

Advanced Finance Cheatsheet (cs.shivi.io)

PART I: OPTIONS

Core Concepts & Definitions

- D:** Option: Right, not obligation, to buy (Call) or sell (Put) an underlying asset ( $S$ ) at a specified strike price ( $X$ ) on or before an expiration date ( $T$ ).
- D:** Premium ( $C_0, P_0$ ): Price paid by option buyer (Long) to seller (Short). Long's max loss; Short's max profit.
- D:** European vs. American: Exercise at expiration only vs. anytime up to expiration. American usually  $\geq$  European value due to early exercise flexibility (esp. with dividends or high interest rates for puts).
- D:** Intrinsic Value: Value if exercised now. Call:  $\max(S - X, 0)$ . Put:  $\max(X - S, 0)$ .
- D:** Time Value: Premium - Intrinsic Value. Decreases as expiration approaches (theta decay).
- D:** Factors Affecting Call Value ( $C_0$ ): Current stock price ( $S_0$ )  $\uparrow$ , Strike price ( $X$ )  $\downarrow$ , Time to expiration ( $T$ )  $\uparrow$ , Volatility ( $\sigma$ )  $\uparrow$ , Risk-free rate ( $r_f$ )  $\uparrow$ . (For Puts:  $S_0$   $\downarrow$ ,  $X$   $\uparrow$ ,  $T$   $\uparrow$ ,  $\sigma$   $\uparrow$ ,  $r_f$   $\downarrow$ ).

Payoffs at Expiration ( $S_T$ ) & Profits

( $S_T$ : Asset price at expiration;  $X$ : Strike price.)

- F:** Call Payoff  $C_T = \max(S_T - X, 0)$
- F:** Put Payoff  $P_T = \max(X - S_T, 0)$
- F:** Profit (Long) = Payoff - Premium
- F:** Profit (Short) = Premium - Payoff

Moneyness

( $S$ : Current asset price;  $X$ : Strike price.)

- D:** In-the-money (ITM): Positive intrinsic value. Call:  $S > X$ . Put:  $S < X$ .
- D:** At-the-money (ATM):  $S \approx X$ .
- D:** Out-of-the-money (OTM): Zero intrinsic value. Call:  $S < X$ . Put:  $S > X$ .

Valuation Models (Discrete, 1-Step Binomial)

( $S_0$ : current stock price;  $S_u, S_d$ : stock price if up/down;  $X$ : strike price;  $C_u = \max(S_u - X, 0)$ ,  $C_d = \max(S_d - X, 0)$ : call payoffs in up/down states;  $r_p$ : risk-free rate per period.)

- D:** Replicating Portfolio (Call): Portfolio of  $\Delta$  shares and risk-free borrowing ( $B_{PV}$ ) that matches option payoffs. **F:**  $C_0 = \Delta S_0 - B_{PV}$   
**F:**  $\Delta = \frac{C_u - C_d}{S_u - S_d}$  (Hedge ratio, shares per option) **F:**  $B_{PV} = \frac{\Delta S_u - C_u}{1 + r_p}$  (PV of amount to borrow)
- A:** E.g.,  $S_0 = 100$ ,  $S_u = 110$ ,  $S_d = 90$ ,  $X = 100$ ,  $r_p = 1\%$ . Then  $C_u = 10$ ,  $C_d = 0$ .  
 $\Delta = \frac{10 - 0}{110 - 90} = 0.5$ .  $B_{PV} = \frac{0.5(110) - 10}{1.01} \approx 44.55$ .  
 $C_0 = 0.5(100) - 44.55 \approx 5.45$ .

- D:** Risk-Neutral Valuation (Call): Discount expected payoff using risk-neutral probability  $p^*$ . ( $u = S_u/S_0$ ,  $d = S_d/S_0$ : up/down factors for stock price.) **F:**  $p^* = \frac{(1+r_p)-d}{u-d}$  **F:**  $C_0 = \frac{p^* C_u + (1-p^*) C_d}{1+r_p}$
- A:** E.g.,  $S_0 = 100$ ,  $S_u = 110$ ,  $S_d = 90 \Rightarrow u = 1.1$ ,  $d = 0.9$ . With  $r_p = 1\%$ ,  $p^* = \frac{1.01-0.9}{1.1-0.9} = 0.55$ .  
 $C_0 = \frac{0.55(10) + 0.45(0)}{1.01} \approx 5.45$ .

Put-Call Parity (European, non-dividend)

- D:** Relationship between European call ( $C_0$ ) and put ( $P_0$ ) prices with same  $X, T$ . ( $S_0$ : current stock price;  $X$ : strike price;  $P_0$ : current put price;  $C_0$ : current call price;  $r_f$ : annual risk-free rate;  $t$ : time to

expiration in years.)

- F:**  $C_0 + \frac{X}{(1+r_f)^t} = P_0 + S_0$
- A:** Find one price or spot arbitrage. E.g.,  $C_0 = 5$ ,  $X = 100$ ,  $S_0 = 98$ ,  $t = 1$ ,  $r_f = 2\%$ .  
 $PV(X) = \frac{100}{(1.02)^1} \approx 98.04$ .  $5 + 98.04 = P_0 + 98 \Rightarrow P_0 \approx 5.04$ .

Black-Scholes Model

- D:** Continuous-time model for European options. Assumes lognormal prices, constant volatility ( $\sigma$ ), constant risk-free rate ( $r_f$ ), no dividends, no transaction costs, continuous trading. (Formula often provided or calculated with  $N(d_1)$ ,  $N(d_2)$ ).

PART II: DEBT FINANCING

Bond Basics & Definitions

- D:** Bond: Issuer owes holder principal (Face Value,  $FV$ ) and typically periodic interest (coupons).
- D:** Coupon Rate: Annual rate for coupon payments ( $C_p = \text{CpnRate} \times FV/k$ , where  $k$  is cpns/yr).
- D:** Yield to Maturity (YTM): Discount rate equating PV of bond's future CFs to its market price ( $P_0$ ).
- D:** Indenture: Legal contract of bond terms. **D:** Trustee: Oversees for bondholders.
- D:** Security: Debenture: Unsecured. Mortgage Bond: Backed by specific assets.
- D:** Seniority: Claim priority in bankruptcy. Senior > Subordinated/Junior.
- D:** Call Provision: Issuer's right to redeem bond early. **A:** Issuer calls if market rates  $\ll$  coupon rate.
- D:** Put Provision: Holder's right to sell bond back to issuer early. **A:** Holder puts if rates  $\gg$  coupon rate or credit deteriorates.
- D:** Convertible Bond: Holder can exchange for issuer's stock. **A:** Value = Straight Bond + Call Option on Stock. Lower coupon for issuer.

Bond Pricing

( $C_p$ : periodic coupon payment;  $FV$ : face value;  $YTM$ : yield to maturity (annual);  $k$ : coupons per year;  $N$ : total number of periods (num years  $\times k$ )).

- F:**  $P_0 = \sum_{i=1}^N \frac{C_p}{(1+YTM/k)^i} + \frac{FV}{(1+YTM/k)^N}$
- A:** Price vs  $FV$ : If  $YTM > \text{CpnRate} \Rightarrow P_0 < FV$  (Discount). If  $YTM < \text{CpnRate} \Rightarrow P_0 > FV$  (Premium). If  $YTM = \text{CpnRate} \Rightarrow P_0 = FV$  (Par).
- A:** Ex: 2yr, 4% semi-annual cpn,  $FV = 1000$ ,  $YTM = 5\%$  (ann.).  $C_p = 20$ ,  $N = 4$ .  $YTM/k = 0.025$ .  $P_0 = \frac{20}{1.025^1} + \dots + \frac{20}{1.025^4} + \frac{1000}{1.025^4} \approx \$981.41$ .

Credit Risk & Risky Debt

- D:** Credit Risk: Risk of issuer default. **D:** Default: Failure to make promised payment.
- D:** Recovery Rate (RR): % of exposure recovered in default. **D:** Loss Given Default (LGD):  $1 - RR$ . ( $CF_{Promised}$ : promised cash flow;  $CF_{Default}$ : cash flow in default (e.g.,  $FV \times RR$ );  $p_D$ : probability of default.)
- F:**  $E[CF] = (1 - p_D)CF_{Promised} + p_D CF_{Default}$
- F:**  $V_{RiskyDebt} = PV(E[CF])$  (discount at risk-adj. rate, or  $r_f$  if  $p_D$  is risk-neutral).
- D:** Option to Default View: Equity is call option on firm assets ( $V_{Assets}$ ) with  $X = \text{Debt } FV$ .  $V_{Equity} = \max(V_{Assets} - FV_{Debt}, 0)$ .  $V_{RiskyDebt} = V_{Assets} - V_{EquityCall}$ .
- D:** Credit Spread:  $YTM_{RiskyBond} -$

$YTM_{RiskFreeBond}$ . Compensates for default risk & liquidity.

Leasing

- D:** Lease: Use an asset (e.g., truck, machine) via regular payments. Lessee uses; lessor owns.
- D:** Operating Lease: Short-term, lessor maintains. **D:** Financial Lease: Long-term, lessee maintains. Like borrowing to buy.
- D:** Net Advantage to Leasing (NAL): Cost difference between leasing and buying. **A:** If  $NAL > 0$ , leasing is better.
- ( $I_0$ : Purchase price if buying. (e.g. \$100k machine),  $L_t$ : Lease payment in year  $t$ . (e.g. \$20k/year),  $T_c$ : Tax rate. (e.g. 30%),  $Dep_t$ : Depreciation (tax shield if owned),  $r_d$ : Pre-tax borrowing rate. (e.g. 8%),  $r_{d,AT}$ : After-tax rate  $= r_d(1 - T_c)$ . (e.g. 5.6%),  $SV$ : After-tax salvage value at end. (e.g. \$10k))

**F:**

$$NAL = I_0 - \sum_{t=0}^{N-1} \frac{L_t(1 - T_c)}{(1 + r_{d,AT})^t} - \sum_{t=1}^N \frac{Dep_t \cdot T_c}{(1 + r_{d,AT})^t} \pm \frac{SV(1 - T_c)}{(1 + r_{d,AT})^N}$$

- Final  $SV$  term: Add if buyer keeps value; subtract if asset returns to lessor.

PART III: RISK MANAGEMENT

Why Manage Risk?

- A:** Reduce costly financial distress (bankruptcy, lost sales).
- A:** Ensure cash for good investments (avoid underinvestment).
- A:** Reduce agency costs (align manager/shareholder interests).
- A:** Improve planning & performance measurement (smoother CFs).
- A:** Goal: Smooth CFs, focus on core biz, avoid disasters (not necessarily higher avg profit).

Tools: Insurance, Derivatives, Hedging

- D:** Insurance: Transfers risk of large, infrequent, non-financial losses for a premium. Premium =  $E[\text{Loss}] + \text{Loadings}$ .
- D:** Financial Derivatives: Value derived from underlying asset.
- D:** Forward Contract: Custom OTC agreement for future buy/sell at forward price ( $F_0$ ). **A:** Locks price, reduces uncertainty. Counterparty risk. ( $S_0$ : spot price;  $r_f$ : risk-free rate (annual);  $t$ : time to maturity in years.)
- F:**  $F_0$  (no income)  $= S_0(1 + r_f)^t$
- ( $PV(I)$ : PV of known income  $I_i$  from asset at times  $t_i$  before  $T$ .)
- F:**  $F_0$  (known income  $I$ )  $= (S_0 - PV(I))(1 + r_f)^t$
- ( $r_{fp}$ : periodic  $r_f$ ;  $u_p$ : periodic storage cost as % of  $S_0$ ;  $y_{cp}$ : periodic convenience yield as % of  $S_0$ ;  $N$ : number of periods to delivery.)
- F:**  $F_0$  (commodity)  $= S_0(1 + r_{fp} + u_p - y_{cp})^N$
- A:** Ex:  $S_0 = \$50$ ,  $r_f = 3\%/yr$ ,  $t = 0.5yr$ .  
 $F_0 = 50(1.03)^{0.5} \approx \$50.74$ .

- D:** Futures Contract: Standardized forward, exchange-traded, daily mark-to-market (MTM), clearinghouse. **A:** More liquid, less counterparty risk. MTM reduces default risk.
- D:** Net Convenience Yield (NCY): Benefit of holding physical commodity ( $y_c$ ) less storage costs ( $u$ ).  $NCY = y_c - u$ .
- D:** Swap: Agreement to exchange series of CFs (e.g., Interest Rate Swap: fixed for float). Notional Principal. **A:** IRS to change debt nature (fixed  $\leftrightarrow$  float) or match Assets/Liabilities.
- D:** Options for Hedging: Buy Put for price fall (floor). Buy Call for price rise (cap). Cost=premium. **A:** Downside protection, retains upside (vs. forwards/futures).

Hedging Concepts

- D:** Hedge Ratio (HR or  $\delta$ ): Amt of hedge instrument per unit of hedged item. For options: Delta ( $\Delta$ ). ( $S$ : spot price of asset being hedged;  $F$ : price of futures contract used for hedging.)
- F:** HR (min variance)  $= \frac{\text{Cov}(S, F)}{\text{Var}(F)}$
- D:** Basis Risk: Imperfect hedge due to  $Basis_t = S_t - F_t$  (spot vs futures) changing unpredictably. Sources: Mismatched asset, maturity, location.
- D:** Duration (Bonds): Price sensitivity to yield changes ( $\Delta YTM$ ). ( $PV(CF_t)$ : PV of cash flow at time  $t$ ;  $P_0$ : current bond price;  $YTM$ : yield to maturity;  $k$ : coupons per year.)
- F:** Macaulay Duration ( $D$ )  $= \frac{\sum t \cdot PV(CF_t)}{P_0}$  (weighted avg time to CFs)
- F:** Modified Duration ( $ModD$ )  $= \frac{D}{1 + YTM/k}$
- F:** Price Change  $\Delta P \approx -ModD \cdot P_0 \cdot \Delta YTM$
- A:** Duration Matching: To immunize portfolio  $NW$  from small parallel  $\Delta i$ , set  $(ModD_{Asset} \cdot MV_{Asset}) = (ModD_{Liab} \cdot MV_{Liab})$ .

PART IV: FINANCIAL PLANNING & WORKING CAPITAL MANAGEMENT

Financial Planning

- D:** Short-Term (Cash Budgeting): Forecasts cash inflows/outflows to find shortages/surpluses.
- A:** Structure: Beg. Cash + Sources - Uses = End Cash (before new fin.). Compare to Min. Cash  $\Rightarrow$  Need/Surplus.
- D:** Long-Term (Pro Forma Statements): Projected Income Statement, Balance Sheet based on sales forecasts.
- D:** Percentage of Sales Method: Many IS/BS items grow proportionally with sales.
- D:** External Funds Needed (EFN) / External Capital Req. (ECR): Added funding for pro forma BS. ( $A^*/S_0$ : assets tied to sales, as % of current sales  $S_0$ ;  $\Delta S$ : projected change in sales;  $L^*_{spont}/S_0$ : spontaneous liabilities (accounts payable (A/P), accruals) as % of  $S_0$ ;  $S_1$ : projected total sales ( $S_0 + \Delta S$ );  $PM$ : profit margin on sales;  $b$ : retention ratio ( $1 - \text{dividend payout ratio}$ )).
- F:**  $ECR = (\text{Req. } \Delta \text{ Assets}) - (\text{Spont. } \Delta \text{ Liab.}) - (\Delta \text{ Ret. Earnings})$
- F:**  $ECR = (A^*/S_0)\Delta S - (L^*_{spont}/S_0)\Delta S - (S_1 \cdot PM \cdot b)$
- A:** If  $ECR > 0$ , need external funds. If  $ECR < 0$ , surplus funds.
- D:** Sustainable Growth Rate ( $g^*$ ): Max sales

growth without new equity, keeping debt to equity (D/E) and payout constant. ( $ROE_{beg}$ : Return on Equity at beginning of period;  $b$ : retention ratio.)

- F:**  $g^* = ROE_{beg} \times b$
- A:** If target growth  $> g^*$ , must: issue equity,  $\uparrow$  debt,  $\uparrow b$ , or  $\uparrow ROE$ .

## Working Capital Management

- D:** Net Working Capital (NWC):  $CurrentAssets(CA) - CurrentLiabilities(CL)$ . Measures ST liquidity.
- D:** Cash Conversion Cycle (CCC): Time from paying for inputs to collecting cash from sales. ( $DSI$ : Days Sales of Inventory;  $DSO$ : Days Sales Outstanding;  $DPO$ : Days Payables Outstanding.)
- F:**  $CCC = DSI + DSO - DPO$
- F:** Inv. Period ( $DSI$ ) =  $\frac{Avg.Inventory}{COGS/365}$
- F:** Rec. Period ( $DSO$ ) =  $\frac{Avg.A/R}{CreditSales/365}$
- F:** Pay. Period ( $DPO$ ) =  $\frac{Avg.A/P}{COGS \text{ (or Purchases)}/365}$
- A:** Goal: Shorten CCC (faster inv. turnover & collections, optimal payments) to cut working capital financing needs.
- D:** Specific Accounts:
  - Cash Mgmt: Balance liquidity vs. investing surplus.
  - Inventory Mgmt (EOQ): Minimize total inv. costs (ordering + carrying). ( $D$ : annual demand (units);  $S$ : cost per order;  $H$ : annual holding cost per unit.)
  - **F:** Economic Order Qty (EOQ) =  $\sqrt{\frac{2 \cdot D \cdot S}{H}}$  **A:** Order EOQ units.
  - Accnt Receivable Mgmt (Credit Policy): Terms (e.g., "2/10, net 30"), Credit Analysis (5 Cs: Character, Capacity, Capital, Collateral, Conditions), Collection Policy.
  - Accnt Payable Mgmt: **A:** Take discount if its effective annual rate (EAR)  $>$  cost of ST funds. Else, pay on last day.

## PART V: FINANCIAL ANALYSIS, MERGERS, & RESTRUCTURING

### Financial Ratios (Selected)

- ( $MV_{Equity}$ : market value of equity;  $BV_{Equity}$ : book value of equity;  $NOPAT$ : Net Operating Profit After Tax;  $EBIT$ : Earnings Before Interest & Taxes;  $T_c$ : corporate tax rate;  $WACC$ : Weighted Avg. Cost of Capital;  $CapitalEmployed$ : total capital (debt + equity);  $NI$ : Net Income;  $Avg.$ : average over period;  $TA$ : Total Assets;  $COGS$ : Cost of Goods Sold;  $A/R$ : Accounts Receivable;  $PM$ : Profit Margin;  $T.O.$ : Turnover;  $CA$ : Current Assets;  $CL$ : Current Liabilities.)
- D:** Market Value Added (MVA):  $MV_{Equity} - BV_{Equity}$ . **A:** Wealth created over capital contributed.
- D:** Economic Value Added (EVA):  $NOPAT - (WACC \times CapitalEmployed)$ . ( $NOPAT = EBIT(1 - T_c)$ ) **A:** True economic profit.
- D:** Profitability:  $ROE = \frac{NI}{Avg.Equity}$ .  $ROA_{adj} = \frac{NI + Int(1 - T_c)}{Avg.TotalAssets}$ . Net PM =  $\frac{NI}{Sales}$ .
- D:** Efficiency (Turnover): Asset T.O. =  $\frac{Sales}{Avg.TA}$ . Inv. T.O. =  $\frac{COGS}{Avg.Inv.}$ . Rec. T.O. =  $\frac{CreditSales}{Avg.A/R}$ .
- D:** Du Pont System (ROE):  $ROE = (\frac{NI}{Sales}) \times$

- $(\frac{Sales}{Avg.TA}) \times (\frac{Avg.TA}{Avg.Equity}) = PM \times AssetT.O. \times Eq.Multiplier$ . **A:** Decomposes ROE.
- D:** Leverage: D/E Ratio =  $\frac{TotalDebt}{TotalEquity}$ . Times Interest Earned (TIE) =  $\frac{EBIT}{InterestExpense}$ . **A:** Debt use; risk & return.
- D:** Liquidity: Current Ratio =  $\frac{CA}{CL}$ . Quick Ratio =  $\frac{CA - Inventory}{CL}$ . **A:** Meet ST obligations.

### Mergers & Acquisitions (M&A)

- ( $PV_A$ ,  $PV_B$ : pre-merger values of acquirer/target;  $PV_{AB}$ : value of combined firm.)
- D:** Merger: Two firms combine. **D:** Acquisition: One buys another.
- D:** Synergy ( $\Delta PV_{AB}$ ):  $PV_{AB} > PV_A + PV_B$ . Sources: Economies, strategic benefits, tax gains.
- D:** Types: Horizontal (competitors). Vertical (supply chain). Conglomerate (unrelated).
- D:** Motives (Sensible): Economies scale/scope, vertical integration, tax gains, improved mgt.
- D:** Motives (Dubious): Diversification (shareholders (SHs) can do), earnings per share bootstrap, managerial hubris.
- D:** Tender Offer: Direct offer to target SHs. **D:** Proxy Contest: Fight for SH votes.
- F:** Economic Gain from Merger =  $\Delta PV_{AB} = PV_{AB} - (PV_A + PV_B)$ .
- F:** Cost of Acquisition (Cash Offer) =  $CashPaid - PV_B$ .
- ( $\alpha$ : fraction of combined firm shares given to target SHs.)
- F:** Cost of Acquisition (Stock Offer) =  $(\alpha \times PV_{AB}) - PV_B$ .
- F:** NPV of Merger to Acquirer =  $\Delta PV_{AB} - CostAcquisition$ . **A:** Proceed if NPV  $> 0$ .
- D:** Takeover Defenses: Target tactics. Poison Pill, Staggered Board, White Knight.

### Corporate Restructuring

- D:** Changes to portfolio, capital structure, or ownership to improve value.
- D:** Leveraged Buyout (LBO): Acquisition (often by private equity + mgt) heavily debt-financed. **A:** Value drivers: Tax shields, mgt incentives, operational improvements. MBO (Mgt Buyout).
- D:** Spin-off: New independent co. from division; shares distributed to parent SHs. No cash raised. **A:** Focus core biz, unlock value.
- D:** Equity Carve-out: Parent sells minority stake of sub to public (IPO). Cash raised. Parent usually keeps control. **A:** Raise K, market value for sub.
- D:** Asset Sale/Divestiture: Selling part of company.
- D:** Privatization: Transfer state-owned enterprises to private ownership.
- D:** Bankruptcy: Ch. 7 (Liquidation): Assets sold, proceeds to creditors. Ch. 11 (Reorganization): Firm protected, develops restructure plan.
- D:** Absolute Priority Rule (APR): Creditor payment order (secured, unsecured, equity). Deviations in Ch.11.

## PART VI: ADVANCED TOPICS

### Sustainable Finance, Regulation, ESG

- D:** ESG: Environmental, Social, Governance criteria for investments & operations.
- D:** CSR (Corporate Social Responsibility): Firm's ethical commitment to sustainable development.

- D:** SDGs (Sustainable Development Goals): 17 UN goals for global sustainability.
- D:** EU Taxonomy: Classification for environmentally sustainable economic activities.
- D:** CSRD (Corp. Sustainability Reporting Directive - EU): Mandates sustainability reporting using ESRS.
- D:** Double Materiality (CSRD/ESRS): Report on how sustainability affects business (financial view) AND how business impacts society/env (impact view).
- D:** SFDR (Sust. Fin. Disclosure Regulation - EU): ESG disclosure rules for financial market participants.
- D:** TCFD (Task Force on Climate-related Fin. Disclosures): Climate risk/opportunity disclosure framework.
- D:** GRI (Global Reporting Initiative): Standards for sustainability reporting.
- D:** ESG Investing: Exclusionary Screening, ESG Integration, Impact Investing.
- D:** Aggregate Confusion (ESG Ratings): Different raters, different scores for same firm.
- A:** ESG factors can be financial risks (carbon tax, stranded assets) or opportunities (green tech) impacting CFs, cost of capital, valuation.

### Bank Regulation & Supervision (BIS perspective)

- D:** BIS (Bank for International Settlements): Fosters intl. monetary/financial cooperation. Hosts BCBS.
- D:** BCBS (Basel Committee on Banking Supervision): Global standard-setter for bank regulation (Basel Accords).
- D:** Basel Accords (I, II, III+): Intl. regs on min. capital, liquidity, supervision. **A:** Aim: bank resilience, reduce systemic risk.
- D:** Regulatory Capital: To absorb unexpected losses.
  - CET1 (Common Equity Tier 1): Highest quality (common shares, ret. earnings).
  - AT1 (Additional Tier 1): E.g., CoCos (absorb losses as going concern).
  - Tier 2 Capital: Subordinated debt (absorb losses in gone-concern).
- D:** RWA (Risk-Weighted Assets): Assets weighted by risk. Capital req. = % of RWA. (These are minimums; buffers (CCB, G-SIB) increase actual requirements.)
- F:** CET1 Ratio =  $\frac{CET1}{RWA} \geq 4.5\%$  (+ buffers)
- F:** Tier 1 Ratio =  $\frac{CET1 + AT1}{RWA} \geq 6\%$  (+ buffers)
- F:** Total Capital Ratio =  $\frac{Tier1 + Tier2}{RWA} \geq 8\%$  (+ buffers)
- D:** Leverage Ratio (non-risk-based): **F:**  $\frac{Tier1Capital}{TotalExposureMeasure} \geq 3\%$  (example)
- D:** Liquidity Coverage Ratio (LCR): ST liquidity. **F:**  $\frac{HighQualityLiquidAssets(HQLA)}{NetCashOutflows(30daystress)} \geq 100\%$
- D:** Net Stable Funding Req. (NSFR): LT funding stability. **F:**  $\frac{AvailableStableFunding(ASF)}{RequiredStableFunding(RSF)} \geq 100\%$
- D:** IRRBB (Interest Rate Risk in Banking Book): Risk to bank capital/earnings from rate moves on non-trading items.
- A:** Crises (GFC 2008, Banks 2023): Highlighted undercapitalization, liquidity/funding issues, IR-

RBB, oversight gaps. Led to reforms (Basel III, reviews).

### Digital Treasury (Holcim Example context)

- D:** Corporate Treasury: Manages financial assets/liabilities, cash, liquidity, funding, fin. risks (FX, IR), bank relations.
- D:** FinTech: Tech/innovation improving financial services.
- D:** Digital Treasury Aspects:
  - Integrated Systems: Platforms connecting treasury functions (cash mgt, payments, FX, risk).
  - Centralization: Consolidating ops (cash pooling, FX netting, in-house banking) via tech.
  - Real-time Data & Analytics: For better forecasting, risk assessment, decisions.
  - Automation: Of routine tasks (payments, reconciliation, reporting).
  - FinTech Solutions: Tools for Supply Chain Finance, Receivables Mgt, Fraud Prevention.
- A:** Digital treasury: from manual/siloed to automated, integrated, data-driven. More strategic role. Holcim likely uses for global treasury.