

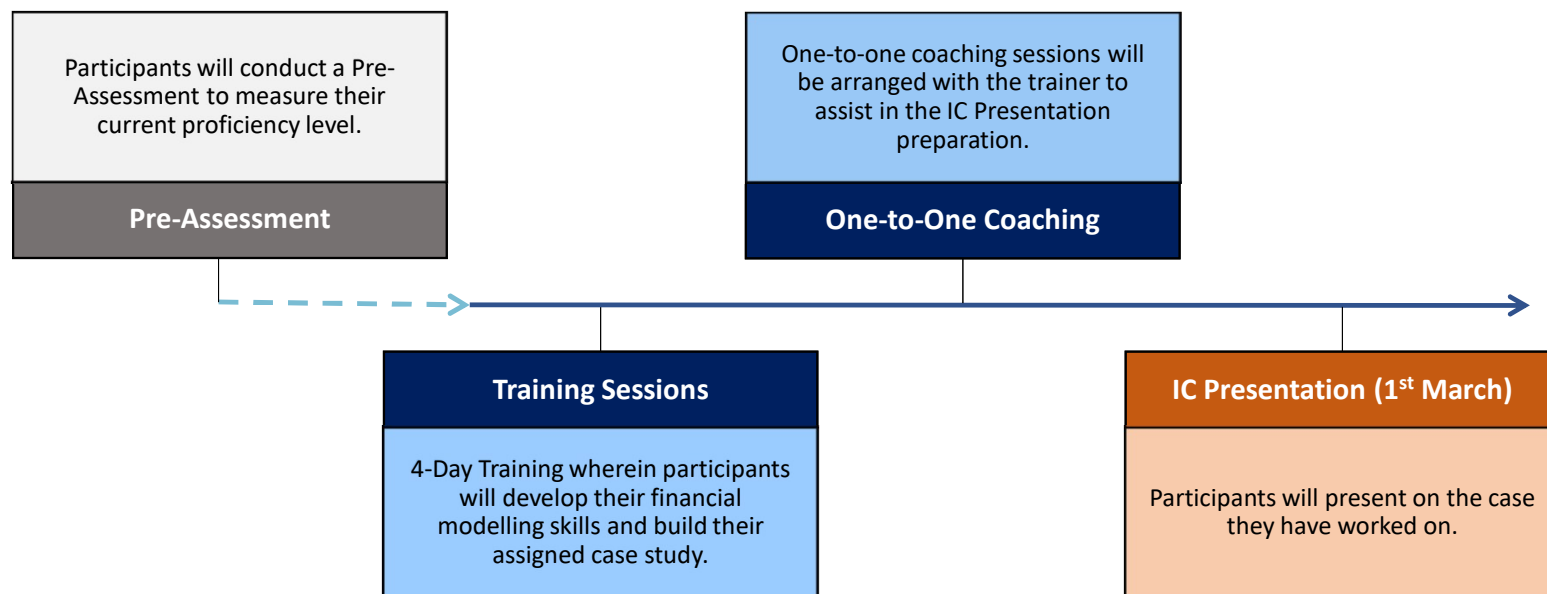


Financial Modelling

Agenda

- 1 Program & Case Study Overview
- 2 Introduction to the 3 Statement Model
- 3 **Tesla**: Model Planning
- 4 Forecasting a Comprehensive 3 Statement Model
- 5 Building a DCF Valuation
- 6 Cap Table Analysis
- 7 Unit Economics
- 8 LBO & Debt Modelling

Program Overview



Case Study: Investment Committee Presentation

- Prepare an IC Presentation to showcase your model on the **1st of March**.
- You will be assigned a company to work on throughout the program and build a comprehensive 3 Statement Model.
- Model should include:
 1. Business Model
 2. 3 Year Historical and 5 Year Projections of Financial Statements
 3. Forecast Drivers
 4. Schedules
 5. Valuation Overview
 6. DCF and Relative Valuation Model
 7. Key Ratios and Dashboards
 8. Sensitivity Analysis

NETFLIX



SAMSUNG

ZOOM

Meta



Alphabet

Purpose of Financial Reporting

Scope of Financial Statement Analysis

Role of Financial Reporting

To Provide information

- Company performance
- Financial position
- Changes in financial position
- Useful to a wide range of users in making economic decisions

Role of financial statement analysis

Analyze financial information

- Evaluate
 - Past, current & prospective performance and financial position of a company
- Purpose
 - Making investment, credit, and other economic decisions

Corporate Value and Shareholder Value

Corporate value

- Financial reporting helps to communicate a company's corporate value by presenting its overall financial performance, including its revenues, expenses, assets, and liabilities. This information is important for investors, stakeholders, and other interested parties to evaluate the company's ability to generate long-term sustainable value.

Shareholder value

- Financial reporting also communicates a company's shareholder value by presenting its financial performance from a shareholder's perspective, such as earnings per share, dividends, and return on equity. This information is critical for shareholders to assess their investment and determine whether the company is creating value for them.

Alignment of interests

- Financial reporting helps to align the interests of a company's management and shareholders by providing transparency into the company's financial performance. This transparency ensures that the management is accountable to shareholders, who can make informed decisions about whether to buy, hold, or sell their shares.

Corporate Value and Shareholder Value

Capital allocation decisions

- Financial reporting informs the capital allocation decisions made by a company's management and board of directors. It helps them to determine how to allocate resources to generate maximum shareholder value, such as investing in growth opportunities, returning capital to shareholders, or reducing debt.

Regulatory compliance

- Financial reporting is necessary to comply with legal and regulatory requirements, including accounting standards and financial reporting regulations. Compliance ensures that financial information is accurate, complete, and transparent, thereby enhancing the credibility of the company and the confidence of investors and other stakeholders.

Scope of Financial Statement Analysis

Analysis of performance: Assessment of profitability and cash flow generating ability

Profitability

- Earn a profit from delivering goods and services

Cash flow

- Cash is needed to pay employees, suppliers etc.
- Essential to continue as a going concern
- Positive cash flow leads to funding flexibility

Liquidity

- Ability to meet short-term obligations

Solvency

- Ability to meet long-term obligations

Financial Statements

Rules for Presentation

Types of Financial Statements

Accounting Principles: GAAP and IFRS

- GAAP simply means the combination of principles, standards and laws which must be followed in a particular country e.g. 'US GAAP', 'UK GAAP'
- Important ones to note are
 - IFRS – International Financial Reporting Standards
 - Set by the International Accounting Standards Board (IASB) and applicable to EU listed companies and other countries which follow IFRS such as Singapore
 - US accounting standards
 - Set by the Financial Accounting Standards Board (FASB) and applicable to US companies
- There is an ongoing project which aims for all countries to eventually follow the same standards (IFRS)

Core Financial Statements

Balance Sheet

Income Statement

Cash flow statement

Other Comprehensive Income

Statement of changes in Equity

Components of Balance Sheet

Non-current Asset – Those assets which are not convertible to cash within a year

Current Asset – Assets that can be converted to cash in less than a year

Current Liabilities – Short-term debts that are paid off within a year

Non-current liabilities – Long-term debts that are paid off after 12 months.

Equity - Equity represents the residual interest in the assets of a company after deducting its liabilities. It includes capital stock, retained earnings, and other reserves

Sainsbury 2022: Balance Sheet Assets

	Note	5 March 2022 £m
Non-current assets		
Property, plant and equipment	14	8,402
Right-of-use assets	15	5,560
Intangible assets	16	1,006
Investments in joint ventures and associates		3
Financial assets at fair value through other comprehensive income	18	604
Trade and other receivables	20	65
Amounts due from Financial Services customers and other banks	21	2,026
Derivative financial assets	32	213
Net retirement benefit surplus	37	2,283
		20,162
Current assets		
Inventories	19	1,797
Trade and other receivables	20	683
Amounts due from Financial Services customers and other banks	21	3,163
Financial assets at fair value through other comprehensive income	18	196
Derivative financial assets	32	78
Cash and cash equivalents	33	825
		6,742
Assets held for sale	22	8
		6,750
Total assets		26,912

Sainsbury 2022: Balance Sheet Liabilities and Equity

Current liabilities		
Trade and other payables	23	(4,546)
Amounts due to Financial Services customers and other deposits	24	(4,444)
Borrowings	35	(54)
Lease liabilities	15	(526)
Derivative financial liabilities	32	(29)
Taxes payable		(169)
Provisions	25	(100)
		(9,868)
Net current liabilities		(3,118)
Non-current liabilities		
Other payables	23	(24)
Amounts due to Financial Services customers and other deposits	24	(815)
Borrowings	35	(707)
Lease liabilities	15	(6,095)
Derivative financial liabilities	32	(3)
Deferred income tax liability	11	(806)
Provisions	25	(171)
		(8,621)
Total liabilities		(18,489)
Net assets		8,423
Equity		
Called up share capital	26	668
Share premium	26	1,406
Merger reserve	26	568
Capital redemption reserve	27	680
Other reserves	27	409
Retained earnings	29	4,692
Total equity before perpetual securities		8,423
Perpetual securities	28	-
Total equity		8,423

Components of Income Statement

Revenue

- Total amount of money earned by the company during a specific period, usually a fiscal year. It includes all sales, services, and other income earned by the company.

Cost of Goods Sold (COGS)

- Direct costs associated with producing the products or services that the company sells. This includes the cost of materials, labor, and overhead expenses.

Gross Profit

- Difference between revenue and COGS. It represents the amount of money the company has left over after deducting the direct costs associated with producing its products or services.

Operating Expenses

- Indirect costs associated with running the business, such as rent, salaries, advertising, and utilities.

Net Income

- Final amount of money that the company has earned after deducting all expenses from its revenue. It represents the company's overall profitability and is a key metric used by investors and analysts to evaluate a company's financial health.



Sainsbury 2022: Income Statement

	52 weeks to 5 March 2022	
		Total £m
Revenue	6	29,895
Cost of sales		(27,529)
Gross profit/(loss)		2,366
Administrative expenses		(1,430)
Other income		220
Operating profit/(loss)		1,156
Finance income	10	20
Finance costs	10	(322)
Profit/(loss) before tax		854
Income tax (expense)/credit	11	(177)
Profit/(loss) for the financial period		677

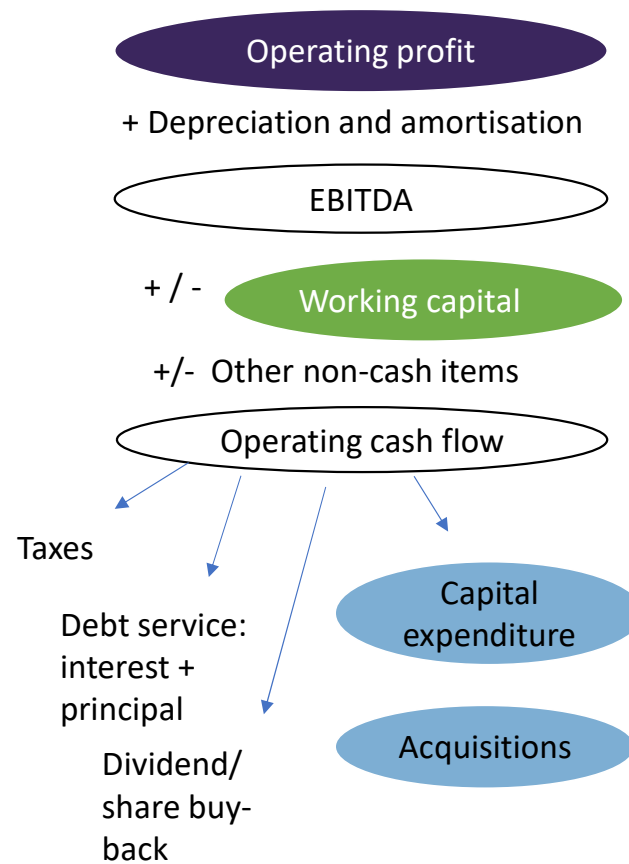
If we were looking at a Bank's Income Statement, what differences would you expect?

Main Financial Statements: Part 2

Cash Flow Statement

- Discloses sources and uses of cash
- Evaluates company's liquidity, solvency and financial flexibility
 - Financial flexibility: Ability to react and adapt to financial adversities and opportunities
- Classification of cash flows
 - Operating, investing and financing
- Sum of net cash flows = Net change in cash

Linking Profits to Cash Flow



Business Activities

Business activities are classified into three groups:

1. Operating activities

- Day-to-day business functioning of an entity

2. Investing activities

- Associated with the acquisition and disposal of long-term assets

3. Financing activities

- Related to obtaining or repaying capital

Sainsbury 2022: Cash Flow Statement

	52 weeks to 5 March 2022	
	Note	£m
Cash flows from operating activities		
Profit/(loss) before tax		854
Net finance costs		302
Operating profit		1,156
Adjustments for:		
Depreciation expense	14, 15	1,069
Amortisation expense	16	151
Net impairment loss on property, plant and equipment, right-of-use assets, intangible assets	14, 15, 16	9
Non-cash adjustments arising from acquisitions		-
Financial Services movement in loss allowance for loans and advances to customers		19
Loss/(profit) on sale of non-current assets and early termination of leases	33	(6)
Non-underlying fair value movements	5	(76)
Share-based payments expense	38	58
Defined benefit scheme expenses	37	4
Cash contributions to benefit schemes	37	(71)
Operating cash flows before changes in working capital		2,313
Changes in working capital	33	
(Increase)/decrease in inventories		(179)
Decrease in financial assets at fair value through other comprehensive income		115
Decrease in trade and other receivables		33
Decrease in amounts due from Financial Services customers and other deposits		161
Increase in trade and other payables		28
(Decrease) in amounts due to Financial Services customers and other deposits		(1,030)
(Decrease)/increase in provisions and other liabilities		(80)
Cash generated from operations		1,361
Interest paid		(329)
Corporation tax paid		(23)
Net cash generated from operating activities		1,009
Cash flows from investing activities		
Purchase of property, plant and equipment	33	(416)
Initial direct costs on new leases		(3)
Purchase of intangible assets	33	(278)
Proceeds from disposal of property, plant and equipment		46
Dividends and distributions received		2
Net cash used in investing activities		(649)
Cash flows from financing activities		
Proceeds from issuance of ordinary shares	26, 29	21
Proceeds from borrowings		-
Repayment of borrowings		(248)
Repayment of short-term borrowings		-
Repayment of perpetual capital securities		(8)
Purchase of own shares	29	(48)
Repayment of capital element of lease obligations		(493)
Dividends paid on ordinary shares	13	(238)
Dividends paid on perpetual securities		(4)
Net cash used in financing activities		(1,018)
Net (decrease)/increase in cash and cash equivalents		(658)
Opening cash and cash equivalents		1,476
Closing cash and cash equivalents	33	818

Direct vs Indirect methods of Cash flow preparation

Criteria	Direct Method	Indirect Method
Definition	Reports cash inflows and outflows directly	Adjusts net income to reflect cash inflows and outflows
Focus	Focuses on actual cash transactions	Focuses on net income and non-cash items
Preparation	Requires detailed records of cash receipts and payments	Can be prepared using financial statements and adjustments
Accuracy	Generally more accurate	May be less accurate due to adjustments
Complexity	More complex and time-consuming	Less complex and quicker to prepare
Relevance	More relevant for small businesses or businesses with simple operations	More relevant for businesses with complex operations or large investments in non-cash items

Links Between the Financial Statements

Income Statement

- (+) Sales Revenue
- (-) Cost of Goods Sold
- (-) Depreciation
- (=) *Gross Profit*
- (-) SG&A (operating expenses)
- (=) *Operating Profit*
- (-) Interest Expense
- (-) Income Taxes
- (=) *Net Income*

Balance Sheet

- (+) Cash and Marketable Securities
- (+) Accounts Receivable
- (+) Inventories
- (+) Other Current Assets
- (+) P P & E (Net)
- (+) Other Assets
- (=) *Total Assets*

- (+) Accounts Payable
- (+) Other Current Liabilities
- (+) Long-Term Debt
- (+) Other Non-current Liabilities
- (+) Common Stock
- (+) Retained Earnings
- (=) *Total Liabilities & Shareholders Equity*

Cash Flow Statement

- (+) Net Income
- (+) Depreciation
- Change in Working Capital
- (-) Accounts Receivable
- (-) Inventories
- (-) Other Current Assets
- (+) Accounts Payable
- (+) Other Current Liabilities
- (=) *Cash Flow from Operations*

- (-) Capital Expenditures
- (=) *Cash Flow from Investing*

- (+) Increase in Long-Term Debt
- (+) Issue of Common Stock
- (=) *Cash Flow from Financing*

- (+) *Change in Cash*
- (+) Cash at the beginning of the year
- (=) *Cash at the end of the year*

Main Financial Statements: Part 3

Other Comprehensive Income

- Discloses revenues, expenses, gains, and losses that are excluded from Income Statement
- Typically consist of amounts that have not been realized yet
- Has the objective of 'smoothing' net income, by separately disclosing unrealized gains and/or losses
 - Unr. Gains or losses from AFS Investments, cash flow hedges, FX, and pension plans
- Evaluates earnings of the company in totality
- Net impact transferred to Statement of Changes in Equity

Statement of Changes in Equity

- Statement of shareholders' equity or statement of retained earnings
- Reports changes in the owners' investment in the business over time
- Assists in understanding changes in financial position

Sainsbury 2022: Other Comprehensive Income

	Note	52 weeks to 5 March 2022 £m
Profit/(loss) for the financial year		677
Items that will not be reclassified subsequently to the income statement		
Remeasurement on defined benefit pension schemes	37	1,457
Movements on financial assets at fair value through other comprehensive income		76
Cash flow hedges fair value movements – inventory hedges	32	73
Current tax relating to items not reclassified		–
Deferred tax relating to items not reclassified	11	(461)
		1,145
Items that may be reclassified subsequently to the income statement		
Currency translation differences		(1)
Movements on financial assets at fair value through other comprehensive income		(5)
Items reclassified from financial assets at fair value through other comprehensive income reserve		4
Cash flow hedges fair value movements – non-inventory hedges	32	131
Items reclassified from cash flow hedge reserve	32	7
Deferred tax on items that may be reclassified	11	(57)
		79
Total other comprehensive income/(loss) for the year (net of tax)		1,224
Total comprehensive income/(loss) for the year		1,901

Sainsbury 2022: Statement of Changes in Equity

	Note	Called up share capital £m	Share premium account £m	Merger reserve £m	Capital redemption and other reserves £m	Retained earnings £m	Total equity before perpetual securities £m	Perpetual capital securities £m	Perpetual convertible bonds £m	Total equity £m
At 7 March 2021 (as previously reported)		637	1,173	568	847	3,131	6,356	–	248	6,604
Opening balance adjustment		–	–	–	–	97	97	–	–	97
At 7 March 2021 (restated)		637	1,173	568	847	3,228	6,453	–	248	6,701
Profit for the period	29	–	–	–	–	677	677	–	–	677
Other comprehensive income	27, 29	–	–	–	285	1,457	1,742	–	–	1,742
Tax relating to other comprehensive income	29	–	–	–	(87)	(431)	(518)	–	–	(518)
Total comprehensive income for the period ended 5 March 2022		–	–	–	198	1,703	1,901	–	–	1,901
Cash flow hedges gains and losses transferred to inventory	27, 32	–	–	–	28	–	28	–	–	28
Transactions with owners:										
Dividends	13, 29	–	–	–	–	(238)	(238)	–	–	(238)
Share-based payment	38	–	–	–	–	60	60	–	–	60
Purchase of own shares	29	–	–	–	–	(48)	(48)	–	–	(48)
Allotted in respect of share option schemes	26, 29	5	17	–	–	(1)	21	–	–	21
Conversion of perpetual convertible bonds	28	26	216	–	–	(2)	240	–	(240)	–
Repayment of perpetual convertible bonds		–	–	–	–	–	–	–	(8)	(8)
Other adjustments		–	–	–	16	(13)	3	–	–	3
Tax on items charged to equity		–	–	–	–	3	3	–	–	3
At 5 March 2022		668	1,406	568	1,089	4,692	8,423	–	–	8,423

Main Financial Statements: Part 4

- **Financial notes and supplementary schedules**
 - Provides explanatory information
 - Business acquisitions/disposals, legal proceedings, stock option plans and related party transactions
- **Footnotes**
 - Information about methods and assumptions used to prepare financial statements
 - Aids comparability of financial statements between companies
 - Required for complete presentation in conformity with US GAAP and IFRS
- **Management discussion and analysis (MD&A)**
 - Required by US GAAP for publicly held companies, similar report required for IFRS
 - Highlight favourable or unfavourable trends
 - Identify significant events and uncertainties
 - Affect liquidity, capital, resources and results of operations
 - Provide information about effects of inflation, changing prices or other material events
 - Discuss critical accounting policies requiring subjective judgments

Example: Revenue Recognition Footnote

- Revenue (aka sales) is a key number affecting not only profits but also valuation multiples for companies, hence any manipulation here has a significant impact on analysis
- Revenue is **typically recognised once a service has been performed or goods have been delivered**. Some alternative rules exist, e.g. for certain **long-term contracts**
 - Revenue can be recognised gradually over the life of the long-term contract or
 - Recognised gradually based on costs incurred to date
- If goods are sold with manufacturer warranties, the company must estimate the likely future cost and create a warranty provision at the time of sale
- **From 2018 under US GAAP and IFRS** there will be a **‘5 step model’** to determine when revenue should be recognised (**IFRS 15, ASU 606**)

The important role of notes and supplementary information

Provides additional context	Notes and supplementary information provide additional context to the financial statements and help readers understand the financial performance and position of the company better.
Explains accounting policies	They explain the accounting policies used by the company to prepare its financial statements, helping readers understand the basis for the financial information presented.
Discloses significant events	Disclosure of significant events that have affected the financial statements, such as changes in accounting policies, acquisitions or disposals of assets, or legal disputes.
Enhances transparency	Enhances transparency by providing more detail on the financial information presented in the primary statements, which helps readers make more informed decisions.
Supports compliance	Supports compliance with accounting standards and regulatory requirements by providing additional information and disclosures that may be required.

Importance of Annual Report

Provides financial information

An annual report provides detailed financial information about a company's performance over the past year.

Reflects transparency and accountability

An annual report reflects a company's commitment to transparency and accountability. By providing detailed information about its operations, financial performance, and future plans, a company can build trust and credibility with its stakeholders.

Helps with decision-making

An annual report provides valuable insights that can help investors and stakeholders make informed decisions about whether to invest in a company or continue their current investments.

Encourages improvement

An annual report can help a company identify areas where it needs to improve. By analyzing its performance over the past year, a company can identify areas where it has done well and areas where it needs to focus more attention in the future.

Demonstrates compliance

An annual report provides evidence that a company is complying with legal and regulatory requirements. It shows that the company is meeting its obligations and is committed to operating in an ethical and responsible manner.

Measuring Business Performance Using Financial Ratios

Financial Ratios can be compared with

- Historical financial ratios (Trend Analysis)
- Budgeted financial ratios (Forecast Analysis)
- Industry-average ratios (Peer/Competitor Analysis)
- Cross-industry ratios
- Cross-country ratios



Horizontal vs Vertical Analysis

Ways to look at financial ratios could be through either:

Horizontal analysis

- Where we compare the year on year performance of a company
- We can review overall performance and establish any trends

Vertical analysis

- Where we compare the performance of the firm against its peer group to gauge how well the firm is doing within its own industry

Horizontal vs Vertical Analysis

Ratio Analysis Trend Analysis

- **Vertical:**
 - Select one item from the financial statement to be the base value, e.g. sales, net worth, etc.
 - Calculate every value (including the base value) as a percentage of the base value (base value becomes 100) for that period
 - Repeat the process for several periods to identify trends

- **Horizontal:**
 - Select one year as the reference or base year
 - Calculate each value in subsequent years as a percentage of the corresponding value in the base year (base year value becomes 100)

Horizontal vs Vertical Analysis

Feature	Vertical Analysis	Horizontal Analysis
Definition	Vertical analysis compares different components of a financial statement to the total value of that statement.	Horizontal analysis compares the same component of a financial statement across multiple periods.
Purpose	To determine the proportion of each item on a financial statement relative to the total amount.	To identify trends or changes in a company's financial performance over time.
Calculation	Each item on the financial statement is expressed as a percentage of the total value of that statement.	Each item on the financial statement is expressed as a percentage change from a base year or period.
Example	Comparing the cost of goods sold to the total revenue on an income statement.	Comparing the revenue from year to year on an income statement.
Focus	Focuses on the current financial statement, highlighting the relationship between the different components.	Focuses on the trend of a specific component over multiple periods, highlighting the change or growth.
Usefulness	Helps to identify any significant changes in the composition of the financial statement.	Helps to analyze the overall financial performance and growth of the company over time.

Financial Ratio Analysis

- **Profitability**
How successful the business is in making return on investments
- **Liquidity/Accounting**
The quality and adequacy of current assets to meet current liabilities as they come due
- **Activity/Efficiency**
The efficiency with which the business uses its resources
- **Leverage/Financial risk ratio/ Solvency Ratio**
Business Ability to service its debt
- **Investor Ratio**
Investors' evaluation of business performance

Profitability Ratio

Profitability ratios look at how well the company is performing:

1. Revenue growth:

$$\frac{\text{TY Revenues} - \text{LY Revenues}}{\text{LY Revenues}} \times 100\%$$

2. Gross profit margin (GPM):

$$\frac{\text{Gross Profit}}{\text{Sales}} \times 100\%$$

3. Operating profit (EBIT) margin (OPM)

$$\frac{\text{Operating Profit}}{\text{Sales}} \times 100\%$$

4. Net profit (Net Income) margin (NPM)

$$\frac{\text{Net Profit}}{\text{Sales}} \times 100\%$$

Liquidity Ratio

Liquidity ratios are designed to look at whether a firm can cover its liabilities in the short term, using its short term assets:

1. Current ratio:

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} \times 100\%$$

Often the convention is to quote 2:1 i.e. the firm has 2x as many current assets as liabilities.

2. Liquid, Quick or Acid Test ratio:

$$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \times 100\%$$

Efficiency Ratio/Activity Ratio

Efficiency ratios measure how efficiently the firm is managing its assets – both in the short and long term

1. Inventory days on hand (DOH) ratio
2. Payables DOH ratio
3. Receivables DOH ratio
4. Total asset turnover ratio
5. Fixed asset turnover ratio

Efficiency Ratio/Activity Ratio

The Days-on-Hand ratios tell you about:

- The length of time customers take to pay the company
- The length of time the company takes to pay its suppliers
- The length of time that inventory is held by the company before being sold

Receivable days	$\frac{\text{Accounts receivable}}{\text{Sales}} \times 365$
Payable days	$\frac{\text{Accounts payable}}{\text{Purchases}^*} \times 365$
Inventory days	$\frac{\text{Inventory}}{\text{Cost of goods sold}} \times 365$

* Or use Cost of Goods Sold

Efficiency Ratio/Activity Ratio

1. Asset Turnover ratio:

$$\frac{\text{Sales}}{\text{Total Assets}} \times 100\%$$

2. Fixed Asset Turnover ratio:

$$\frac{\text{Sales}}{\text{Fixed Assets}} \times 100\%$$

Solvency Ratios

Solvency ratios measure the firm's financial leverage and ability to meet its long term obligations

- The two basic types of ratio are 'leverage' and 'coverage':
 - Leverage ratios tell you about the amount of debt in the company
 - Coverage ratios tell you about the ability of the company to meet its interest obligations
- There are many variations of how these ratios are calculated:
 1. Gearing and Leverage
 2. Interest coverage ratio

Solvency Ratios

1. Gearing

$$\frac{\text{Debt}}{\text{Equity}} \times 100\%$$

All on-balance sheet short & long term debt e.g. o/d, CPLTD, Loans, Bonds, Commercial Paper

2. Leverage

$$\frac{\text{Total Liabilities}}{\text{Equity}} \times 100\%$$

Equity or Shareholders' Funds comprise of Share Capital, Share Premium, Retained Earnings & Reserves

Total Liabilities include all short and long term liabilities, so debt as above, plus payables, o/s tax & dividends, accrued expenses

Coverage Ratios

Interest coverage ratio

$$\frac{\text{EBIT}}{\text{Interest Paid}} \times 100\%$$

- The ratio tells us how many times the firm can cover its interest costs from profits
- Note use of pre-interest profits i.e. EBIT
- Many analysts now supplement this ratio with a cash flow metric, as the numerator as ultimately interest costs are paid in **cash**

Investor Ratios

- Investor ratios are largely concerned with the equity investor
- As analysts we use these ratios selectively, tending to focus on:
 1. EPS
 2. Dividend Payout rate
 3. ROE

Return on Equity Breakdown

Return on equity (ROE) measures the returns to shareholders only.

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total Shareholders' Equity}}$$

- ROE can also be analysed through the **DuPont method**:

$$\text{ROE} = \frac{\text{Net income}}{\text{Total equity}} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Equity}}$$

↑ ↑ ↑

Profitability Efficiency Leverage

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$$\frac{\text{Net Income}}{\text{Pretax Income}} \times \frac{\text{Pretax Income}}{\text{Op Income}} \times \frac{\text{Op Income}}{\text{Sales}}$$

Cleaning Data: Normalizing Earnings



Key Question:

- Have we cleaned the data to remove items that may not be 'representative'?
- Do we have a clear estimate of the 'recurring' earnings of the business?

Recurring Net Income and EBIT/EBITDA

Recurring net income is bottom line net profit adjusted for the post-tax impact of non-recurring items only

This is then used to calculate normalised earnings per share measures which are used in valuation

As for EBIT and EBITDA, there is subjectivity in deciding which items are non-recurring

All non-recurring items adjusted in EBIT and EBITDA are also non-recurring for net income

Example: Non-Recurring Income

Net income	X
Add back: post-tax non-recurring expenses	X
Deduct: post-tax non-recurring income	<u>(X)</u>
Recurring net income	X

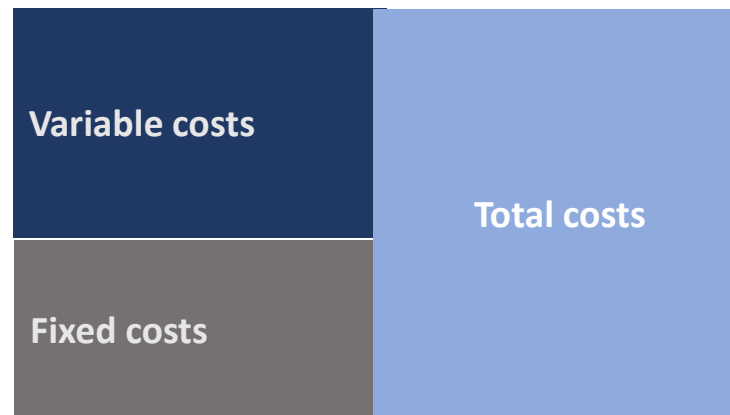
- Companies sometimes disclose the tax impact of non-recurring items
- If the tax impact has not been disclosed then use the companies **marginal tax rate** to estimate the tax effect of non-recurring items, if taxable

$$\text{Post-tax non-recurring item} = \text{Pre-tax non recurring item} * (1 - \text{MTR})$$

Related Concept: Operating Leverage

Examining fixed vs. variable costs (FC/TC, VC/TC)

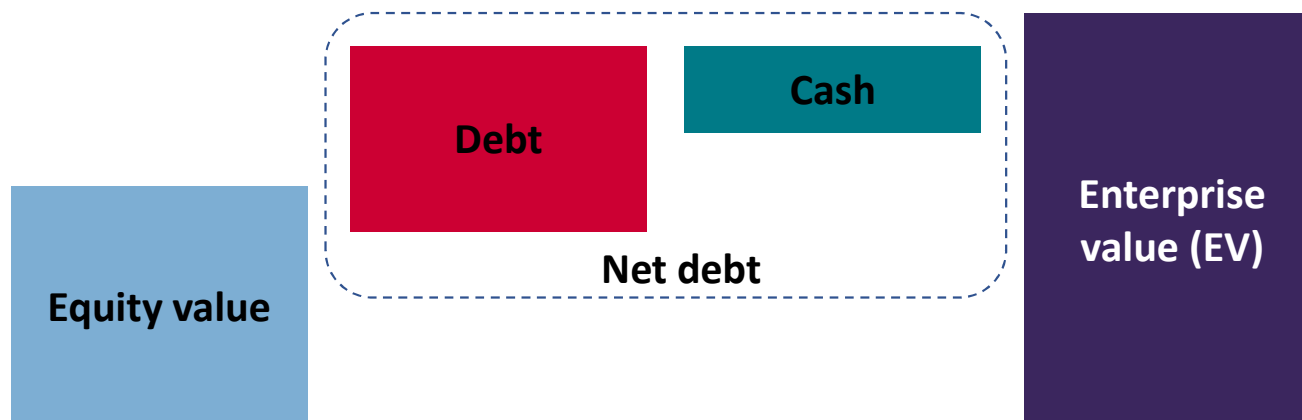
- Understand the advantages of low fixed costs when sales decline
- Understand the advantages of low variable costs when sales increase



Forecasting and Valuation

What are we valuing?

- Usually, we value a firm. A firm is a group of assets (and associated liabilities) used to generate profit for its owners:
 - Equal to the value of the financing to support operations (at its simplest, debt, cash and/or equity)
- Valuation can be done at equity or enterprise level:
 - Equity value reflects only the claims due to equity holders
 - Enterprise value reflects the value of claims by all stakeholders



Valuation Methodologies

Relative valuation



References what other people think about the value of the asset we are looking at

- Using multiples
- Comparable company analysis (using public companies)
- Comparable transaction analysis (M&A based comps)

Absolute valuation



Based on assumptions of future performance of the company

- DCF – PV of future operating cash flows available to stakeholders
- Implied private equity valuation – range based on target returns given a certain capital structure and exit timeframe

Valuation Methods

➤ Absolute Valuation Methods

- Dividend discount model
- Discounted free cash flow (DCF) models
- Asset based valuation methods

➤ Relative Valuation Methods

- Multiple valuations (comparables)
 - P/E ratio
 - P/S ratio
 - P/B ratio
 - P/CF ratio
 - EV/EBITDA

DCF Valuation Framework

Equity Valuation

Equity value = PV of cash available for distribution to equity holders

- Free Cash Flow To Equity (FCFE)
- Discounted at required return of equity

Only used to value financial institutions (no ability to distinguish operational and financial assets)

Enterprise Value

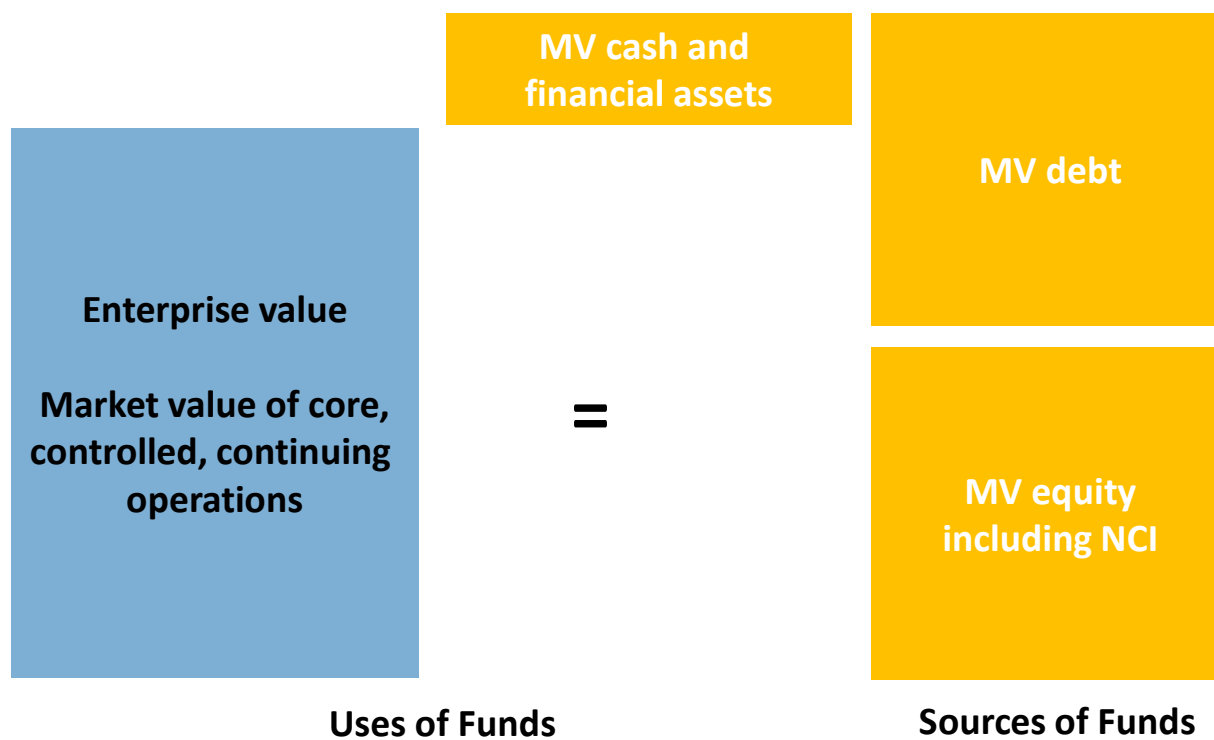
Enterprise value = PV of cash flows from operations available for distribution to all capital providers

- Free Cash Flow To Firm (FCFF)
- Discounted at weighted average required return of all capital providers (WACC)

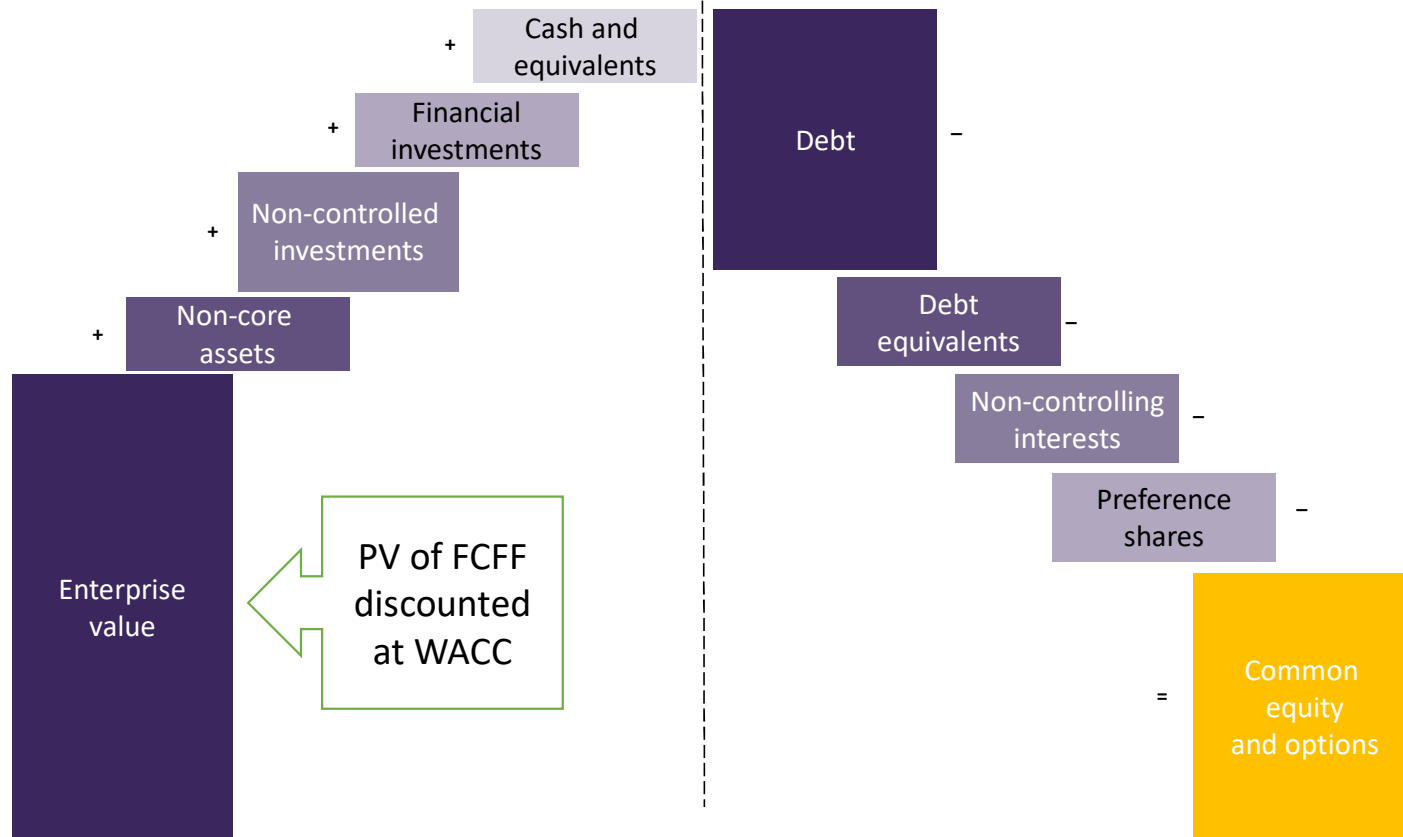
Will need to bridge from Enterprise/Firm Value to Equity value

Enterprise Value (EV): The Intuition

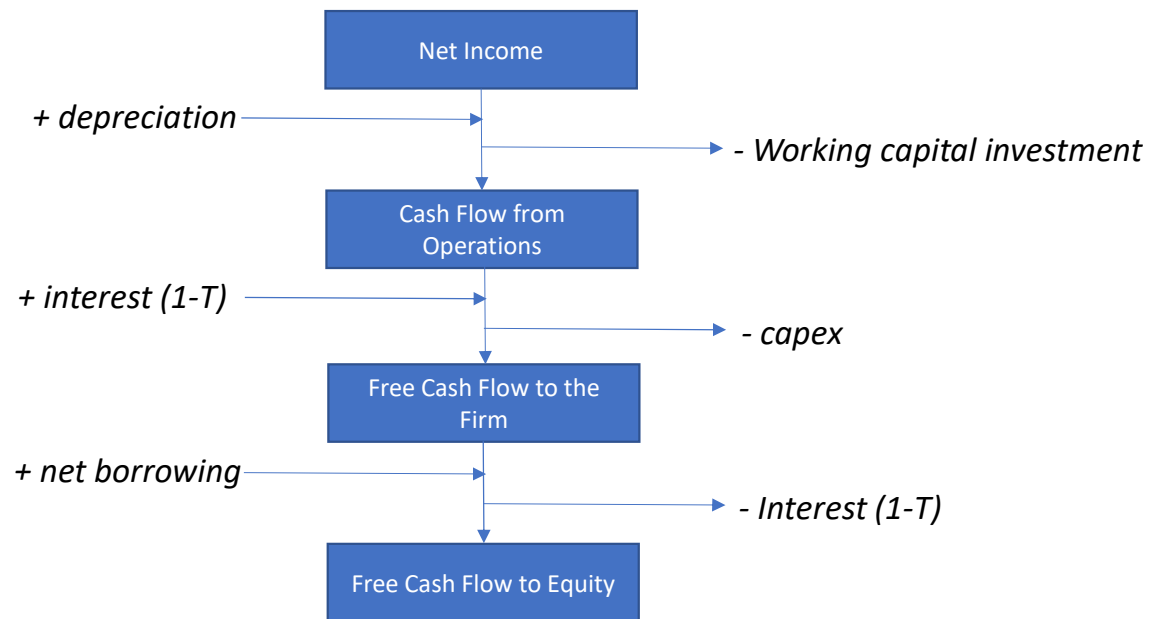
$$\text{Enterprise value} = \text{MV equity} + \text{MV debt} - \text{MV financial assets}$$



Enterprise to Equity Value: Derivation



Free Cash Flow Overview



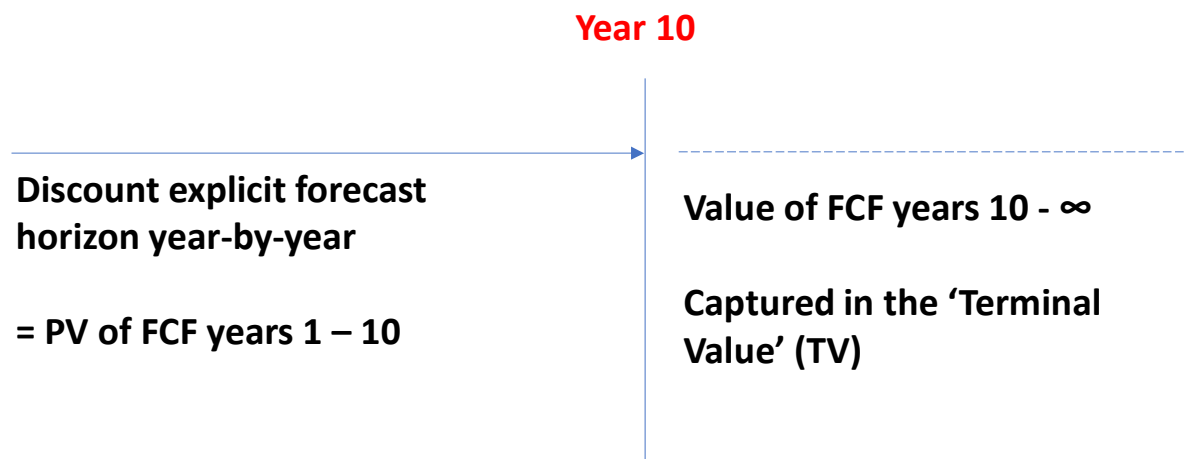
Deriving FCFF/ Unlevered FCF

EBIT	43,200
Effective tax rate	23.0%
NOPAT [EBIT x (1-t)]	33,264
Capex (net of disposal proceeds)	(3,900)
Depreciation	1,640
Amortization	345
(Inc.) / dec. in net working capital	(750)
(Inc.) / dec. in other operating assets	(278)
Inc. / (dec.) in other operating liabilities	102
Unlevered FCF	30,423

- **Do not** adjust FCF for non-cash **stock-based compensation**
- Forecast of **operating items only** is required:
 - Excludes any income from financial assets
 - Excludes claims of financing capital providers

FCF Forecast

- Good DCF will be based on valid, justifiable forecasting assumptions
- Forecast horizon may be 5 to 10 years
- Need to forecast until reach sustainable mid-cycle position, viz, 'Steady state'



Terminal Value Methods

Growing perpetuity

- Assumes constant long-term growth rate (LTG) in FCF in perpetuity.
- Ensure integrity of final forecast FCF.
- Should reflect steady state

$$TV_N = \frac{\text{Steady state } FCF_N \times (1 + LTG)}{(WACC - LTG)}$$

- Requires discounting back from final year (N)
- May ignore link between reinvestment and growth

EV multiple

- Use a multiple of final forecast EBIT(DA).
- Ensure integrity of final year forecast.
- The multiple must reflect steady state growth and margins
- Use a mature multiple

$$TV_N = \text{Steady state } EBIT(DA)_N \times \text{Multiple}$$

- Requires discounting back from final year (N)

Discount Rate

Discount rate = Hurdle rate

Value is only created if the FCF at least covers the cost of funding.

- **FCFF are discounted by WACC:**

- WACC must be calculated using a capital structure which is appropriate to the length of your forecast period:
 - The 'long-term'/'target'/'targeted'/'optimal' capital structure. This may be different from the company's actual capital structure
 - Beta must also be calculated according to the target capital structure (expressed as D/E)
- Use up-to-date market values

- **Note: FCFE are discounted by 'Cost of Equity'**

What is WACC?

$$\text{WACC} = \frac{(\text{Kd} \times \text{D}) + (\text{Ke} \times \text{E})}{(\text{D} + \text{E})}$$

WACC = Weighted average cost of capital (aka cost of capital). Weighted individual cost of each capital structure component

- Influenced by perceptions of risk and opportunity cost
- Driven by market expectations

K_d = Cost of debt after tax = $R_d \times (1 - t)$

D = Market value of target debt amount

K_e = Cost of equity

E = Market value of target equity amount

Enterprise Value (EV) Multiples

The EV can be used to value drivers in a ratio.

- Much like PE ratio (where share price compared to EPS value driver).

- Value drivers include:

Sales, EBIT, EBITDA.

- To get multiples:

EV/Sales, EV/EBIT, EV/EBITDA

for Enterprise Value = Market value of debt + Market value of equity – cash – short term investments

Common multiple used is: Enterprise value / EBITDA

Example: A company has total debt outstanding of 232m, 36m of cash and 18m of short-term investments. Assuming an enterprise value of 518m, calculate the value of equity.

Understanding the Venture Capital Term Sheet: Overview

Sources of Capital

Type	Pros	Cons
Founders	<ul style="list-style-type: none"> • No dilution • Points (Amex) 	<ul style="list-style-type: none"> • Higher risk • Lack of liquidity
Crowdsourcing	<ul style="list-style-type: none"> • No equity stake • Market validation 	<ul style="list-style-type: none"> • Public knowledge of ideas • New / potential fad?
Family & Friends	<ul style="list-style-type: none"> • Minimal equity stake • “Easy” ask 	<ul style="list-style-type: none"> • Mixing business & family • Letting down Uncle Bob
Angel	<ul style="list-style-type: none"> • Minimal dilution • Good contacts 	<ul style="list-style-type: none"> • Growing sophistication • Increasing expectations
Venture / Private Equity / Institutional	<ul style="list-style-type: none"> • Lots of capital chasing deals • Invaluable contacts 	<ul style="list-style-type: none"> • Limited timeline • High expectations
Strategic / Corporate Investors	<ul style="list-style-type: none"> • Brand name / cache • Access to channel / customers 	<ul style="list-style-type: none"> • Rights can limit some exits • Lack of strategic influence
Venture Debt / Convertible Debt / Bridge Loan	<ul style="list-style-type: none"> • Does not dilute equity(initially) • Provides additional runway 	<ul style="list-style-type: none"> • High carrying costs • Only option?

“Revenue is the best investor”

Stages of Capital

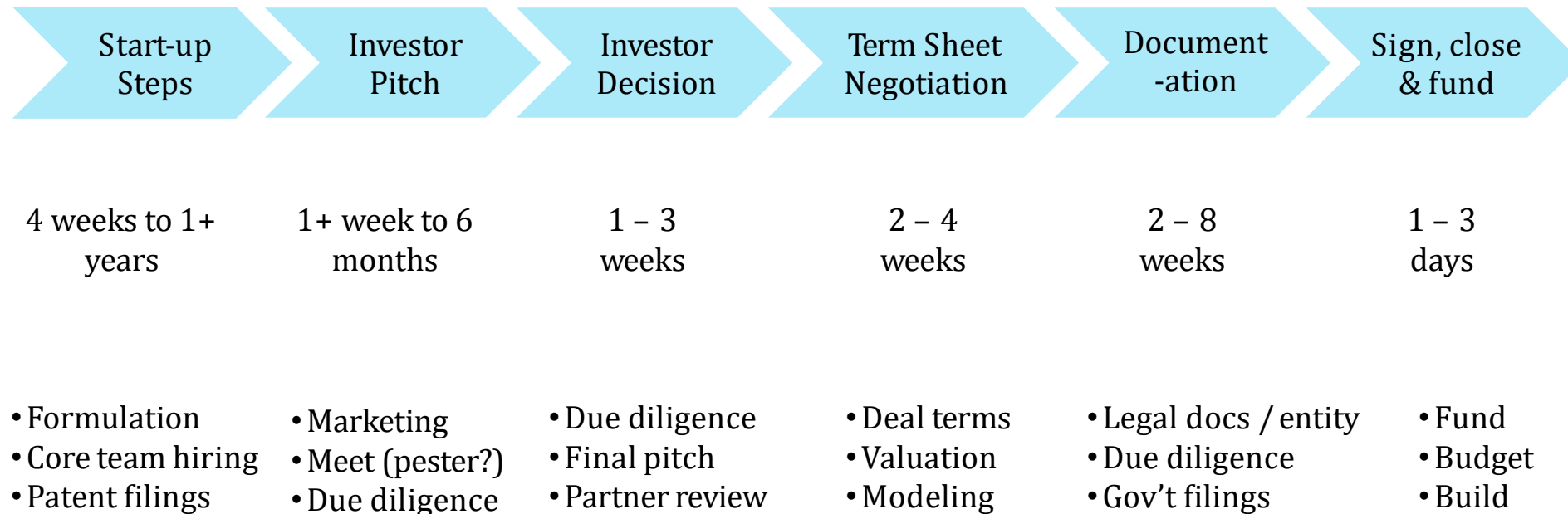
- **Rounds**

- Seed / start-up – angel, family & friends, founders, etc.
- Early stage – Series A
- Expansion – Series B / C
- Late stage – Series C, D, etc.

- **Staged capital**

- Pros:
 - Investors: control mechanism (go/no go), chance to double down or hedge risk
 - Entrepreneur: higher valuation if performing well
- Cons:
 - Investors: potential to dilute ownership
 - Entrepreneur: it can be a full time job to raise funds – who is managing business?

Venture Capital Process / Timeline



“We won’t look at any deal brought to us by a banker”

Venture Capital vs. Entrepreneur

Venture Capital Goals:

- Maximize financial return of investment while mitigating risk
- Help govern portfolio company's financial and strategic decisions
- Provide additional capital if / when needed / warranted
- Obtain liquidity through eventual sale or IPO
- Return high rate of return on fund to LPs
- Leverage success to raise additional capital

Entrepreneur Goals:

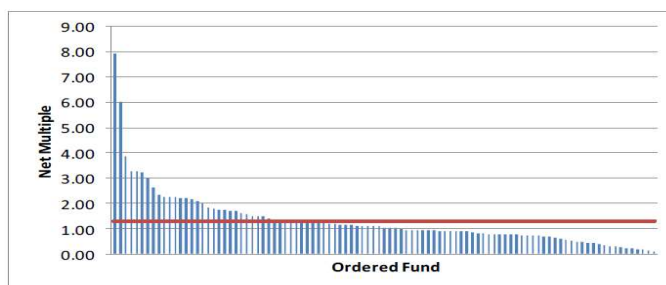
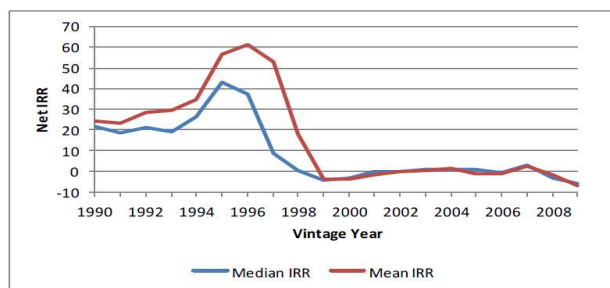
- Prove validity of business idea
- Raise funds to operate business
- Maintain control of company
- Share some risk with financial backers
- Establish operational success for company
- Establish a profitable business (which no longer needs outside funding)
- Achieve financial success (for self and management team)
- Lead to next stage or repeat start-up process with new venture

Potential Sources of Conflict:

- Control rights
- Share of returns
- Time to achieve outcome / liquidity
- Definition of success / time to achieve

Challenges

- Law of returns
 - Rule of thumb: for 10 VC investments, 20% (2) pay, 40% (4) break even & 40% (4) fail
 - Among venture firms, some big winners and lots of losers
- Fund Economics
 - To meet investor expectations, winners need to return a multiple of fund – harder for big fund to do with small investments
 - Incentives of 2% management fee & 20% carry returned to GPs
 - Limited life of fund; raise new funds while liquidating old
- Mitigation
 - Shared risk model with other venture firms
 - Staged capital



Net Return Multiple	No. of Funds
<1x	50
1x-<2x	33
2x-<3x	10
3x+	6

Valuation Drivers

- **In favor of venture capitalists:**

- Illiquid investment – limited ability to sell securities before (or even following) an event (e.g. IPO); note private companies normally get a liquidity discount of 20%-30% vs. public companies
- Uncertainty – discount entrepreneur’s expectations of success
- Added value – compensate for industry knowledge, contacts, guidance, etc.
- Supply – more capital means higher valuations while less capital = lower valuations

- **In favor of entrepreneurs:**

- Track record – past behavior does indicate future performance
- Demand – competition from multiple interested investors can increase price
- Timing / momentum – market cycle plays into perceived likelihood of exit

“Manage your business like you will run it forever, or you will”

Exercise 1: Return Economics

- Assume a \$100M venture fund with a 10 year life
- To achieve a 20% annual return, what multiple of original investment must fund pay, excluding fees? Please model.
- Assuming the firm makes approximately 20 investments and “law of returns” holds, how much do the investments need to return, again excluding fees? Is this realistic? Please model.
- Is a 100x return necessary for the fund to be successful? Again, assuming 20 investments are made, the VC will have one “home run” at a 100x multiple, three “doubles” at a 5.0x multiple, 8 singles at a 1.0x multiple and 8 “strikes” at a 0.0x return multiple. Please model.
- What does this imply about the size of the investment (i.e. does a smaller initial investment hold more promise of achieving return expectations)? To be discussed.
- What does this imply about the price at which VCs are willing to sell an investment? To be discussed.
- How do fees weigh into the conversation? To be discussed...

“The money is in the money”

Start-Up Valuation

Approaches to Start-Up Valuation

- Discounted Cash Flow (DCF)
 - Value a business based on future cash flows
 - Pros: academically sound, often tied to business model
 - Cons: negative cash flows, changing capital structure, assumption driven (g / WACC)
- Comps
 - Value a business based on like company trading / transaction multiples
 - Pros: easily calculated, market check
 - Cons: finding like companies (product, stage, etc.)
- VC Method
 - Work backwards from eventual exit (at desired rate of return) to find current value
 - Pros: based on above components, tied to expected return & ownership share
 - Cons: estimating timing and value at exit

Working Backwards Using VC Method

- Step 1: Estimate investment needed
- Step 2: Forecast sales / earnings / cash flow
- Step 3: Determine timing of exit (IPO, M&A, etc.)
- Step 4: Calculate multiple at exit (based on comps)
- Step 5: Discount back to current day at desired rate of return
- Step 7: Determine post-money / pre-money / required ownership stake

Working Backwards Using VC Method

- Step 1: Estimate investment needed
 - Startup.com needs a \$7 million Series A
- Step 2: Forecast sales / earnings / cash flow
 - Startup.com is expected to grow accordingly:

\$M	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	1.0	3.1	7.2	15.5	\$35.7	\$50.0
Earnings	(5.0)	(7.5)	(0.2)	1.0	3.0	8.0

- Step 3: Determine timing of exit (IPO, M&A, etc.)
 - Investors plan to exit in year 5
- Step 4: Calculate multiple at exit (based on comps)
 - Companies in space are trading at 15x earnings
- Step 5: Discount back to current day at desired rate of return
 - Assume desired rate of return is 40%, exit value = $\$120 / (1.4)^5 = \22.3M
- Step 7: Determine post-money / pre-money / required ownership stake
 - Post money = \$22.3, pre-money = \$15.3, VC ownership = $\$7 / \$22.3 = 31\%$

Pre-Money vs. Post-Money & Determining VC Stake

- Pre-money: value before financing round
- Post-money: value after financing round (pre-money + financing amount)
- VC stake expressed as a percentage of post-money
 - Example 1: \$15 million pre-money valuation with a \$10 million investment (aka \$10 on \$15)
 - \$25 million post-money valuation (\$15 + \$10)
 - 40% ownership (\$10/\$25)
- Example 2: \$5 on \$10
 - \$10M pre-money
 - \$5M round
 - \$15M post-money
 - 33% ownership

Valuation Calculations

- New investment = ownership percentage * post-money $\rightarrow \$5M = 33.3\% * \$15M$
- Pre-money = post-money - new investment $\rightarrow \$10M = \$15M - \$5M$
- Post-money = pre-money + new investment $\rightarrow \$15M = \$10M + \$5M$
- Post-money = new investment / ownership percentage $\rightarrow \$15M = \$5M / 33.3\%$
- Post-money = new investment * (total outstanding shares post investment / shares for new investment) $\rightarrow \$15M = \$5M * (1,500,000 / 500,000)$
- Share purchase price = pre-money / total outstanding shares pre-investment $\rightarrow \$10 = \$10M / 1,000,000$
- Share purchase price = new investment / new shares $\rightarrow \$10 = \$5M / 500,000$
- New shares issued = new investment / share purchase price $\rightarrow 500,000 = \$5M / \10
- Total outstanding shares post-investment = total outstanding shares pre-investment + new shares issued $\rightarrow 1,500,000 = 1,000,000 + 500,000$

Up vs. Down Round

➤ Up round

- Pre-money of subsequent round greater than post money of previous round
- Good for ownership share of original investors / founders
- Normally a sign that business is performing well and multiple investors (“outside round”) are interested

➤ Down round

- Pre-money of subsequent round less than post money of previous round
- Often results in dilution (lower equity stake for initial investors and/or founder)
- Normally a sign business is not hitting its milestones; could be a sign of general health of venture investing

➤ Flat round

- Pre-money of subsequent round equal to post money of previous round
- Often a way to appease previous investors (“inside round”)

Exercise 2: Valuation Decisions

- Acme Co. is controlled by its founders (100% ownership)
- It has been able to grow to \$35M in sales over a relatively short history
- Founders are exploring three potential options
 - Option 1: Sell the company today for a 3x revenue multiple (based on industry comps)
 - Option 2: Raise a \$40M round of institutional capital (at 25% valuation discount to sale) to buy a distressed competitor (\$20M in sales) with adjacent offerings and hope to sell at a higher revenue multiple (4x) in 3 years (assume no organic growth for simplicity and a 15% WACC)
 - Option 3: Take \$40M off the table now to hedge some founder's risk but do not do the acquisition and hope to sell in 5 years at a 3.5x rev multiple (again, assume no organic growth and a 15% WACC)
- What should the founders do?
- What are good sensitivities to analyze in model? Please model data tables as shown.
- As a VC/PE/I-banker, how can you add value to the decision process?

Term Sheets

Term Sheet

- Short (<10 pages) document prepared by venture firm
- Main value is in laying out specifics of investment
- Meant to mitigate potential conflicts (financial and control) between investors and entrepreneurs
- Negotiable to a point
- Inability to protect / guarantee everything
- Not a legal document but considered binding (don't shop)
- Will form the basis of the cap table
- Will also feed into other legal docs (e.g. purchase agreement, voting agreements, etc.)
- Short term win vs. long term relationship → setting the stage

“I live by the golden rule, which is those that have the gold make the (expletive) rules”

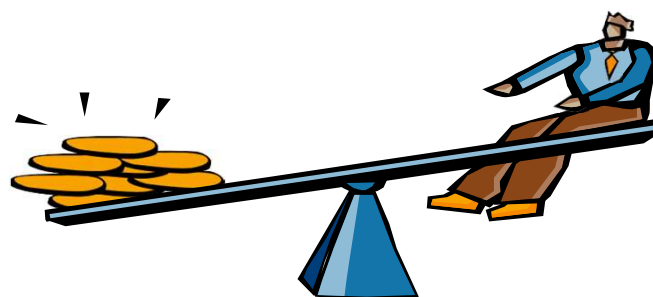
Common vs. Preferred

Common:

- Founders / employees (options & RSUs)
- Minimal rights (e.g. voting) & protection
- Low cost basis
- Goal is to incentivize founders and employees to work towards a successful outcome

Preferred:

- Venture capitalists (and sometimes founders)
- Significant rights (e.g. liquidation preference) and protection (anti-dilution)
- Higher cost basis
- Goal is to minimize downside risk, especially in case of mediocre outcome, while ensuring right to participate in upside



Common Ways to Structure Investments

Convertible debt

- Debt a company issues that can be converted to common shares at a certain strike price
- The conversion feature allows the corporation an opportunity to obtain equity capital without giving up more ownership control than necessary and/or entice investors to accept lower interest rates than they would normally accept on a straight debt issue

Convertible preferred

- May include a cash (or accrued - PIK) preferred dividend and is convertible into common
- Enjoys significant privileges over common stock
 - Sits ahead of common stock
 - Typically has a liquidation preference (more on this shortly)
- Majority of VC investments structured as preferred stock
 - VC receives preferred stock
 - Founders receive common stock
 - Employees receive options/common stock
- **Example:** Initial investment of \$1 million with conversion price of \$5 / share → converts into 200,000 shares. If 600,000 shares of common outstanding, then own 25% of common on conversion (no div's.). Convert if $.25 * \text{value} > \$1$ million or value $> \$4$ million

Preferred Stock Features

- Preferred shares: represent the number of preferred convertible shares currently outstanding – do not confuse this with shares authorized – as this number is typically much bigger
- Original issue price (OIP): represents the value of each preferred share
- Conversion ratio: the number of common shares that each convertible share can receive upon conversion
 - A similar concept is the conversion price, which represents the implied value of each share of common stock given the conversion ratio
- **Example**
 - \$25m investment will provide the investor with 3.1m shares of preferred shares, with OIP of \$8.06, and conversion ratio of 2
 - Preferred shares are convertible into 6.2m shares of common stock
 - Since the initial investment is \$25m, the conversion price into common stock is $\$25\text{m}/6.2\text{m} = \4.03 .
 - Alternatively, the conversion price can be calculated as: $\text{OIP}/(\text{Conversion ratio})$

Preferred Dividends

- Dividends expressed on a per share basis: Preferred dividends are usually stated on a per share basis (1m preferred shares with a \$0.08 per share dividend).
- Dividends expressed as a % coupon: Sometimes the dividend is expressed as a coupon as a % of the face value of the obligation (\$25m face value investment with a 13% dividend).
- Dividends can be cash dividends, or often they are PIK (accrued) dividends, meaning they increase the value of the liquidation preference every year
- Preferred dividend yield = $\frac{\text{dividends per share}}{OOIP}$
- **Example:** \$25m investment with a 13% coupon PIK dividend means that (as long as the preferred shareholders do not redeem their investment or convert their shares into common stock) the liquidation preference grows every year by 13% such that:

Preference After Year 1 Dividend	\$28,250,000
Preference After Year 2 Dividend	\$31,922,500
Preference After Year 3 Dividend	\$36,072,425
Preference After Year 4 Dividend	\$40,761,840
Preference After Year 5 Dividend	\$46,060,879
Preference After Year 6 Dividend	\$52,048,794
And so on....	

Liquidation Preference

- Preferred stock term sheet almost always includes a liquidation preference.
 - VCs get money back before common gets anything
- Gives the investor the option – in a liquidity event– of either receiving their liquidation preference as their return or converting into common stock and receiving their percentage ownership as their return.
- Liquidation preference represents the amount the company must pay at exit (after secured debt, trade creditors, and other company obligations)
- Liquidation preference determines the relative distribution between the preferred shareholders (the investors) and the common shareholders.
- The liquidation preference is often expressed as a multiple (i.e. 1.0x) of the initial investment:
 - $\text{liquidation preference} = \text{Investment} * \text{liquidation preference multiple}$

Types of Liquidation Preferences

1) Non-participating preference (1x or multiple) – “straight preferred”

- At exit investors choose between a return of capital (sometimes partial) and participation with the common shareholders in proportion to their ownership. (See example below.)
- If investors choose return of capital, any remaining proceeds are divided among common shareholders
- Example: \$25m investment with a 1.2x liquidation preference multiple implies that if the investors choose not to convert to common stock, the company must redeem the obligation at no less than $1.2x * \$25m = \$30m$ at exit. Any remaining proceeds flow down to common shareholders. Had the investors chosen to convert, they would have shared in the proceeds pro rata with the common shareholders (which could be more or less than preference, depending on ownership % and amount of proceeds)

Types of Liquidation Preferences

2) Participating 1x liquidation preference – “participating preferred”, “full participating preferred”, “participating preferred with no cap”

- In this structure (sometimes called “double dipping”), investors first receive their capital (1x preference) and then their shares convert to common
- First returning capital to preferred investors
- Then distributing the gains from the sale of the company in proportion to (pro rata) ownership, but including the preferred investors on the second distribution on an as-converted basis
- Example: \$10M post-money valuation (VCs invested \$5M), that sells for \$30M with a 1x liquidation participation, VCs get \$5M ($\$5M \times 1$), then 50% of remaining \$25M, or \$12.5M, for a total of \$17.5M vs. \$12.5M for employees → 50%/50% ownership vs. 58%/42% share

Types of Liquidation Preferences

3) Capped participation – “capped participating preferred”

- Capped participation indicates that the stock will share in the liquidation proceeds on a pro rata basis until total proceeds reach a certain multiple of the original investment (plus any accrued dividends)
- Example: 2x cap (1x pref) on a \$5M investment that gave 50% ownership. If the exit = \$25M, the VC's capped proceeds of \$10M ($\$5M + <<.5*\$20M$) is less than had it converted and received \$12.5M ($.5*\$25M$)

Liquidation Preferences Features

- Liquidation preferences protect the downside of preferred investors
- In environments when capital is scarce, liquidation preferences carry higher multiples than 1x (in certain circumstances even as high as 5x or 7x or more) preferences although this is rare – “multiple liquidation participating preferred”
 - **Example:** \$10M post-money valuation (VCs invested \$5M), that sells for \$30M with a 3x multiple liquidation participation, VCs get \$15M ($\$5M \times 3$), then 50% of remaining \$15M, or \$7.5M, for a total of \$22.5M vs. \$7.5M for employees → 50%/50% ownership vs. 75%/25% share → even more drastic at lower exits
- Preferences vis-a-vis multiple classes of stock
 - Liquidation preferences are generally structured on a first-in, last out (FILO) basis
 - In other words, the latest investors “stacked” their preferences on top of each other (i.e. series B gets its preference first, then series A)
 - An alternative is where the series are equivalent in status (“pari passu”) where series A and B share pro-ratably until the preferences are returned.

Liquidation Preferences Examples

- Three outcomes for an investor investing \$1 million for 25 percent of a company later sold for \$2 million:
 - No liquidation preference: without a liquidation preference, investors get only \$500,000 (25% of proceeds), losing half of their capital, and entrepreneurs receive \$1.5M.
 - Non-participating 1x liquidation preference: Investors would get \$1 million from the preference, with common getting the remaining \$1 million.
 - Participating 1x liquidation preference: Preferred investors get \$1 million off the top plus another \$250,000 (25 percent of the remaining \$1 million). The common shareholders would receive \$750,000.
 - Participating 1x liquidation preference with 2x cap: Preferred investors get \$1 million off the top plus another \$250,000 (cap does not go into effect).

Redeemable Preferred Stock

- The company may incorporate the ability to repay the investors into the capital raise.
- Restrictions on how quickly the preferred stock can be redeemed (for example, a term sheet may stipulate that the preference is not redeemable until two years after the initial investment)
- When preferred stock is redeemable, another feature is a redemption premium (also called call premium for bonds). This feature allows companies to redeem at a premium (often expressed as a %) above the face value of the preference amount. The investment premium can vary year by year.
 - **Example:** Revisiting our example for a \$25m investment with a 13% PIK dividend, imagine the investors structured the investment such that preferred stock was not redeemable for the first two years, and then it would be redeemable in year 3 with a redemption premium of 6%, year 4 with a redemption premium of 3%, and no premium thereafter. Assuming the same 13% PIK dividend, the redemption amount would be:

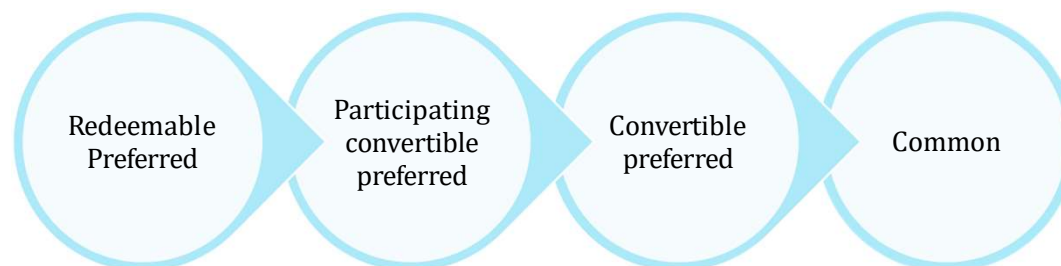
Redeemable Preferred Stock

	Preference Amt.	Redemption Amt.	Redemption Premium
Preferred Coupon	13.0%		
Preference After Year 1 Dividend	\$28,250,000	Not Redeemable	
Preference After Year 2 Dividend	\$31,922,500	Not Redeemable	
Preference After Year 3 Dividend	\$36,072,425	38,236,771	106.0%
Preference After Year 4 Dividend	\$40,761,840	41,984,695	103.0%
Preference After Year 5 Dividend	\$46,060,879	46,060,879	100.0%
Preference After Year 6 Dividend	\$52,048,794	52,048,794	100.0%

Evolution of Preferred Stock

- 1970's – 80's: Redeemable preferred
 - Not an active IPO market
- 1980's – 90's: Convertible preferred
 - Active IPO market
 - More funds
- 1990's – 2000's: Participating convertible preferred
 - Increasing valuations
 - Less active IPO market

Use of securities as an incentive
(carrot or stick?)



Other Items to Negotiate

- Composition of board of directors
 - Usually a mix of founders, VCs, and outside advisors' 4-6 people on average
 - Composition (majority) often driven by % ownership
- Size of the employee option pool
 - Percentage of stock reserved for key employees (existing and new hires)
 - On average, ~20% reserved for option pool which generally comes out of founder pool; key employees range from <1% to 10% (depending on round)
- Vesting of employee shares
 - Vested shares generally tied to time or milestones; can be accelerated or upfront
 - Unvested shares can be bought back by company (for little if anything) in case of termination or quitting

Other Items to Negotiate

Anti-dilution

- Protection for VCs in case of a down round, so that their conversion ratio to common stays equal to new investors
- Full ratchet means previous round is priced to the next round's lower price
 - Formula: new conversion price = lower price of down round
 - **Example:** old conversion price of \$1, new conversion price of \$0.50, new issue of 500K shares; old common of 2 million; old preferred of 2 million
 - Old convertible preferred now own 62% or 4 million / 6.5 million

Other Items to Negotiate

Anti-dilution

- Weighted average takes into account the number of new shares issued in lower next round
 - Formula: new conversion price = (# of common before new investment + # of shares to be issued if old conversion price held) / (# of common before new investment + # of shares issued under new conversion price) * old conversion price
 - New shares to initial preferred investors = (old price / new price) * initial shares
 - **Example:** old conversion price of \$1, new conversion price of \$0.50, new issue of 500K shares; old common of 2 million; old preferred of 2 million
 - New conversion price = (4 million + 250K) / (4 million + 500K) * \$1 = \$0.944
 - Convertible preferred now own 45.9% or $(\$1 / \$0.944) * 2 \text{ million} = 2,117,648$; $2,117,648 / (2,117,648 + 2,000,000 + 500,000)$

Other Items to Negotiate

- Redemption rights
 - Force timing of redemption of preferred by company through purchase at fair market value; if company can not redeem, then penalties (e.g. decrease conversion price)
- Registration rights
 - Right to register shares with SEC so that investor can sell on public market
- Pay to play provisions
 - Preferred shareholders lose anti-dilution protection unless they invest in next round at lower price; normally preferred will automatically convert to common in such a case
- Rights of first refusal
 - Right to buy shares being sold by any shareholders; prevents dilution

Other Items to Negotiate

- Preemptive rights
 - Right to buy shares offered in subsequent financing rounds
- Information rights
 - Right for preferred shareholders to get a copy of quarterly / annual financials, etc.
- Piggyback registration rights
 - Investors can include shares along side company in an IPO
- Drag along rights
 - All shareholders must sell if board and/or majority shareholders approve
- Tag along rights
 - An offer for a shareholder's stake must be offered to all shareholders

Exercise 3: Term Sheet Translation

➤ From the dividends section:

- “Dividends: The holders of the Series A Preferred shall be entitled to receive cumulative, non-compounding dividends in preference to any dividend on the Common Stock at the rate of 10% of the Original Purchase Price per annum. The holders of Series A Preferred also shall be entitled to participate pro rata in any dividends paid on the Common Stock on an as-if-converted basis.”
- Scenario 1: Assume a \$10M initial investment, how long will it take for dividends to achieve a 5x return. What is not factored into calculation? What is the purpose of dividends?
- Scenario 2: Assume a \$40M investment (straight preferred) which bought 40% of company and five years later trades for \$80M. Calculate post-money. What is the value of dividends here? What does this say about dividends?

How to Build a Simple VC Cap Table: Cap Table Mechanics

VC Term Sheet Review

- So far, we have covered:
 - The respective negotiating positions of venture capitalists and entrepreneurs
 - How capital return expectations, timelines, valuation, control rights and liquidity influence these negotiating positions
 - How term sheets are used to manage potential differences at time of investment

The VC Cap Table

- We now turn to the cap table:
 - The term sheet's impact on a cap table
 - The mechanics associated with adding a new investor
 - Debt conversion
 - Calculating price per share
 - Calculating ownership percentages

Cap Table Overview

- When analyzing a new investment round, a capitalization table (“cap table”) provide a summary of various capital providers’ ownership in the business
- In addition, a cap table typically includes an analysis of expected returns and proceeds to various providers of capital based on certain exit valuation assumptions
- Recall, the new investment determines the post-money valuation
 - **Example:** \$25m investment for 25% ownership implies a post-money valuation of the business of $\$25\text{m}/25\% = \100 million
- Pre money valuation is determined by subtracting the investment from the post money valuation
 - In the above example, the pre-money valuation is $\$100\text{m} - \$25\text{m investment} = \75m

Sample Cap Table

Classes of shareholders

Total Shares & Ownership %

Startup.com - Cap Table Post Financing

New round October 2009

\$8m

Pre-money valuation

\$12m

Investor	Share Capital			Options	Warrants	New Options (Pre)	NOSH	% Ownership
	Common	Series A	Series B					
ABC Co.		40,739,801	8,543,828		115,568		49,399,197	43.4%
Individual Investors	338,149	797,113		1,134	49,025		1,185,421	1.0%
Hill Investors	-				17,830		17,830	0.0%
Bank of America	3,720			1,677	203		5,600	0.0%
New Investors			37,023,255				37,023,255	32.5%
Directors	210,070	520,649		89,465	8,376		828,560	0.7%
Founder	68,367	384,826		1,074,679	6,108		1,533,980	1.3%
CEO				1,142,942			1,142,942	1.0%
Other current employees	2,302			1,222,342	974		1,225,618	1.1%
Former employees	22,712			24,289	2,936		49,937	0.0%
Unallocated options				97,863		21,407,505	21,505,368	18.9%
Total	645,320	42,442,389	45,567,083	3,654,391	201,020	21,407,505	113,917,708	100.0%
% Total	0.57%	37.26%	40.00%	3.21%	0.18%	18.79%	100.00%	

Names / titles of investors;
usually founders first followed
by execs followed by investors

Potentially dilutive
securities

Exercise 1: Impact of Simple VC Investment

- Assume VC asking for **40% of company** with investment of **\$7 million**
- Company already has **500,000** outstanding shares

Please answer the following two questions

1. How many new shares does VC get with investment?
2. What would be the price per share issued?

Exercise 2: Impact of simple VC investment + Option Pool

- Same as before but now assume company needs to also **reserve 20% of shares for option pool**
- Remember that option pool usually comes out of founder pool - i.e. pre-money
- VC still wants **40%** with investment of **\$7 million**
- Company already has **500,000** outstanding shares

Please answer the following two questions

1. How many new shares does VC get with investment?
2. What would be the price per share issued?

Exercise 3: Impact of Additional VC Round

- Same as before but now assume **another VC wants 10%** for **\$5 million**
- Company still needs to **reserve 20% of shares for option pool**
- VC still wants **40%**
- Company already has **500,000** outstanding shares

Please answer the following two questions

1. How many new shares does VC get with investment?
2. What would be the price per share issued?

Exercise 4: Impact of Convertible Debt

- Company has **2,050,000** common shares, company also has **\$1 million convertible debt**
- Convertible not reflected on cap table until conversion in next round at the new round price per share
- New investment round: **\$2.5 million investment**
- Agreed upon pre-money valuation **\$7.5 million** / post-money valuation **\$10 million**

Please complete the following table:

	Shares	% ownership
Company shares	2,050,000	
Investor shares		
Convertible shares		
Total shares (post conversion)		
Price per share		

Extra credit: Recut the table assuming the convertible notes were given a 30% discount on the price per share for conversion purposes.

Exercises

Exercise 1: Cap Table Calculations of Adding a New Investor

- Assume that you are venture capitalist, and are weighing a decision to invest in ABC Co.
- You are given their Series A cap table showing a \$7.5M pre-money valuation and 2,050,000 common shares outstanding
- Today, the CEO has majority control with 61.0% (1,250,000 shares)
- There are three other investors: Investor 1 with 24.4% (500,000 shares), Investor 2 with 2.4% (50,000 shares) and Investor 3 with 12.2% (250,000 shares)
- There is no convertible debt or current outstanding options
- Model the Series B round assuming your firm is the only investor at \$2.5M for 25% and the inclusion of a 20% option pool (pre-money)
- For discussion, how would you model option pool post-money?

Exercise 2: Cap Table Calculations of Debt Converting

- Building on the previous Exercise:
 - Now assume \$1 million in convertible debt
- Model impact of debt converting into common shares prior to new round
- Who is impacted by debt converting?
- For discussion:
 - How would you model debt converting in current round?
 - Why would new investors be against this?
 - What is a potential scenario where this could happen?
 - How would they attempt to counter dilution?

Exercise 3: Flow of Funds

- Let's discuss an example to highlight concept behind flow of funds:
 - Two investors, A and B (incidentally, also their series)
 - A invested \$5M and owns 25% with a 1x participating preference and 2x cap
 - B invested \$7.5M and owns 40% with a 1x participating preference and 3x cap
 - Preferences are stacked
 - Common owns rest
 - Company sells for \$50M
 - How much does each investor get?

Understanding the CAC and LTV

Customer Acquisition Cost

- Customer Acquisition Cost, or CAC for short, refers to the amount of money that a company spends to gain a new customer.
- This cost includes all expenses related to marketing and advertising efforts, as well as sales and promotional activities.

$$\text{Customer Acquisition Cost} = \frac{\text{Total Marketing \& Sales Spend}}{\text{Total \# of Customers}}$$

- In addition to CAC, startups track metrics such as lifetime value (LTV)

- LTV or lifetime value is the estimated net profit attributed to the entire future relationship with a customer. In other words, it's a measure of how much revenue a single customer can bring in over the course of their relationship with your company
- There are a few ways to calculate LTV, but the most common is to take the gross margin from a customer and divide it by the churn rate.
- For example, if a customer has a 20% gross margin and the annual churn rate is 5%, then the LTV would be 4%.

LTV/CAC Ratio

- CAC is the amount of money you spend to acquire a new customer, while LTV is the total value of all the purchases a customer makes over their lifetime
- Let's say we spend \$100,000 on marketing and sales in one year, and acquire 200 new customers as a result
 - CAC would be \$500 (\$100,000 divided by 200)
 - If each of those customers has an LTV of \$1,000, your LTV:CAC ratio would be 2 (1,000 divided by 500)
- The higher LTV:CAC ratio, the better. In general, a ratio of 3:1 or higher is considered healthy

Understanding the ARR

What is Annual Recurring Revenue (ARR)?

- **Recurring Revenue:** You *exclude* non-recurring items like Installation Fees, Consulting, Professional Services, or One- Time License Fees
- **Why:** Investors value *recurring revenue* at higher multiples because it is *more predictable*
- **Annual or “Annualized”:** You should *annualize* the company’s revenue based on its results from the last month or quarter (especially if it uses monthly or quarterly invoices)

What is Annual Recurring Revenue (ARR)?

- **Why:** You want to see how well the company *would do* over the entire year based on its results from a *recent period*
- **Useful For:** Budgeting and planning, especially for high-growth startups that are burning cash
- **And:** When *valuing* companies, ARR is a useful metric that lets you benchmark peers more easily
 - **EX:** Is one company's growth mostly due to *non-recurring* sources, such as consulting engagements? Is its growth lower when you limit revenue to just the recurring sources?

Part 2: How Do You Calculate ARR?

- **Step 1:** Look at the company's revenue from its most recent period (month, quarter, etc.) and **remove all non-recurring revenue** from consulting, services, licenses, etc.
- **Step 2:** Multiply by 4, 12, or another appropriate number to **annualize** this figure

From Customers to ARR

- **More Challenging:** If you get a startup or small business's customer or revenue stats, how do you calculate ARR?
- **Easy Part:** Excluding the non-recurring sources
- **Then:** Start with Recurring Revenue in a previous period and...
 - **Add:** Revenue from New Customers
 - **Add:** "Expansion ARR" (Upsells and Price Increases from Customers)
 - **Subtract:** Downgrades from Existing Customers
 - **Subtract:** Cancellations ("Churn")
- **And:** If required, multiply by 4, 12, etc., to *annualize* this

What Does ARR Mean in Real Life?

- **Valuation:** Some people turn ARR into a multiple (Enterprise Value / ARR or TEV / ARR) – see the Bessemer “Cloud Index” for an example
- **Useful If:** The companies in your set have high percentages of non-recurring revenue, and you want to normalize them
- **Benchmarking:** Useful to see which company is growing because of rising subscriptions vs. ancillary services offered to customers
- **Budgeting:** Does a startup need more support? Sales reps?

What Does ARR Mean in Real Life?

- **TRUTH:** In many real-life cases, especially for large companies, ARR doesn't add *that much* over normal revenue
- **More Useful:** Company is > 50% services/hardware/licenses, or its growth rate has changed a lot in the past month or quarter

Program: Mubadala - Financial Modeling





Thank you!