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risk, leverage and capital.

Who uses derivatives and why, the difference between exposure and risk, how the big hedge funds stop one trader from sinking the fund, how Big Tech is paying for AI, and the two kinds of smart that matter in a career next to AI.

> the idea
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> Read the game. Paolo Maldini, the AC Milan defender, is famously quoted as saying: *"If I have to make a tackle, then I have already made a mistake."* Great defenders don't chase the ball. They position for where the play will be in five or ten seconds. Most of finance is the same skill: think about where markets, the economy and policy are going, and position before the dangerous moment arrives.

1. who uses derivatives, and why

player	examples	what they want from a derivative
Sell side (dealers, market makers)	Goldman Sachs, JPMorgan, BNP Paribas	Quote two-way prices, earn the bid-offer, hold as little risk as possible
Buy side (hedge funds, asset managers)	Citadel, Millennium, Bridgewater	Express a specific view, or hedge out the risks they don't want, often with leverage
Corporates (treasury)	Ryanair, Meta, any company with debt or foreign revenue	Remove risk that comes from running the business: fuel, interest rates, currencies

The sell side's dream trade is **back to back**: an option is worth $1.00, you sell it to a hedge fund at $1.05 and buy the same option from a corporate at $1.00. You keep the nickel and carry no risk. Desks call it clipping the bid-offer. It is never that clean, but that is the model.

> real market data
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> **Ryanair's jet-fuel hedge.** Going into its 2027 fiscal year (April 2026 to March 2027), Ryanair had hedged about 80% of its jet fuel at about **$668 a metric tonne** (FY26 results, May 2026). After the Middle East conflict broke out in late February 2026, European jet fuel went from about $831 a tonne to a record of about **$1,840** in early April. Ryanair's hedged 80% stayed near $668; airlines without hedges paid the market. That is defense: you give up the gain if fuel falls, to remove a risk that could sink the business.

Why derivatives carry leverage. A spot trade: I pay you $2,000 and you hand me a laptop, today. A forward: we agree today that in two months I pay $2,000 and you deliver the laptop. No money changes hands today. If laptop prices rise to $3,000 by then, I have made $1,000 on a contract that cost me nothing

up front. In practice each side posts margin (collateral) and positions are marked to market daily, but the margin is a fraction of the contract's value. Controlling a large exposure with a little capital is leverage.

2. exposure is not risk

Buying $100 of one stock is $100 of risk. Being long $100 of one stock and short $100 of a similar one is $200 of exposure, but far less risk. That distinction runs through everything that follows.

worked example

A hedge fund with **$100 of capital** runs a relative-value trade: long $150 of Apple, short $100 of Google. A prime broker (the investment bank that holds and finances a fund's positions) lends the rest. Say Apple's beta is 1.0 and Google's is 1.2.

measure	calculation	value
Gross exposure	$150 long + $100 short	$250 (250% of capital)
Net exposure	$150 long − $100 short	$50 (50%)
Net beta exposure	$150 × 1.0 − $100 × 1.2	$30

The position is big ($250 gross), but the market risk is small: $30 of beta.

Professionals describe risk in factors, not dollars: delta, gamma, vega and theta for options; duration and convexity for bonds; beta, size and value versus growth for equities. That vocabulary grew up on derivatives desks, which is why derivatives and risk management go hand in hand. A hedged trade might earn 1 to 2% on its size, and nobody pays a hedge fund for 2%, so funds use prime brokerage and derivatives to lever a low-risk spread into a real return on capital. Daily margin calls keep that leverage honest.

3. how the big hedge funds control risk

Macro funds have a few decision-makers taking large views on rates, currencies, commodities and equity indices: Bridgewater (Ray Dalio), Soros Fund Management, Stanley Druckenmiller's Duquesne. Treasury Secretary Scott Bessent came from this world. Macro is hard because you don't control elections, policymakers or natural disasters. On October 26, 2026, the day after Brazil's presidential runoff, the Ibovespa fell about 14% in a single session.

Multi-manager funds ("pod shops") such as Citadel and Millennium hire hundreds of portfolio managers (Millennium runs more than 300 investment teams). Each one trades a narrow sandbox: precious metals, US tech, even just the front end of the Treasury curve. Their risk limits are written in Greeks and factors, and each has a **drawdown limit**. The commonly reported rule of thumb: lose about 5% from peak and your capital is cut in half; lose about 7.5% and you are out, with your positions unwound. Thresholds vary by firm. No single manager can sink the fund, and the goal is not to beat the S&P 500 but to deliver a steady return with little correlation to the market, in my view somewhere around 7 to 10% a year after fees.

4. corporate finance: how Big Tech is paying for AI

A CFO and treasurer have two jobs: raise money as cheaply as possible, and spend it on projects with a positive NPV. The AI buildout tests both.

worked example

Cost of debt versus cost of equity (illustrative numbers). Meta borrows at 8% with a 25% tax rate; the 10-year Treasury is 5%, the market is expected to return 10%, and Meta's beta is 1.2.

$$\text{after-tax cost of debt} = r_d(1-t) = 8\% \times (1-0.25) = 6.0\%$$

$$\text{cost of equity (CAPM)} = r_f + \beta\,(E[R_m] - r_f) = 5\% + 1.2 \times (10\% - 5\%) = 11.0\%$$

Interest is tax-deductible, so of every 8 cents Meta pays its bondholders, about 2 come back as lower taxes.

Debt is cheaper, so why not borrow everything? Because every extra dollar of debt raises default risk, pressures the credit rating and widens spreads. The first billion is nearly free for a company like Meta. But capex at the largest tech companies now absorbs most of the cash their businesses generate, some of them borrow to cover the gap, and bond investors are asking to be paid more. So they use every channel:

channel	example (as of october 2026)
Equity	Meta priced a **$37.5B** raise in late October 2026: $25B of common stock at $625 a share plus $12.5B of 6.50% mandatory convertible preferred. Expensive and dilutive, but it adds no leverage
Debt	Investment-grade bonds across the hyperscalers. At its October 28, 2026 investor day, Oracle capped new capital-markets funding for FY27 to FY30 at **$20B** (about half equity, half debt) and said capex peaks in FY27 and FY28
Off balance sheet	Meta's Hyperion data center in Louisiana: a joint venture **80% owned by Blue Owl** (Meta 20%) sold about **$27.3B** of bonds in 2025, with Meta as the tenant. The debt sits in the venture, but analysts treat a long lease as debt-like
Cut costs	In October 2026 Microsoft offered voluntary buyouts to about **60,000 employees** (roughly a quarter of its staff) as its AI spending climbs. At an assumed $200,000 per employee, full uptake saves about **$12B a year**. Spending less is a way of raising money

Fixed-to-floating swaps. Almost all corporate bonds pay a fixed coupon. A treasurer who doesn't want to bet on rates can swap with a dealer: receive fixed, pay floating (SOFR plus a spread). When I studied this as an intern, the answer was to swap about half of a new issue. A credit hedge fund buying the same bonds often wants the opposite (pay fixed, receive floating) because it wants the credit spread, not the rate. The underwriting bank can intermediate both swaps on issue day and earn on each side.

5. two kinds of smart: a career next to AI

	fluid intelligence	crystallized intelligence
What it is	Reasoning through new problems, thinking on your feet	Accumulated knowledge, connecting what you've already learned
When it peaks	Early: processing speed around 18 or 19, some parts (working memory) into the 30s	Late: vocabulary and knowledge kept rising into the late 60s and early 70s
Who has it	The 25-year-old trader making split-second calls	The 60-year-old lawyer who knows every precedent
AI today	Weak: novel, open-ended judgment calls	Very strong: code, the tax code, anything written down and codified

Peak ages from Hartshorne and Germine (2015), a study of nearly 50,000 people. AI is someone who has read a billion books and remembers all of them: superb at crystallized work, weak at fluid work. Your fluid intelligence and fresh eyes are your edge right now. So get so good with AI that the crystallized tasks (summarize the meeting, build the first-draft deck, set up the standard model) take five minutes, and spend the rest of your time on judgment: *here is what the numbers say, here is what I would do, and why.* Ask AI for that last step and you get an answer that sounds intelligent and isn't.

> try this week
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> **Swing the racket.** Use AI for everything, not just chat: coding agents, research tools, your inbox. Build the muscle memory now. Twenty years ago someone would have told you to learn the internet; AI will be assumed of you the same way.
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> **Always ask why.** The top federal income tax rate is 37%; long-term capital gains top out at 20%. Why? To reward investing, and because capital only grows with labor that is already taxed, so a full second tax is close to double taxation. Ask why on your first day, find out why things are done the way they are, then ask whether that is the best way.

my path

I learned finance in the years after the 2008 crisis, when mortgages, ABS and credit derivatives clicked for me. After a master's in computational finance I spent **seven years on the sell side** at BNP Paribas, structuring and selling credit derivatives to hedge funds, family offices, wealth managers and corporates. Then **three years on the buy side** at Citadel, in credit portfolio finance: working with prime brokers and derivatives desks to finance the fund's positions efficiently, which is exposure-versus-risk as a full-time job. When crypto became a serious asset class I went to Ava Labs, a blockchain technology company in New York, to build its treasury function.

None of that was planned. Steve Jobs put it best in his 2005 Stanford commencement address: *"You can't connect the dots looking forward; you can only connect them looking backwards."* Move toward what you are good at and what you love, take on more responsibility, and the arc will make sense later.

corrections from the session

- **Microsoft buyouts.** I said 60,000 × $200,000 is about $3B. It is about **$12B a year** if everyone accepted.
- **Fluid intelligence.** I said it peaks in the late 30s or early 40s. Research puts the peak **in early adulthood**, with some parts holding into the 30s; crystallized knowledge keeps rising into the late 60s. That makes the point stronger: a graduating senior is at the peak now.
- **Tax shield.** The after-tax cost of debt is $r_d \times (1 - \text{tax rate})$, not one minus the interest rate. The 6% answer was right.
- **Beta example.** I set both stocks at a beta of 1, then used 1.2 for the short. The setup above is fixed: 1.0 long, 1.2 short, $30 net.
- **Brazil.** The Ibovespa fell about **14%** (13.9%) on October 26, 2026, not 20%.
- **Drawdown limits.** I described a cut at 2% and an exit at 5%. The commonly reported thresholds are about **5% to cut and 7.5% to exit**, and they vary by firm.
- **Put options.** The **buyer** of a put has the right to sell at the strike; the seller has the obligation to buy, and is paid the premium for it.

go further

- **Ryanair FY26 results** (May 2026), with the fuel-hedge position: investor.ryanair.com.
- **Meta's equity offering** and **Oracle's investor day**: each company's October 2026 Form 8-K, at sec.gov/edgar/search.
- **Hartshorne and Germine (2015)**, "When does cognitive functioning peak?", *Psychological Science*.
- **Ray Dalio, *Principles* (2017)**, and **Steve Jobs's Stanford commencement address (2005)**.

> note
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> For education only, not investment advice. Illustrative numbers are simplified for teaching. Views are my own and not those of any current or former employer.

Questions, or want to compare notes? Write to aayyash@fgcu.edu.

This handout and my notes from other talks are at **akram.education/talks**.

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