Market dangers and strategy risks

Portfolio Construction

1 A story: the express lift

- Fast machines make small errors huge
- A slip can repeat thousands of times a second
- If everyone steps back at once, nobody is left
- Fences are built to slow the damage

IN THE LESSON

- Picture an express lift in a tall building.
- It carries hundreds of people up in seconds, which is wonderful until something goes wrong.
- A loose cable in a slow lift is a nuisance.
- In a fast lift it is a disaster before anyone can press a button.
- Electronic markets are the express lift of finance.
- Orders travel in millionths of a second, so one small slip can repeat thousands of times before a human notices.
- Dara Okonkwo is advising the Tarn Reserve Fund, whose head trader is Mikel Soro.
- She wants him to know both the dangers and the safety fences, so we start with how electronic markets fail.

2 Failures and fences

How it fails

Errors enter → Liquidity vanishes → Contagion spreads

What contains it

Firm limits, kill switch → Halts and price bands → Cancel bad trades

IN THE LESSON

- Here is the whole story in one picture.
- The top row shows how electronic markets fail, read from left to right.
- It starts with errors entering.
- A faulty algorithm, which is a trading program that misfires, may send the same order again and again.
- A fat finger error is a human slip, like typing an extra zero.
- Next, liquidity vanishes.
- The firms that normally post prices all step back together, and prices gap, which is called a flash crash.
- Finally, contagion spreads, because linked venues and related instruments move together.
- The bottom row puts a fence under each stage: firm limits and a kill switch, then halts and price bands, then the cancelling of clearly erroneous trades.

3 Four ways the machines go wrong

Dangers and their short names

Danger	Short name
Faulty program repeats orders	Runaway
Typing slip, extra zeros	Fat finger
Messages jam the systems	Overload
Quotes pulled all at once	Flash crash

IN THE LESSON

- Let us name the four failures a manager meets most.
- The first is a runaway algorithm: a program that keeps sending orders it should not, because of a bug or a bad input.
- The second is the fat finger error, a person typing the wrong size or price.
- The third is overload.
- Some programs send enormous numbers of messages, orders and cancels, until the exchange's systems slow down for everyone.
- The fourth is the flash crash, where the firms that provide liquidity pull their quotes at the same moment.
- With nobody quoting, even a modest sale can drop the price sharply, and then the price often snaps back.

4 Example 1: a fat finger and a size limit

Sell 5,000 shares at 40; the broker's limit is 50,000 shares

Intended order	5,000 × 40	**200,000**
Typed order	500,000 × 40	**20m**
Size of the slip	500,000 ÷ 5,000	**100 times**
Pre-trade limit	50,000 × 40	**2m**
Outcome	typed order above 50,000	**Rejected**

IN THE LESSON

- Mikel Soro, Tarn's head trader, means to sell five thousand shares of a stock priced at forty.
- His finger slips, and the screen shows five hundred thousand.
- Meant, that is two hundred thousand in value.
- Typed, it is twenty million.
- That is a hundred times too big.
- Now look at the broker's pre trade control: no single order above fifty thousand shares, which is two million in value.
- The typed order is far above the limit, so it is rejected before it ever reaches the market.
- This is the best kind of fence.
- It is preventive, and it stops the error at its source, before anyone else can be hurt.

5 A price band, drawn

Chart: Share price vs Time (minutes)

- Upper band 42.00
- Reference 40.00, band 5%
- Lower band 38.00
- Trading pauses here

IN THE LESSON

- Now a fence that works on the whole market.
- The horizontal axis is time in minutes and the vertical axis is the share price.
- The middle line is the reference price, forty.
- Around it the exchange draws a band of five per cent on each side, so the upper edge is forty two and the lower edge is thirty eight.
- These are called limit up, limit down bands.
- Now follow the price curve.
- A big seller pushes the price down toward the lower line.
- At thirty eight trading pauses instead of letting the price fall through the floor.
- After the pause the price recovers a little.
- The band slows the fall, but it does not remove whatever caused it.

6 Example 2: a flash crash and the pause

Tarn holds 1 million shares at 40; band floor 38.00

Tarn's holding	1m shares × 40	**40m**
Flash fall of 9%	40 × 0.91	**36.40**
Paper loss, full fall	1m × 3.60	**3.6m**
Paper loss when the band halts	1m × 2.00	**2.0m**
Shares Tarn can sell in the pause	while halted	**0**

IN THE LESSON

- Back to Tarn.
- It holds one million shares at forty, which is worth forty million.
- A flash crash knocks nine per cent off the price in a few minutes, down to thirty six point four zero.
- On paper that is a loss of three point six million.
- Now apply the band.
- Trading pauses at thirty eight, so the first leg of the fall costs two million on paper.
- That sounds comforting.
- But look at the last row.
- While trading is paused, Tarn can sell none of its one million shares.
- A halt protects the market from disorderly prices, yet it also removes the exit.
- A manager who might need cash must plan for the pause.

7 The tools, and what each one does

Four main fences

Tool	Job
Pre-trade size and price limits	Block errors
Kill switch	Stop a firm
Halts, bands, circuit breakers	Pause trading
Cancel clearly erroneous trades	Undo prints

IN THE LESSON

- Here are the four main tools, and the job of each.
- Pre trade limits on order size and price block bad orders before they leave the firm, as we saw.
- A kill switch lets a firm, a broker or an exchange cut off a misbehaving program at once.
- Halts, price bands and circuit breakers pause trading in one stock or a whole market after a sharp fall.
- A circuit breaker is simply a rule that says: if prices fall this far this fast, stop and let people think.
- Finally, exchanges have rules for cancelling clearly erroneous trades, which are trades so far from fair value that leaving them standing would be unjust.

8 More fences, and what a manager does

- Market makers must keep minimum quotes up
- Surveillance watches order-to-trade ratios
- Fast firms see first, so the field is uneven
- Expect halts and thin markets in stress
- Breakers pause trading; they do not end volatility

IN THE LESSON

- Regulators add more.
- Market makers can be obliged to keep minimum quotes up, so they cannot vanish the moment trouble starts.
- Surveillance teams watch order to trade ratios, which count how many orders are sent for every trade done, to catch message floods.
- There is also the question of fairness.
- Fast firms see prices and news first, so the playing field is not even, and slower investors can pay more to trade.
- What should Mikel Soro do with all this?
- Expect halts and thin markets in stress, and plan his orders and his cash for a pause.
- The common trap is to think circuit breakers end volatility.
- They pause trading, and pressure may move to other venues.

9 A story: the fake queue

- A long queue looks like a bargain
- Fake crowds fool real shoppers
- Manipulators fake supply, demand or news
- Watchers study orders and cancels, not only trades

IN THE LESSON

- Imagine a bakery with a long queue outside.
- You assume the bread must be good, so you join.
- But suppose the owner hired actors to stand in line.
- The queue was a trick, designed to change what you do.
- Markets have fake queues too.
- A manipulator may fake supply, demand, volume or news, so that other traders act at worse prices.
- Nothing looks wrong if you only count the loaves sold.
- The trick shows up in the pattern: who stood in line, how long they stayed, and who walked away at the very moment you arrived.
- That is why monitoring looks at orders, cancels and owners, not just completed trades.

10 Practices that mislead, part one

Practices that mislead, part one

Practice	The trick
Front running	Trade first
Spoofing and layering	Fake orders
Wash trading	Fake volume
Bluffing, momentum ignition	Bait others

IN THE LESSON

- Here are the first four practices.
- Front running, or trading ahead, is when a broker or insider trades for itself before a client's order, to profit from the move the order will cause.
- Spoofing and layering place orders with no intention of letting them trade, to create a false picture of demand or supply.
- Layering means stacking several such orders at different prices.
- Wash trading puts the same beneficial owner on both sides of a trade, to fake volume.
- Bluffing and momentum ignition try to provoke other traders, perhaps by pushing the price in short bursts, so that they join in and move the price to a worse level.

11 Practices that mislead, part two

Practices that mislead, part two

Practice	The trick
Gunning the market	Hit stops
Squeezing and cornering	Hold supply
Rumour spreading	False news
Pump and dump	Hype, sell

IN THE LESSON

- Now the other four.
- Gunning the market means pushing the price to a level where many stop loss orders sit, so that they fire and move the price further, which the gunner then trades against.
- Squeezing and cornering use control of supply.
- A squeeze traps people who must buy back what they sold short, and a corner goes further by holding nearly all of an asset.
- Rumour spreading uses false information to move prices.
- And a pump and dump hypes a stock, often with false claims, so that others pile in and push the price up, and then the schemer sells at the top.
- Regulators forbid all of these where the rules apply.

12 How live monitoring works

From data to a decision

Orders and trades stream in →
Rules scan for patterns →
Analyst reviews the alert

IN THE LESSON

- So how are these caught as they happen?
- Think of a security guard with a wall of cameras and a rule book.
- The first box is the data: a constant stream of every order, every change, every cancel and every trade, with the account that made it.
- The second box is the rules.
- The system scans for patterns, such as many large orders cancelled within a second, trades between accounts with the same owner, or a broker trading just before a large client order.
- When a rule trips, the third box begins.
- An analyst reviews the alert and the full order history, and decides whether it is innocent or abuse.
- The alert alone proves nothing.

13 Example 3: front running Tarn's order

Tarn buys 300,000 shares; a dealer trades first

Dealer buys for itself first	20,000 × 40.00	**800,000**
Price after Tarn's order	40.00 to 40.30	**+0.30**
Dealer sells at 40.30	20,000 × 0.30	**6,000 gain**
Tarn's average price is worse by	per share	**0.10**
Extra cost to Tarn	300,000 × 0.10	**30,000**

IN THE LESSON

- Suppose Tarn instructs a broker to buy three hundred thousand shares.
- A dishonest dealer at the broker first buys twenty thousand for itself at forty, which costs eight hundred thousand.
- Then Tarn's big order is worked, and the price rises from forty to forty point three zero.
- The dealer sells its twenty thousand at the higher price and pockets six thousand.
- Meanwhile, the extra buying pressure makes Tarn's average price worse by ten cents a share.
- On three hundred thousand shares that is thirty thousand of extra cost.
- The client pays, and the insider profits, from the same piece of private knowledge.
- This is why a broker must put the client's order first.

14 Order-to-trade ratio

Order-to-trade ratio = shares ordered ÷ shares traded

Shares ordered	All sent, filled or cancelled
Shares traded	Only those that executed
Order-to-trade ratio	High means many unfilled
Alert level	Set by the monitoring team

IN THE LESSON

- Surveillance teams rely on a simple measure.
- The order to trade ratio compares how much was ordered with how much actually traded.
- The top is every share put into orders, whether the order was filled, changed or cancelled.
- The bottom is only the shares that traded.
- A low ratio means most orders were filled.
- Genuine market makers have higher ratios, because they update their quotes constantly.
- But a very high figure for one account, above the alert level the monitoring team has set, does not prove abuse.
- It tells an analyst to look at what the cancelled orders did to the price while the account traded on the other side.

15 Example 4: spoofing, seen in the cancels

One burst by one account, in a stock Tarn trades

Buy orders placed below the bid	6 × 20,000	**120,000**
Buy orders filled	all cancelled	**0**
Shares sold at the higher price	price up 0.06	**4,000**
Order-to-trade ratio	(120,000 + 4,000) ÷ 4,000	**31**
Gain from the move	4,000 × 0.06	**240**

IN THE LESSON

- Now the other direction.
- Mikel Soro wants to buy a stock, and monitoring flags an account that, in one burst, placed six buy orders of twenty thousand shares each, all just below the best bid.
- That is one hundred and twenty thousand shares of apparent demand.
- None of those orders was filled.
- They were cancelled.
- While they were showing, the price ticked up by six cents, and the account sold four thousand shares at the higher price, gaining two hundred and forty.
- The order to trade ratio is one hundred and twenty four thousand over four thousand, which is thirty one.
- The trades look small.
- The evidence is in the cancelled orders.

16 Which accounts get an alert

Order-to-trade ratio

Pension fund	**2**
Market maker	**12**
Alert level	**20**
Spoofing example	**31**

Illustrative figures

IN THE LESSON

- Here is the ratio for three accounts, and the alert level.
- The vertical axis is the order to trade ratio, and the numbers are made up to illustrate the idea.
- The first bar is a pension fund, with a ratio of two, which is what you would expect from an investor who mostly trades what it orders.
- The second is a market maker, at twelve.
- It posts and updates many quotes, so a higher ratio is normal.
- The third bar is the alert level the monitoring team has set, twenty.
- The fourth is the account from our example, at thirty one, well above the line.
- It earns a review, but the review, not the number, decides whether it is abuse.

17 Mistakes to avoid, so far

- Circuit breakers pause trading, they do not end volatility
- A halt can trap you with no exit
- Cancelled orders are evidence, not only executed trades
- One cancel is not abuse; the pattern is
- Speed alone is not manipulation

IN THE LESSON

- Let us stop and list the traps from this half of the lesson.
- First, believing that circuit breakers remove volatility.
- They pause trading, and pressure may simply shift to other venues.
- Second, forgetting that a halt traps you: Tarn cannot sell while the market is paused.
- Third, thinking only executed trades matter.
- Spoofing leaves its evidence in cancelled orders.
- Fourth, treating every cancellation as abuse.
- Honest market makers cancel all day, and it is the pattern, not one cancel, that counts.
- Fifth, calling all fast trading manipulation.
- Speed alone is not abuse, but faking your intention to trade is.

18 A story: the umbrella and the rain

- Judge the fund against the sponsor's balance sheet
- Gas pays the budget and fills the fund
- A gas shock can hit both at once
- Four risks: market, liquidity, concentration, counterparty

IN THE LESSON

- Think of a farmer who keeps savings in a jar for a bad harvest, and then invests the jar in seed companies.
- When the harvest fails, the farmer needs the jar, and the seed companies have fallen too.
- The savings failed in the very year they were needed.
- Now meet the Tarn Reserve Fund.
- Its sponsor, the state, earns most of its revenue from gas.
- The fund was set up to save for bad years.
- So Dara Okonkwo does not judge the fund on its own.
- She judges it against the sponsor's whole balance sheet, then asks four questions: market, liquidity, concentration and counterparty risk.

19 One shock, three hits

The sponsor's side

Gas price falls → Budget revenue falls → Fund asked for cash

Inside the portfolio

Gas shares fall → Correlations rise → Sell into weak market

IN THE LESSON

- Here is one shock, followed through.
- The top row starts with a fall in the gas price.
- Government revenue falls, because the state earns so much from gas.
- The government then turns to the fund and asks for cash.
- The bottom row shows what happens inside the portfolio at the same moment.
- Gas related shares fall.
- Correlations rise, because in a crisis assets that normally behave differently start falling together, so diversification works less well just when it is needed.
- And the fund must sell into a weak market to raise the cash.
- Looked at from inside the portfolio, none of this is visible.
- Looked at from the sponsor's side, it is the main danger.

20 Four financial risks

The financial risks of a strategy

Risk	Plain meaning
Market risk	Prices move
Liquidity risk	Cannot sell
Concentration risk	One big bet
Counterparty risk	Partner fails

IN THE LESSON

- Here are the four financial risks, in plain words.
- Market risk is exposure to moves in equity prices, interest rates, credit spreads and currencies, together with how they move together, which is the correlation.
- Liquidity risk is the risk of being unable to sell at a fair price when cash is needed.
- It matters most when the strategy holds private markets or direct investments, and when the fund must pay out.
- Concentration risk is too much in a few companies, sectors, or the sponsor's own economy.
- Counterparty risk is that the other side of a derivative or a co investment fails to pay.
- For each one, the question is how it links to the sponsor.

21 Example 5: the gas tilt

Fund 80bn; gas shares fall 30% in a slump

Loss, proposed 15% tilt	15% × 80bn × 30%	**3.6bn**
Loss, index weight 5%	5% × 80bn × 30%	**1.2bn**
Extra loss from the tilt	3.6bn − 1.2bn	**2.4bn**
Transfer asked for, 8% of fund	8% × 80bn	**6.4bn**
Recommended gas weight	below the index	**under 5%**

IN THE LESSON

- The fund's board proposes a tilt.
- Tarn Reserve Fund has eighty billion.
- The index holds five per cent in gas related shares, and the board wants fifteen.
- In a gas slump, those shares fall thirty per cent.
- With the tilt, the loss is fifteen per cent of eighty billion times thirty per cent, which is three point six billion.
- At the index weight, it would be one point two billion.
- So the tilt adds two point four billion of loss.
- And the same year the state asks for eight per cent of the fund, six point four billion.
- A tilt that doubles up on the sponsor's gas risk should be rejected.
- The fund should hold less than the index.

22 Example 6: can the fund pay?

Fund 80bn: 20% cash and bonds, 50% listed, 30% private

Transfer asked for	8% × 80bn	**6.4bn**
Cash and bonds held, 20%	20% × 80bn	**16.0bn**
Cover for the transfer	16.0 ÷ 6.4	**2.5 times**
If cash and bonds were only 5%	5% × 80bn	**4.0bn**
Shortfall to sell elsewhere	6.4 − 4.0	**2.4bn**

IN THE LESSON

- Now liquidity, in the same year.
- Suppose the fund holds twenty per cent in cash and bonds, fifty per cent in listed shares, and thirty per cent in private assets.
- The state asks for six point four billion.
- Cash and bonds are twenty per cent of eighty billion, sixteen billion.
- That covers the transfer two and a half times, sixteen over six point four.
- Fine.
- Now suppose the board shrinks cash and bonds to five per cent, which is only four billion.
- The shortfall is six point four less four, two point four billion.
- The fund must then sell listed shares into a falling market, or private assets at a discount.
- The private holdings cannot be sold quickly, so they do not help.

23 Example 7: correlations rise in a crisis

Two equal holdings, each with volatility 20%

Portfolio vol, correlation 0.3	20 × √0.65	**16.1%**
Portfolio vol, correlation 0.8	20 × √0.90	**19.0%**
Diversification lost	19.0 − 16.1	**2.9 points**

IN THE LESSON

- A last numeric illustration, about correlation.
- Take two equal holdings, each with volatility of twenty per cent.
- In calm markets their correlation is point three.
- With equal weights, the portfolio's volatility is twenty times the square root of point six five.
- That is sixteen point one per cent.
- In a crisis the correlation jumps to point eight, and the portfolio's volatility becomes twenty times the square root of point nine zero, which is nineteen point zero per cent.
- The diversification benefit shrinks by nearly three points, just when the fund can least afford it.
- Risk models fitted to calm periods understate this.

24 Loss in the gas slump, by weight

Loss in the gas slump (bn)

Gas 2%	**0.48**
Gas 5%, index	**1.2**
Gas 15%, tilt	**3.6**

Fund 80bn; shares fall 30%

IN THE LESSON

- Here are three possible gas weights side by side.
- The vertical axis is the loss in billions if gas shares fall thirty per cent.
- The first bar is an underweight of two per cent, which loses only point four eight billion.
- The second is the index weight of five per cent, losing one point two.
- The third is the proposed fifteen per cent tilt, which loses three point six.
- The shape of the bars is the argument.
- Every extra point of gas weight adds loss in the one scenario where the sponsor is already weakest.
- The underweight is not about expecting gas to fall.
- It is about not doubling the sponsor's bet.

25 Propose and defend

- Propose: gas shares below the index weight
- Defend: the sponsor already holds gas risk
- Keep a cash and bond bucket for transfers
- Cap private assets and single large stakes
- Trap: judging assets apart from the sponsor

IN THE LESSON

- Let us put the answer in the form the exam wants: a proposal, a defence and a warning.
- Dara Okonkwo proposes that the fund hold gas shares below the index weight.
- She defends it by pointing out that the sponsor already carries gas risk through its revenue, so the fund should offset it, not add to it.
- She also keeps a bucket of cash and bonds for the transfers, and caps private assets and single stakes.
- She checks the banks behind any derivatives for counterparty exposure.
- The trap is analysing assets in isolation from the sponsor's balance sheet.

26 A story: the flood and the factory

- A flood does not ask why you invested
- Long horizons mean long exposure
- These risks reach cash flows and the cost of capital
- They also reach a public fund's legitimacy

IN THE LESSON

- A flood does not ask why you invested.
- A factory that treats its workers badly does not become safer because you owned it for kind reasons.
- Environmental and social risks used to be filed under conscience, but for a fund that holds assets for decades, they are cash flow questions.
- Floods, heat and drought damage property.
- Carbon rules and new technology can make some businesses worth far less.
- Poor labour practices bring fines and strikes.
- All of these raise costs, and a fund that is owned by a state also carries public trust, which can be lost.
- Let us sort these risks, and then put numbers on them.

27 Environmental and social risks

Risks that follow from the strategy

Risk	What it looks like
Physical climate	Floods, heat
Transition	Carbon rules
Labour, health, safety	Fines, strikes
Community, rights, privacy	Lost trust

IN THE LESSON

- Here are the main kinds.
- Physical climate risk is the weather acting directly on assets: floods, heat and drought.
- Transition risk comes from the economy's response to climate change, such as carbon regulation, new technology and changing demand, which can strand fossil fuel assets, leaving them worth far less than their books say.
- Social risks cover how companies treat people.
- That includes labour standards, health and safety, community relations, human rights in supply chains, and the privacy of customers' data.
- Each of these can impair cash flows, raise the cost of capital, and damage reputation.
- For a sovereign fund, that last damage matters greatly.

28 Carbon footprint and carbon bill

Footprint = Σ (stake × emissions) ÷ invested
Carbon bill = emissions × carbon price

Ownership share	Share of the company owned
Company emissions	Tonnes a year
Value invested	Money in the portfolio
Carbon price	Assumed in the scenario

IN THE LESSON

- Two small formulas turn the idea into numbers.
- The carbon footprint of a portfolio adds up, over each holding, the ownership share times that company's emissions, and divides by the value invested.
- This gives tonnes of carbon dioxide per million invested, so a fund can see where its exposure sits.
- The carbon bill is a scenario.
- It takes a company's emissions and multiplies them by an assumed price on carbon.
- Set the bill next to the company's profit and you have a measure of how hard a transition would bite.
- The price is an assumption chosen for the scenario, not a forecast.

29 Example 8: footprint and bill

Tarn has 800m invested; scenario: carbon at 80 a tonne

Granite Steel stake's emissions	2% × 6m t	**120,000 t**
Lowland Power stake's emissions	0.5% × 8m t	**40,000 t**
Portfolio footprint	160,000 t ÷ 800m	**200 t per m**
Granite's carbon bill	6m t × 80	**480m**
Bill against its profit	480m ÷ 1,500m	**32%**

IN THE LESSON

- Tarn holds two stakes and has eight hundred million invested in all.
- It owns two per cent of Granite Steel, which emits six million tonnes a year.
- Two per cent of that is one hundred and twenty thousand tonnes.
- It owns half of one per cent of Lowland Power, which emits eight million tonnes, so forty thousand tonnes.
- Together that is one hundred and sixty thousand tonnes over eight hundred million, a footprint of two hundred tonnes per million.
- Now a scenario with carbon at eighty a tonne.
- Granite's bill is six million times eighty, four hundred and eighty million.
- Its profit is one thousand five hundred million, so the bill takes thirty two per cent.

30 Profit as the carbon price rises

Chart: Profit after carbon bill (m) vs Carbon price per tonne

- No carbon price: 1,500
- At 80: 1,020
- At 150: 600

IN THE LESSON

- Here is the same company as a picture.
- The horizontal axis is the carbon price per tonne, and the vertical axis is Granite's profit after paying for its carbon, in millions.
- Start on the left.
- With no carbon price, the profit is the full one thousand five hundred.
- Now follow the line down and to the right.
- Each rise in the carbon price takes a steady amount off the profit, because the company emits a fixed number of tonnes.
- At a carbon price of eighty, profit is one thousand and twenty.
- At one hundred and fifty it is six hundred.
- The line is straight, but it only holds if the company cannot cut emissions or pass the cost on, and that is exactly what an investor must judge.

31 Example 9: a physical climate scenario

Coastal and farm assets, 7.5% of an 80bn fund

Exposed real assets	7.5% × 80bn	**6.0bn**
Scenario value hit, 15%	15% × 6.0bn	**0.9bn**
Insurance pays one third	0.9bn ÷ 3	**0.3bn**
Net loss	0.9bn − 0.3bn	**0.6bn**
As a share of the fund	0.6bn ÷ 80bn	**0.75%**

IN THE LESSON

- Now physical risk.
- Tarn holds coastal logistics hubs and farmland, together seven and a half per cent of the fund, which is six billion out of eighty.
- A flood and drought scenario cuts the value of these assets by fifteen per cent, a loss of nine hundred million.
- Insurance pays one third of that, three hundred million.
- The net loss is six hundred million, which is point seven five per cent of the whole fund.
- That may sound small.
- But the scenario hits real assets that cannot be sold quickly, it can repeat as the climate shifts, and insurers may raise prices or withdraw.
- The point is that the loss is money, not a matter of opinion.

32 Respond, and the trap

- Identify exposures, then measure what you can
- Footprints and scenarios turn them into money
- Build the result into buying and selling
- Engage with companies and managers
- Trap: calling these risks purely ethical

IN THE LESSON

- What does a fund do about all this?
- It identifies the exposures first, across the listed holdings and the direct ones.
- It measures what it can, through footprints and scenarios like those we just built.
- It builds the results into what it buys and sells, and it engages with companies and managers, using its ownership to ask for change.
- For a sovereign or public fund, social risks also threaten legitimacy, the public's willingness to let the fund exist as it is.
- And now the trap: treating all this as purely ethical, a matter for the conscience, rather than financial, a matter for cash flows and the cost of capital.

33 Recap: the lesson in five lines

- Failures: errors, liquidity gone, contagion
- Fences pause trading; they do not end volatility
- Cancelled orders are evidence of manipulation
- Judge financial risks against the sponsor's balance sheet
- Environmental and social risks are financial risks

IN THE LESSON

- Let us pull it all together.
- First, electronic markets fail through errors, vanishing liquidity and contagion, and the fences are firm limits and kill switches, then halts and bands, then the cancelling of bad trades.
- Circuit breakers pause trading, they do not end volatility.
- Second, live monitoring finds manipulation in orders, cancels and owners, so cancelled orders are evidence.
- Third, a strategy's financial risks are market, liquidity, concentration and counterparty, judged against the sponsor's balance sheet.
- Fourth, environmental and social risks are financial risks that can be measured.
- Fifth, propose, defend, and warn.

34 Try three quick questions

1. Orders 90,000 shares, traded 3,000. Ratio? Alert at 20.
   Answer: 90,000 ÷ 3,000 = 30. Above 20, so review it.
2. 50bn fund, gas 10% vs index 4%, shares fall 30%. Extra loss?
   Answer: (10% − 4%) × 50bn × 30% = 0.9bn.
3. Emits 2m t, carbon 50 a tonne, profit 400m. Bill vs profit?
   Answer: 2m × 50 = 100m; 100m ÷ 400m = 25%.

IN THE LESSON

- Now try three quick questions yourself.
- Pause after each one.
- Question one.
- An account sends orders for ninety thousand shares and trades three thousand.
- What is its order to trade ratio?
- Ninety thousand over three thousand is thirty, above an alert level of twenty, so it earns a review.
- Question two.
- A fifty billion fund holds ten per cent in gas shares against an index weight of four.
- Gas shares fall thirty per cent.
- What is the extra loss from the tilt?
- Six per cent of fifty billion times thirty per cent is point nine billion.
- Question three.
- A company emits two million tonnes, carbon is priced at fifty a tonne, and its profit is four hundred million.
- The bill is one hundred million, which is twenty five per cent of profit, a financial risk for any owner.