%)**
Equity	nothing left	**$0**

Fulcrum: the unsecured class. It usually gets the new equity

IN THE LESSON

- Larkspur studies Brindle Steel, which has filed for bankruptcy reorganisation.
- Its enterprise value, the value of the whole business, is five hundred million dollars.
- Administrative and legal costs of forty million are paid ahead of all claims.
- Its claims are two hundred and fifty million secured, three hundred million unsecured and one hundred and fifty million subordinated.
- The value to distribute is five hundred minus forty, four hundred and sixty million.
- Secured creditors are paid in full, two hundred and fifty million.
- Unsecured creditors get what is left, four hundred and sixty minus two hundred and fifty, two hundred and ten million, which is seventy per cent of their claim.
- Subordinated creditors get nothing, and neither does equity.
- The unsecured class is the fulcrum, and it usually receives the new equity.

30 Example 13: price, recovery and time

Unsecured bonds bought at 50 per 100 of claim. Recovery from the waterfall

Price paid per 100 of claim	market price	**50**
Recovery per 100 of claim	from the waterfall	**70**
Gain over the whole process	70 ÷ 50 − 1	**40%**
Annualised if it takes 1 year	1.40 − 1	**40%**
Annualised if it takes 2 years	√1.40 − 1	**18.3%**

IN THE LESSON

- Larkspur bought Brindle's unsecured bonds at fifty cents per dollar of claim.
- The waterfall says they recover seventy.
- The gain over the whole process is seventy divided by fifty, minus one, forty per cent.
- But returns depend on how long the process takes.
- If it takes one year, the annualised return is the full forty per cent.
- If it takes two years, the annualised return is the square root of one point four, minus one, only eighteen point three per cent.
- Delay cuts the annualised return sharply, and legal costs that grow with time would cut the recovery itself.

31 Example 14: the common errors, and valuation risk

Same claims: secured $250m, unsecured $300m, sub $150m. Costs $40m

Wrong: assume par recovery	100 ÷ 50 − 1	**+100%**
Wrong: pro rata, no seniority	460 ÷ 700	**65.7% for all**
Right: waterfall, unsecured	210 ÷ 300	**70%**
If EV is $420m: left for unsecured	420 − 40 − 250	**$130m**
Unsecured recovery then	130 ÷ 300	**43.3%: a loss**

IN THE LESSON

- Keep the same claims and the same costs of forty million.
- Now the common errors.
- A beginner might assume the bonds will be repaid at par, one hundred, and expect one hundred divided by fifty, minus one, a gain of one hundred per cent.
- Another might ignore seniority and share the value pro rata across all debt: four hundred and sixty divided by seven hundred, sixty five point seven per cent for every class.
- Both are wrong.
- The waterfall gives the unsecured class two hundred and ten divided by three hundred, seventy per cent.
- Valuation is the other big risk.
- If the enterprise value is four hundred and twenty million instead, the unsecured class receives four hundred and twenty minus forty minus two hundred and fifty, one hundred and thirty million.
- That is one hundred and thirty divided by three hundred, forty three point three per cent, below the fifty Larkspur paid: a loss.

32 Why distressed investing is hard

- Illiquid, thinly traded positions
- Legal uncertainty; plans may deviate from strict priority
- Limited information and long horizons
- Active involvement: committees and negotiation
- Hedging is imperfect

IN THE LESSON

- Distressed investing is hard to carry out.
- The positions are illiquid and thinly traded, so getting in and out is slow and costly.
- There is legal and procedural uncertainty.
- In practice the plan is negotiated, and it can deviate from strict priority.
- Information is limited, because the company is in turmoil, and the horizons are long.
- The fund often needs active involvement, sitting on creditor committees and negotiating the plan, which takes time and expertise.
- Finally, hedging is imperfect.
- There is rarely a liquid instrument that offsets the risk of one company's reorganisation.

33 Mistakes to avoid

- Dollar neutral is not beta neutral: weight by beta
- Leverage and crowding hide in neutral books
- Convertible hedge: bonds × CR × delta
- Merger arbitrage: small gain, large loss; use the break price
- Distressed: waterfall, never par or pro rata

IN THE LESSON

- Before the questions, here are the mistakes to avoid.
- Do not treat dollar neutral as beta neutral: weight each side by its beta.
- Remember that leverage and crowded factor exposure can hide inside a book that calls itself neutral.
- Size a convertible hedge as bonds times conversion ratio times delta, not the conversion ratio alone.
- In merger arbitrage, remember the payoff is a small gain or a large loss, and use the break price to find the implied probability.
- In distressed investing, never assume par recovery and never ignore seniority.
- Compute recovery by the waterfall, class by class.

34 Try three quick questions

1. Longs $60m (beta 1.2), shorts $60m (beta 0.9). Net beta dollars?
   Answer: 72 − 54 = $18m: dollar neutral, not beta neutral.
2. Cash offer $30, target $27, break price $20. Implied probability?
   Answer: (27 − 20) ÷ (30 − 20) = 70%.
3. $300m to distribute. Secured $120m, unsecured $240m. Unsecured recovery?
   Answer: 300 − 120 = 180; 180 ÷ 240 = 75%; the fulcrum.

IN THE LESSON

- Now try three quick questions.
- Pause the video, think, then listen to the answers.
- Question one.
- A book holds sixty million dollars of longs with a beta of one point two, and sixty million of shorts with a beta of point nine.
- What are its net beta dollars?
- Seventy two million minus fifty four million, so eighteen million dollars: it is dollar neutral but not beta neutral.
- Question two.
- A cash offer is thirty dollars, the target trades at twenty seven, and the break price is twenty.
- What is the implied probability of completion?
- Twenty seven minus twenty, divided by thirty minus twenty, seventy per cent.
- Question three.
- Three hundred million dollars is available to distribute.
- Secured claims are one hundred and twenty million and unsecured claims two hundred and forty million.
- What do the unsecured recover?
- Three hundred minus one hundred and twenty leaves one hundred and eighty, and one hundred and eighty over two hundred and forty, seventy five per cent; they are the fulcrum.