- Measure of Leverage
- Working capital management

Measure of Leverage

Leverage 固定费用

- The amount of fixed costs a firm has
- Fixed costs
  - Operating expenses
  - Financing costs
- Great leverage leads to greater variability of firm's after-tax operating earnings and net income

Business risk (sales + operating risks)

- Risk associated with a firm's operating income
- **Sales risk**: uncertainty about firm's sales
- **Operating risk**: uncertainty about operating earnings caused by fixed operating costs

Financial risk

- Risks that common stockholders must bear when a firm uses fixed cost (debt) financing

Notations

- Q: quantify of units sold
- P: price per unit
- V: variable cost per unit
- F: fixed (operating) costs
- I: fixed interest costs
- t: tax rate
- N: number of shares
- S: total sales $\mathrm{S} = \mathrm{Q} \times \mathrm{P}$
- TVC: total variable costs $\mathrm{TVC} = \mathrm{Q} \times \mathrm{V}$
- EBIT: earnings before interest and tax
  - $\mathrm{EBIT} = \mathrm{P(Q-V)-F = S - TCV - F}$

Degree of operating leverage (DOL)

- Percentage change in operating income (RBIT) that results from a percentage change in sales
- $\mathrm{DOL} = \frac{\%\mathrm{EBIT}}{\%sales\ quantity} = \frac{\frac{\Delta EBIT}{EBIT}}{\frac{\Delta Q}{Q}} = \frac{\Delta EBIT}{\Delta Q} \times \frac{Q}{EBIT}$
  - $\Delta Q = 1 \rightarrow \Delta\mathrm{EBIT} = \mathrm{P-V}$
  - $\rightarrow \mathrm{DOL} = \frac{\mathbf{Q(P-V)}}{\boldsymbol{Q(P-V)-F}} = \frac{\boldsymbol{P-V}}{\boldsymbol{P-V-\frac{F}{Q}}}$
  - $\rightarrow \mathbf{DOL} = \frac{\mathbf{S-TVC}}{\mathbf{S-TVC-F}}$
  - $\rightarrow \boldsymbol{DOL} = \frac{\boldsymbol{EBIT+F}}{\boldsymbol{EBIT}}$
- If sales increase, DOL decrease

Degree of financial leverage (DFL)

- Sensitivity of changes to EPS (EBT, or NI) changes in EBIT
  - $\mathrm{DFL} = \frac{\%\mathrm{EPS}}{\%EBIT} = \frac{\Delta EPS}{\Delta EBIT} \times \frac{EBIT}{EPS}$
- NI
  - $NI = EBIT - I - T = (EBIT - I) \times (1 - t) \rightarrow \frac{\Delta NI}{\Delta EBIT} = (1 - t)$
  - $\mathrm{DFL_{NI}} = (1 - t) \times \frac{EBIT}{(EBIT-I)\times(1-t)} = \frac{\boldsymbol{EBIT}}{\boldsymbol{EBIT-I}}$
- EPS
  - $\mathrm{EPS} = \frac{\mathrm{NI}}{\mathrm{N}} \rightarrow \frac{\Delta EPS}{\Delta EBIT} = \frac{1}{N} \times \frac{\Delta NI}{\Delta EBIT}$
  - The DFL is
  - $\mathrm{DFL_{EPS}} = \frac{1}{N} \times \frac{\Delta NI}{\Delta EBIT} \times \frac{EBIT}{NI/N} = DFL_{NI}$
- EBT
  - $EBT = EBIT - I \rightarrow \frac{\Delta EBT}{\Delta EBIT} = 1$
  - $\mathrm{DFL_{EBT}} = \frac{\mathrm{EBIT}}{\mathrm{EBT}} = \frac{\mathrm{EBIT}}{\mathrm{EBIT-I}} = DFL_{NI}$

Degree of total leverage (DTL)

- Sensitivity of EPS to changes in sales
  - $\mathrm{DTL} = \mathrm{DOL} \times \mathrm{DFL}$
  - $\rightarrow \mathrm{DTL} = \frac{\mathrm{EBIT+F}}{\mathrm{EBIT}} \times \frac{EBIT}{EBIT-I} = \frac{\boldsymbol{EBIT+F}}{\boldsymbol{EBIT-I}}$

ROE

- ROE is higher using leverage than it is without leverage
- Financial leverage
  - Increase the level of ROE
  - Increase the rate of change for ROE
  - Increase the risk of default but also the potential return for equity holders

Breakeven Quantity of sales

- $\mathrm{Q_{BE}} = \frac{F+I}{P-V}$
  - $P - V$ is the contribution margin

Operating Breakeven Quantity of sales

- $\mathrm{Q_{OBE}} = \frac{F}{P-V}$

Sales	Cost	Profit	Leverage
P*Q	V	Q*(P-V) = EBIT + F	
	F	EBIT = Q*(P-V)-F	(EBIT + F)/EBIT
	I	EBT = EBIT – I	EBIT/(EBIT-I)

Working Capital Management

Primary source of liquidity

- Sources of cash it uses in normal day-to-day operations
- Includes
  - Cash balances from selling goods and services
  - Collecting receivables
  - Shot-term investment cash
  - Shot-term funding
    - Trade credit from vendors
    - Lines of credit from banks
  - Effective cash flow management of collections and payments

Secondary sources of liquidity

- **Liquidate** short-term or long-term assets
- **Negotiate** debt agreements
- Fill for **bankruptcy** and reorganize company
- Indicate the financial position is deteriorating

Factors Weaken liquidity position

- Drags
  - Delay or reduce cash inflows
  - Increase borrowing costs
  - Examples
    - Uncollected receivables, bad debts, obsolete inventory, tight short-term credit
- Pulls
  - Accelerate cash outflows
  - Examples
    - Pay vendors sooner than is optimal

Liquidity measures

- Current ratio
  - $\text{current ratio} = \frac{\text{current assets}}{current\ liabilities}$
  - $working\ capital = current\ assets - current\ liabilities$
- Quick ratio
  - $\text{quick ratio} = \frac{\text{cash+marketable securities+receivables}}{current\ liabilities}$
- receivable turnover
  - $\text{receivable turnover} = \frac{\text{credit sales}}{average\ receivables}$
  - $\text{number of days of receivable} = \frac{365}{receivable\ turnover}$
    - too high: customer too slow in paying bills
    - too low: credit policy is too rigorous
- inventory turnover
  - $\text{inventory turnover} = \frac{\text{Ccost of goods sold}}{average\ inventory}$
  - $\text{number of days of inventory} = \frac{365}{inventory\ turnover}$

        - too high: too much capital in inventory (obsolete inventory)
        - too low: inadequate stock on hand
- payable turnover
    - $\text{payable turnover } = \frac{\text{purchase}}{average\ paybles}$
    - $\text{number of days of payable} = \frac{365}{payable\ turnover}$

Cycles
- $\text{operating cycle} = \text{days of inventory} + \text{days of receivables}$
    - turn raw materials into cash proceeds from sale
- $\text{cash convertion cycle (net operating cycle)}$
    - $= \text{days of inventory} + \text{days of receivables} - \text{days of payable}$
    - Too high: an excessive amount of investment in working capital

Daily cash position
- **Uninvested cash** balances a firm has available to make routine purchase and pay expense as they come up
- Have sufficient cash but avoid keeping excess cash
- **Analyse** its typical cash **inflows and outflows** by category and prepare **forecasts** over short-term (daily or weekly), medium-term (monthly balances for next year), and long-term horizons

short-term investing
- US treasury bills
- short-term federal agency securities
- bank certificates of deposit
- banker's acceptances
- time deposits
- repurchase agreements
- commercial paper
- money market mutual funds
- adjustable-rate preferred stock
    - tax advantage

short-term investing measures
- discount rate
    - $\text{discount rate} = \frac{\text{Face value} - \text{price}}{face\ value} \times \frac{360}{t}$
- money market yield
    - $\text{money maket yield} = \frac{\text{Face value} - \text{price}}{price} \times \frac{360}{t}$
- bond equivalent yield (different from it defined before)
    - $\text{bond equivalent yield} = \frac{\text{Face value} - \text{price}}{price} \times \frac{365}{t}$

Cash management investment policy
- objective
    - make a return without taking on much risk, either default or liquidity risk

- written investment policy statement (IPS)
    - purpose, objective, guidelines, specific information
    - limitations on types or credit ratings

Accounts Receivable Management

- aging schedule
    - group by days outstanding
- weighted average collection period
    - group by days outstanding
    - weight in each group
    - average collection days in each group

Inventory Management

- Compare average days of inventory between industries or different business strategies can be **misleading**
- Grocery has high turnover, auto parts firms have lower turnover

Accounts Payable Management

- 2/10 net 60
    - Get 2% discount if it is paid within 10 days, or have to pay within 60 days
- Cost of trade credit
    - $1 - \text{discount} \rightarrow 1 => \text{ HPR} = \frac{\text{discount}}{1-discount}$
    - $days\ past\ discount = x - 10$ (pay after the discount day)
    - $\text{cost of trade credit} = (1 + \text{HRP})^{\frac{365}{days\ past\ discount}} - 1$
- trade credit can be a source of liquidity for a company
    - cost of trade > other short-term sources -> pay within the discount day
    - the trade credit **decreases** over time, so either pay it at the end of **discount** day or pay it at the end of **due** day

Short-term funding from banks

- **Lines of credit – large financially sound companies**
    - Uncommitted line of credit
        - Extend an offer of credit but may **refuse** to lend
    - Committed (regular) line of credit / overdraft lines of credit
        - Extend an offer of credit that it "commits to" for some time
        - Charge a fee for this commitment
    - **Revolving line of credit**
        - More reliable source
        - For longer terms, as long as years
        - Along with committed lines of credit, revolving credit lines can be verified and listed on firm's financial statements in the footnotes
    - Collateral
        - Blanket lien
            - A claim to all current **and future** firm assets
- Banker's acceptances – internal trade
    - Exporting company can sell it at discount to get immediate funds

- Factoring - receivables
    - Sell **receivables** at a discount

Short-term funding from Non-Bank sources

- Smaller and poor credit firms may use nonbank finance companies for short-term funding
- Commercial paper – lower than bank interest
    - **Large, creditworthy** companies
- It is worth having slighter **higher** overall short-term funding costs in order to have flexibility and redundant sources of financing