〔菁華重點摘要〕 **LEVEL 1**

§ **Important concepts: Financial Statement Analysis**

Cash conversion cycle (or net operating cycle)
= Average receivables collection period + Average processing time for inventory
- Payables payment period

- Receivables turnover

$$= \frac{\text{Net annual sales}}{\text{average receivables}}$$

- Average receivables collection period

$$= \frac{365}{\text{receivables turnover}}$$

- Inventory turnover

$$= \frac{\text{COGS}}{\text{average inventory}}$$

- Processing time for inventory

$$= \frac{365}{\text{inventory turnover}}$$

- Payables turnover ratio

$$= \frac{\text{COGS}}{\text{average trade payables}}$$

- Payables payment period

$$= \frac{365}{\text{payables turnover ratio}}$$

WC = CA – CL; CR = CA/CL

Anti-dilutive?

Begin Bal. + Purchase – Depr. = End Bal.

Ratio analysis using **duPont System**

Return on equity (ROE)

$$= \frac{\text{Net Income}}{\text{Equity}} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Equity}}$$

= (Net Profit Margin) x (Equity Turnover)

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

= (Net Profit Margin) x (Asset Turnover) x (Equity Multiplier)

$$\text{ROE} = \frac{\text{EBT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \times (1-t)$$

$$\text{ROE} = \left(\frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} - \frac{\text{I}}{\text{Assets}}\right) \times \frac{\text{Assets}}{\text{Equity}} \times (1-t)$$

= [(Operating Profit Margin) (Total Asset Turnover) – (Interest Expense Rate)]
(Financial Leverage Multiplier) (Tax Retention Rate)

BI + P = COGS + EI

FIFO COGS = LIFO COGS – Δ LIFO Reserve

Balance Sheet items:

LIFO reserve = FIFO inventory – LIFO inventory

Inventory: (LIFO basis ➔ FIFO basis)	**Retained Earning:**
	+ (LIFO reserve) x (1-t)
+ LIFO reserve	**Deferred tax liability:**
	+ (LIFO reserve) x (t)

Income Statement items:

FIFO COGS = LIFO COGS – Δ LIFO Reserve

FIFO Net Income = LIFO Net Income + [Δ LIFO Reserve x (1–t)]

Tax Expense = tax payable + deferred tax expense

↑ Current ↓ ↑ Future

Tax expense = tax payable + Δ def. tax liab. – Δ def. tax asset

Deferred tax liab. = t_n (pretax income – taxable income)* = t_n (timing difference) *

deferred tax asset = t_n (taxable income – pretax income)* = t_n (timing difference) *

tax expense = (taxable income) (t_c) + Δ deferred tax liab – Δdeferred tax asset

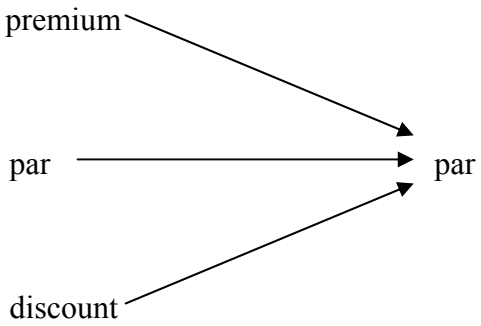
*** cumulative**

Capital Lease payment	**Interest Expense → CFO (outflow)** **Principal Repayment → CFF (outflow)**
Operating Lease payment	**Rent Expense → CFO (outflow)**

- Financial Statement Effects of Issuing a Bond

⊕ Statement of Cash Flow

	CFF	CFO
Issuance of debt	↑ cash received = PV of bond at market interest rate	No effect
Periodic interest payments	No effect	↓ interest paid = (coupon rate) (par value)
Payment at maturity	↓ face (par) value	No effect



⊕ Balance Sheet

Issued at Par	Issued at a Premium	Issued at a Discount
Carried @ face value	Carried @ Face value + premium	Carried @ face value – discount
–	Liability ↓ as premium is amortized to interest expense	Liability ↑ as discount is amortized to interest expense

⊕ Income Statement

Issued at Par	Issued at a Premium	Issued at a Discount
–	CFF ↑	CFF ↓
Market rate = face rate	Market rate < face rate	Market rate > face rate
Interest expense = (face rate) (face value) = cash paid	Interest expense = cash paid – amortization of premium	Interest expense = cash paid + amortization of discount
–	CFO ↓	CFO ↑
Interest is constant	Interest ↓ over time	Interest ↑ over time

§ **Important concepts: Corporate Finance**

- **After-tax** cost of negotiated debt capital

$$r_{\textbf{after tax}} = \textbf{(1 – t)}\ r_{\textbf{D}}$$

- Cost of Preferred Stock Capital

$$= r_{\textbf{P}} = DIV_{\textbf{P}} / P_{\textbf{PS}}$$

- Cost of Common Equity ($r_{\textbf{CE}}$)

  * Capital Asset Pricing Model (CAPM): $r_{\textbf{CE}} = r_{\textbf{F}} + \beta_{\textbf{CS}} (r_{\textbf{M}} - r_{\textbf{F}})$

  * Implied Return (or **Dividend Yield** plus **Growth Rate**) Method

$$\textbf{P}_{\textbf{CS}} = \textbf{DIV}_{\textbf{1}} / (\textbf{r}_{\textbf{CE}} - \textbf{g}_{\textbf{DIV}})$$

$$r_{\textbf{CE}} = (DIV_{\textbf{1}} / P_{\textbf{CS}}) + g_{\textbf{DIV}}$$

$$\text{Current Dividend Yield} = DIV_{\textbf{0}} / P_{\textbf{CS}}$$

$$r_{\textbf{CE}} = (\text{Current Dividend Yield})\ (1 + g_{\textbf{DIV}}) + g_{\textbf{DIV}}$$

  * Traditional Build-up (or **Bond Yield** plus **Risk Premium**) Method

$$r_{\textbf{CE}} = (1 + r_{\textbf{F}})\ (1 + r_{\textbf{ERP}}) - 1$$

$$r_{\textbf{CE}} \approx r_{\textbf{F}} + r_{\textbf{ERP}}$$

- Cost of Newly Issued Common Stock (or Cost of External Equity)

$$r_{\textbf{new CE}} = [DIV_{\textbf{1}} / P_{\textbf{CS}}\ (1 - f)] + g_{\textbf{DIV}}$$

- Weighted-Average Cost of Capital (WACC)

$$r_W = [(1 - t)\ r_D\ V_D + r_P\ V_P + r_{CE}\ V_{CE}] / V_A, \quad \text{where } V_A = V_D + V_P + V_{CE}$$

$P \propto 1 / WACC$

- Net Present Value (NPV)

$$NPV = CF_0 + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n}$$

- Internal Rate of Return (IRR)

  $\oplus$ PV (Inflows) = PV (Investment costs)

$$\textbf{NPV = 0} = CF_0 + \frac{CF_1}{(1 + IRR)^1} + \frac{CF_2}{(1 + IRR)^2} + \ldots + \frac{CF_n}{(1 + IRR)^n}$$

- Operating Cash Flow (**Free Cash Flow to the Firm**):

$$FCF_F = EBIT\,(1 - t) + DEPR - CAPX - \Delta WC$$

Break even point: Sales = Costs (or EBIT = 0)

➔ $Q_{BE}\,(P - V) - F = 0$ or $Q_{BE}\,(P - V) - F - \text{Depreciation} = 0$

- Degree of Operating Leverage (DOL)

$$\textbf{DOL} = \frac{\textbf{\%}\,\Delta\,\textbf{EBIT}}{\textbf{\%}\,\Delta\,\textbf{Sales}} = \frac{\textbf{EBIT} + \textbf{C}_\textbf{F}}{\textbf{EBIT}}$$

- Degree of Financial Leverage (DFL)

$$\textbf{DFL} = \frac{\textbf{\%}\;\Delta\,\textbf{Pretax Income}}{\textbf{\%}\;\Delta\,\textbf{EBIT}} = \frac{\textbf{EBIT}}{\textbf{EBIT} - \textbf{I}}$$

- Degree of Total Leverage (DTL) = **(DOL)(DFL)**

$$\textbf{\%}\,\Delta\,\textbf{Pretax Income} = \frac{\Delta\,\textbf{Pretax Income}}{\textbf{Pretax Income}} = \textbf{(DOL)(DFL) (\%}\,\Delta\,\textbf{Sales)}$$

$$\textbf{\%}\,\Delta\,\textbf{EPS = (DOL)(DFL) (\%}\,\Delta\,\textbf{Sales)}$$

$$\textbf{EPS}_1 = \textbf{EPS}_0\ \textbf{[1 + (DOL)(DFL) (\%}\,\Delta\,\textbf{Sales)]}$$

§ **Important concepts: Equity Investments**

* There are four types of orders: market orders(市價單), limit orders (限價單), short sale orders (放空), stop loss orders (停損單)

* The *uptick rule* states that stocks can only be shorted in an up market. Thus a *short sale can only trade at a price higher than the previous trade*.

* Margin Call Trigger Price (long) = [(original price)(1-initial margin%)]/[1- *maintenance margin* %] ➔ $P_1(1 - M_1) = P_0(1 - M_0)$

* Return on (un-margined) investment = $(V_{END} - V_{BEGIN}) / V_{BEGIN}$

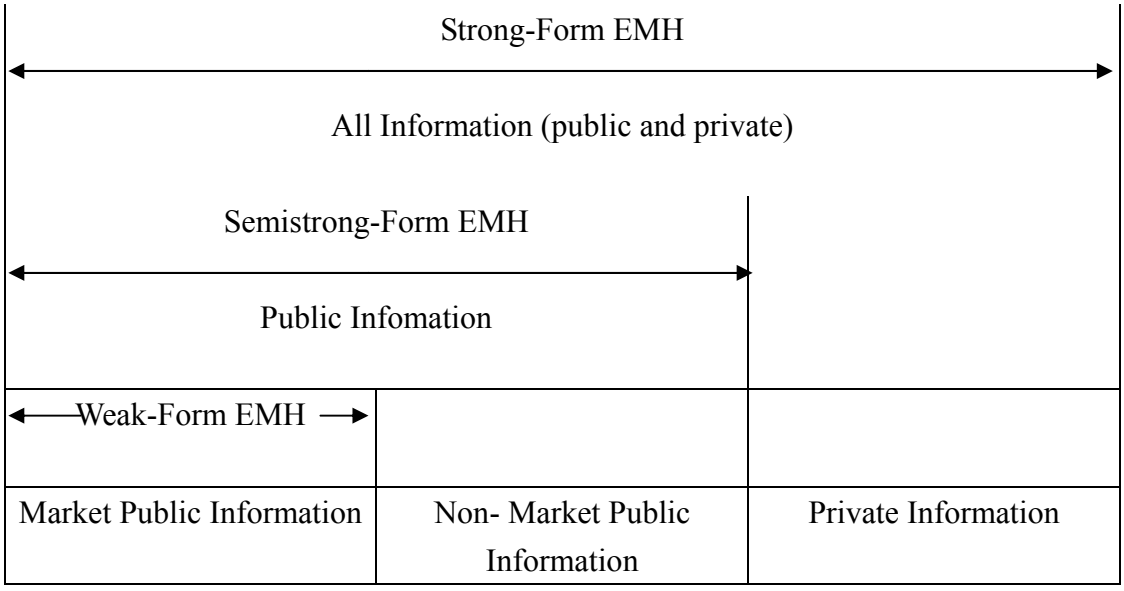
* Return on (margined) investment = $(V_{END} - V_{BEGIN} - \text{Interest}) / (V_{BEGIN} - V_{BORROWED})$

* Price-weighted series: Examples: Dow Jones Industrial Average (DJIA), Nikkei225;
  Formula: [Σ of stock prices]/[# of stocks in the index adjusted for splits]

* Market value-weighted series: Examples: S&P500, NASDAQ, FT Actuaries
  Formula: [Σ (Price today)(# of shares) / Σ (Price base year)(# of shares)] *(Beginning Index Value)

* Unweighted price indicator series: Examples: FT30; geometric return

* Efficient Market Hypothesis (EMH)



重點中的重點: 評價公式Valuation of Bonds, Preferred Stocks and Common Stocks

* Required rate of return (RRR or k)

* $RRR = (1+R_{\text{real rate}})(1+I_{\text{inflation premium}})(1+P_{\text{risk premium}})-1$

* $k = R_{\text{risk free}} + \text{Beta} * (R_{\text{market}} - R_{\text{risk free}})$

■ $$V_{bond} = \frac{C_1}{(1+k_B)^1} + \frac{C_2}{(1+k_B)^2} + \ldots + \frac{C_n + Par}{(1+k_B)^n}$$

■ $V_{\text{preferred stocks}} = \frac{D}{(1+k_p)^1} + \frac{D}{(1+k_p)^2} + \ldots + \frac{D}{(1+k_p)^\infty} = \frac{D}{k_p}$

■ $V_{\text{Common Stocks}} = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_\infty}{(1+k_e)^\infty}$

- Infinite period model

$$V_{\text{Common Stocks}} = \frac{D_0(1+g)^1}{(1+k_e)^1} + \frac{D_0(1+g)^2}{(1+k_e)^2} + \ldots + \frac{D_0(1+g)^\infty}{(1+k_e)^\infty}$$

Simplifying the above equation to

$V_{\text{Common Stocks}} = \frac{D_0(1+g)}{k_e - g} = \frac{D_1}{k_e - g}$, which is called ***constant growth DDM***

✧ $k_{\text{market discount rate}} = D_1/P_0 + g$

- Temporary supernormal growth

$$V_{\text{supernormal grwoth}} = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \ldots. \frac{D_{(n+1)}/ k_e - g}{(1+k_e)^n}$$

本益比公式Earnings multiplier model:

$P_0 = D_1/ (k – g)$ ➔ $P_0 / E_1 = (D_1/ E_1) / (k – g)$

* Expected growth rate of dividends (g) is defined as the firm's plowback ratio (also called retention rate, RR) times the return on equity (ROE) portion of the new investments. Dividend payout ratio = 1 – RR

$$g = RR * ROE$$

* Breaking down ROE

ROE = Profit margin * Total asset turnover * financial leverage

= (Net income/Sales)(Sales/ Total assets)(Total assets/Equity)

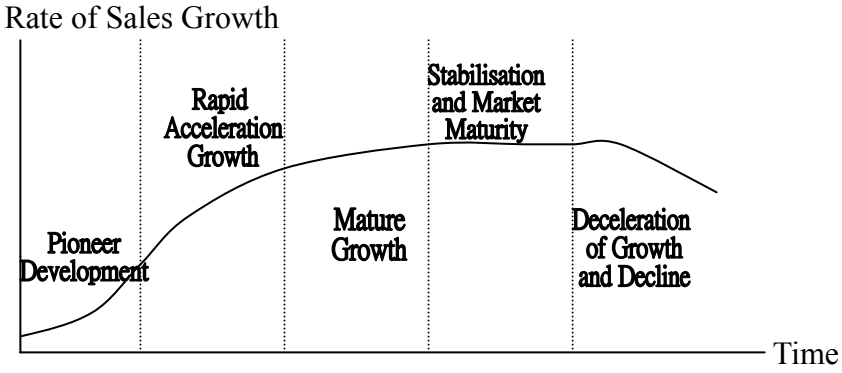
* Estimated EPS = [(Sales per share * EBITDA%) –D – I] * (1-T)

Business Cycle Stages ➔ Attractive investment targets

- *Recovery* ➔cyclicals, commodities & commodity-linked equities
- *Early Expansion* ➔ stocks in general & real estate
- *Late Expansion* ➔ bonds & interest-sensitive stocks

- *Slowing, entering recession* ➔ bonds & interest-sensitive stocks
- *Recession* ➔ commodities & stocks

Industry life cycle analysis



Trends of sales growth/ profit margins at each stage of the cycle

	Sales Growth	Profit Margin
Pioneer	Limited	Low or Negative
Rapid Acceleration	High	High
Mature Growth	Above Normal; Decelerating	Decelerating
Stabilization	GDP Growth Rate	Slim (normal ROE)
Deceleration	Slow	Tight

Industry Concentration

- Concentration ratio: *N*firm concentration ratio: combined market share of the largest *N* firms in the industry
- Herfindahl index
  - Herfindahl index (H) = $MS_1^2 + MS_2^2 + \ldots + MS_n^2$
    - where MS_n = market share of firm *n*
    - $H < 0.1$ ➔ low concentration
    - $0.1 < H < 0.18$ ➔ moderate concentration
    - $H > 0.18$ ➔ high concentration

Technical Analysis: 以下技術分析指標重理解，不需死記，最多出 1~2 題左右

Indicators for Contrarian View (逆勢操作指標)

(1) Mutual fund cash position ratio

If the ratio > 13% ⟶ market bearish ⟶ technicians bullish

If the ratio < 5% ⟶ market bullish ⟶ technicians bearish

(2) Investor credit balance in brokerage accounts

When balances fall ⟶ investors bullish ⟶ technicians bearish

When balances rise ⟶ investors bearish ⟶ technicians bullish

(3) Investment advisory opinions

Investment Advisor Ratio (IAR) = Bearish opinions /Total opinions

If the ratio ≥ 60% ⟶ market bearish ⟶ technicians bullish

If the ratio ≤ 20% ⟶ market bullish ⟶ technicians bearish

(4) OTC/ NYSE volume (Indication of speculative activities in the market)

Volume ratio (VR)= OTC volume/ NYSE volume

If the ratio ≥ 112% ⟶ market bullish ⟶ technicians bearish

If the ratio ≤ 87% ⟶ market bearish ⟶ technicians bullish

(5) CBOE put/call ratio

Put call ratio = Puts / Calls

If the ratio > 0.5 ⟶ market bearish ⟶ technicians bullish

If the ratio < 0.35 ⟶ market bullish ⟶ technicians bearish

(6) Futures traders bullish on stock index futures

When > 75% of the traders bullish ⟶ technicians bearish

When < 25% of the traders bullish ⟶ technicians bullish

Smart Money Technicians

(1) The confidence index (CI)

CI = Quality bond yields / Average bond yields (always < 1)

When confidence goes up ⟶ Prices of average bond rise⟶

Yields of average bond fall ⟶ Index goes up

(2) T-bill/Eurodollar yield spread: in times of international crisis, this spread widens as funds flow into safer haven.

(3) Short sales by specialists

Ratio = (Specialists' short sales/ Total NSE short sales)

If the ratio < 30% ⟶ market bullish ⟶ specialists buying

If the ratio > 50% ⟶ market bearish ⟶ specialists selling

(4) Debit balances in brokerage accounts

When balances rise ⟶ investors bullish ⟶ technicians bullish

When balances fall ⟶ investors bearish ⟶ technicians bearish

Other Indicators

- Short Interest

Short interest Ratio (SIR) = Outstanding short interests/Avg daily volume

If the ratio ≥ 6 ⟶ potential demand ⟶ market bullish

If the ratio ≤ 4 ⟶ potential supply ⟶ market bearish

- Stocks above their 200-day moving average

When > 80% of total stocks above 200D MA ⟶ overbought, bearish

When < 20% of the total stocks above 200D MA ⟶ oversold, bullish

- Block uptick/downtick ratio

$$\text{Uptick-Downtick ratio} = \frac{\text{\# of block uptick transactions}}{\text{\# of bock downtick transactions}}$$

If the ratio approaches 0.70 ⟶ bullish

If the ratio approaches 1.10 ⟶ bearish

- Volume helps to gauge market sentiment.

$$\text{Upside-Downside Volume Ratio} = \frac{\text{Volume of stocks that increased}}{\text{Volume of stocks that declined}}$$

If the ratio ≥ 1.5 ⟶ overbought, bearish signal

If the ratio ≤ 0.7 ⟶ oversold, bullish signal